GV350CEU @Track Air Interface Protocol

GSM/GPRS/LTE CAT1/GNSS Tracker

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1 Revision History

Version	Date	Author	Description of Change
1.00	2021-11-11	Elvin Shen	1. Initial. 2. Added <Network Time Checking> to the command **AT+GTTMA**.
2.00	2022-07-07	Elvin Shen	1. Added mode 3 to <CAN Module Operation Mode> in command **AT+GTRTO**. 2. Added <Encrypt Type> to the command **AT+GTSRI**. 3. Added parameters related to Digital Output in the command **AT+GTBAS**.
2.01	2022-07-18	Elvin Shen	1. Added parameters <Service distance>, <Engine Cold Starts Count>, <Engine All Starts Count>, <Engine Starts by Ignition Count>, <Total Engine Cold Running Time> and <Handbrake Applies During Ride Count> to the message **+RESP:GTCAN**. 2. Added mode 1 to <Output Direction> in the command **AT+GTRTO**.
2.02	2022-08-03	Elvin Shen	1. Added <Working Mode> to the command **AT+GTASC**. 2. Added mode 2 to <LED On> in the command **AT+GTCFG**. 3. Added parameters <RAT> and <Band> to the message **+RESP:GTERI**. 4. Added type 1/2/7/10/11 to parameter <Accessory Type> in the command **AT+GTBAS**. 5. Added the parameter <Index> to the command **AT+GTBID**. 6. Added model 1/2 to parameter <Beacon ID Model> in the command **AT+GTBID**. 7. Added the parameter <ID List Type> to the command **AT+GTIDA**. 8. Modified the range of parameter <AT Command> in command **AT+GTRTO**.

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Version	Date	Author	Description of Change
			9. Added the parameter <Modem IMEI> to the message **+RESP:GTATI**. 10. Deleted the parameter <Configuration Mask> from the command **AT+GTRTO**.
2.03	2022-09-20	Elvin Shen	1. Added mode 2 to parameter <AGPS Mode> in the command **AT+GTCFG**.
3.00	2022-11-30	Elvin Shen	1. Added the parameter <Accelerator Pedal Pressure High Threshold> to the command **AT+GTCLT** to support Kick-Down alarm.
3.01	2023-02-23	Archie Li	1. Added the parameter <Electric Report Mask> to the command **AT+GTCAN** to support reading some parameters of the electric vehicles. 2. Added model 4 to parameter <Beacon ID Model> in the command **AT+GTBID**. 3. Added type 3A to parameter <Sub Command> in the command **AT+GTRTO**.
3.02	2023-03-13	Elvin Shen	1. Added the parameter <Gaseous Fuel Level> to the <CAN Report Expansion Mask> in the command **AT+GTCAN**. 2. Added the command **AT+GTMQT**. 3. Added mode 9 to the parameter <Report Mode> in the command **AT+GTSRI**.
3.03	2023-03-31	Elvin Shen	1. Added mode 2 to the parameter <ODO Enable> in the command **AT+GTCFG**. 2. Added the parameter <Server ID> to the command **AT+GTMQT** to support the configuration of different server IDs.
4.00	2023-05-06	Elvin Shen	1. Added Bit47, Bit48 to the parameter <Input ID Mask> in the command **AT+GTUDF**. 2. Added the **+RESP:GTEUC** message in HEX format. 3. Added the command **AT+GTLTP** to support writing the CA certificate file to the device by subcontracting.

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Version	Date	Author	Description of Change
			4. Added the command **AT+GTRTP** to support downloading CA certificate file from the backend server. 5. Added the command **AT+GTTLS** to support TLS encryption.
4.01	2023-05-15	Allen Zhang	1. Added parameter <Reboot Device Type> to the command **AT+GTDOG**. 2. Added type 6 to <Power On Reason> in the message **+RESP: GTPNR**. 3. Modified the default value of parameter <Bluetooth Name> in command **AT+GTBTS**.
4.02	2023-05-19	Aleo Liu	1. Added mode 5 to the parameter <Keyfob Detection Mode> in the command **AT+GTBID**.
4.03	2023-06-01	Archie Li	1. Added model 5 to parameter <Accessory Model> in the command **AT+GTBAS**.
4.04	2023-06-08	Elvin Shen	1. Added the parameter <Client ID> to the command **AT+GTMQT** to support the configuration of different ClientIDs. 2. Added type 2 to the parameter <Certificate Verification> in the **AT+GTTLS** command to support two-way certification between server and client. 3. Added the parameter <Inverse Alarm Mask 1> in the **AT+GTCLT** command. 4. Added bit29 to <Alarm Mask1> in the **AT+GTCLT** command. 5. The parameter <Mode> of the protocol command **AT+GTEPS** extends the range to mode 3. 6. Added the parameter <IDC Enable>, <IDC Output>, and <IDC Timeout> to the command **AT+GTIDA**. 7. Added the command **AT+GTIDC** to support to delete or verify the authorization status of the target ID.

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Version	Date	Author	Description of Change
			8. Added the **+RESP:GTIDC** message in HEX format and ASCII format.
4.05	2023-06-09	Aleo Liu	1. Added mode 2 to parameter <Report Mode> in the command **AT+GTHBM**. 1. Added the parameter <CRA Debounce Time> in the command **AT+GTCRA**.
4.06	2023-06-14	Bennett Cui	1. Added the parameter <Fixed Temperature Report> in the command **AT+GTACD**. 2. Added the **+RESP:GTFRT** message in HEX format and ASCII format. 3. Added WR200 sensor type in parameter <ID Read Timer> of the command **AT+GTACD**.
	2023-06-19	Rain Wu	4. Added <Format> to Mode 7 of <Working Mode> in the command **AT+GTURT**.
	2023-06-20	Ying Xiong	5. Modified <Alarm Mask 1> to <Combined Alarm Mask1> in message **+RESP:GTCLT**.
4.07	2023-06-26	Elvin Shen	1. Extended the range of parameter <CAN Information Mask> from 0xFF to 0xFFFF to support getting CAN configuration version.
4.08	2023-07-06	Elvin Shen	1. Added Bit13 and Bit14 to <Expansion Information> in the **+RESP:GTCAN** message. 2. Extended parameter <Additional Event> to parameter <Additional Event Mask> and added Bit 5 to the parameter <Additional Event Mask> in the command **AT+GTCAN**. 3. Added <Extended Debug Information>, <Standard Debug Information> and <Hardware Information> to parameter <CAN Information Mask> in the command **AT+GTRTO**.
4.09	2023-07-14	Walker Wang	1. Added Bit 51 <The device fixes GNSS successfully>, Bit 52 <The device fails to fix GNSS>, Bit 53 <TCP server connected> and Bit 54 <TCP server disconnected> to parameter <Input ID Mask> in the command **AT+GTUDF**.
4.10	2023-07-24	Elvin Shen	1. Added the parameter <CAN Report Expansion Mask1> to the command **AT+GTCAN**.

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Version	Date	Author	Description of Change
			2. Added the parameter <Retarder Usage> and <Power Mode> to <CAN Report Expansion Mask1> in the command **AT+GTCAN**. 3. Added <Tachograph Information Expand> to parameter <CAN Report Expansion Mask> in the command **AT+GTCAN**.
5.00	2023-08-02	Aleo Liu	1. Added type 15 to parameter <Accessory Type> and model 0 to parameter <Accessory Model> in the command **AT+GTBAS**. 2. Added the command **AT+GTBTD** to support reporting Bluetooth accessory data.
	2023-08-09	Rain Wu	3. Modified the description of <Working Mode> 7 in the command **AT+GTURT**.
5.01	2023-08-16	Elvin Shen	1. Added "OUT" information to parameter <Tachographer Information Expand> in the **+RESP:GTCAN** message.
5.02	2023-08-29	Len Liu	1. Added Mode 6 and 7 to the command **AT+GTAIS**. 2. Added the command **AT+GTMSI**.
		Walker Wang	3. Deleted mode 1 of <Virtual Ignition Mode> from the **AT+GTVMS** command.
5.03	2023-08-30	Aleo Liu	1. Added Bit 36/37 to the parameter <Input ID Mask> in the command **AT+GTUDF**. 2. Added type 15 and model 1 to the parameters <Accessory Type> and <Accessory Model> in the command **AT+GTBAS** to support MOV ELA Bluetooth sensor.
5.04	2023-09-18	Elvin Shen	1. Added <Battery Instantaneous Voltage>,< Battery Charging Cycles Count>, <Total Energy Recuperated>, <Battery Temperature>, <Battery Charging Current>, <Battery Instantaneous Power>, <Battery State of Health (SoH)>, <Total Energy Used>, <Total Energy Used When Idling>, <Total Energy Charged > parameters to <Electric Report Mask> in the **AT+GTCAN** command.
5.05	2023-09-25	Elvin Shen	1. Added mode 4 to <CAN Module Operation Mode> in the **AT+GTRTO** command

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Version	Date	Author	Description of Change
5.06	2023-10-30	Elvin Shen	1. Deleted the parameters <Brake Speed Threshold>, <Delta Speed Threshold>, <Delta Heading Threshold>, <Working Mode>, <Output ID>, <Output Status>, <Duration> and <Toggle Times> in the command **AT+GTASC**. 2. Added the parameter <Report Mode> in the command **AT+GTASC**.
5.07	2023-11-08	Len liu	1. Added the parameter <Format Version> in the command **AT+GTRTO**.
5.08	2023-12-04	Elvin Shen	1. Update the protocol version.
6.00	2023-10-30	Walker Wang	1. Added <Validity Time> in the **AT+GTDIS** command. 2. Added mode 12/14 to the parameter <GNSS Working Mode> in the command **AT+GTCFG**.
6.01	2023-10-31	Harper Kuang	1. Added parameters <Scan Interval> and <Scan Window> to the command **AT+GTBTS**.
6.02	2023-11-14	Elvin Shen	1. Added Bit1, Bit2, Bit3, Bit4 and Bit6 to <Additional Event Mask> in the **AT+GTCAN** command. 2. Added the parameter <ID Report Format> to the message **+RESP:GTGIN** / **+RESP:GTGOT**.
6.03	2023-11-21	Bear Cao	1. Added the command **AT+GTCDS**.
6.04	2023-12-13	Ying Xiong	1. Expanded PEO number to 200. 2. Added the **AT+GTPEG** command.
6.05	2023-12-14	Haze Zhang	1. Added <Format> to Mode 8 of <Working Mode> in the command **AT+GTURT**.
	2023-12-15	Arthur Li	2. Added mode 14 to the command **AT+GTURT**.
6.06	2023-12-19	Len Liu	1. Added the parameter <Fast STP Mode> to the command **AT+GTSSR**.
6.07	2023-12-29	Elvin Shen	1. Added the parameter <Index> to the command **AT+GTRTO**.
7.00	2024-02-28	Elvin Shen	1. Added the parameters <Machine Model> and <E-GENSET Report Mask> to the command **AT+GTCAN**. 2. Added mode 6 to the command **AT+GTCAN**.

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Version	Date	Author	Description of Change
7.01	2024-03-11	Aleo Liu	1. Added the parameters <Expand Organization Unique Identifier Numbers> and <Organization Unique Identifier> to the command **AT+GTBID**.
7.02	2024-04-24	Claire Liu	1. Added value 4 to <Output Direction> in the command **AT+GTRTO**.
7.03	2024-05-16	Allen Zhang	1. Added the parameters <Primary DNS Server> and <Secondary DNS Server> to the commands **AT+GTSRI** and **AT+GTQSS**.
7.04	2024-05-30	Ying Xiong	1. Added the command **AT+GTTPM** to support RS232 TPMS accessory. 2. Added type 3C to parameter <Sub Command> in the command **AT+GTRTO**. 3. Added mode 41 to parameter <Mode> in the command **AT+GTURT**.
7.05	2024-06-05	Elvin Shen	1. Added Bit16 (<Charge State Optimization>) to <Electric Report Mask> in the **AT+GTCAN** command. 2. Added parameter <Charge State Optimization> to the message **+RESP:GTCAN**.
8.00	2024-06-13	Claire Liu	1. Added parameters <UUID>/<NAME> and modes 2/3 to the command **AT+GTBID**.
8.01	2024-06-19	Vincent Cui	1. Added parameter <ID Filter Mode> to the command **AT+GTIDA.**
8.02	2024-07-05	Archie Li	1. Added model 2/3 to parameter <Accessory Model> when <Accessory Type> is 10 in the command **AT+GTBAS**.
8.03	2024-07-15	Arthur Lee	1. Added <Accessory Type> to mode 41 in the command **AT+GTURT**. 2. Added <Time Out>, <RF Quality> and <Reference Pressure> to <Append Mask> in the command **AT+GTTPM**.
8.04	2024-07-18	Ying Xiong	1. Added parameters <Operation Mask>, <Independent Password Mode>, <Independent Password> and <New Independent Password> to the command **AT+GTSIM**.
	2024-07-23	Elvin Shen	2. Added Bit4 - Bit12 to parameter <CAN Report Expansion Mask1> in the **AT+GTCAN** command.

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Version	Date	Author	Description of Change
	2024-07-24	Bear Cao	3. Supported not resetting the configuration of **AT+GTSIM** when setting <Sub Command> of **AT+GTRTO** to 4.
8.05	2024-08-12	Claire Liu	1. Added parameter <Message Type> to the **AT+GTBID** command. 2. Added **+RESP:GTBIE** message.
8.06	2024-09-02	Len Liu	1. Added command **AT+GTBFS**. 2. Deleted the parameters <NAME> and <UUID> from the command **AT+GTBID**. 3. Added Bit8 to <CAN Information Mask> in the command **AT+GTRTO**.
8.07	2024-09-20	Archie Li	1. Added parameter <IDA Trigger> to the command **AT+GTBID**. 2. Added the parameters <RPM>, <Total Revolutions Counter> and <Angle Sensor Mode> to the message **+RESP:GTERI**. 3. Added the command **AT+GTSVR**. 4. Added type 14 to parameter <Sub Command> in the command **AT+GTRTO**.
	2024-09-24	Elvin Shen	5. Added type 13 to <Command Type> in the **AT+GTTTR** command to support querying driver2 name/id/time related status. 6. Added type 10 to <Message Type> in the **+RESP:GTTTR** message.
		Bennett Cui	7. Deleted the parameter <Read Interval> from the command **AT+GTBAS**.
8.08	2024-10-10	Elvin Shen	1. Added the parameter <Total Fuel or Idle Fuel Used Expand> to <CAN Report Expansion Mask1> in the command **AT+GTCAN** to support petrol/diesel total fuel usage and gas total fuel usage.
9.00	2024-10-14	Archie Li	1. Added command **AT+GTIDS**, and added option 2 to parameter <ID List Type> in **AT+GTIDA**.
	2024-10-18	Claire Liu	2. Added Bit 0 (<Accessory Name>) to the parameter <Accessory Append Mask> in the **AT+GTBID** command.

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Version	Date	Author	Description of Change
9.01	2024-10-31	Len Liu	1. Added type 2 to the parameter <Satellite Terminal Type> in the command **AT+GTURT**.
	2024-11-06	Len Liu	2. Added parameter <ID Reader Type> to the command **AT+GTACD** to support 1-wire keyboard.
	2024-11-07	Elvin Shen	3. Added parameter <PDP Type> to **AT+GTBSI** command to support IPV6 feature.
	2024-11-13	John Wang	4. Modified the description of <SACK Mode> in the command **AT+GTSRI**. 5. Added Enhanced <Satellite in Use> to <+RSP Expansion Mask> and <+EVT Expansion Mask> in the command **AT+GTHRM**.
	2024-12-02	Bear Cao	6. Added Bit 3 to the parameter <Satellite Information Mask> in the command **AT+GTRTO**. 7. Added the **+RESP:GTASV** message. 8. Added Bit 5 to the parameter <INF Expansion2 Mask> in the command **AT+GTHRM**.
9.02	2024-12-10	Elvin Shen	1. Added Bit 9 to the parameter <Alarm Mask 3> in the command **AT+GTCLT** to support charge status alarm when <Charging State> changes. 2. Added the parameter <Electric Report Mask> to the **AT+GTCLT** command. 3. Added Bit 28 to the parameter <CAN Data Mask> in the command **AT+GTCLT** to support enabling <Electric Report Mask>. 4. Added type 3 to parameter <ID Report Type> in the message **+RESP:GTIDA**.
9.03	2024-12-26	Len Liu	1. Added parameter <Reboot Switch Mask> to the command **AT+GTDOG**. 2. Modified the maximum range of parameters <Samples Before Crash> and <Samples After Crash> to 3200 in the command **AT+GTCRA**.
9.04	2025-01-02	Len Liu	1. Added the command **AT+GTGPJ**. 2. Added the parameter to the message **+RESP:GTDTT** (Long Format).

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Version	Date	Author	Description of Change
	2025-01-17	Elvin Shen	3. Added %IMEI% to the parameter <Subscribe/Publish Topic> in the command **AT+GTMQT**.
10.00	2025-02-14	Elvin Shen	1. Added Bit14 (<Vehicle Gross Weight>) to parameter <CAN Report Expansion Mask1> in the **AT+GTCAN** command. 2. Added Bit4 (GNSS Jamming State) to parameter <Position Append Mask> in the **AT+GTCFG** command to support reporting GNSS Jamming state.
10.01	2025-02-14	Elvin Shen	1. Added Bit19 to the parameter <Event Mask> in the **AT+GTCFG** command to support reporting **+RESP:GTSOT** message.
	2025-02-20	Archie Li	2. Added the parameter <Sensitivity> and <Warning Output> to the command **AT+GTJDC**. 3. Added the state 5 and 6 to the parameter <Jamming Status> of the message **+RESP:GTJDS**.
10.02	2025-03-31	Len Liu	1. Added Bit4 - Bit21 to the parameter <E-GENSET Report Mask> in the **AT+GTCAN** command.
	2025-04-02	Ying Xiong	2. Added RFID Type 8 to the command **AT+GTURT**. 3. Added the command **AT+GTUHF**.
10.03	2025-04-15	Bear Cao	1. Added the command **AT+GTROS**.
		Elvin Shen	2. Added the parameters <CAN Report Expansion Mask1>, <High Retarder Usage> and <Low Retarder Usage> to the command **AT+GTCLT**. 3. Added Bit10 - Bit13 to the parameter <Alarm Mask 3> in the command **AT+GTCLT**.
	2025-04-30	Bear Cao	4. Added Type 4 to parameter <Report Type> in the command **AT+GTDAT**.
	2025-05-09	Len Liu	5. Added unknown type to parameter <Beacon Type> in the messages **+RESP:GTBID** and **+RESP:GTBIE**.
11.00	2025-05-14	Len Liu	1. Added Bit15 <Tire Pressures and Tire Temperatures> and Bit16 <Remaining Time to Maintenance Service> to the parameter <CAN

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Version	Date	Author	Description of Change
			Report Expansion Mask1> in the **AT+GTCAN** command.
	2025-05-20	Len Liu	2. Added mode 5 to the parameter <Mode> and mode 3 to the parameter <RFID Report Mode> in the **AT+GTIDA** command.
11.01	2025-05-28	Len Liu	1. Added the parameter <Accelerator Pedal Pressure Low Threshold> to the command **AT+GTCLT**. 2. Added Bit14 to parameter <Alarm Mask 3> in the **AT+GTCLT** command.
	2025-06-04	Len Liu	3. Added Bit17 <Total Fuel Read from Vehicle's Computer> and Bit18 <Total Gaseous Fuel Usage> to the parameter <CAN Report Expansion Mask1> in the command **AT+GTCAN**.
	2025-06-05	Bear Cao	4. Added model 10 to the parameter <Beacon ID Model> in the command **AT+GTBID**. 5. Added type 5 to the parameter <Power On Reason> in the message **+RESP:GTPNR**.
		Ying Xiong	6. Supported wildcard %CSN% for the parameter <Download URL> when setting the parameter <Update Type> to 5.
	2025-06-12	Bear Cao	7. Added **+RESP:GTSOT** message to the high-priority messages.
11.02	2025-07-07	Bear Cao	1. Added the command **AT+GTATS**. 2. Added mode 44 to the parameter <Working Mode> in the command **AT+GTURT**.
	2025-07-11	Elvin Shen	3. Added the parameter <Connect Mask> to the command **AT+GTMQT** to support Cumulocity MQTT broker server.
11.03	2025-07-12	Elvin Shen	1. Supported DR200_V80 1-wire accessory.
11.04	2025-07-21	Bear Cao	1. Added the parameter <DTC Status> to the <CAN Report Expansion Mask1> in the command **AT+GTCAN**.
		Len Liu	2. Added Bit22 - Bit25 to the parameter <E-GENSET Report Mask> in the **AT+GTCAN** command.

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Version	Date	Author	Description of Change
	2025-07-23	Bear Cao	3. Modified the default value of the parameter <GNSS Working Mode> in the command **AT+GTCFG** to 12.
11.05	2025-08-01	Bear Cao	1. Added model 9 to parameter <Beacon ID Model> in the command **AT+GTBID**. 2. Added **+RESP:GTBFS** and **+RESP:GTBFE** messages. 3. Added type 44 to parameter <Sub Command> in the command **AT+GTRTO**.
	2025-08-06	Bear Cao	4. Deleted the parameter <Position Append Mask> from the **+RESP:GTDAT** message in long format.
12.00	2025-08-14	Elvin Shen	1. Optimized <Battery Level> parameter reading on electric and hybrid vehicles.
12.01	2025-09-03	Arthur Li	1. Added model 7 to parameter <Beacon ID Model> in the command **AT+GTBID**.
12.02	2025-09-09	Arthur Li	1. Added mode 3 to the command **AT+GTIDC**.
	2025-09-11	Len Liu	2. Added the parameter <Speed Delta> to the command **AT+GTFRI**.
12.03	2025-09-16	Bear Cao	1. Added the parameters <Validity Time> and <Timeout after Ignition Off> to the command **AT+GTATS**.
12.04	2025-09-28	Bear Cao	1. Added the parameter <Encryption Mode> to the command **AT+GTMSI**. 2. Added the parameter <GNSS off Latency> to the command **AT+GTCFG**. 3. Added the command **AT+GTGNA**.
12.05	2025-10-27	Len Liu	1. Added type 10 to the <Command Type> parameter in the **AT+GTTTR** command.
12.06	2025-10-31	Bear Cao	1. Added Bit29 to the parameter <ERI Mask> in the command **AT+GTFRI**. 2. Added <Data Mask> to Mode 4 of <Working Mode> in the command **AT+GTURT**.
12.07	2025-11-14	Len Liu	1. Added type 46 to parameter <Sub Command> in the command **AT+GTRTO**. 2. Added the message **+RESP:GTCBS**.

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Version	Date	Author	Description of Change
			3. Added parameters <THR100 Check Information> and <THR100 bus Status> to the message **+RESP:GTTTR**.
12.08	2025-11-21	Bear Cao	1. Added the commands **AT+GTTMC** and **AT+GTTMT**. 2. Added mode 46 to the command **AT+GTURT**.
13.00	2025-12-22	Bear Cao	1. Added the parameter <Last Position> to the commands **AT+GTAIS** and **AT+GTEPS**.
13.01	2026-01-07	Bear Cao	1. Modified the unit of the parameter <Report Message Interval> in the **AT+GTTMT** command to seconds, with a range of 0 - 86400.
	2026-01-13	Bear Cao	2. Added the parameters <TMR ASCII Mask> and <Report Item Mask> to the message **+RESP:GTTMR**.
13.02	2026-02-27	Arthur Lee	1. Added type 23 to parameter <Accessory Type> and model 0 to parameter <Accessory Model> in the command **AT+GTBAS**.
	2026-03-04	Bear Cao	2. Modified the range of the parameter <Length of ID Number> in the command **AT+GTIDS** to 4 - 28.
13.03	2026-03-23	Bear Cao	1. Added type 14 to the parameter <Accessory Type> in the command **AT+GTBAS**.
13.04	2026-03-26	Bear Cao	1. Added the command **AT+GTCAS**.
13.05	2026-04-20	Arthur Lee	1. Added model 4 to the parameter <Authorised> in the command **AT+GTIDC**.
13.06	2026-05-13	Bear Cao	1. Added the command **AT+GTETI**.

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2 Overview

2.1 Scope of This Document

The @Track Air Interface Protocol is a digital communication interface between Queclink Trackers and the backend server. It is used for all communication between the backend server and the terminal via SMS or GPRS. The backend server sends a command to the terminal and then the terminal confirms the receipt with an acknowledgement message. If configured, the terminal also sends report messages to the backend server.

The purpose of this document is to describe how to build the backend server based on the @Track Air Interface Protocol.

2.2 Terms and Abbreviations

Abbreviation	Description
APN	Access Point Network
ASCII	American National Standard Code for Information Interchange
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
GNSS	Global Navigation Satellite System
HDOP	Horizontal Dilution of Precision
ICCID	Integrated Circuit Card identity
IP	Internet Protocol
SMS	Short Message Service
TCP	Transmission Control Protocol
UDP	User Datagram Protocol
UTC	Coordinated Universal Time

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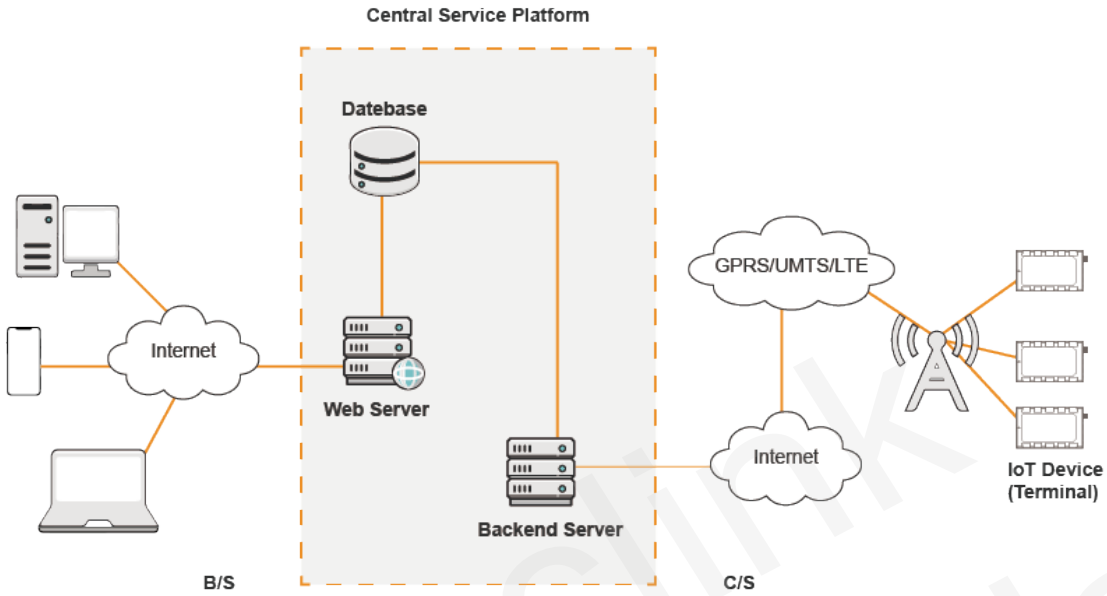
2.3 System Architecture



The backend server needs to be accessible by many terminals and should have the following abilities:

- ✧ The backend server should be able to access the Internet and listen for the connection requests originating from the terminal.
- ✧ The backend server should be able to support TCP or UDP connection with the terminal. It should be able to receive data from the terminal and send data to the terminal.
- ✧ The backend server should be able to receive and send SMS.

2.4 Frame Types

The @Track protocol contains the following types of frames, depending on their purpose:

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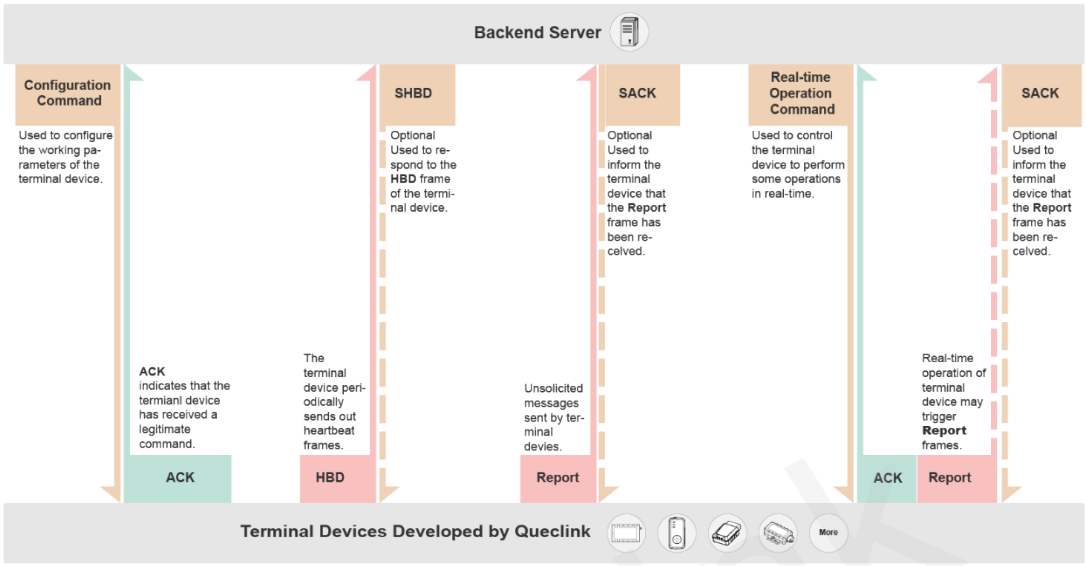

Frame Types and Encoding

For each frame, the unit of Length is Byte. Please refer to Commands/ ASCII/ HEX for the detailed format of the above types of frames.

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3 Commands

Commands are used to set the working parameters of the terminal or to cause the terminal to perform certain operations. Please refer to the details below.

3.1 Network Settings

This section describes the commands related to the connection between the terminal device and external units (such as the backend server). Please refer to the details below.

3.1.1 BSI (Bearer Setting Information)

The command **AT+GTBSI** is used to configure the parameters for GSM/GPRS/LTE Cat1 data connection.

Example:
AT+GTBSI=gv350ceu,cmnet,,,3gnet,,,0,,,0000$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	BSI	BSI
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	APN	<=64		
	APN User Name	<=30		
	APN Password	<=30		
	Backup APN	<=64		
	Backup APN User Name	<=30		
	Backup APN Password	<=30		
	Network Mode	1	0| 1| 3	0
	Reserved	0		
	PDP Type	1	0-1	0
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	

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Parts	Fields	Length	Range/Format	Default
	Tail	1	$	$

- *Password*
  The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".
- *APN*
  Access point name (APN).
- *APN User Name*
  The user name of APN.
- *APN Password*
  The password of APN.
- *Backup APN*
  Backup access point name. If <APN> does not work, <Backup APN> will be used.
- *Backup APN User Name*
  The user name of backup APN.
- *Backup APN Password*
  The password of backup APN.

  Note

  Please set the parameter value to "%CLR%" if there is a need to erase the parameter <APN>, <APN User Name>, <APN Password> , <Backup APN>, <Backup APN User Name> or <Backup APN Password>. These parameter values will not be cleared if they are empty.
- *Network Mode*
  - **0** - Auto (LTE & GSM/EGPRS)
  - **1** - GSM/EGPRS Only
  - **3** - LTE Only
- *PDP Type*
  - **0** - IPV4 Internet Protocol (IETF STD 5)
  - **1** - IPV6 Internet Protocol, version 6 (IETF RFC 2460)
- *Serial Number*
  The serial number of the command. It will be included in the ACK message for the command.
- *Tail*
  A character which indicates the end of the command. It must be "$".

3.1.2 SRI (Backend Server Registration Information)

The command **AT+GTSRI** is used to configure how to report all the messages, including the server information and the method of communication between the backend server and the terminal. If the terminal is configured correctly, it should be able to report data to the backend server.

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Example:
AT+GTSRI=gv350ceu,3,,1,60.174.225.173,20581,60.174.225.173,20581,13812341234,15,1,0,0,,,0.0.0.0,0.0.0.0,0,0001$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	SRI	SRI
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Report Mode	1	0-7| 9	0
	Reserved	0		
	Buffer Mode	1	0-2	1
	Main Domain	<=60	ASCII(not including '=' and ',')	
	Main Port	<=5	0-65535	
	Backup Domain	<=60	ASCII(not including '=' and ',')	
	Backup Port	<=5	0-65535	
	SMS Gateway	<=20		
	Heartbeat Interval	<=3	0| 2-360(min)	0
	SACK Mode	1	0-2	0
	Protocol Format	1	0| 1	0
	SMS ACK Mode	1	0| 1	0
	Reserved	0		
	Reserved	0		
	Primary DNS Server	<=15		0.0.0.0
	Secondary DNS Server	<=15		0.0.0.0
	Encryption Mode	1	0-2	0
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Report Mode*

This parameter defines the method of communication between the backend server and the terminal. Supported report modes are as follows:

- **0** - Stop mode
- **1** - TCP short-connection preferred mode

The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. If the terminal fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will try to send data to the SMS gateway via SMS.

- **2** - TCP short-connection forced mode

The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes sending data. If the terminal fails to establish TCP connection to the backend server (both Main Server and Backup Server), it will store the data in the memory buffer if the buffer report function is enabled. Otherwise, the data is discarded.

- **3** - TCP long-connection mode

The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using heartbeat data. The backend server should respond to the heartbeat data from the terminals.

- **4** - UDP mode

The terminal will send data to the backend server through the UDP protocol. Receiving protocol commands via UDP is supported if the GPRS network allows it. It is recommended to enable heartbeat and **PDP** (ASCII)/(HEX) report when receiving commands via UDP.

- **5** - Forced SMS mode

Only SMS is used for data transmission.

Note

The messages **GSM** (ASCII)/(HEX) , **PHL** (ASCII)/(HEX), **ALM** (ASCII) , and +DAT are sent via TCP short connection when the report mode is forced SMS mode.

- **6** - UDP with fixed local port mode

Like the UDP mode, the terminal will send data using UDP protocol. The difference is the terminal will use a fixed local port rather than a random port to communicate with the server in this mode. Thus the backend server could use the identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the main server.

- **7** - Backup server supported TCP long-connection mode

The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using the heartbeat data. The backend server should respond to the heartbeat data from the terminals. If the connection to the main server is lost, the

terminal will try to connect to the backup server. If the connection to the backup server is also lost, the terminal will try to connect to the main server again.

- **9** - MQTT mode

MQTT is a Client-Server based on message Publish/Subscribe transport protocol. The protocol is built on the TCP protocol. This mode has a default username(**admin**) and password(**password**) as well as a subscription topic(**quec_msg**) and a publication topic(**quec_ctrl**).

✧ *Buffer Mode*

The working mode of the buffer report function.

If the buffer report function is enabled and the device goes into areas without network coverage, it will store all reports locally.

If the device goes into areas with network coverage again, it will then send all the buffered reports.

- **0** - Disable
- **1** - Low priority

In this mode, the device will send the buffered messages after real-time messages.

- **2** - High priority

In this mode, the device will send all the buffered messages before real-time messages, except the messages **+RESP:GTSOS**, **+RESP:GTPFA**, **+RESP:GTPFR**, **+RESP:GTPDP**, **+RESP:GTUPD**, **+RESP:GTSOT**.

✧ *Main Domain*

The IP address or the domain name of the main server.

✧ *Main Port*

The port number of the main server.

✧ *Backup Domain*

The IP address or the domain name of the backup server.

✧ *Backup Port*

The port number of the backup server.

✧ *SMS Gateway*

It is a maximum of 20 characters including the optional national code starting with "+" for sending SMS messages. Short code (for example, 10086) is also supported.

✧ *Heartbeat Interval*

The interval for sending heartbeat messages (**+ACK:GTHBD**) when report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat message will be sent.

✧ *SACK Mode*

Specify whether the terminal needs to wait for the SACK message from the backend server after successfully sending a message to the backend server. Please note that it requires the backend server to be able to reply to the terminal with the SACK message if <SACK Mode> is not 0.

- **0** - The terminal does not wait for the SACK message after sending a message to the backend server.

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- **1** - The terminal will wait for the SACK message for 20 seconds after sending a message to the backend server. It will resend the message up to 4 times if the SACK message from backend server cannot be received correctly or the serial number of the SACK message does not match the last message sent.
- **2** - Similar to <SACK Mode> 1, the difference is that the terminal does not check the serial number of the SACK message in this mode.

Note

If the terminal receives **+SACK:GTHBD** from the backend server, the terminal must check the serial number of the SACK message **+SACK:GTHBD** regardless of the value of <SACK Mode>.

✧ *Protocol Format*

This parameter defines the format of the report messages sent from the device to the backend server.

- **0** - ASCII format
- **1** - HEX format

✧ *SMS ACK Mode*

This parameter defines whether to reply with the ACK confirmation via SMS when the command is sent via SMS.

- **0** - The device will send the ACK confirmation using the mode specified by <Report Mode>.
- **1** - The device will send the ACK confirmation via SMS to the phone number from which the command is sent via SMS.

✧ *Primary DNS Server*

The address of primary DNS server.

✧ *Secondary DNS Server*

The address of secondary DNS server.

Note

If both <Primary DNS Server> and <Secondary DNS Server> are 0.X.X.X, 127.X.X.X or 255.X.X.X, the default DNS server obtained from network will be used.

✧ *Encryption Mode*

A numeral to indicate the message encryption method.

- **0** - Disable encryption
- **1** - AES-256 encryption includes IMEI.
- **2** - AES-256 encryption does not include IMEI, using report head +ARSP/+ABUF.

Note

Only messages with the header type "**+RESP**" or "**+BUFF**" can be encrypted but the message encryption method does not support SMS encryption.

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3.1.3 QSS (Quick Start Settings)

The command **AT+GTQSS** is used to configure GPRS and backend server parameters if the length of all the settings is less than 160 bytes. Otherwise, the two commands AT+GTBSI and AT+GTSRI are used to set those parameters.

Example:
AT+GTQSS=gv350ceu,cmnet,,,3,,1,60.174.225.173,20581,60.174.225.173,20581,13812341234,15,1,0,0,0.0.0.0,0,0.0.0.0,0,0002$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	QSS	QSS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	APN	<=64		
	APN User Name	<=30		
	APN Password	<=30		
	Report Mode	1	0-7| 9	0
	Reserved	0		
	Buffer Mode	1	0-2	1
	Main Domain	<=60	ASCII(not including '=' and ',')	
	Main Port	<=5	0-65535	
	Backup Domain	<=60	ASCII(not including '=' and ',')	
	Backup Port	<=5	0-65535	
	SMS Gateway	<=20		
	Heartbeat Interval	<=3	0| 2-360(min)	0
	SACK Mode	1	0-2	0
	Protocol Format	1	0| 1	0
	SMS ACK Mode	1	0| 1	0

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Parts	Fields	Length	Range/Format	Default
	Primary DNS Server	<=15		0.0.0.0
	Secondary DNS Server	<=15		0.0.0.0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

3.1.4 MQT (MQTT Server Information)

The command **AT+GTMQT** is used to configure the username and password to connect to the MQTT server and to subscribe and publish topics. If the terminal is configured correctly, it should be able to report data to the MQTT server.

Example:
AT+GTMQT=gv350ceu,0,60,admin,password,,quec_ctrl,,quec_msg,,#,0,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	MQT	MQT
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Server ID	1	0	0
	Keep Alive	<=4	0| 5-1080(min)	60
	Username	<=64	ASCII(not including ',')	admin
	MQTT Password	<=150	ASCII(not including ',')	password
	Reserved	0		
	Subscribe Topic	<=64	ASCII(not including ',')	quec_ctrl
	Reserved	0		
	Publish Topic	<=64	ASCII(not including '+' and '#' ',')	quec_msg
	Reserved	0		
	Client ID	<=64	'0' - '9' 'a' - 'z' 'A' - 'Z' '#'	#
	Connect Mask	<=2	0-FF	0

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

- *Password*

  The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

- *Keep Alive*

  It is used to set keep alive mechanism for MQTT. It is a time interval measured in minutes. In particular, 0 means the keep alive mechanism is disabled. Unit: minute.

- *Username*

  If the MQTT server uses authentication, the username is specified here.

- *MQTT Password*

  If the MQTT server uses authentication, the password is specified here.

  Note

  If using the Azure IOT platform and using SAS Token authentication. This parameter field here is the SAS Token.

- *Subscribe Topic*

  The client subscribes to topic name.

  Note

  If the MQTT server supports wildcards, the rules for using the ('#' U+0023) and ('+' U+002B) wildcards in the <Subscribe Topic> are as follows:

  The number sign ('#' U+0023) is a multi-level wildcard that can match any number of levels within a topic. When used, it must be specified either on its own or following a topic level separator ('/' U+002F). In either case, it must be the last character specified in the Topic Filter.

  The plus sign ('+' U+002B) is a single-level wildcard that matches only one level within a topic. The single-level wildcard can be used at any level in the Topic Filter, including the first and the last levels. Where it is used, it must occupy the entire level of the filter. It can be used at more than one level in the Topic Filter and can also be used in conjunction with the multi-level wildcard.

- *Publish Topic*

  The client publishes topic name.

- *Client ID*

  Each client connected to the server has a unique client identifier (Client ID). Both the client and the server must use the Client ID to identify the state associated with the MQTT session between them. The Client ID can contain only uppercase letters, lowercase letters and numeric characters.

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For example:

0123456789abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ

✧ *Connect Mask*

The parameter contains a number of parameters specifying the behavior of the MQTT connection.

Mask Bit	Item	Description
Bit 0	<Clean Session>	The Client and Server can store Session state to enable reliable messaging to continue across a sequence of Network Connections. This bit is used to control the lifetime of the Session state. If this bit is set to 0, the server must resume communications with the client. If this bit is set to 1, the client and server must discard any previous session and start a new one.
Bit 1-7	Reserved	

Note

In addition, a single character "#" is defined to indicate the use of the IMEI number that will be used internally as the Client ID.

The "%IMEI%" in the Subscribe Topic or Publish Topic name are replaced with IMEI number.

3.1.5 OWL (Operator List Configuration)

The command **AT+GTOWL** is used to configure an allowlist or blocklist of operators to allow GPRS connection.

Example:

AT+GTOWL=gv350ceu,1,1,1,46000,60,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	OWL	OWL
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	Start Index	<=3	1-100	1
	End Index	<=3	1-100	1

Parts	Fields	Length	Range/Format	Default
	Operator List	<=6*100		
	TCP Connection Timeout	2	30-90(min)	60
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of this function.

- **0** - Disable
- **1** - Allowlist mode

The parameter <Operator List> is allowlist.

- **2** - Blocklist mode

The parameter <Operator List> is allowlist.

✧ *Start Index*

A numeral to indicate the first index of the list operator numbers to be input. For example, if it is 1, the device will update the list operators from the first one. If it is empty, there should be no list number.

✧ *End Index*

A numeral to indicate the last index of the list operator numbers to be input. For example, if it is 2, the device will update the list operators until the second one. If it is empty, there should be no list number.

✧ *Operator List*

A list of PLMN codes for network operators. The PLMN code comprises of mobile country code **MCC** and mobile network code **MNC**, each of which consists of 3 digits. The last digit of MNC can be omitted, for example, **46001F** or **46001** represents the PLMN of **CHINA UNICOM**.

The operators in this list will be considered as in **Home** state. And two adjacent operator codes are separated with ','. The number of the operators in the list is determined by the parameters <Operator Start> and <Operator End>. For example, if <Operator Start> is 1 and <Operator End> is 2, the operator list should include 2 operator codes (empty value acceptable) and the two numbers are separated by with ','.

MCCFF type code is used to identify operators across a whole country. For example, **460FF** covers the mobile network operators all across China.

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✧ *TCP Connection Timeout*

The timeout period for the terminal to establish connection to the TCP server.

Note

In order to prevent conflicts, please do not use commands **AT+GTOWL** and AT+GTRMD to configure the same operator.

3.1.6 FTP (FTP Server Information)

The command **AT+GTFTP** is used to configure the FTP server information as to where and how to upload data packets.

Example:

AT+GTFTP=gv350ceu,116.228.146.250,21,SW_RD/Projects/,queclink,queclink,0,1,1,IMEI,,,000B$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	FTP	FTP
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Server Address	<=60		
	Server Port	<=5	0-65535	0
	Full Name	<=60		
	User Name	<=20		
	Login Password	<=20		
	Transfer Mode	1	0-1	0
	Operate Type	1	0-1	0
	Report FTP	1	0-1	0
	File Name Prefix	<=20	'0' - '9' 'a' - 'z' 'A' -'Z' '-' '_'	
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

- *Server Address*
  The IP address or the domain name of the FTP server.
- *Server Port*
  The server port of the FTP server.
- *Full Name*
  The file path to save pictures. To restore the default path after a path is set, set it to "\".
- *User Name*
  The user name to login to the FTP server.
- *Login Password*
  The password to login to the FTP server.
- *Transfer Mode*
  The mode of transferring file.
  - **0** - Passive mode
  - **1** - Active mode
- *Operate Type*
  The mode of transferring picture after transfer fails.
  - **0** - Resume transferring the failed file
  - **1** - Restart transferring the failed file from the beginning
- *Report FTP*
  Whether to report **FTP**(ASCII)/(HEX) to the backend server after transferring a file.
  - **0** - Disable
  - **1** - Enable
- *File Name Prefix*
  The file name prefix of transformed file. It should not include ".".

3.1.7 MSI (Multi Server Information)

The command **AT+GTMSI** is used to configure where and how to report all the messages, including the server information and the communication method between the backend server and the terminal. When the terminal is configured correctly, it should be able to report data to the backend server.

Example: AT+GTMSI=gv350ceu,,2,0,60.174.225.173,20581,0,0,,,,,,FFFF$

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Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	MSI	MSI
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Server ID	1	2	2
	Report Mode	1	0| 2-4| 6	0
	Domain	<=60	ASCII(not including '=' and ',')	
	Port	<=5	0-65535	
	Heartbeat Interval	<=3	0| 2-360(min)	0
	SACK Mode	1	0-2	0
	Reserved	0		
	Encryption Mode	1	0-2	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Server ID*

The index of the Multi Server.

✧ *Report Mode*

This parameter defines the communication method between the backend server and the terminal. Supported report modes are as follows:

- **0** - Stop mode
- **2** - TCP short-connection forced mode

The connection is based on TCP protocol. The terminal connects to the backend server every time it needs to send data and will shut down the connection when the terminal finishes

sending data. If it fails to establish TCP connection to the backend server, the data will be stored in the memory buffer when buffer report function in AT+GTSRI command is enabled. Otherwise, the data will be discarded.

- **3** - TCP long-connection mode

The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using heartbeat data. The backend server should respond to the heartbeat data from the terminals.

- **4** - UDP mode

The terminal will send data to the backend server by UDP protocol. Receiving protocol commands via UDP is supported if the GPRS network allows it. It is recommended to enable heartbeat sending and **+RESP:GTPDP** report when receiving commands via UDP.

- **6** - UDP with fixed local port

Like the UDP mode, the terminal will send data using UDP protocol. The difference is the terminal will use a fixed local port rather than a random port to communicate with the server in this mode. Thus, the backend server could use the identical port to communicate with all terminals if the backend server and the terminals are all in the same VPN network. The port number the device uses is the same as the port number of the primary server.

✧ *Domain*

The IP address or the domain name of the primary server.

✧ *Port*

The port number of the primary server.

✧ *Heartbeat Interval*

The interval for sending heartbeat package message (**+ACK:GTHBD**) when report mode is TCP long-connection mode or UDP mode. If it is set to 0, no heartbeat package message will be sent.

✧ *SACK Mode*

Specify whether the terminal needs to wait for the SACK message from the backend server after successfully sending a message to the backend server. Please note that it requires the backend server to be able to reply to the terminal with the SACK message if<SACK Mode> is not 0.

- **0** - The terminal does not wait for the SACK message after sending a message to the backend server.
- **1** - The terminal will wait for the SACK message for 20 seconds after sending a message to the backend server. It will resend the message up to 4 times if the SACK message from backend server cannot be received correctly or the serial number of the SACK message does not match the last message sent.
- **2** - Similar to <SACK Mode> 1, the difference is that the terminal does not check the serial number of the SACK message in this mode.

Note

If the terminal receives **+SACK:GTHBD** from the backend server, the terminal must check the serial number of the SACK message **+SACK:GTHBD** regardless of the value of <SACK Mode>.

✧ *Encryption Mode*

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A numeral to indicate the message encryption method.

- **0** - Disable encryption.
- **1** - AES-256 encryption includes IMEI.
- **2** - AES-256 encryption does not include IMEI, using report head **+ARSP/+ABUF**.

Note

Only messages with the header type "+RESP" or "+BUFF" can be encrypted but the message encryption method does not support SMS encryption.

3.1.8 TLS (TLS Data Encryption)

The command **AT+GTTLS** is used to configure TLS encryption parameters.

Example:

AT+GTTLS=gv350ceu,0,1,1,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TLS	TLS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Server ID	1	0	0
	Mode	1	0-1	0
	Verification Mode	1	0-2	0
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Server ID*

The index of the Server.

- **0** - The server is configured in the AT+GTSRI command.

✧ *Mode*

The working mode of the TLS function.

- **0** - Disable
- **1** - Enable

✧ *Verification Mode*

It specifies the certificate verification method for the terminal.

- **0** - Do not verify the certificates

  In this method, no certificates need to be built into the terminal.
- **1** - Only server certification

  In this method, at least the CA file needs to be built into the terminal.
- **2** - Two-way certification between server and client

  In this method, at least the CA file, Client Certificate file, Client key file need to be built into the terminal.

Note

TLS encryption is only valid for TCP and MQTT connections, whereas DTLS encryption is used for the UDP connection.

3.1.9 ETI (Electronic Toll Information)

The command **AT+GTETI** is used to configure **ETI** (ASCII) reporting.

Example:

AT+GTETI=gv350ceu,,3,3,60.174.225.173,30411,0,0,,,30,0,0,0,0,0,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	ETI	ETI
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Server ID	1	3	3
	Report Mode	1	0| 3	0
	Domain	<=60	ASCII (not including '=' and ',')	
	Port	<=5	0-65535	
	Reserved	0		
	SACK Mode	1	0-2	0

Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Check Interval	<=5	0-86400(s)	0
	Send Interval	<=5	1-86400(s)	30
	IGF Report Interval	<=5	0| 5-86400(s)	600
	Geographical Scope	1	0	0
	Output ID	1	0-5	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Server ID*

The index of the Server.

✧ *Report Mode*

This parameter defines the communication method between the backend server and the terminal. Supported report modes are as follows:

- **0** - Stop mode.
- **3** - TCP long-connection mode.

The connection is based on TCP protocol. The terminal connects to the backend server and maintains the connection using heartbeat data. The backend server should respond to the heartbeat data from the terminals.

✧ *Domain*

The IP address or the domain name of the primary server.

✧ *Port*

The port number of the primary server.

✧ *SACK Mode*

Specify whether the terminal needs to wait for the SACK message from the backend server after successfully sending a message to the backend server. Please note that it requires the backend server to be able to reply to the terminal with the SACK message if <SACK Mode> is not 0.

- **0** - The terminal does not wait for the SACK message after sending a message to the

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backend server.

- **1** - The terminal will wait for the SACK message for 20 seconds after sending a message to the backend server.

It will resend the message up to 4 times if the SACK message from backend server cannot be received correctly or the serial number of the SACK message does not match the last message sent.

- **2** - Similar to <SACK Mode> 1, the difference is that the terminal does not check the serial number of the SACK message in this mode.

✧ *Check Interval*

The interval for updating GNSS position. If the parameter value is 0, the device will update GNSS position according to the value of <Send Interval>. Make sure <Check Interval> is not greater than <Send Interval> so that position data is ready before sending time arrives.

✧ *Send Interval*

The interval for sending the position information by the message **+RESP:GTETI**.

Note

Due to the limit of the maximum report message length, make sure the <Send Interval>/<Check Interval> ratio is less than or equal to 15.

✧ *IGF Report Interval*

The interval for acquiring and sending the position information when < Report Mode> is not 0 and <Power Saving Mode> in AT+GTCFG is set to 0 or 2 with engine off. If <IGF Report Interval> is less than 60 seconds, the GNSS will be always on.

✧ *Geographical Scope*

Location information outside the designated area will not generate an **+RESP:GTETI** message.

- **0** - Poland

Note

If the device possesses network connectivity and obtains valid GNSS positioning, it shall output data according to the parameters <Output ID>, <Output Status>, <Duration>, <Toggle Times>. Otherwise, it shall output an active status according to <Output ID>.

3.2 Device Configuration

This section describes the commands related to the device generic configurations. Please refer to the details below.

3.2.1 ASC (Axis Self-Calibration)

The command **AT+GTASC** is used to define the condition for calibrating the directions of accelerometer. When the auto self-calibration factor is updated, the device will report the event

message **ASC** (ASCII)/(HEX) containing the calibration result to the backend server. The pre-condition for the calibration is ignition on and movement.

Note

To avoid possible inaccuracies caused by historical calibration data, please clear the self-calibration status of the acceleration data via the sub command 25 in AT+GTRTO after the device is installed.

Example:

AT+GTASC=gv350ceu,,,,,1,,,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	ASC	ASC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Report Mode	1	0| 1	1
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z', and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Report Mode*

Enable/disable the **+RESP:GTASC** report.

- **0** - Disable
- **1** - Enable

3.2.2 CFG (Global Configuration)

The **AT+GTCFG** command is used to configure global parameters.

Example:

AT+GTCFG=gv350ceu,,GV350CEU,0,0.0,,,003F,1,00,7DEF,,0,0,300,00,1,0,0,001F,0,12,,,,,,300,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CFG	CFG
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	New Password	4 - 20	'0' - '9' 'a' - 'z' 'A' - 'Z'	
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' -'Z' '-' '_'	GV350CEU
	ODO Mode	1	0-2	0
	ODO Initial Mileage	<=9	0.0-4294967.0(km)	0.0
	Reserved	0		
	Reserved	0		
	Report Item Mask	<=4	0-FFFF	003F
	Power Saving Mode	1	0-2	1
	Position Append Mask	2	00-FF	00
	Event Mask	<=8	0-FFFFFFFF	7DEF
	Reserved	0		
	LED Mode	1	0-2	0
	Device Information Report	1	0| 1	0
	Device Information Interval	<=5	30-86400(s)	300
	Location Request Mask	2	00 - 23	00
	Battery Working Mode	1	0| 1	1
	Power Mode	1	0| 1	0

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Parts	Fields	Length	Range/Format	Default
	AGPS Mode	1	0-2	0
	Cell Report	4	0000-FFFF	001F
	GNSS Lost Time	<=2	0-30(min)	0
	GNSS Working Mode	<=2	0-1| 4| 12	12
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	GNSS off Latency	<=3	0-300(s)	300
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *New Password*

It is set to change the current password.

✧ *Device Name*

An ASCII string which represents the name of the device.

✧ *ODO Mode*

Enable/disable the odograph function to calculate the total mileage. The current mileage is included in every position report message.

- **0** - Disable.
- **1** - Enable the odograph function to calculate the total mileage by GNSS.
- **2** - Enable the odograph function to calculate the total mileage by CAN Module and GNSS.

If the value of CAN Module is invalid, the device will calculate the total mileage by GNSS.

✧ *ODO Initial Mileage*

The initial value for calculating the total mileage.

✧ *Report Item Mask*

Bitwise mask to configure the composition of report messages, especially the composition of GNSS information.

- **Bit0** - for <Speed>
- **Bit1** - for <Azimuth>

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- **Bit2** - for <Altitude>
- **Bit3** - for Cell information, including <MCC>, <MNC>, <LAC>, <Cell ID>.
- **Bit4** - for <Mileage>
- **Bit5** - for <Send Time>, the time when the report message is generated.
- **Bit6** - for <Device Name>
- **Bit7 - 15** Reserved

For each bit, set it to 1 to enable the corresponding component in the report, and set it to 0 to disable. This mask is valid for all report messages.

Note

The GSM tower data is not controlled by Bit 3 in the message **GSM** (ASCII)/(HEX).

✧ *Power Saving Mode*

The mode of the power saving function.

If <Power Saving Mode> is set to 0, the fixed report will follow <IGF Report Interval> when the engine is off.

If <Power Saving Mode> is set to 1, the fixed report **FRI**(ASCII)/(HEX) or **ERI** (ASCII)/(HEX), geo-fence **GIN/GOT**(ASCII)/(HEX) and speed alarm **SPD**(ASCII)/(HEX) report messages will be suspended when the device is stationary or the engine is off (Auto parking fence and manual parking fence will not be suspended in this case).

If <Power Saving Mode> is set to 2, it is mostly like Mode 1 and the difference is that the fixed report will not be suspended and the fix and send interval of it will be set to <IGF Report Interval> in AT+GTFRI when the engine is off.

- **0** - Disable the power saving function
- **1** - GNSS deep saving mode
- **2** - GNSS low saving mode

✧ *Position Append Mask*

A bitwise numeral to control whether to include the corresponding fields in each position after <Cell ID>.

- **Bit0** - The number of satellites in use for the current position (GNSS Satellite Number).
- **Bit1** - Reserved for indicating <GNSS Trigger Type> in **FRI** (ASCII)/(HEX) and **ERI** (ASCII)/(HEX) report, which cannot be set here.
- **Bit2 - 3** Reserved
- **Bit4** - The jamming state (GNSS Jamming State). This state in the message is obtained simultaneously with the GNSS positioning information.

  Note

  The hardware version 2.01 does not support the detection of GNSS jamming state. When using devices with the 2.01 hardware version, this parameter will be reported as empty.
- **Bit5 - 7** Reserved

Note

If <Wrap Corner Point> is set to 1, the bit 1 of <Position Append Mask> in **FRI** (ASCII)/(HEX) and

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ERI (ASCII)/(HEX) will be set to 1, but it will always be 0 in other messages.

✧ *Event Mask*

Bitwise mask to configure which event report should be sent to the backend server.

- **Bit0** - for **PNA** (ASCII)/(HEX)
- **Bit1** - for **PFA** (ASCII)/(HEX)
- **Bit2** - for **MPN** (ASCII)/(HEX)
- **Bit3** - for **MPF** (ASCII)/(HEX)
- **Bit4** - Reserved
- **Bit5** - for **BPL** (ASCII)/(HEX)
- **Bit6** - for **BTC** (ASCII)/(HEX)
- **Bit7** - for **STC** (ASCII)/(HEX)
- **Bit8** - for **STT** (ASCII)/(HEX)
- **Bit9** - Reserved
- **Bit10** - for **PDP** (ASCII)/(HEX)
- **Bit11** - for the power on **RTL** (ASCII)/(HEX)
- **Bit12** - for the ignition report **IGN** (ASCII)/(HEX), **IGF** (ASCII)/(HEX), **VGN** (ASCII)/(HEX) and **VGF** (ASCII)/(HEX)
- **Bit13** - for ignition on and off location report **IGL** (ASCII)/(HEX) and **VGL**(ASCII)/(HEX)
- **Bit14** - for **EXP** (ASCII)/(HEX)
- **Bit15** - for **PNR** (ASCII)/(HEX)
- **Bit16** - for **PFR** (ASCII)/(HEX)
- **Bit17 - 18** Reserved
- **Bit19** - for **SOT** (ASCII)/(HEX)
- **Bit20 - 31** Reserved

For each bit, set it to 1 to enable the corresponding event report, and set it to 0 to disable. If **+RESP:GTPNR** and **+RESP:GTPFR** events are enabled, **+RESP:GTPNA** and **+RESP:GTPFA** will not be reported even if they are enabled.

Note

The configuration in order to avoid generating a large amount of **STT** (ASCII)/(HEX) messages, 1A (Fake Tow) state is ignored.

✧ *LED Mode*

It configures the working mode of the LED lights.

- **0** - Each time the device is powered on, all the LEDs will work for 30 minutes and then turn off.
- **1** - All the LEDs turn on as configured.
- **2** - After the device is powered on, all the LEDs will work for 10 minutes and then turn off.

✧ *Device Information Report*

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Enable/disable the device information report **INF**(ASCII)/(HEX).

The device information includes state of the device, ICCID, GSM signal strength, voltage of external power supply, battery voltage, charging status, working mode of LED lights, the last known time of GNSS fix, analog input voltage, status of all digital inputs and outputs, time zone information and daylight-saving setting.

- **0** - Disable
- **1** - Enable

✧ *Device Information Interval*

The interval for reporting the device information.

✧ *Location Request Mask*

Bitwise mask for SMS. 4 high bits for SMS request. Each bit represents one kind of report. Set it to 1 to enable the corresponding report, and set it to 0 to disable.

4 high bits for SMS request.

- **0 -** Ignore SMS location request
- **1 -** Report the current location **LBC**(ASCII)/(HEX) to server.
- **2 -** Send current location with Google map link to Caller ID via SMS.

4 low bits for how to handle the incoming call.

- **0 -** Hang up only.
- **1 -** Hang up and report the current location **LBC**(ASCII)/(HEX) to server.
- **2 -** Hang up the call and send current location with Google map link to Caller ID via SMS.
- **3 -** Hang up and report the current location **LBC**(ASCII)/(HEX) to server, simultaneously send current location with Google map link to Caller ID via SMS.

✧ *Battery Working Mode*

It configures whether to enable backup battery. The backup battery will only be used when this parameter is set to 1 and the external power is not connected.

- **0** - Disable backup battery
- **1** - Enable backup battery

✧ *Power Mode*

It configures the power supply mode of the terminal.

- **0** - If the main power supply is connected, the backup battery is charged as needed.
- **1** - If the main power supply is connected, the backup battery is only charged when ignition is on. The charge process will begin 3 minutes after ignition on and stop when the ignition is off.

✧ *AGPS Mode*

A numeral which indicates whether to enable AGPS. AGPS helps increase the chances of getting GNSS position successfully and reduces the time needed to get GNSS position.

- **0** - Disable the AGPS function
- **1** - Enable the AGPS function
- **2** - Enable the AGPS online function

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✧ *Cell Report*

A hexadecimal numeral to indicate how to report cell information **GSM**(ASCII)/(HEX).

2 high bits represent the GSM working mode.

- **0b00 -** Do not allow the cell information report
- **0b01 -** Allow the cell information report after failing to get GNSS position if cell information is available.
- **0b10 -** Report the message **GSM**(ASCII)/(HEX) after getting GNSS position successfully every time if cell information is available.
- **0b11 -** Report the message **GSM**(ASCII)/(HEX) no matter whether it is successful to get GNSS position if cell information is available.

Other bits control whether the following events will trigger the report GSM(ASCII)/(HEX).

- **Bit 0 -** for **RTL** (ASCII)/(HEX)
- **Bit 1 -** for **LBC** (ASCII)/(HEX)
- **Bit 2 -** for **FRI**(ASCII)/(HEX) / **ERI** (ASCII)/(HEX)
- **Bit 3 -** for **SOS** (ASCII)/(HEX)
- **Bit 4 -** for **TOW** (ASCII)/(HEX)
- **Bit 5-15** - Reserved

For each bit, set it to 1 to enable the corresponding event report, and set it to 0 to disable.

✧ *GNSS Lost Time*

A time parameter to monitor the GNSS signal. If there is no GNSS signal or no successful GNSS fix for consecutive <GNSS Lost Time>, the device will send the event report **GSS**(ASCII)/(HEX) to indicate "GNSS signal lost". If the GNSS signal is recovered or a successful fix is obtained again, the device will send the event report **GSS**(ASCII)/(HEX) to indicate the recovery. 0 means "Disable this feature".

Note

If the device is rebooted, it will not report **GSS**(ASCII)/(HEX) to indicate GNSS signal recovery even if it has reported **GSS**(ASCII)/(HEX) to indicate "GNSS signal lost" before reboot.

✧ *GNSS Working Mode*

The working mode of GNSS chip. If the current GNSS chip doesn't support combination mode, the device will get position by GPS only.

- **0** - GPS and GLONASS positioning systems.

  In this mode, the device fixes positions with GPS and GLONASS systems.
- **1** - GPS positioning system.

  In this mode, the device fixes positions only with GPS system.
- **4** - GPS and Beidou positioning systems.

  In this mode, the device fixes positions with GPS and Beidou systems.
- **12** - GPS, Galileo and Beidou positioning systems.

  In this mode, the device fixes positions with GPS, Galileo and Beidou systems.

✧ *GNSS off Latency*

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The time to turn off GNSS after engine off when <Power Saving Mode> is enabled.

3.2.3 DOG (Protocol Watchdog)

The **AT+GTDOG** command is used to reboot the device in a time-based manner or upon ignition to prevent the device from working improperly for a long time.
Besides these two automatic reboot methods, the device also supports triggering the reboot manually by digital input.

Example:
AT+GTDOG=gv350ceu,1,60,30,0200,,1,0,,60,60,60,,,0,0013$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	DOG	DOG
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	Ignition Frequency	<=3	10-120(min)	60
	Interval	<=2	1-30(day)	30
	Time	4	HHMM	0200
	Reserved	0		
	Report Before Reboot	1	0| 1	1
	Input ID	1	0-3	0
	Reserved	0		
	No Network Interval	<=4	0| 5-1440(min)	60
	No Activation Interval	<=4	0| 5-1440(min)	60
	Send Failure Timeout	<=4	0| 5-1440(min)	60
	Reserved	0		
	Reserved	0		
	Reboot Device Type	1	0| 1	0
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reboot Switch Mask	1	1-3	3
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the watchdog function.

- **0** - Disable
- **1** - Reboot periodically according to the <Interval> and <Time> settings.
- **2** - Reboot when the ignition is turned on.

✧ *Ignition Frequency*

If the interval between the current ignition-on and last ignition-on reboot is greater than the value specified by this parameter when <Mode> is 2, the device will automatically reboot upon ignition on. The device will reboot automatically upon the second ignition-on for the first time use whatever the time interval from the first ignition-on is.

✧ *Interval*

The interval for rebooting the device. It is measured in days. Rebooting the device for the first time will ignore this interval.

✧ *Time*

The time at which the reboot operation is performed when <Interval> condition is met.

✧ *Report Before Reboot*

Whether to report the **DOG**(ASCII)/(HEX) message before reboot. 0 means "Do not report the **DOG**(ASCII)/(HEX) message", and 1 means "Report the **DOG**(ASCII)/(HEX) message". If this parameter is enabled, the device will initiate a real-time fix before sending the message with the current location information.

✧ *Input ID*

The ID of the digital input port which is used to trigger the manual reboot. 0 means "Do not use manual reboot".

✧ *No Network Interval*

The interval for rebooting the device when there is no network signal. 0 means "Do not reboot the device".

✧ *No Activation Interval*

The interval for rebooting the device when the device is unable to be registered on the EGPRS/LTE network. 0 means "Do not reboot the device".

✧ *Send Failure Timeout*

The length of time (in minutes) before rebooting the device when the device fails to send a

message. 0 means “Do not reboot the device”.

✧ *Reboot Device Type*
It is used to set the category that needs to be rebooted.

- **0** - Reboot device
- **1** - Reboot RF-Radio Frequency, only valid for <No Network Interval>, <No Activation Interval> and <Send Failure Timeout>

✧ *Reboot Switch Mask*
Bitwise mask to configure when the device will reboot periodically according to the <Interval> and <Time> settings.

- **Bit0** - Reboot when ignition is off
- **Bit1** - Reboot when ignition is on

3.2.4 GAM (GNSS-Assisted Motion)

The command **AT+GTGAM** is used for assisting in measuring motion with GNSS if the sensor detects stationary state while the vehicle is ignition on.

Example:
AT+GTGAM=gv350ceu,1,1,25,10,60,60,,,,,0006$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	GAM	GAM
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1	1
	Speed Mode	1	0| 1	1
	Motion Speed Threshold	<=2	5-50(km/h)	25
	Motion Cumulative Time	<=3	10-100(s)	10
	Motionless Cumulative Time	<=3	10-250(s)	60
	GNSS Fix Failure Timeout	<=4	5-1800(s)	60
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the GNSS-assisted motion measurement function.

- **0** - Disable this function
- **1** - Enable this function

✧ *Speed Mode*

Enable/disable the use of GNSS speed to assist with motion status measurement based on motion sensor state.

- **0** - Disable
- **1** - Enable

✧ *Motion Speed Threshold*

The speed threshold which is combined with GNSS speed to measure the status of movement.

✧ *Motion Cumulative Time*

If the average speed is higher than <Motion Speed Threshold> for <Motion Cumulative Time>, the device is considered to be in moving state.

✧ *Motionless Cumulative Time*

If the average speed is lower than <Motion Speed Threshold> for <Motionless Cumulative Time>, the device is considered to be in stationary state.

✧ *GNSS Fix Failure Timeout*

If the time of GNSS fix is more than <GNSS Fix Failure Timeout>, the device will update motion status by motion sensor. There may be a maximum error of 4 seconds.

3.2.5 HMC (Hour Meter Count)

The command **AT+GTHMC** is used to measure the accumulated use time of the device with each actuation of ignition on. When the device sends **FRI** (ASCII)/(HEX), **IGN** (ASCII)/(HEX) or **IGF** (ASCII)/(HEX) message, <Hour Meter Count> will be included in these reports.

Example:

AT+GTHMC=gv350ceu,1,00000:00:00,,,,,,,,0018$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	HMC	HMC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1	0
	Initial Hour Meter Count	11-13	00000:00:00-1193000:00:00	00000:00:00
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

Enable/disable the hour meter count function. If the hour meter count function is enabled, the hour meter count will be increased when the device detects the vehicle ignition is turned on.

- **0** - Disable the hour meter count function
- **1** - Difference Calculation Mode

  The current <Hour Meter Count> reported in **+RESP:GTFRI**, **+RESP:GTIGN** and **+RESP:GTIGF** is equal to (=) <Hour Meter Count> + current <Initial Hour Meter Count> - last <Initial Hour Meter Count>.

✧ *Initial Hour Meter Count*

The initial value of <Hour Meter Count> ranges from 00000:00:00 to 1193000:00:00. It consists of three parts separated by ":", the first part is the hour digit and the length of it is between 5 to 7 bytes, the second part is the 2-byte minute digit, and the last part is the 2-byte second digit. When the ignition is turned on for the first time, the <Hour Meter Count> reported in **+RESP:GTFRI** , **+RESP:GTIGN** or **+RESP:GTIGF** will be increased based on this value.

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3.2.6 HRM (HEX Report Mask)

The **AT+GTHRM** command consists of <+ACK Mask>, <+RSP Mask>, <+EVT Mask>, <+INF Mask>, <+HBD Mask>, <+CRD Mask> , <+DAT Mask>, <+CAN Mask>which control the composition of the corresponding HEX report message. In each HEX report message, the corresponding mask for the report indicates which part is reported.

Example:
AT+GTHRM=gv350ceu,,,7F,9FEDFFF,9FEDFFF,FF7F,FF,7F,7D,7FF,,0018$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	HRM	HRM
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Reserved	0		
	+ACK Mask	<=4	0-FFFF	7F
	+RSP Mask	<=16	0-FFFFFFFFFFFFFFFF	9FEDFFF
	+EVT Mask	<=16	0-FFFFFFFFFFFFFFFF	9FEDFFF
	+INF Mask	<=16	0-FFFFFFFFFFFFFFFF	FF7F
	+HBD Mask	<=2	0-FF	FF
	+DAT Mask	<=8	0-FFFFFFFF	7F
	+CRD Mask	<=4	0-FFFF	7D
	+CAN Mask	<=8	0-FFFFFFFF	7FF
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *+ACK Mask*

Component mask of the acknowledgement received.

Mask Bit	Item
Bit 0	<Length>
Bit 1	<Device Type>
Bit 2	<Protocol Version>
Bit 3	<Firmware Version>
Bit 4	<Device Name>
Bit 5	<Send Time>
Bit 6	<Count Number>
Bit 7	<ACK Expand Mask>
Bit 8	<Additional Number>
Bit 9-15	Reserved

Note

Bit 8 to Bit 15 of <+ACK Mask> belong to parameter <+ACK Expand Mask>, which serves as a component mask for extended acknowledgment information reporting. Each bit indicates which extended information is included.

✧ *+RSP Mask*

Component mask of the location report message.

Mask Bit	Item
Bit 0	<Speed>
Bit 1	<Azimuth>
Bit 2	<Altitude>
Bit 3	<MCC / MNC / LAC / Cell ID / Reserved>
Bit 4	<Send Time>
Bit 5	<Count Number>
Bit 6	<Device Name>
Bit 7	<Length>
Bit 8	<Device Type>
Bit 9	<Protocol Version>
Bit 10	<Firmware Version>
Bit 11	<Battery Level>
Bit 12	<External Power Voltage>
Bit 13	<Analog Input Mode>
Bit 14	<Analog Input1 Voltage>
Bit 15	<Analog Input2 Voltage>
Bit 16	Reserved
Bit 17	<Digital IO Status>

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Mask Bit	Item
Bit 18	<Motion Status>
Bit 19	<Satellite in Use>
Bit 20	<Current Mileage>
Bit 21	<Total Mileage>
Bit 22	<Current Hour Meter Count>
Bit 23	<Total Hour Meter Count>
Bit 24	<RFID>
Bit 25	<CAN Data>
Bit 26	<EIO100 IO Status>
Bit 27	<RFID Length>
Bit 28	Reserved
Bit 29	Reserved
Bit 30	<Analog Input3 Voltage>
Bit 31	Extend Mask Flag
Bit 32	Reserved
Bit 33	Enhanced <Satellite in Use>
Bit 34-63	Reserved

Note

Bit 32 - Bit 63 of <+RSP Mask> belong to parameter <+RSP Expand Mask>, which serves as a component mask for extended acknowledgment information reporting. Each bit indicates which extended information is included when the device reports the message **+RSP** (HEX).

If Bit 1 of <+RSP Expansion Mask> is set to 1, Bit 19 of <+RSP Mask> will be forced to 0.

Bit 24 <RFID> and Bit 27 <RFID Length> are bound. Setting either bit to 1 will force the other to 1.

✧ *+EVT Mask*

Component mask of the event report message.

Mask Bit	Item
Bit 0	<Speed>
Bit 1	<Azimuth>
Bit 2	<Altitude>
Bit 3	<MCC / MNC / LAC / Cell ID / Reserved>
Bit 4	<Send Time>
Bit 5	<Count Number>
Bit 6	<Device Name>
Bit 7	<Length>
Bit 8	<Device Type>

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Mask Bit	Item
Bit 9	<Protocol Version>
Bit 10	<Firmware Version>
Bit 11	<Battery Level>
Bit 12	<External Power Voltage>
Bit 13	<Analog Input Mode>
Bit 14	<Analog Input1 Voltage>
Bit 15	<Analog Input2 Voltage>
Bit 16	Reserved
Bit 17	<Digital IO Status>
Bit 18	<Motion Status>
Bit 19	<Satellite in Use>
Bit 20	<Current Mileage>
Bit 21	<Total Mileage>
Bit 22	<Current Hour Meter Count>
Bit 23	<Total Hour Meter Count>
Bit 24	<RFID>
Bit 25	<CAN Data>
Bit 26	<EIO100 IO Status>
Bit 27	<RFID Length>
Bit 28	Reserved
Bit 29	Reserved
Bit 30	<Analog Input3 Voltage>
Bit 31	Extend Mask Flag
Bit 32	Reserved
Bit 33	Enhanced <Satellite in Use>
Bit 34-63	Reserved

Note

Bit 32 - Bit 63 of <+EVT Mask> belong to parameter <+EVT Expansion Mask>, which serves as a component mask for extended acknowledgment information reporting. Each bit indicates which expand which extended information is included when the device reports the message **+EVT** (HEX).

If Bit 1 of <+EVT Expansion Mask> is set to 1, Bit 19 of <+EVT Mask> will be forced to 0.

Bit 24 <RFID> and Bit 27 <RFID Length> are bound. Setting either bit to 1 will force the other to 1.

✧ *+INF Mask*

Component mask of the information report message. Bit 8 - Bit 15 indicate which groups of information items are included when the device reports the message **INF** (HEX).

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Mask Bit	Item
Bit 0	<Length>
Bit 1	<Device Name>
Bit 2	<Device Type>
Bit 3	<Protocol Version>
Bit 4	<Firmware Version>
Bit 5	<Send Time>
Bit 6	<Count Number>
Bit 7	<INF Expansion Mask>
Bit 8	+RESP:GTVER
Bit 9	+RESP:GTIOS
Bit 10	+RESP:GTGPS
Bit 11	+RESP:GTBAT
Bit 12	+RESP:GTCID
Bit 13	+RESP:GTCSQ
Bit 14	+RESP:GTTMZ
Bit 15	+RESP:GTGSM
Bit 16	+RESP:GTGSV
Bit 17	+RESP:GTUVN
Bit 18	+RESP:GTCVN
...	Reserved
Bit 22	+RESP:GTCML
Bit 23	Reserved
Bit 24	+RESP:GTWRT
Bit 25	+RESP:GTBTI
Bit 26	Reserved
Bit 27	Reserved
Bit 28	+RESP:GTSCS
Bit 29	+RESP:GTCIF
Bit 30	+RESP:GTRSV
Bit 31	<INF Expansion2 Mask>
Bit 32	Reserved
Bit 33	Reserved
Bit 34	+RESP:GTBSV
Bit 35	+RESP:GTTVN
Bit 36	<Network Type>

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Mask Bit	Item
Bit 37	+RESP:GTASV
Bit 38	Reserved
Bit 39	+RESP:GTCBS
Bit 40-63	Reserved

Note

Bit 16 - Bit 31 of <+INF Mask> belong to parameter <+INF Expansion Mask>, which serves as a component mask for extended acknowledgment information reporting. Each bit indicates which extended information is included when the device reports the message **+INF**(HEX).

Bit 32 - Bit 47 of <+INF Mask> belong to parameter <+INF Expansion2 Mask>, which serves as a component mask for extended acknowledgment information reporting. Each bit indicates which extended information is included when the device reports the message **+INF**(HEX).

✧ *+HBD Mask*

Component mask of the heartbeat data.

Mask Bit	Item
Bit 0	<Length>
Bit 1	<Device Type>
Bit 2	<Protocol Version>
Bit 3	<Firmware Version>
Bit 4	<Device Name>
Bit 5	<Send Time>
Bit 6	<Count Number>
Bit 7	<UID>

✧ *+DAT Mask*

Component mask of the data report message.

Mask Bit	Item
Bit 0	<Length>
Bit 1	<Device Type>
Bit 2	<Protocol Version>
Bit 3	<Firmware Version>
Bit 4	<Device Name>
Bit 5	<Send Time>
Bit 6	<Count Number>
Bit 7-31	Reserved

✧ *+CRD Mask*

Component mask of the crash data packet.

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Mask Bit	Item
Bit 0	<Length>
Bit 1	<Device Name>
Bit 2	<Device Type>
Bit 3	<Protocol Version>
Bit 4	<Firmware Version>
Bit 5	<Send Time>
Bit 6	<Count Number>
Bit 7-15	Reserved

✧ *+CAN Mask*

Component mask of the CAN bus Information packet in HEX format.

Mask Bit	Item
Bit 0	<Speed>
Bit 1	<Azimuth>
Bit 2	<Altitude>
Bit 3	<MCC / MNC / LAC / Cell ID / Reserved>
Bit 4	<Send Time>
Bit 5	<Count Number>
Bit 6	<Device Name>
Bit 7	<Length>
Bit 8	<Device Type>
Bit 9	<Protocol Version>
Bit 10	<Firmware Version>
Bit 11-31	Reserved

3.2.7 OWH (Outside Working Hours)

To protect the privacy of the driver when he is off duty, the device could be configured to report empty location information outside working hours.

The command **AT+GTOWH** is used to define the working hours and the working mode to protect the privacy. If this function is enabled in non-working hours, in all ASCII format reports except **SOS** (ASCII)/(HEX), the fields Latitude, Longitude, MCC, MNC, LAC, Cell ID will be empty, <Position Append Mask> will be 00 and the optional parameters next to it will not exist. Meanwhile, in HEX format reports where location should be hidden, the fields Latitude and Longitude will be filled with 0x054C5638, and the fields MCC, MNC, LAC Cell ID will be filled with 0.

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Example:

AT+GTOWH=gv350ceu,3,1F,0900,1200,1300,1800,,,0,0,0,0,0,,,,,0012$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	OWH	OWH
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-3	0
	Day of Work	<=2	0-7F	1F
	Working Hours Start1	4	HHMM	0900
	Working Hours End1	4	HHMM	1200
	Working Hours Start2	4	HHMM	1300
	Working Hours End2	4	HHMM	1800
	Reserved	0		
	Reserved	0		
	Digital Input ID	1	0-3| 9-C	0
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*

A numeral to indicate the working mode of this function.

- **0** - Disable this function
- **1** - Manual start mode

By connecting an external unit to a specified digital input of the device, the driver manually enables time check. If it is outside of working hours, the device will hide the location information in the report messages. Otherwise, the location information will be reported normally.

- **2** - Full manual mode

By connecting an external unit to a specified digital input of the device, the driver has full control of the privacy protection. The device will not check the time against the working hours range automatically. It hides location information if the input is activated and reports location information normally if the input is deactivated.

- **3** - Automatic mode

In this mode, the device will ignore the status of the digital input. It will automatically check the current time against the working hours range. If it is outside of working hours, location information will be hidden. Otherwise, location information will be reported normally.

✧ *Day of Work*

It specifies the working days in a week in a bitwise manner.

- **Bit0** - for Monday
- **Bit1** - for Tuesday
- **Bit2** - for Wednesday
- **Bit3** - for Thursday
- **Bit4** - for Friday
- **Bit5** - for Saturday
- **Bit6** - for Sunday

For each bit, 0 means “Off Day”, and 1 means “Working Day”.

✧ *Working Hours Start1, Working Hours End1*

The first period of working hours in a day.

✧ *Working Hours Start2, Working Hours End2*

The second period of working hours in a day.

✧ *Digital Input ID*

The input ID used to trigger this function when <Mode> is 1 or 2.

The working parameters of the specified input must be set by AT+GTDIS first. If interruptible digital input is used, please connect slide switch instead of tact button to the input for this function.

✧ *Output ID, Output Status, Duration and Toggle Times*

If this function is enabled and it is outside of working hours, the specified wave will be output on the specified output.

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3.2.8 PDS (Preserving Device's States)

The command **AT+GTPDS** is used to preserve specified logic state for the device. The function works according to the <Mode> setting, and the logic state to be saved are selected according to the value of <Mask>.

Example:
AT+GTPDS=gv350ceu,1,11,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	PDS	PDS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	Mask	<=4	0-FFFF	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*
The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*
The working mode of preserving special logic state of the device.

- **0** - Disable this function
- **1** - Preserve specified logic state of the device according to the value of <Mask>
- **2** - Reset all the specified logic state listed in <Mask> after receiving the command, and then preserve the specified logic state according to the value of <Mask>

✧ *Mask*

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Bitwise mask to configure the device state to be preserved.
Each bit represents a state.

- **Bit0** - State of GEO
- **Bit1 - 2** Reserved
- **Bit3** - Information of last known position
- **Bit4** - State of ignition
- **Bit5** - State of wave shape 1
- **Bit6** - State of digital input
- **Bit7** - State of SPD
- **Bit8** - State of SSR
- **Bit9** - State of main power
- **Bit10** - State of PEO
- **Bit11 - 15** Reserved

3.2.9 PIN (Auto-unlock PIN)

The command **AT+GTPIN** is used to configure the auto-unlock PIN function of the device. Some operators offer SIM card with PIN code protection by default. To make the device work with the PIN-protected SIM card, this command is used to configure the device to auto-unlock the SIM PIN with the preset PIN code.

Example:
AT+GTPIN=gv350ceu,1,1234,,,,,,0014$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	PIN	PIN
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Auto-unlock PIN Mode	1	0| 1	0
	PIN	4 - 8	'0'–'9'	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

- *Password*
  The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".
- *Auto-unlock PIN Mode*
  Set it to 1 to enable the auto-unlock PIN function, and set it to 0 to disable this function.
- *PIN*
  The code used to unlock the SIM PIN.

3.2.10 TMA (Time Adjustment)

The command **AT+GTTMA** is used to remotely adjust the local time of the device. Upon receiving this command, the device will set the time zone and daylight saving accordingly. Then it will use the given UTC time to adjust for the local time based on the time zone and daylight-saving setting. This command will also be a trigger for the device to start GNSS. After a successful GNSS fix, the device will update the local time with the GNSS UTC time again.

Example:
AT+GTTMA=gv350ceu,+,3,52,0,20090917203500,1,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TMA	TMA
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Sign	1		+
	Hour Offset	<=2	0-12	0
	Minute Offset	<=2	0-59	0
	Daylight Saving Mode	1	0| 1	0
	UTC Time	14	YYYYMMDDHHMMSS	
	Network Time Checking	1	0| 1	1

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

- *Password*
  The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".
- *Sign*
  It indicates the positive or negative offset of the local time from UTC time.
- *Hour Offset*
  UTC offset in hours.
- *Minute Offset*
  UTC offset in minutes.
- *Daylight Saving Mode*
  Enable/disable daylight saving time.
  - **0** - Disable
  - **1** - Enable
- *UTC Time*
  UTC time used to adjust for the local time.
- *Network Time Checking*
  A numeral to indicate whether to check GNSS UTC time with network time.
  - **0** - Only correct device time when the device can't get GNSS UTC time
  - **1** - Always correct device time with network time

3.2.11 WLT (Allowlist)

The command **AT+GTWLT** is used to configure a list of authorized phone numbers which are allowed to perform the SMS function.

Example:

AT+GTWLT=gv350ceu,0,1,2,13813888888,13913999999,,,,0018$

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Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	WLT	WLT
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Call Filter	1	0 - 7	0
	Start Index	<=2	1-10	1
	End Index	<=2	1-10	1
	Phone Number List	<=20*10		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Call Filter*

It configures the working mode of this function. If a bit is set to 1, only the phone numbers in allowlist will be valid for the corresponding feature. If a bit is set to 0, the corresponding allowlist will be ignored.

- **Bit0** - Allowlist for location by call
- **Bit1** - Reserved.
- **Bit2** - Allowlist for SMS. The <SMS Gateway> (refer to AT+GTSRI) is always available even if it is not in the allowlist.

✧ *Start Index, End Index*

The index range of the allowlist to which the phone numbers are to be updated. For example, if <Start Index> is set to 1 and <End Index> is set to 2, then the first two phone numbers in the allowlist will be updated by the numbers provided in the parameter <Phone Number List>. <Start Index> and <End Index> determine the number of phone numbers that will be updated. If either one is empty, there should be no <Phone Number List>.

✧ *Phone Number List*

A list of comma-separated phone numbers to be updated to the allowlist. The total number of the phone numbers is determined by <Start Index> and <End Index>. The format of the phone

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numbers includes area code and phone number. The area code is optional.

Note

If more phone numbers are needed, please adjust <Start Index> and <End Index> for appropriate setup. If some phone numbers in <Phone Number List> are empty, then the corresponding phone numbers will be deleted.

For example, to delete the 4th, 5th and 6th numbers of the <Phone Number List>, please set <Start Index> to 4 and set <End Index> to 6 and keep those three phone numbers of <Phone Number List> empty.

3.2.12 AVS (Accelerometer Virtual Ignition)

The command **AT+GTAVS** is used to configure parameters for detecting virtual ignition status based on motion status. It works when Accelerometer (motion status) virtual ignition mode is enabled by AT+GTVMS.

Note

Please make sure hard-wired ignition line is not connected.

Example:

AT+GTAVS=gv350ceu,30,60,,,,000B$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	AVS	AVS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Rest Validity	<=3	1-255(s)	30
	Movement Validity	<=3	1-255(s)	60
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Rest Validity*

A time parameter to determine whether the device enters stationary state. The device will be considered in stationary state after the motion sensor detects stationary state and the stationary state is maintained for the period specified by the parameter <Rest Validity>.

✧ *Movement Validity*

A time parameter to determine whether the device enters moving state. The device will be considered in moving state after the motion sensor detects movement and the moving state is maintained for the period specified by the parameter <Movement Validity>.

3.2.13 VVS (Voltage Virtual Ignition)

The command **AT+GTVVS** is used to configure parameters for detecting virtual ignition state by voltage. It works when Voltage Virtual Ignition mode is enabled by AT+GTVMS.

Note

Please make sure hard-wired ignition line is not connected.

Example:

AT+GTVVS=gv350ceu,13500,600,10,1,10,000B$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	VVS	VVS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Ignition On Voltage	<=5	250-90000(mV)	13500
	Voltage Offset	<=4	200-2000(mV)	600
	Ignition On Debounce	<=3	5-255(x2s)	10
	Smart Voltage Adjustment	1	0| 1	1
	Ignition Off Debounce	<=3	5-255(x2s)	10
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Ignition On Voltage*

The external power voltage in ignition on state. Different vehicles have different voltage in ignition

on state. This parameter should be set very close to the original external power so that the device can detect ignition event more accurately.

✧ *Voltage Offset*

The offset from <Ignition On Voltage> used to determine ignition on or ignition off state.

If the voltage of the external power is higher than **<Ignition On Voltage> - <Voltage Offset>** and is maintained for <Ignition On Debounce> seconds, the device will consider it as virtual ignition on state.

If the voltage of the external power is lower than **<Ignition On Voltage> - <Voltage Offset>** and is maintained for <Ignition Off Debounce> seconds, the device will consider it as virtual ignition off state.

✧ *Ignition On Debounce*

The debounce time before updating virtual ignition on state according to the external power voltage. Unit: second.

✧ *Smart Voltage Adjustment*

Enable/disable smart voltage adjustment algorithm.

- **0** - Disable

  The values of <Ignition On Voltage> and <Voltage Offset> will remain unchanged.

- **1** - Enable

  The values of <Ignition On Voltage> and <Voltage Offset> will dynamically change according to the actual ignition on and off voltage.

✧ *Ignition Off Debounce*

The debounce time before updating the virtual ignition off state according to the external power voltage.

3.2.14 VMS (Virtual Ignition Mode Selection)

The command **AT+GTVMS** is used to configure the mode of virtual ignition state detection.

Example:

AT+GTVMS=gv350ceu,7,03,03,1,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	VMS	VMS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Virtual Ignition Mode	1	0| 2| 4| 7	0

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Parts	Fields	Length	Range/Format	Default
	Virtual Ignition On Mask	2	00-03	3
	Virtual Ignition Off Mask	2	00-03	3
	Virtual Ignition On Logic	1	0| 1	1
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Virtual Ignition Mode*

A numeral to define the working mode of virtual ignition state detection.

- **0** - Disable the virtual ignition detection function
- **2** - Voltage virtual ignition detection mode

The ignition state is related to the voltage of the external power supply. Please use the command AT+GTVVS to configure the parameters.

- **4** - Accelerometer virtual ignition detection mode

Ignition state can be indicated by the motion state determined by <Rest Validity> and <Movement Validity> defined in the AT+GTAVS command. Stationary state indicates ignition off and moving state indicates ignition on.

- **7** - Combined detection mode

In this mode, ignition on/off trigger conditions can be selected using parameters <Virtual Ignition On Mask> and <Virtual Ignition Off Mask>.

Note

<Virtual Ignition off Mask> must contain <Virtual Ignition On Mask> to prevent logic errors.

✧ *Virtual Ignition On Mask*

Bitwise mask to detect the ignition on event. The logic of each bit is controlled by the parameter <Virtual Ignition On Logic>.

- **Bit0** - Voltage virtual ignition detection
- **Bit1** - Motion status virtual ignition detection

✧ *Virtual Ignition Off Mask*

Bitwise mask to detect ignition off event. All bits matched are considered as ignition off event.

- **Bit0** - Voltage virtual ignition detection
- **Bit1** - Motion status virtual ignition detection

For example:

Bit (00000003): Voltage virtual ignition detection and motion status virtual ignition detection combined mode. Only when ignition off is detected by both Mode 2 and Mode 4 will the device

be considered in ignition off state.

✧ *Virtual Ignition On Logic*

The logic of each bit in <Virtual Ignition On Mask>.

- **0** - AND logic

  All bits matched are considered as ignition on event.

- **1** - OR logic

  Any one bit matched is considered as ignition on event.

Note

Records of hard-wired ignition are forcibly saved when PDS mode is enabled. When the hard wired is recorded, virtual ignition detection will be ignored.

3.2.15 CMD (Command String Storage)

The **AT+GTCMD** command is used to store the commands to be used by the command AT+GTUDF.

Example:

AT+GTCMD=gv350ceu,1,0,AT+GTRTO=gv350ceu,0,,,,,,000B$,,,,,0005$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CMD	CMD
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1	0
	Command ID	<=2	0-31	0
	Command String	<=200	AT command	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*
The working mode of storing command string.

- **0** - Delete the stored command
- **1** - Add the stored command

✧ *Command ID*
A numeral to identify the stored command.

✧ *Command String*
The whole content of the stored command.

3.2.16 UDF (User Defined Function)

The **AT+GTUDF** command is used to bind input events and stored commands. The input events will trigger the corresponding stored commands.

Example:
AT+GTUDF=gv350ceu,0,0,FF,0,0,0,0,1,0,0,,,0005$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	UDF	UDF
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	Group ID	<=2	0-31	
	Input ID Mask	<=16	0-FFFFFFFFFFFFFFFF	0
	Debounce Time	<=5	0-86400(s)	0
	Inzizo Mask	<=5	00000-FFFFF	0
	Outzizo Mask	<=5	00000-FFFFF	0
	Command ID Mask	<=8	0-FFFFFFFF	0
	Command Ack Mode	1	0| 1	0
	Inpeo Mask	<=5	00000-FFFFF	0
	Outpeo Mask	<=5	00000-FFFFF	0
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the user defined function.

- **0** - Disable the group
- **1** - Enable the group
- **2** - Delete the group

✧ *Group ID*

A numeral to identify the group of input events and stored commands to be executed.

✧ *Input ID Mask*

The bitwise mask to indicate the input events included in the group.

- **Bit 0 (00000001)** - Select ID1
- **Bit 1 (00000002)** - Select ID2
- **Bit 2 (00000004)** - Select ID3
- **Bit 3 (00000008)** - Select ID4

For example:

- **Bit (00000003)** - SelectID1 and ID2
- **Bit (00000017)** - Select ID1, ID2, ID3, and ID5

Mask Bit	Item
Bit 0	Power on finished
Bit 1	Ignition on
Bit 2	Ignition off
Bit 3	Attached to the GPRS network
Bit 4	Not attached to the GPRS network
Bit 5	Registered on the GSM network
Bit 6	Not registered on the GSM network
Bit 7	Network roaming
Bit 8	Network non-roaming
Bit 9	SIM card is locked
Bit 10	GNSS is on
Bit 11	GNSS is off

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Mask Bit	Item
Bit 12	The device is stationary
Bit 13	The device is moving
Bit 14	External charge inserted
Bit 15	No external charge
Bit 16	The device is charging
Bit 17	The device is not charging
Bit 18	Digital input 2 is activated
Bit 19	Digital input 2 is deactivated
Bit 20	Digital input 1 is activated
Bit 21	Digital input 1 is deactivated
Bit 22	SIM card is inserted
Bit 23	SIM card is not inserted
Bit 24	Reserved
Bit 25	Reserved
Bit 26	Inside the speed range
Bit 27	Outside the speed range
Bit 28	Messages need to be sent
Bit 29	No messages need to be sent
Bit 30	Digital input 3 is activated
Bit 31	Digital input 3 is deactivated
Bit 32	Backup battery inserted
Bit 33	No backup battery
Bit 34	No change of SIM card
Bit 35	SIM card change
Bit 36	Network jamming is detected
Bit 37	Network jamming is not detected
...	Reserved
Bit 47	Driver authorized
Bit 48	Driver unauthorized
Bit 49	Reserved
Bit 50	Reserved
Bit 51	The device fixes GNSS successfully
Bit 52	The device fails to fix GNSS
Bit 53	TCP server connected
Bit 54	TCP server disconnected

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Mask Bit	Item
Bit 55-63	Reserved

✧ *Debounce Time*

The debounce time for input events before the specified stored commands are executed.

✧ *Inzizo Mask*

The bitwise mask to indicate the input events within the circular GEO-Fence.

Mask Bit	Item
Bit 0	Inside the GEO 0
Bit 1	Inside the GEO 1
Bit 2	Inside the GEO 2
Bit 3	Inside the GEO 3
Bit 4	Inside the GEO 4
Bit 5	Inside the GEO 5
Bit 6	Inside the GEO 6
Bit 7	Inside the GEO 7
Bit 8	Inside the GEO 8
Bit 9	Inside the GEO 9
Bit 10	Inside the GEO 10
Bit 11	Inside the GEO 11
Bit 12	Inside the GEO 12
Bit 13	Inside the GEO 13
Bit 14	Inside the GEO 14
Bit 15	Inside the GEO 15
Bit 16	Inside the GEO 16
Bit 17	Inside the GEO 17
Bit 18	Inside the GEO 18
Bit 19	Inside the GEO 19

✧ *Outzizo Mask*

The bitwise mask to indicate the input events outside the circular GEO-Fence.

Mask Bit	Item
Bit 0	Outside the GEO 0
Bit 1	Outside the GEO 1
Bit 2	Outside the GEO 2
Bit 3	Outside the GEO 3
Bit 4	Outside the GEO 4
Bit 5	Outside the GEO 5

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Mask Bit	Item
Bit 6	Outside the GEO 6
Bit 7	Outside the GEO 7
Bit 8	Outside the GEO 8
Bit 9	Outside the GEO 9
Bit 10	Outside the GEO 10
Bit 11	Outside the GEO 11
Bit 12	Outside the GEO 12
Bit 13	Outside the GEO 13
Bit 14	Outside the GEO 14
Bit 15	Outside the GEO 15
Bit 16	Outside the GEO 16
Bit 17	Outside the GEO 17
Bit 18	Outside the GEO 18
Bit 19	Outside the GEO 19

✧ *Command ID Mask*

The bitwise mask of the stored commands to be executed after the state of the group becomes TRUE (i.e. all the included input events occur).

✧ *Command Ack Mode*

A numeral to indicate whether to return an acknowledgement message after a stored command is executed.

- **0** - Do not send an acknowledgement message when a stored command is executed
- **1** - Send an acknowledgement message when a stored command is executed

✧ *Inpeo Mask*

The bitwise mask to indicate the input events within the polygon GEO-Fence.

Mask Bit	Item
Bit 0	Inside the PEO 0
Bit 1	Inside the PEO 1
Bit 2	Inside the PEO 2
Bit 3	Inside the PEO 3
Bit 4	Inside the PEO 4
Bit 5	Inside the PEO 5
Bit 6	Inside the PEO 6
Bit 7	Inside the PEO 7
Bit 8	Inside the PEO 8
Bit 9	Inside the PEO 9

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Mask Bit	Item
Bit 10	Inside the PEO 10
Bit 11	Inside the PEO 11
Bit 12	Inside the PEO 12
Bit 13	Inside the PEO 13
Bit 14	Inside the PEO 14
Bit 15	Inside the PEO 15
Bit 16	Inside the PEO 16
Bit 17	Inside the PEO 17
Bit 18	Inside the PEO 18
Bit 19	Inside the PEO 19

✧ *Outpeo Mask*

The bitwise mask to indicate the input events outside the polygon GEO-Fence.

Mask Bit	Item
Bit 0	Outside the PEO 0
Bit 1	Outside the PEO 1
Bit 2	Outside the PEO 2
Bit 3	Outside the PEO 3
Bit 4	Outside the PEO 4
Bit 5	Outside the PEO 5
Bit 6	Outside the PEO 6
Bit 7	Outside the PEO 7
Bit 8	Outside the PEO 8
Bit 9	Outside the PEO 9
Bit 10	Outside the PEO 10
Bit 11	Outside the PEO 11
Bit 12	Outside the PEO 12
Bit 13	Outside the PEO 13
Bit 14	Outside the PEO 14
Bit 15	Outside the PEO 15
Bit 16	Outside the PEO 16
Bit 17	Outside the PEO 17
Bit 18	Outside the PEO 18
Bit 19	Outside the PEO 19

Note

The maximum number of the stored commands to be executed in a group is five.

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3.2.17 GNA (GNSS Assistance)

The command **AT+GTGNA** is used to configure GNSS assistance data download and update.

Example:
AT+GTGNA=gv350ceu,1,,http://offline-live1.services.u-blox.com/,0,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	GNA	GNA
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1	0
	Reserved	0		
	Offline URL	<= 50	'0' - '9' 'a' - 'z' 'A' - 'Z' ':' '/' '.'	http://offline-live1.services.u-blox.com/,0,xm-TGtIk40uDvJgJazUBfg
	Server Type	1	0| 1	0
	Server Token	<=30		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

A numeral which indicates whether to enable AGPS. AGPS helps increase the chances of getting GNSS position successfully and reduces the time needed to get GNSS position. This parameter is the same as <AGPS Mode> in the AT+GTCFG command.

- **0** - Disable the AGPS function
- **1** - Enable the AGPS function

✧ *Offline URL*

It specifies the URL to download GNSS assistance offline data.

✧ *Server Type*

The AGPS sever type.

- **0** - Custom
- **1** - Queclink server, the URL and the token are private and do not need to be set.

✧ *Server Token*

AGPS server access token.

Note

Please set the parameter value to "%CLR%" if there is a need to erase the parameter <Offline URL> and <Server Token>. These parameter values will not be cleared if they are empty.

3.3 Bluetooth Settings

This section describes the commands related to the Bluetooth setting and Bluetooth accessories configuration. Please refer to the details below.

3.3.1 BTS (Bluetooth Setting)

The command **AT+GTBTS** is used to configure Bluetooth settings for the device to report certain events.

Example:

AT+GTBTS=gv350ceu,1,,GV350CEU%IMEI,,3,0,0D03,0003,0,123456,,,,,,,,,400,240,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	BTS	BTS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-1	1

Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Bluetooth Name	<=18	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_' '%'	GV350CEU%IMEI
	Reserved	0		
	Discoverable Mode	1	0-3	3
	Discoverable Time	<=4	0-1440(min)	0
	Bluetooth Report Mask	4	0000-FFFF	0D03
	Bluetooth Event Mask	4	0000-FFFF	0003
	PIN Code Mode	1	0-1	0
	PIN Code	4|6	'0'–'9'	123456
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Scan Interval	<=5	4-65535(x0.625ms)	400
	Scan Window	<=5	4-65535(x0.625ms)	240
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the Bluetooth.

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- **0** - Disable Bluetooth
- **1** - Enable Bluetooth

✧ *Bluetooth Name*

The name of the device for Bluetooth identification. The "%IMEI" in the Bluetooth broadcast name is replaced with "_" and IMEI number.

Note

The <Bluetooth Name> cannot exceed 26 bytes. Since the "%IMEI" occupies 16 bytes, any additional characters beyond 10 bytes will be truncated.

✧ *Discoverable Mode*

The mode to configure the Bluetooth to be non-discoverable or discoverable for the period according to <Discoverable Time>.

- **0** - Non-discoverable mode
- **1** - General discoverable mode

  The device will remain discoverable for <Discoverable Time> minutes after the ignition is turned on.
- **2** - General discoverable mode

  The device will remain discoverable for <Discoverable Time> minutes after the ignition is turned off.
- **3** - General discoverable mode

  The device will remain discoverable for <Discoverable Time> minutes after it is powered on.

✧ *Discoverable Time*

The time period for the device to remain discoverable. If it is set to 0, the device will always be discoverable when a specific condition as described in <Discoverable Mode> is met.

✧ *Bluetooth Report Mask*

Bitwise mask to configure the composition of Bluetooth information in report messages.

- **Bit0** - for <Bluetooth Name>
- **Bit1** - for <Bluetooth MAC Address>
- **Bit2 - 7** Reserved
- **Bit8** - for <Peer Role>
- **Bit9** - Reserved
- **Bit10** - <Peer Address Type>
- **Bit11** - <Peer MAC Address>
- **Bit12 - 15** Reserved

For each bit, set it to 1 to enable the corresponding component in the report, and set it to 0 to disable. This mask is valid for **+RESP:GTBCS**, **+RESP:GTBDS** messages.

✧ *Bluetooth Event Mask*

Bitwise mask to configure which event report should be sent to the backend server.

- **Bit0** - for **BCS** (ASCII)/(HEX)

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- **Bit1** - for **BDS** (ASCII)/(HEX)
- **Bit2 - 15** Reserved

✧ *PIN Code Mode*

It defines whether a PIN code for pairing is needed or not.

- **0** - No PIN code is needed
- **1** - PIN code is needed for pairing

✧ *PIN Code*

PIN code for pairing if needed.

✧ *Scan Interval*

Frequency of scanning.

✧ *Scan Window*

The duration of each scan.

Note

The <Scan Interval> and <Scan Window> determine the scanning frequency and scanning time of the controller. When the <Scan Interval> and <Scan Window> are set to the same value, scanning continues. The <Scan Window> cannot be larger than the <Scan Interval>.

3.3.2 BAS (Bluetooth Accessory)

The command **AT+GTBAS** is used for device scanning or connecting Bluetooth accessories to obtain data such as humidity and temperature. To use this command, the parameter <Mode> in the command AT+GTBTS must be enabled.

Example:

AT+GTBAS=gv350ceu,0,6,5,WTH301,7805412CF340,7FFF,30,2400,,0,0,10,2,300,0,20,30,2,300,,0,0,0,0,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	BAS	BAS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Index	1	0-9	0
	Accessory Type	<=2	0-2| 6-8| 10-15| 23	0
	Accessory Model	1	0-5	0
	Accessory Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'	

Parts	Fields	Length	Range/Format	Default
	Accessory MAC	12	000000000000-FFFFFFFFFFFF	FFFFFFFFFFFF
	Accessory Append Mask	<=8	0 - FFFFFFF	7FFF
	Reserved	0		
	Low Voltage Threshold	<=4	0-5000(mV)	2400
	Reserved	0		
	Accessory Parameters (Optional)			
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Index*

The index of the Bluetooth accessory.

✧ *Accessory Type*

The type of the Bluetooth accessory which is defined in the <Index>. The following is supported now:

- **0** - No Bluetooth accessory
- **1** - Escort Bluetooth accessory
- **2** - Beacon temperature sensor
- **6** - Multi-functional beacon sensor
- **7** - Technoton accessory
- **8** - External Input Output Bluetooth accessory

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The input/output configuration of the accessory can be found in the commands AT+GTIEX, AT+GTAEX and AT+GTOEX.

- **10** - Mechatronics Bluetooth accessory
- **11** - Magnet Bluetooth accessory
- **12** - BLE TPMS sensor
- **13** - Relay Bluetooth accessory
- **14** - Smart Cap Bluetooth accessory
- **15** - Movement-angle BLE sensor
- **23** - Epsilon Bluetooth accessory

✧ *Accessory Model*

The model of the Bluetooth accessory which is defined in <Accessory Type>.

The following is supported now:

The model of Escort Bluetooth accessory (<Accessory Type> is 1):

- **0** - TD_BLE fuel sensor
- **3** - Angle sensor

The model of beacon temperature sensor (<Accessory Type> is 2):

- **0** - WTS300 (Temperature sensor)
- **1** - Temperature ELA

The model of multi-functional beacon sensor (<Accessory Type> is 6):

- **2** - WTH300 (Temperature and humidity sensor)
- **3** - RHT ELA (Temperature and humidity sensor)
- **4** - WMS301 (Door sensor with embedded temperature and humidity sensor)
- **5** - WTH301 (Temperature and humidity sensor)

The model of Technoton accessory (<Accessory Type> is 7):

- **0** - DUT-E S7 (Fuel level sensor)
- **1** - DFM 100 S7 (Fuel flowmeter sensor)
- **2** - DFM 250DS7 (Fuel flowmeter sensor)
- **3** - GNOM DDE S7 (Axle load sensor)
- **4** - GNOM DP S7 (Axle load sensor)

The External Input Output Bluetooth accessory (<Accessory Type> is 8):

- **0** - WBC300 (External input output sensor)

Note

The current version supports only one WBC300 configuration.

The model of Mechatronics accessory (<Accessory Type> is 10):

- **0** - Fuel sensor
- **1** - Angle sensor
- **2** - DDS sensor(Axle load sensor)
- **3** - DPS sensor(Axle load sensor)

Note

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For Fuel sensor, By default, the fuel sensor using Protocol Version 1. However, this can be switched via the Mechatronics mobile application. For more information, please contact the fuel level sensor manufacturer.

The model of Magnet sensor (<Accessory Type> is 11):

- **0** - MAG ELA (Used to check whether the door is open or closed)

The model of TPMS sensor (<Accessory Type> is 12):

- **0** - MLD BLE TPMS (ATP100/ ATP102)

The model of Relay sensor (<Accessory Type> is 13):

- **0** - WRL300 sensor

The model of Smart Cap sensor (<Accessory Type> is 14):

- **0** - TR21 (Fuel Cap sensor)

The model of Movement-angle BLE sensor (<Accessory Type> is 15):

- **0** - WID320G (Used to check the motion/crash/tilt/fall status)
- **1** - MOV ELA (Used to check the motion and still status)

Note

For WID320G, please use APP(NFC_Config_Tool_1.1.apk) to enable accessory broadcast and features.

The model of Epsilon Bluetooth accessory (<Accessory Type> is 23):

- **0** - ER2-BLE Fuel Sensor

✧ *Accessory Name*

The name of the Bluetooth accessory. For details about whether the accessory can be connected by name, please refer to Appendix.

✧ *Accessory MAC*

The MAC address of the Bluetooth accessory. If <Accessory MAC> of the Bluetooth accessory is valid and the MAC address of the Bluetooth accessory is unique, the device will use the MAC address to scan or connect Bluetooth accessories. If <Accessory MAC> is the default value, the device will search for the Bluetooth accessory by accessory name.

✧ *Accessory Append Mask*

If the device is connected with the Bluetooth accessory, and Bit 8 (for <Bluetooth Accessory Data>) of <ERI Mask> is set to 1, the device will report Bluetooth accessory data via **ERI** (ASCII)/(HEX) instead of **FRI** (ASCII)/(HEX).

This mask is used to configure the accessory data fields to be reported in the **ERI** (ASCII)/(HEX) and **BAA** (ASCII)/(HEX). messages. To obtain the <Accessory Append Mask> supported by the accessory, refer to the BLE Accessory Appendix.

If Bit14 is set to 1, the device will report <Relay State> but not report <Relay Config Result> in the message +RESP:GTERI.

Mask Bit	Item	Description
Bit 0	<Accessory Name>	Accessory name
Bit 1	<Accessory MAC>	Accessory MAC

Mask Bit	Item	Description
Bit 2	<Accessory Status>	Accessory Bluetooth connection status
Bit 3	<Accessory Battery Voltage>	Accessory battery voltage
Bit 4	<Accessory Temperature>	Accessory temperature
Bit 5	<Accessory Humidity>	Accessory humidity
Bit 6	Reserved	Reserved
Bit 7	<Accessory Input Output Data>	Including <Accessory Output Status>, <Accessory Digital Input Status>, <Accessory Analog Input Voltage>
Bit 8	<Accessory Event Notification Data>	Including <Accessory Mode>, <Accessory Event>
Bit 9	<Tire pressure>	Tire pressure
Bit 10	<Timestamp>	Timestamp
Bit 11	<Enhanced Temperature>	Enhanced temperature
Bit 12	<Magnet Data>	Including <Magnet ID>, <MAG Event Counter>, <Magnet state>
Bit 13	<Accessory Battery Percentage>	Accessory battery percentage
Bit 14	<Relay Data>	Including <Relay Config Result>, <Relay State>
Bit 15	<Expansion Mask>	Expanded mask for Bit 16 - Bit 31
Bit 16	<Tri-axial Acceleration Data>	Tri-axial acceleration data
Bit 17	<Angle Values>	Angle values
Bit 18	<Sensor Event Mask>	Including <Event Mask>, <Tilt Event>, <Motion Event>, <Crash Event>, <Falling Event>
Bit 19	<MOV ELA Data>	<Move Event>
Bit 20	Reserved	Reserved
Bit 21	<Accessory RSSI>	Accessory RSSI
Bit 22	Reserved	Reserved
Bit 23	<ER2 Info Mask>	Including <Device Serial Number>, <Sensor Identifier>
Bit 24-30	Reserved	

✧ *Low Voltage Threshold*

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It specifies the lower voltage limit. When the voltage of Bluetooth accessory is below this value, the device will report message **BAA** (ASCII)/(HEX) to the backend server. 0 means "Disable low voltage detection".

✧ *Accessory Parameters (Optional)*

Some parameters for Bluetooth accessories. For different Accessory Types, there are different definitions.

If the Accessory Type is **1** (Escort Bluetooth Accessory), <Accessory Parameters (Optional)> will be unfolded as follows.

Fields	Length	Range/Format	Default
Event Notification	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

- *Event Notification*

  It configures whether to enable event notification function.

  – **0** - Disable

  – **1** - Enable

  If a new event occurs on the accessory, the device will report the message **BAA** (ASCII)/(HEX).

If the Accessory Type is **2** (Beacon temperature sensor), <Accessory Parameters (Optional)> will be unfolded as follows.

The device will report the message **BAA** (ASCII)/(HEX) to the backend server when the temperature outside or inside the range is detected.

Fields	Length	Range/Format	Default
Mode	1	0-3	0
Low Temperature	<=3	-40-80(℃)	0
High Temperature	<=3	-40-80(℃)	10
Validity	<=2	1-10(s)	2
Send Interval	<=5	30-43200(s)	300

- *Mode*

  The working mode of the temperature alarm.

  – **0** - Disable temperature alarm.

  – **1** - Report temperature alarm if the current temperature is within the temperature range defined by <Low Temperature> and <High Temperature>.

  – **2** - Report temperature alarm if the current temperature is outside the temperature

range defined by <Low Temperature> and <High Temperature>.

– **3** - Report temperature alarm only once if the current temperature enters or exits the temperature range defined by <Low Temperature> and <High Temperature>. In this mode, <Send Interval> will be ignored.

- *Low Temperature*
  It specifies the lower temperature limit in centigrade.
- *High Temperature*
  It specifies the upper temperature limit in centigrade.
- *Validity*
  If the sensor detects that the ambient temperature meets the alarm condition, it will continuously check the temperature. If the temperature keeps meeting the alarm condition for <Validity> time, the temperature alarm will be triggered.

If the Accessory Type is **6** (Multi-functional beacon sensor), <Accessory Parameters (Optional)> will be unfolded as follows.
The device will report the **BAA** (ASCII)/(HEX) message to the backend server when the temperature and humidity meet alarm conditions.

Fields	Length	Range/Format	Default
Temperature Mode	1	0-3	0
Low Temperature	<=3	-40-80(°C)	0
High Temperature	<=3	-40-80(°C)	10
Temperature Validity	<=2	1-10(s)	2
Temperature Send Interval	<=5	30-43200(s)	300
Humidity Mode	1	0-3	0
Low Humidity	<=3	0-100(%RH)	20
High Humidity	<=3	0-100(%RH)	30
Humidity Validity	<=2	1-10(s)	2
Humidity Send Interval	<=5	30-43200(s)	300

- *Temperature Mode*
  The working mode of the temperature alarm.

  – **0** - Disable temperature alarm.

  – **1** - Report temperature alarm if the current temperature is within the temperature range defined by <Low Temperature> and <High Temperature>.

  – **2** - Report temperature alarm if the current temperature is outside the temperature range defined by <Low Temperature> and <High Temperature>.

  – **3** - Report temperature alarm only once if the current temperature enters or exits the temperature range defined by <Low Temperature> and <High Temperature>. In this

mode, <Temperature Send Interval> will be ignored.

- *Low Temperature*
  It specifies the lower temperature limit in centigrade.
- *High Temperature*
  It specifies the upper temperature limit in centigrade.
- *Temperature Validity*
  If the sensor detects that the ambient temperature meets the alarm condition, it will continuously check the temperature. If the temperature keeps meeting the alarm condition for <Temperature Validity> times, the temperature alarm will be triggered.
- *Humidity Mode*
  The working mode of the humidity alarm.
  - **0** - Disable humidity alarm.
  - **1** - Report humidity alarm if the current humidity is within the humidity range defined by <Low Humidity> and <High Humidity>.
  - **2** - Report humidity alarm if the current humidity is outside the humidity range defined by <Low Humidity> and <High Humidity>.
  - **3** - Report humidity alarm only once if the current humidity enters or exits the humidity range defined by <Low Humidity> and <High Humidity>. In this mode, <Humidity Send Interval> will be ignored.
- *Low Humidity*
  It specifies the lower humidity limit.
- *High Humidity*
  It specifies the upper humidity limit.
- *Humidity Validity*
  If the sensor detects that the ambient humidity meets the alarm condition, it will continuously check the humidity. If the humidity keeps reaching to the alarm condition for <Humidity Validity> time, the humidity alarm will be triggered.

If the Accessory Type is **7** (Technoton accessory), <Accessory Parameters (Optional)> will be unfolded as follows.

Fields	Length	Range/Format	Default
IGN Send Interval	<=5	0|10-86400(s)	30
IGF Send Interval	<=5	0|10-86400(s)	60
Actual Sensor Length	<=5	0-6000(mm)	0
Empty Frequency	<=7	0-4294967(Hz)	0
Full Frequency	<=7	0-4294967(Hz)	0

- *IGN Send Interval*
  The interval for sending the report message **BAR** (ASCII)/(HEX) to the backend server when

the ignition is on. 0 means "Do not report the message **+RESP:GTBAR**".

- *IGF Send Interval*
  The interval for sending the report message **+RESP:GTBAR** to the backend server when the ignition is off. 0 means "Do not report the message **+RESP:GTBAR**".
- *Actual Sensor Length*
  The actual length of sensor after cutting.
- *Empty Frequency*
  The frequency of empty sensor (not immersed in fuel).
- *Full Frequency*
  The frequency of sensor fully immersed in fuel.

Note

The parameters <Actual Sensor Length>, <Empty Frequency> and <Full Frequency> only supported by DUT-E fuel sensor, and if they are set to non-default values, the value of fuel level will send the message **ERI** (ASCII)/(HEX) instead of **+RESP:GTBAR**.

If the Accessory Type is **10** (Mechatronics Bluetooth accessory), <Accessory Parameters (Optional)> will be unfolded as follows.

Fields	Length	Range/Format	Default
Fuel Level Format	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

- *Fuel Level Format*
  The format of fuel level in the message.
  - **0** - The original value of fuel level
  - **1** - The percentage of fuel level

If the Accessory Type is **11** (Magnet Bluetooth accessory), <Accessory Parameters (Optional)> will be unfolded as follows.

Fields	Length	Range/Format	Default
MAG Event Notification	1	0|1	0
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

- *MAG Event Notification*

It configures whether to enable magnet event notification function.

- **0** - Disable
- **1** - Enable

If a new event occurs on the accessory, the device will report the message **BAA** (ASCII)/(HEX).

If the Accessory Type is **12** (BLE TPMS sensor), this parameter will work as follows.

The device will report the **BAA** (ASCII)/(HEX) message to the backend server when the tire pressure keeps meeting alarm conditions.

Fields	Length	Range/Format	Default
Reserved	0		
Tire Pressure Alarm Mode	1	0-3	0
Low Tire Pressure	<=3	0-500(kPa)	150
High Tire Pressure	<=3	0-500(kPa)	300
Validity	<=2	1-10	2
Alarm Send Interval	<=5	0-86400(s)	60
Available Validity Time	<=5	60-86400(s)	60

- *Tire Pressure Alarm Mode*

  The working mode of the tire pressure alarm.

  - **0** - Disable tire pressure alarm.
  - **1** - Report tire pressure alarm if the current tire pressure is within the tire pressure range defined by <Low Tire Pressure> and <High Tire Pressure>.
  - **2** - Report tire pressure alarm if the current tire pressure is outside the tire pressure range defined by <Low Tire Pressure> and <High Tire Pressure>.
  - **3** - Report tire pressure alarm only once if the current tire pressure enters/exits the tire pressure range defined by <Low Tire Pressure> and <High Tire Pressure>. In this mode, <Alarm Send Interval> will be ignored.

- *Low Tire Pressure*

  The lower tire pressure limit.

- *High Tire Pressure*

  The upper tire pressure limit.

- *Validity*

  If the tire pressure keeps meeting the alarm condition for <Validity> times, the tire pressure alarm will be triggered.

- *Alarm Send Interval*

  After the <Validity> checking, the device will report tire pressure alarm every <Alarm Send Interval> times of tire pressure reading based on reading timer of the tire pressure sensor. If <Alarm Send Interval> is set to 0, the device will only report the tire pressure alarm once.

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- *Available Validity Time*

  If the device does not detect the tire pressure sensor in the <Available Validity Time>, the <Accessory Status> in the message **+RESP:GTERI** report messages will be 0.

If the Accessory Type is **13** (Relay Bluetooth accessory), this parameter will work as follows.

Fields	Length	Range/Format	Default
Relay Event Notification	1	0|1	0
Password	<=6	'0'-'9' 'a'-'z' 'A'-'Z'	123456
New Password	<=6	'0'-'9' 'a'-'z' 'A'-'Z'	123456
Reserved	0		
Reserved	0		

- *Relay Event Notification*

  It configures whether to enable relay event notification function.

  – **0** - Disable

  – **1** - Enable

  If a new event occurs on the accessory, the device will report the **BAA** (ASCII)/(HEX) message.

- *Password*

  It is the current password for the accessory device.

- *New Password*

  It is set to change the current password.

  Note

  If <New Password> is set successfully, <Password> will be changed to <New Password>.

If the Accessory Type is **14** (Smart Cap Bluetooth accessory), this parameter will work as follows.

For smart cap sensor:

The device will report the message **BAA** (ASCII)/(HEX) to the backend server when the temperature reaches alarm conditions.

Fields	Length	Range/Format	Default
Temperature Mode	1	0-3	0
Low Temperature	<=3	-40-80(℃)	0
High Temperature	<=3	-40-80(℃)	10
Temperature Validity	<=2	1-10(s)	2
Temperature Send Interval	<=5	30-43200(s)	300

- *Temperature Mode*

  The working mode of the temperature alarm.

  – **0** - Disable temperature alarm.

  – **1** - Report temperature alarm if the current temperature is within the temperature

range defined by <Low Temperature> and <High Temperature>.

– **2** - Report temperature alarm if the current temperature is outside the temperature range defined by <Low Temperature> and <High Temperature>.

– **3** - Report temperature alarm only once if the current temperature enters or exits the temperature range defined by <Low Temperature> and <High Temperature>. In this mode, <Temperature Send Interval> will be ignored.

- *Low Temperature*
  It specifies the lower temperature limit in centigrade.
- *High Temperature*
  It specifies the upper temperature limit in centigrade.
- *Temperature Validity*
  If the sensor detects that the ambient temperature meets the alarm condition, it will continuously check the temperature. If the temperature keeps meeting the alarm condition for <Temperature Validity> time, the temperature alarm will be triggered.

✧ *Output ID*
The ID of the output port to output the specified wave shape when the **BAA** (ASCII)/(HEX) event is detected.

Note
If <Accessory Type> is 7, the parameters <Accessory Append Mask>, <Low Voltage Threshold>, <Output ID>, <Output Status>, <Duration> and <Toggle Times> are invalid. And the data would not be reported via the message **ERI** (ASCII)/(HEX).

3.3.3 BID (Bluetooth Beacon ID)

The command **AT+GTBID** is used for the device to scan Bluetooth beacon accessories and report the scanning results via **BID** (ASCII)/(HEX) or **BIE** (ASCII)/(HEX) messages. To use this function, the parameter <Mode> in the command AT+GTBTS must be 1.
The MAC address of some Bluetooth accessories can be used as authorization ID. For detailed information, please refer to AT+GTIDA.

Example:
AT+GTBID=gv350ceu,0,0,0,000A,2400,0,1,1,78054101F479,0,0,30,,,AC233F,0,0,0,0,0,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	BID	BID
	Leading Symbol	1	=	=

Parts	Fields	Length	Range/Format	Default
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Index	1	0-2	0
	Mode	1	0-3	0
	Beacon ID Model	<=2	0-2| 4| 7| 9-10	0
	Accessory Append Mask	<=4	0000-FFFF	000A
	Low Voltage Threshold	<=4	0-5000(mV)	2400
	Expand OUI Numbers	1	0-4	0
	Start Index	<=3	1-300	1
	End Index	<=3	1-300	1
	MAC List	<=12*75		
	Accessory Parameters(Optional)			
	OUI	6	000000-FFFFFF	
	OUI 1(Optional)	6	000000-FFFFFF	
	OUI 2(Optional)	6	000000-FFFFFF	
	OUI 3(Optional)	6	000000-FFFFFF	
	OUI 4(Optional)	6	000000-FFFFFF	
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Message Type	1	0| 1	0
	IDA Trigger	1	0| 1	1
	Reserved	0		
	Accessory Parameters Extend(Optional)			
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Index*

The index of the beacon Bluetooth accessory. A Beacon ID Model can only be bound to one index.

✧ *Mode*

The working mode of this function.

- **0** - Disable
- **1** - MAC or OUI
- **2** - UUID

Note

Mode 2 only valid when <Beacon ID Model> is ID ELA accessory or CARLOCK accessory and it is necessary to configure the corresponding UUID using the AT+GTBFS command.

- **3** - NAME

Note

Mode 3 only valid when <Beacon ID Model> is ID ELA accessory and it is necessary to configure the corresponding NAME using the **AT+GTBFS** command.

✧ *Beacon ID Model*

The model of the beacon Bluetooth accessory. The following is supported now:

- **0** - WKF300
- **1** - iBeacon E6
- **2** - ID ELA
- **4** - WID310
- **7** - WKF310
- **9** - CARLOCK

Note

When set to model 9, **+RESP:GTBFS** will replace **+RESP:GTBID** , **BFE** (ASCII)/(HEX) will replace **+RESP:GTBIE**.

- **10** - WID330

✧ *Accessory Append Mask*

Bitwise mask to configure the composition of Bluetooth accessory information in messages **BAA** (ASCII)/(HEX), **BID** (ASCII)/(HEX) and **BIE** (ASCII)/(HEX).

- **Bit0** - <Accessory Name>
- **Bit1** - <Accessory MAC>
- **Bit2** - Reserved
- **Bit3** - <Accessory Battery Level> iBeacon E6 is not supported.
- **Bit4 - 5** Reserved
- **Bit6** - <Accessory Signal Strength>
- **Bit7** - <Beacon Type> and <Beacon Data>
- **Bit8 - 14** Reserved

Note

Bit 0 is only valid in Mode 3.

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✧ *Low Voltage Threshold*

It specifies the lower voltage limit. When the voltage of the Bluetooth accessory falls below this value, the device will report the message **+RESP:GTBAA** to the backend server. 0 means "Disable low voltage detection".

✧ *Expand OUI Numbers*

The expand number of <OUI>.

✧ *Start Index, End Index*

The index range of the MAC list to which the MAC addresses are to be updated.

For example, if <Start Index> is set to 1 and <End Index> is set to 2, then the first two MAC addresses in the MAC list will be updated by the MAC addresses provided in the parameter <MAC List>. <Start Index> and <End Index> determine the total number of MAC addresses that will be updated. If either one is empty, there should be no <MAC List> following the empty value. A maximum of 75 MAC addresses can be updated each time.

✧ *MAC List*

A list of comma-separated MAC addresses to be updated to the MAC list. The number of the MAC addresses is determined by <Start Index> and <End Index>.

Note

If more accessories are needed, please adjust <Start Index> and <End Index> for appropriate setup.

If some MAC addresses in <MAC List> are empty, then the corresponding MAC addresses will be deleted.

For example, to delete the 4th, 5th and 6th MAC addresses of the <MAC List>, please set <Start Index> to 4 and set <End Index> to 6 and keep those three MAC addresses of <MAC List> empty.

The maximum number of MAC addresses for all indexes is 300.

✧ *Accessory Parameters(Optional)*

Some parameters for Bluetooth Beacon. For different Beacons, there are different definitions.

If Beacon ID Model is **0** (WKF300), the following parameters are used:

Fields	Length	Range/Format	Default
Push Button Event	1	0|1	0
Keyfob Detection Mode	1	0-2|5	0
Keyfob Detection Interval	<=3	3-600(s)	30
Reserved	0		
Reserved	0		

- *Push Button Event*

  If this parameter is set to 1 and the button on WKF300 is pushed, the device will report the message **BAA** (ASCII)/(HEX) to the backend server.

- *Keyfob Detection Mode*

  It specifies the mode of detecting Keyfob.

– **0** - Disable Keyfob detection

– **1** - Scan only once

After entering ignition on and moving state, the device will scan Keyfob once for the time period specified by <Keyfob Detection Interval> and then send the message **BID** (ASCII)/(HEX) to report information of Keyfob. If more than 3 Keyfobs are detected, the message **+RESP:GTBID** contains information of the top 3 Keyfobs with the strongest signal.

– **2** - Conditional Continuous Scan1

After entering ignition on and moving state, the device will keep scanning Keyfob(s) continuously. If the device detects Keyfob or change of available Keyfob, it will send the message **+RESP:GTBID** to report information of Keyfob. If more than 3 Keyfobs are detected, the message **+RESP:GTBID** contains information of the top 3 Keyfobs with the strongest signal.

– **5** - Conditional Continuous Scan2

After entering ignition on, the device will keep scanning Keyfob(s) continuously. If the device detects Keyfob or change of available Keyfob, it will send the message **+RESP:GTBID** to report information of Keyfob. If more than 3 Keyfobs are detected, the **+RESP:GTBID** message contains information of the top 3 Keyfobs with the strongest signal.

- *Keyfob Detection Interval*

  The device scans Keyfob for the time period specified by this parameter.

If Beacon ID Model is **1** (iBeacon E6), the following parameters are used:

Fields	Length	Range/Format	Default
Reserved	0		
E6 Detection Mode	1	0-2	0
E6 Detection Interval	<=3	30-600(s)	30
Reserved	0		
Reserved	0		

- *E6 Detection Mode*

  It specifies the mode of detecting Beacon E6.

  – **0** - Disable detection

  – **1** - Scan only once

  After entering ignition on and moving state, the device will scan E6 one time for the time period specified by <E6 Detect Interval> and then it will send the message **+RESP:GTBID** to report information of E6. If more than 15 iBeacon E6 are detected, the message **+RESP:GTBID** contains the information about the top 15 iBeacon E6.

  – **2** - Conditional Continuous Scan1

  After entering ignition on and moving state, the device will keep scanning E6

continuously. If the device detects E6 or change of available E6, it will send the message **+RESP:GTBID** to report information of E6. If more than 15 iBeacon E6 are detected, the message **+RESP:GTBID** contains the information of the top 15 iBeacon E6.

- *E6 Detection Interval*

  The device scans E6 for the period specified by this parameter.

If Beacon ID Model is **2** (ID ELA), the following parameters are used:

Fields	Length	Range/Format	Default
Alarm Mode	1	0-3	0
ID ELA Detection Mode	1	0-3	0
ID ELA Detection Interval	<=3	30-600(s)	30
Reserved	0		
Reserved	0		

- *Alarm Mode*

  It specifies the mode of alarm report.

  – **0** - Disable alarm
  – **1** - Alarm when receiving Bluetooth broadcast
  – **2** - Alarm when Bluetooth broadcast is not received
  – **3** - Alarm when receiving Bluetooth broadcast or exiting Bluetooth broadcast

- *ID ELA Detection Mode*

  It specifies the mode of detecting ID ELA.

  – **0** - Disable detection
  – **1** - Scan only once

  After entering ignition on and moving state, the device will scan ID ELA one time for the time period specified by <ID ELA Detect Interval> and then it will send the message **+RESP:GTBID** to report information of ID ELA. If more than 15 ID ELA are detected, the message **+RESP:GTBID** contains the information of the top 15 ID ELA.

  – **2** - Conditional Continuous Scan1

  After entering ignition on and moving state, the device will keep scanning ID ELA continuously. If the device detects ID ELA or change of available ID ELA, it will send the message **+RESP:GTBID** to report information of ID ELA. If more than 15 ID ELA are detected, the message **+RESP:GTBID** contains the information of the top 15 ID ELA.

  – **3** - Continuous Scan

  In this mode, the device will keep scanning continuously. If the device detects ID ELA or change of available ID ELA, it will send the message **+RESP:GTBID** to report information of ID ELA. If more than 15 ID ELA are detected, the message **+RESP:GTBID** contains the information of the top 15 ID ELA.

- *ID ELA Detection Interval*

  The device scans ID ELA for the time period specified by this parameter.

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If Beacon ID Model is **4** (WID310), the following parameters are used:

Fields	Length	Range/Format	Default
Reserved	0		
Detection Mode	1	0|2|3	0
Detection Interval	<=3	30-600(s)	30
IGN Scan & Report Interval	<=5	0|10-86400(s)	60
IGF Scan & Report Interval	<=5	0|10-86400(s)	60

- *Detection Mode*
  The parameter which specifies the mode of detecting WID310.
  - **0** - Disable detection
  - **2** - Conditional Continuous Scan1
    After entering ignition on and moving state, the device will keep scanning WID310 continuously. If the device detects WID310 or change of available WID310, it will send the **+RESP:GTBID** messages to report information of WID310. If more than 15 WID310 are detected, the message **+RESP:GTBID** contains the information of the top 15 WID310.
  - **3** - Continuous Scan
    In this mode, the device will keep scanning continuously. The **+RESP:GTBID** message is sent to the backend server periodically according to the parameter <IGN Scan & Report Interval>/<IGF Scan & Report Interval>. If more than 15 WID310 are detected, the message **+RESP:GTBID** contains the information of the top 15 WID310.
- *Detection Interval*
  The device scans WID310 for the time specified by this parameter when <Detection Mode> is 2.
- *IGN Scan & Report Interval*
  The time interval for sending **+RESP:GTBID** messages when the engine is on and <Detection Mode> is 3.
- *IGF Scan & Report Interval*
  The time interval for sending **+RESP:GTBID** messages when the engine is off and <Detection Mode> is 3.

If Beacon ID Model is **7** (WKF310), the following parameters are used:

Fields	Length	Range/Format	Default
Push Button Event	1	0|1	0
Keyfob Detection Mode	1	0-2|5	0
Keyfob Detection Interval	<=3	30-600(s)	30
Reserved	0		
Reserved	0		

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- *Push Button Event*
  If this parameter is set to 1 and the button on WKF310 is pushed, the device will report the message **BAA** (ASCII)/(HEX) to the backend server.
- *Keyfob Detection Mode*
  It specifies the mode of detecting Keyfob.
  - **0** - Disable Keyfob detection
  - **1** - Scan only once
    After entering ignition on and moving state, the device will scan Keyfob once for the time period specified by <Keyfob Detection Interval> and then send the message **BID** (ASCII)/(HEX) to report information of Keyfob. If more than 3 Keyfobs are detected, the message **+RESP:GTBID** contains information of the top 3 Keyfobs with the strongest signal.
  - **2** - Conditional Continuous Scan1
    After entering ignition on and moving state, the device will keep scanning Keyfob continuously. If the device detects Keyfob or change of available Keyfob, it will send the message **+RESP:GTBID** to report information of Keyfob. If more than 3 Keyfobs are detected, the message **+RESP:GTBID** contains information of the top 3 Keyfobs with the strongest signal.
  - **5** - Conditional Continuous Scan2
    After entering ignition on, the device will send the **+RESP:GTBID** message to report information of Keyfob if it detects Keyfob or change of available Keyfob within <Keyfob Detection Interval> time. If more than 3 Keyfobs are detected, the **+RESP:GTBID** message contains information of the top 3 Keyfobs with the strongest signal.
- *Keyfob Detection Interval*
  The device scans Keyfob for the time period specified by this parameter.

If Beacon ID Model is **9** (CARLOCK), the following parameters are used:

Fields	Length	Range/Format	Default
Reserved	0		
Detection Mode	1	0|3|4	0
Detection Interval	<=3	30-600(s)	60
Lost Count	<=3	1-120	6
Reserved	0		

- *Detection Mode*
  It specifies the mode of detecting CARLOCK.
  - **0** - Disable detection.
  - **3** - Continuous Scan.
    In this mode, the device will keep scanning continuously. If the device detects UUID or change of available UUID, it will send the message **BFS** (ASCII)/(HEX) to report

information of CARLOCK accessory.

– **4** - Continuous Scan and periodically report.
In this mode, the device will keep scanning continuously. The **+RESP:GTBFS** message is sent to the backend server periodically according to the parameter <IGN Scan & Report Interval>/<IGF Scan & Report Interval>. If more than 10 CARLOCK accessory are detected, the message **+RESP:GTBFS** contains the information of the top 10 CARLOCK accessory.

- *Detection Interval*
  The device will check whether the scanned iBeacon is lost accordingly when <Detection Mode> is 3.
- *Lost Count*
  The device will send the **+RESP:GTBFS** message when one iBeacon is not scanned within <Lost Count> * <Scan Interval> seconds and <Detection Mode> is 3.

If Beacon ID Model is **10** (WID330), the following parameters are used:

Fields	Length	Range/Format	Default
Reserved	0		
Detection Mode	1	0|2|3	0
Detection Interval	<=3	30-600(s)	30
IGN Scan & Report Interval	<=5	0|10-86400(s)	60
IGF Scan & Report Interval	<=5	0|10-86400(s)	60

- *Detection Mode*
  The parameter which specifies the mode of detecting WID330.

  – **0** - Disable detection

  – **2** - Conditional Continuous Scan1
  After entering ignition on and moving state, the device will keep scanning WID330 continuously. If the device detects WID330 or change of available WID330, it will send the **+RESP:GTBID** messages to report information of WID330. If more than 15 WID330 are detected, the message **+RESP:GTBID** contains the information of the top 15 WID330.

  – **3** - Continuous Scan
  In this mode, the device will keep scanning continuously. The **+RESP:GTBID** message is sent to the backend server periodically according to the parameter <IGN Scan & Report Interval>/<IGF Scan & Report Interval>. If more than 15 WID330 are detected, the message **+RESP:GTBID** contains the information of the top 15 WID330.
- *Detection Interval*
  The device scans WID330 for the time specified by this parameter when <Detection Mode> is 2.
- *IGN Scan & Report Interval*
  The time interval for sending **+RESP:GTBID** messages when the engine is on and <Detection

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Mode> is 3.

- *IGF Scan & Report Interval*
  The time interval for sending **+RESP:GTBID** messages when the engine is off and <Detection Mode> is 3.

✧ *OUI*

It is the first three bytes of Bluetooth address, which is composed of NAP and UAP. Only one Organization Unique Identifier (OUI) is allowed for each type of Bluetooth accessory.
For example, "AC233F" represents the Bluetooth iBeacon E6. The "AC23" is NAP, the "3F" is UAP. If the device detects this OUI, the message **+RESP:GTBID** will be reported. If the value is empty, it means "Disable this function".
The number of <OUI> must match the value of <Expand OUI Numbers>. If <OUI> is empty, the corresponding value will be deleted. The maximum number of <OUI> for all indexes is 5.

✧ *Message Type*

A numeral to indicate which kind of messages will be reported.

- **0** - Report **+RESP:GTBID/+RESP:GTBFS** (A maximum of 3/15 device information will be reported).
- **1** - Report **+RESP:GTBIE/+RESP:GTBFE** (A maximum of 100 device information will be reported).

✧ *IDA Trigger*

If it is enabled, the scanned Bluetooth accessory will be used for IDA authorization.

- **0** - Disable
- **1** - Enable

✧ *Accessory Parameters Extend(Optional)*

Some parameters for Bluetooth beacons are used as extension parameters (Accessory Parameters (Optional)), and their definitions vary across different beacons.

If Beacon ID Model is **9** (CARLOCK), the following parameters are used:

Fields	Length	Range/Format	Default
IGN Scan & Report Interval	<=5	0|10-86400(s)	60
IGF Scan & Report Interval	<=5	0|10-86400(s)	60
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

- *IGN Scan & Report Interval*
  The time interval for sending **+RESP:GTBFS** messages when the engine is on and <Detection Mode> is 4.

- *IGF Scan & Report Interval*
  The time interval for sending **+RESP:GTBFS** messages when the engine is off and <Detection Mode> is 4.

3.3.4 AEX (Analog Input Expansion)

The command **AT+GTAEX** is used to configure the parameters of External Bluetooth Analog Input accessories. All these inputs are customizable.

Example:
AT+GTAEX=gv350ceu,0,0,1,5,0,8000,32000,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	AEX	AEX
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Analog Input Expansion Type	1	0	0
	Bind BAS Index	1	0-9	0
	Analog Input Number	1	1-1	1
	Analog Input ID	1	5-5	5
	Mode	1	0-2	0
	Min Threshold	<=5	8000-32000(mV)	8000
	Max Threshold	<=5	8000-32000(mV)	32000
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*
The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is

"gv350ceu".

✧ *Analog Input Expansion Type*
It indicates which extended device the following parameters are used for.

- **0** - Bluetooth Analog Input accessory setting

✧ *Bind BAS Index*
It is used to bind the specific configuration in AT+GTBAS.

✧ *Analog Input Number*
The total number of configured Bluetooth Analog Input Setting. In one configuration, <Analog Input ID>, <Mode>, <Min Threshold> and <Max Threshold> are included and others are reserved.

✧ *Analog Input ID*
The ID of 5 is Bluetooth Analog Input ID, the parameters <Accessory Type> and <Accessory Model> should be set in AT+GTBAS.

✧ *Mode*
The working mode of the analog input alarm **AIS**(ASCII)/(HEX).

- **0** - Disable analog input alarm
- **1** - Enable analog input alarm
  If the current input voltage is within the range of (<Min. Threshold>, <Max. Threshold>), the alarm will be triggered.
- **2** - Enable analog input alarm
  If the current input voltage is outside the range of (<Min. Threshold>, <Max. Threshold>), the alarm will be triggered.

✧ *Min Threshold*
This parameter specifies the lower voltage limit for the analog input port to trigger the alarm when the <Mode> is set to 1 or 2.

✧ *Max Threshold*
This parameter specifies the upper voltage limit for the analog input port to trigger the alarm when the <Mode> is set to 1 or 2.

3.3.5 BTD (Bluetooth Accessory Data)

The command **AT+GTBTD** is used for the device to report message **BTD** (ASCII) to the backend server.

This command is only valid for Bluetooth accessory WID320G.

Example:

AT+GTBTD=gv350ceu,,0,0,,7,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT

Parts	Fields	Length	Range/Format	Default
	Command Word	3	BTD	BTD
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Bind BAS Index	1	0-9	0
	Send Interval	<=5	0-86400(s)	0
	Reserved	0		
	Data Mask	<=8	0-7FFFFFFF	7
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Bind BAS Index*

It is used to bind the specific configuration in AT+GTBAS.

✧ *Send Interval*

The interval for sending Bluetooth accessory data. The value range is 0 - 86400. Unit: second.

✧ *Data Mask*

This mask is used to configure the accessory data fields to be reported in the **+RESP:GTBTD** messages.

Mask Bit	Item	Description
Bit 0	<Accessory Name>	Accessory Name
Bit 1	<Accessory MAC>	Accessory MAC
Bit 2	<Accessory Status>	Accessory Bluetooth connection Status
Bit 3	<Accessory Battery Level>	Accessory Battery Level
Bit 4	<Accessory Temperature>	Accessory Temperature
Bit 5	<Enhanced Temperature>	Enhanced Temperature
Bit 6	<Tri-axial Acceleration Data>	Tri-axial Acceleration Data

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Mask Bit	Item	Description
Bit 7	<Angle Values>	Angle Values
Bit 8	<Sensor Event Mask>	Including <Event Mask>, <Tilt Event>, <Motion Event>, <Crash Event>, <Falling Event>
Bit 9-30	Reserved	

3.3.6 SVR (Stolen Vehicle Recovery)

The command **AT+GTSVR** is used to configure the Bluetooth settings for the Primary device. If the Primary device does not successfully communicate with the Ghost device within the time defined by <Connect Interval> * <Connect Fail Count>, it will report the message **SVR**(ASCII)/(HEX) to the backend server. When the Primary device connects to the Ghost device for the first time, and meanwhile the Primary matches the Ghost's MAC address, IMEI and UTC time successfully, the Primary device will report the message **+RESP:GTSVR** to the backend server, and the CEL LED will be ON (2 seconds) and OFF (2 seconds) periodically which lasts 40 seconds.

Example:
AT+GTSVR=gv350ceu,0,78054125E8D8,10,1,863574046024485,0,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	SVR	SVR
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1	0
	Ghost MAC Address	12	000000000000-FFFFFFFFFFFF	
	Connect Interval	<=4	10| 20| 30| 60| 120| 180| 240| 360| 480| 720| 1440	10
	Connect Fail Count	<=2	1-10	1
	Match Connected IMEI	15	'0'–'9'	
	BTI Report Interval	<=4	0-1440	0

Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the Primary device's stolen vehicle recovery function.

- **0** - Disable.
- **1** - Enable this function as Primary device.

Note

If <Mode> in **AT+GTSVR** is set to 1, the broadcast service for AT+GTBTS will not work.

✧ *Ghost MAC Address*

The MAC address of the Ghost device which is used to pair with the Primary device.

✧ *Connect Interval*

The maximum amount of time allowed for the Ghost device to establish a connection with the Primary device. Unit: minute.

Note

The parameter <Connect Interval> for the Ghost device should be set to a value less than or equal to the <Connect Interval> set for the Primary device.

✧ *Connect Fail Count*

The maximum number of connection failures between the Primary device and the Ghost device.

✧ *Match Connected IMEI*

The IMEI of the Ghost device which is used to match with the Primary device.

✧ *BTI Report Interval*

It specifies the interval for reporting the **BTI** (ASCII)/(HEX) message regarding the status and Bluetooth information of the Ghost device.

0 means "Disable the **+RESP:GTBTI** report". Unit: minute.

Note

If the connection between the Primary device and the Ghost device fails, the message **+RESP:GTBTI** will not be reported.

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3.3.7 BFS (Bluetooth Fields Settings)

The command **AT+GTBFS** is specifically used to configure Bluetooth fields scanned with the **AT+GTBID** command.

Example:

AT+GTBFS=gv350ceu,0,,,1,02020204050607080 90A0B0C0D0E0E0B,0,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	BFS	BFS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Index	1	0-2	0
	Reserved	0		
	Reserved	0		
	UUID Numbers	<=2	0-10	0
	UUID 1(Optional)	32	HEX	
	UUID 2(Optional)	32	HEX	
	UUID 3(Optional)	32	HEX	
	…			
	UUID 8(Optional)	32	HEX	
	UUID 9(Optional)	32	HEX	
	UUID 10(Optional)	32	HEX	
	Name Numbers	<=2	0-10	0
	Name 1(Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', ' ', '_'	
	Name 2(Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', ' ', '_'	
	Name 3(Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', ' ', '_'	
	…			

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Parts	Fields	Length	Range/Format	Default
	Name 8(Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '	
	Name 9(Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '	
	Name 10(Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '	
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

- *Password*
  The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".
- *Index*
  The index of the beacon Bluetooth accessory.
- *UUID Numbers*
  The number of <UUID>.
- *UUID*
  When the parameter <Mode> of **AT+GTBID** is set to 2, the device detects Bluetooth accessories by UUID.
- *Name Numbers*
  The number of <NAME>.
- *NAME*
  When the parameter <Mode> of **AT+GTBID** is set to 3, the device detects Bluetooth accessories by NAME.

Note

If <UUID> or <NAME> is empty, the corresponding value will be deleted. The total number of valid values of <UUID> and <NAME> in all indexes cannot exceed 10.

3.4 Tracking Settings

This section describes the commands related to the location messages. Please refer to the details below.

3.4.1 FRI (Fixed Report Information)

The command **AT+GTFRI** is used to configure the parameters for fixed report **FRI** (ASCII)/(HEX) or **ERI** (ASCII)/(HEX).

Example:

AT+GTFRI=gv350ceu,0,1,,1,0000,0000,0,30,1000,1000,,0,600,00000000,,,0,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	FRI	FRI
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-5	0
	Discard No Fix	1	0-1	1
	Reserved	0		
	Period Mode	1	0| 1	1
	Start Time	4	HHMM	0000
	End Time	4	HHMM	0000
	Check Interval	<=5	0-86400(s)	0
	Send Interval	<=5	1-86400(s)	30
	Distance	<=5	50-65535(m)	1000
	Mileage	<=5	50-65535(m)	1000
	Reserved	0		
	Corner Value	<=3	0| 1-180	0
	IGF Report Interval	<=5	0| 5-86400(s)	600
	ERI Mask	8	00000000-FFFFFFFF	00000000
	Reserved	0		
	Reserved	0		
	Wrap Corner Point	1	0| 1	0
	Reserved	0		
	Speed Delta	<=3	0| 1-100(km/h)	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*

The working mode of the fixed report function.

- **0** - Disable this function.
- **1** - Fixed Time Report.

  The position report message is sent to the backend server periodically according to the parameter <Send Interval>.
- **2** - Fixed Distance Report.

  The position report message is sent to the backend server when the straight-line distance between the current GNSS position and the last sent GNSS position is greater than or equal to the distance specified by the parameter <Distance>.
- **3** - Fixed Mileage Report.

  The position report message is sent to the backend server when the path length between the current GNSS position and the last sent GNSS position is greater than or equal to the mileage specified by the parameter <Mileage>.
- **4** - Optimum Report.

  The device simultaneously checks both time interval and path length between two adjacent position reports. Device position will be reported if the calculated time interval between the current time and the time of last report is greater than <Send Interval>, and the length of the path between the current position and the last position is greater than <Mileage>.
- **5** - Fixed Time or Mileage Report.

  It checks either time interval or path length between two adjacent reports. Device position will be reported if the calculated time interval between current time and time of last report is greater than <Send Interval>, or the length of path between the current position and the last position is greater than <Mileage>.

Note

1. For mode 2/3/4/5, the vehicle ignition signal should be connected to the specified digital input port of the device or enabling virtual ignition detection.
2. If the engine is off, the position report message will be sent to the backend server periodically according to the parameter <IGF Report Interval>.

✧ *Discard No Fix*

Enable/disable report when there is no GNSS fix.

- **0** - Enable.
- **1** - Disable.

✧ *Period Mode*

Enable/disable the time range specified by <Start Time> and <End Time>. If the time range is enabled, the position reporting will be limited within the time range.

✧ *Start Time*

The start time of the fixed report. The valid format is “HHMM”. The value range of “HH” is “00”-“23”. The value range of “MM” is “00”-“59”.

✧ *End Time*

The end time of the fixed report. The valid format and range are the same as those of <Start Time>.

✧ *Check Interval*

The interval for updating GNSS position. If the parameter value is 0, the device will update GNSS position according to the value of <Send Interval>. Make sure <Check Interval> is not greater than <Send Interval> so that position data is ready before sending time arrives.

✧ *Send Interval*

The interval for sending the position information. If <Report Mode> in AT+GTSRI is set to forced SMS mode, this parameter should not be less than 15 seconds, otherwise the device will send the position information via TCP short connection.

Note

Due to the limit of the maximum report message length, make sure the <Send Interval>/<Check Interval> ratio is less than or equal to 15.

✧ *Distance*

The specified distance for sending the position information when <Mode> is 2. Unit: meter.

✧ *Mileage*

The specified length for sending the position information when <Mode> is 3/4/5. Unit: meter.

✧ *Corner Value*

A numeral indicating whether to report **+RESP:GTFRI** message based on change in the direction of device movement.

- **0** - Disable.
- **1 - 180** - The angle used to determine whether the device turns around a corner. If the change in the direction of device movement is greater than the specified value, the device is considered turning around a corner. Unit: degree.

Note

If FRI multi-point report occurs at the same time with corner report, the corner point will be included in multi-point report message, and the <Report Type> of the **+RESP:GTFRI** message will be 0.

✧ *IGF Report Interval*

The interval for acquiring and sending the position information when <Mode> is not 0 and <Power Saving Mode> in AT+GTCFG is set to 0 or 2 with engine off. If <IGF Report Interval> is less than 60 seconds, the GNSS will be always on.

✧ *ERI Mask*

When the device is connected with a peripheral, and the bit for the peripheral is set to 1, the device will report **+RESP:GTERI** instead of **+RESP:GTFRI**. This mask is used to configure whether to report the data from peripherals via **+RESP:GTERI**.

- **Bit0** - For the <Digital Fuel Sensor Data> field in **+RESP:GTERI**.
- **Bit1** - For the <1-Wire Data> field in **+RESP:GTERI**.
- **Bit2** - For the <CAN Data> field in **+RESP:GTERI**. This mask only works in ASCII-formatted **+RESP:GTERI** message.

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- **Bit3** - For the <Percentage> field in **+RESP:GTERI**. If it is set to 1, the data block <Fuel Sensor Data> will be present.
- **Bit4** - For the <Volume> field in **+RESP:GTERI**. If it is set to 1, the data block <Fuel Sensor Data> will be present.
- **Bit5 - 6** Reserved
- **Bit7** - For the <RF433 Accessory Data> field in **+RESP:GTERI**.
- **Bit8** - For the <Bluetooth Accessory Data> field in **+RESP:GTERI**.
- **Bit9** - Reserved
- **Bit10** - For the <Fuel Temperature> field in **+RESP:GTERI**. It is only valid for <Sensor Type> 2 and 6. For other fuel sensors, it will be reserved in the ASCII message and forced to 0x7F in the HEX message.
- **Bit11 - 14** Reserved
- **Bit15** - For the <RAT and Band Data> field in **+RESP:GTERI**. RAT means Radio Access Technology.
- **Bit16 - 28** Reserved
- **Bit29** - For the <Expand Digital Fuel Sensor Data> field in **+RESP:GTERI**. If it is set to 1, Bit 0 will automatically be set to 0.
- **Bit30 - 31** Reserved

Note

Bit 3 and Bit 4 are related to AT+GTFSC. If none of the calibration table is set or <Num of Node> is 0, the percentage and volume of the fuel will be shown as reserved in the message **+RESP:GTERI**. Bit 1 is related to command AT+GTACD . If **AT+GTACD** is supported, the 1-Wire device number information will be included in the **+RESP:GTERI** message.

✧ *Wrap Corner Point*

A numeral to indicate whether to wrap corner point with other fixed GNSS points and wait to send **+RESP:GTFRI** message according to the value of <Mode>.

- **0** - Do not wrap corner point and send the corner point immediately when it is found.
- **1** - Wrap corner point and wait to send **+RESP:GTFRI** according to the value of <Mode>.

Note

If <Wrap Corner Point> is set to 1, all the wrap corner points and normal points will be influenced by AT+GTOWH if it is used.

✧ *Speed Delta*

This parameter is used to set the speed difference threshold. When the device is in the motion state with ignition on, it determines whether to report the **+RESP:GTFRI** message based on changes in the GNSS point speed.

- **0** - Disable.
- **1 - 100** - Continuously monitor speed changes at GNSS points. If the speed change exceeds the configured threshold, a **+RESP:GTFRI** message will be reported. Unit: km/h.

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3.4.2 FFC (Frequency Change of FRI)

The command **AT+GTFFC** is used to change the parameters of fixed report when a certain event occurs, so that different report interval requirements can be met. When the event disappears, the device will resume its previous settings.

The device supports up to 5 sets of parameters for different events. Priority is assigned among these events. Only the parameters for the highest priority event are applied if more than one event occurs at the same time.

Example:

AT+GTFFC=gv350ceu,0,1,0,30,500,500,300,0,,,,0000$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	FFC	FFC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Priority	1	0-4	0
	Mode	1	0-3	0
	FRI Mode	1	0-5	0
	FRI IGN Report Interval	<=5	1-86400(s)	30
	FRI Report Distance	<=5	50-65535(m)	500
	FRI Report Mileage	<=5	50-65535(m)	500
	FRI IGF Report Interval	<=5	0| 5-86400(s)	300
	FRI IGN Check Interval	<=5	0-86400(s)	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

- *Priority*
  The priority of the event which triggers the change of fixed report parameters. 0 means "The highest priority".
- *Mode*
  It specifies the trigger event for the fixed report parameter change.
  - **0** - Disable the parameters of the specified priority.
  - **1** - Change the fixed report parameters when the device enters any of the defined Geo-Fence.
  - **2** - Change the fixed report parameters when the device enters known roaming state. Please refer to the AT+GTRMD command for more information.
  - **3** - Change the fixed report parameters when the device enters unknown roaming state.
- *FRI Mode*
  If the specified event occurs, the working mode of the fixed report will be changed according to this parameter.
  - **0** - Do not change the working mode.
  - **1** - Change the working mode to "Fixed Time Report".
  - **2** - Change the working mode to "Fixed Distance Report".
  - **3** - Change the working mode to "Fixed Mileage Report".
  - **4** - Change the working mode to "Optimum Report".
  - **5** - Change the working mode to "Fixed Time or Mileage Report".
- *FRI IGN Report Interval*
  The interval for sending the position information when the ignition is on. Unit: second.
- *FRI Report Distance*
  The specified distance for sending the position information when the mode is fixed distance report. Unit: meter.
- *FRI Report Mileage*
  The specified path length for sending the position information when the mode is fixed mileage report or optimum report. Unit: meter.
- *FRI IGF Report Interval*
  The interval for fixing and sending the position information when the ignition is off and <Power Saving Mode> in AT+GTCFG is set to 0 or 2. Unit: second.
- *FRI IGN Check Interval*
  The interval for GNSS fix. Unit: second.

3.5 Alarm Settings

This section describes the commands related to the alarm settings. Please refer to the details below.

3.5.1 CRA (Crash Detection)

The command **AT+GTCRA** is used to configure the parameters for crash detection. When the current acceleration in a certain direction exceeds the configured threshold, the device will report the **CRA** (ASCII)/(HEX) event message and data packets **CRD**(ASCII)/(HEX) to the backend server.

Example:

AT+GTCRA=gv350ceu,1,10,10,10,0,100,100,0,0,0,0,1,1,5,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CRA	CRA
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	Threshold_X	<=3	0-160	50
	Threshold_Y	<=3	0-160	50
	Threshold_Z	<=3	0-160	50
	Sampling Start Mode	1	0| 1	0
	Samples Before Crash	<=4	1-3200	500
	Samples After Crash	<=4	1-3200	500
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Report ACC Mode	1	0| 1	0
	Report GNSS Mode	1	0| 1	0
	CRA Debounce Time	1	0-9(x10ms)	2
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the crash detection function.

- **0** - Disable.
- **1** - Enable. In this mode, no three-axis self-calibration is required.
- **2** - In this mode, the acceleration sensor data will be converted in accordance with three-axis self-calibration.
  In the new coordinate system, the positive X-axis points in the direction the vehicle travels; the positive Y-axis is perpendicular to X-axis, and the direction conforms to the right-hand rule; and the positive Z-axis is the opposite direction of gravity.

Note

The device will keep monitoring crash event based on the original three-axis data from sensor until it detects the first **ASC** (ASCII)/(HEX) event.

✧ *Threshold_X*

The acceleration threshold for crash in X direction. The smaller the parameter, the easier it is to detect crash events. If <Threshold_X> is 0, the device will not monitor crash event in X-axis. The unit is 0.1g.

✧ *Threshold_Y*

The acceleration threshold for crash in Y direction. The smaller the parameter, the easier it is to detect crash events. If <Threshold_Y> is 0, the device will not monitor crash event in Y-axis. The unit is 0.1g.

✧ *Threshold_Z*

The acceleration threshold for crash in Z direction. The smaller the parameter, the easier it is to detect crash events. If <Threshold_Z> is 0, the device will not monitor crash event in Z-axis. The unit is 0.1g.

✧ *Sampling Start Mode*

A numeral to indicate when to start sampling acceleration data.

- **0** - Start acceleration sampling after the device is powered on.
- **1** - Start acceleration sampling when ignition is on.

✧ *Samples Before Crash*

The number of recorded XYZ-axis acceleration samples before crash.

✧ *Samples After Crash*

The number of recorded XYZ-axis acceleration samples after crash.

✧ *Report ACC Mode*

A numeral which indicates whether to report the acceleration data to the backend server.

- **0** - Disable the acceleration report.
- **1** - Enable the acceleration report.
  The device will report 75 sets of tri-axial acceleration data to the backend server in the message **ACC** (ASCII)/(HEX).

✧ *Report GNSS Mode*

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A numeral which indicates whether to report the GNSS information of 10 seconds before/after crash to the backend server.

- **0** - Disable the GNSS information report.
- **1** - Enable the GNSS information report, reported via the message **CRG** (ASCII)/(HEX). The device will report the GNSS information of 10 seconds before/after crash to the backend server in the message **+RESP:GTCRG**.

✧ *CRA Debounce Time*

The debounce time for crash event to avoid accidental triggering.

3.5.2 DUC (Data Usage Consumption)

The command **AT+GTDUC** is used to get statistics about data usage.

Example:

AT+GTDUC=gv350ceu,1,0,10,1,50,3000,,,,,,0015$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	DUC	DUC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1	0
	Statistical Period	1	0| 1	0
	Data Usage	<=8	0-99999999(Mbyte)	0
	Report Interval	<=2	0-30(day)	0
	Total Percentage	<=3	0-100(%)	0
	Day Data Usage	<=8	0-99999999(Kbyte)	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	

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Parts	Fields	Length	Range/Format	Default
	Tail	1	$	$

✧ *Password*
The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*
The working mode of this function.

- **0** - Disable this function and clear the statistics of data usage.
- **1** - Enable this function.

✧ *Statistical Period*
The unit of statistics period. The device will clear the statistics before a new data usage cycle starts.

- **0** - Month
- **1** - Year

✧ *Data Usage*
The maximum data usage allowed in the <Statistical Period>.

✧ *Report Interval*
The interval for the report **DUC** (ASCII)/(HEX). If it is set to 0, this function will be disabled.

✧ *Total Percentage*
The **+RESP:GTDUC** will be reported when the total data usage reaches the level specified by this parameter.

✧ *Day Data Usage*
The **+RESP:GTDUC** will be reported when the daily data usage reaches the level specified by this parameter.

3.5.3 GEO (Geo-Fence)

The command **AT+GTGEO** is used to configure the parameters of circular Geo-Fence. Circular Geo-Fence is a virtual perimeter around a geographic area using a location-based service. When the terminal with geo-fencing enters or exits the area, a notification containing information about the terminal's location is generated that can be sent to the backend server.

Example:
AT+GTGEO=gv350ceu,0,3,112.129273,32.839031,50,0,0,0,0,0,0,0,0000,0000,0,000A$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT

Parts	Fields	Length	Range/Format	Default
	Command Word	3	GEO	GEO
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	ID	<=2	0-19	0
	Mode	1	0-3	0
	Longitude	<=11	(–)xxx.xxxxxx	0
	Latitude	<=10	(–)xx.xxxxxx	0
	Radius	<=7	50-6000000(m)	50
	Check Interval	<=5	0| 5-86400(s)	0
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Trigger Mode	<=2	0| 21| 22	0
	Trigger Report	1	0| 1	0
	Start Time	4	HHMM	0000
	End Time	4	HHMM	0000
	State Mode	1	0| 1	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *ID*

The ID of the circular Geo-Fence. A total of 20 zones (0 - 19) are supported.

✧ *Mode*

The working mode for the device to report the Geo-Fence message **GIN**(ASCII)/(HEX) or **GOT**(ASCII)/(HEX) to the backend server.

- **0** - Disable the zone's circular Geo-Fence function.
- **1** - Enter the zone. The device will send the message **+RESP:GTGIN** to the server when the vehicle enters the Geo-Fence.
- **2** - Exit the zone. The device will send the message **+RESP:GTGOT** to the server when the

vehicle exits the Geo-Fence.

- **3** - Report **+RESP:GTGIN** and **+RESP:GTGOT** when entering and exiting the Geo-Fence respectively.

✧ *Longitude*

The longitude of a point which is defined as the center of the circular Geo-Fence. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the sign "-" and east longitude is defined as positive without "+".

✧ *Latitude*

The latitude of a point which is defined as the center of the circular Geo-Fence. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "-" and north latitude is defined as positive without "+".

✧ *Radius*

The radius of the circular Geo-Fence. Unit: meter.

✧ *Check Interval*

The interval for GNSS to check location information based on Geo-Fence alarms.

✧ *Trigger Mode*

A numeral to indicate the trigger mode of the Geo-Fence function.

- **0** - Disable automatic triggering.
- **21** - Automatic parking fence.

Automatically set up Geo-Fence after ignition off. In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is off. It will only send the alarm report when the device exits the Geo-Fence, and the Geo-Fence will be cancelled after the device exits the zone.

- **22** - Manual parking fence.

Manually enable Geo-Fence after ignition off. In this mode, the device will automatically set up a Geo-Fence with the current location as the center point of the Geo-Fence when the ignition is off. It will only send the alarm report when the device exits the Geo-Fence. After the device exits the Geo-Fence, it will cancel the Geo-Fence and disable the trigger mode at the same time. If the driver wants to use this trigger mode again, he has to manually set the trigger mode again.

✧ *Trigger Report*

Whether to report the **GES** (ASCII)/(HEX) message when the specified trigger mode is activated or the Geo-Fence is cancelled.

- **0** - Disable the **+RESP:GTGES** report.
- **1** - Enable the **+RESP:GTGES** report.

✧ *Start Time*

The time to start monitoring when the device enters or exits the Geo-Fence. The valid format is "HHMM". The value range of "HH" is "00"-"23". The value range of "MM" is "00"-"59".

✧ *End Time*

The time to end monitoring when the device enters or exits the Geo-Fence. The valid format and

range are the same as those of <Start Time>.

✧ *State Mode*

The mode for reporting the device's GEO state.

- **0** - Report when getting the GEO state for the first time.
- **1** - Do not report until the GEO state changes.

3.5.4 PEO (Polygon Geo-Fence)

The command **AT+GTPEO** is used to configure the parameters of polygon Geo-Fence. Polygon Geo-Fence is a virtual perimeter around a geographic area using a location-based service. When the terminal with geo-fencing enters or exits the area, a notification containing information about the terminal's location is generated that can be sent to the backend server.

Note

This command can be used to set less than ten sets of longitude and latitude coordinates each time.

Example:

AT+GTPEO=gv350ceu,0,0,1,3,121.412240,31.187801,121.412248,31.187891,121.412258,31.187991,0,0,0,0,,,,,000B$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	PEO	PEO
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	ID	<=3	0-199	0
	Mode	1	0-3	0
	Start Point	<=2	1-10	1
	End Point	<=2	3-10	3
	Longitude	<=11	(-)xxx.xxxxxx	
	Latitude	<=10	(-)xxx.xxxxxx	
	Check Interval	<=5	0| 5-86400(s)	0
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0

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Parts	Fields	Length	Range/Format	Default
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *ID*

The ID of the polygon Geo-Fence. A total of 20 zones (0 - 19) are supported.

✧ *Mode*

The working mode for the device to report the polygon Geo-Fence message to the backend server.

- **0** - Disable the zone's polygon Geo-Fence function.
- **1** - Enter the zone. The **GIN**(ASCII)/(HEX) message will be generated only when the terminal enters the Geo-Fence.
- **2** - Exit the zone. The **GOT**(ASCII)/(HEX) message will be generated only when the terminal exits the Geo-Fence.
- **3** - Report the **+RESP:GTGIN** and **+RESP:GTGOT** when entering and exiting the Geo-Fence zone respectively.

✧ *Start Point*

The start point of the polygon GEO-Fence formed by a set of points.

✧ *End Point*

The end point of the polygon GEO-Fence formed by a set of points.

✧ *Longitude*

The longitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The unit is degree, and accuracy is 6 decimal places. West longitude is defined as negative starting with the minus sign "-" and east longitude is defined as positive without "+".

✧ *Latitude*

The latitude of a point which is defined as the endpoint of the polygon Geo-Fence region. The unit is degree, and accuracy is 6 decimal places. South latitude is defined as negative starting with the minus sign "-" and north latitude is defined as positive without "+".

Note

If more sets of <Longitude> and <Latitude> are needed, please adjust <Start Point> and <End

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Point> for appropriate setup. If some sets of <Longitude> and <Latitude> are empty, then the corresponding vertices will be deleted. For example, to delete the 4th, 5th, and 6th vertices of a polygon Geo-Fence, please set <Start Point> to 4 and set <End Point> to 6 and keep the three sets of <Longitude> and <Latitude> empty.

✧ *Check Interval*

The interval for GNSS to check location information based on polygon Geo-Fence alarms.

3.5.5 PEG (Polygon Geo-Fence Group)

The command **AT+GTPEG** is used to configure the groups of Polygon Geo-Fence.

Example:

AT+GTPEG=gv350ceu,0,0,0,19,,64,,60,,0,1,0,0,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	PEG	PEG
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Group ID	1	0-9	0
	Mode	1	0-1	0
	Start ID	<=3	0-199	0
	End ID	<=3	0-199	19
	Reserved	0		
	Speed Threshold	<=3	0-400(km/h)	0
	Reserved	0		
	Validity	<=4	0-3600(s)	60
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*
The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Group ID*
The ID of a GEO group. The smaller the ID, the higher the priority of a group. If the device enters Polygon GEO-Fence within a higher priority Polygon Geo-Fence group, it will not check the GEO status of those Polygon Geo-Fence groups of relatively low priority.

✧ *Mode*
Enable/disable the group's Polygon Geo-Fence function. If this parameter is set to 0 for all groups, the **AT+GTPEG** command does not take effect, and the device works according to configuration of AT+GTPEO.

- **0** - Disable.
- **1** - Enable.

✧ *Start ID, End ID*
The range of the GEO IDs. It indicates which IDs are currently in the group. A GEO ID cannot be set in two groups. A group supports a maximum of 32 GEO IDs.

✧ *Speed Threshold*
The minimum value that triggers the speed alarm when the device is inside the Geo Fence within this group. It will report **SPE** (ASCII)/(HEX) for the alarm. 0 means the speed alarm function is disabled.

✧ *Validity*
If the speed is higher than the speed threshold for period longer than the time specified by <Validity>, the speed alarm will be triggered.

✧ *Output ID, Output Status, Duration, Toggle Times*
When the speed alarm is triggered, the specified wave will be output at the specified output.

3.5.6 HBM (Harsh Behavior Monitoring)

The command **AT+GTHBM** is used to monitor the harsh driving behavior based on GNSS or motion sensor. The same harsh behavior within 30 seconds will only be reported once if only GNSS is used to measure harsh driving behavior.

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Example:

AT+GTHBM=gv350ceu,1,3,1,100,5,5,,60,10,10,,,30,30,,0,0,0,0,25,50,20,50,,,25,50,0,0010$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	HBM	HBM
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-5	0
	Behavior Duration	1	3-5	3
	Discard Unknown Event	1	0| 1	1
	High Speed	<=3	100-400(km/h)	100
	ΔVhb	<=3	0-100(km/h)	0
	ΔVha	<=3	0-100(km/h)	0
	Reserved	0		
	Medium Speed	<=3	60-100(km/h)	60
	ΔVmb	<=3	0-100(km/h)	0
	ΔVma	<=3	0-100(km/h)	0
	Reserved	0		
	Reserved	0		
	ΔVlb	<=3	0-100(km/h)	0
	ΔVla	<=3	0-100(km/h)	0
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Cornering Threshold	<=3	10-100	25
	Cornering Duration	<=3	10-250(x100ms)	50
	Acceleration Threshold	<=3	5-100	20
	Acceleration Duration	<=3	10-250(x10ms)	50

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
	Brake Threshold	<=3	10-100	25
	Brake Duration	<=3	10-250(x10ms)	50
	Report Mode	1	0-2	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the harsh behavior monitoring function.

- **0** - Disable this function.
- **1** - Enable this function: Detected by GNSS only.

In this mode, 2 harsh behaviors are monitored, namely harsh braking and harsh acceleration. According to the speed read from GNSS, 3 levels of speed are defined including high speed, medium speed and low speed. For each speed level, 2 thresholds of speed change are defined to determine harsh braking and harsh acceleration. If the change of speed within <Behavior Duration> seconds is greater than the corresponding threshold, the device will report the **HBM** (ASCII)/(HEX) message to the backend server to indicate the harsh behavior.

- **2** - Enable this function: Detected by motion sensor only.

In this mode, three types of harsh behavior can be detected, namely harsh braking, harsh acceleration and harsh cornering. The device needs GNSS information to get the harsh behavior direction, so it is necessary to keep GNSS always on to collect all the information needed.

- **3** - Enable this function: Detected by motion sensor or GNSS.
- **4** - Enable this function: Detected by motion sensor and GNSS.
- **5** - Enable this function: Detected by XYZ-axis acceleration data only.

In this mode, the XYZ-axis data will be converted in accordance with 3-axis self-calibration. If the value change of the positive X-axis (vehicle driving direction) is greater than <Acceleration Threshold> for the time of <Acceleration Duration>, the device will report the message **+RESP:GTHBM** to the backend server to indicate harsh acceleration.
If the value change of opposite direction of positive X-axis is greater than <Brake Threshold> for the time of <Brake Duration>, the device will report the message **+RESP:GTHBM** to indicate harsh braking behavior.

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If the value change of the Y-axis (left and right direction of vehicle moving direction) is greater than <Cornering Threshold> for the time of <Cornering Duration>, the device will report the message **+RESP:GTHBM** to indicate harsh cornering behavior, and the message **HBE** (ASCII)/(HEX) will be reported when the harsh behavior is over.

Note

The device will not detect harsh behavior until it has already detected the first **ASC** (ASCII)/(HEX) event.

✧ *Behavior Duration*

The speed change within <Behavior Duration> is measured.

✧ *Discard Unknown Event*

It configures whether to discard the **+RESP:GTHBM** message that indicates unknown harsh behavior.

- **0** - Do not discard unknown harsh behavior message.
- **1** - Discard unknown harsh behavior message.

✧ *High Speed, Medium Speed*

If the last known speed of the device read from GNSS is greater than or equal to <High Speed>, the vehicle that the device is attached to is considered to be at high speed.

If the last known speed is less than <High Speed> but greater than or equal to <Medium Speed>, the vehicle is considered to be at medium speed.

If the last known speed is less than <Medium Speed>, the vehicle is considered to be at low speed.

✧ *ΔVhb*

The threshold for harsh braking at high speed level.

If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within <Behavior Duration> seconds, harsh braking is detected at high speed level.

If it is set to 0, it means “Do not monitor harsh braking behavior at high speed level”.

✧ *ΔVha*

The threshold for harsh acceleration at high speed level.

If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within <Behavior Duration> seconds, harsh acceleration is detected at high speed level.

If it is set to 0, it means “Do not monitor harsh acceleration behavior at high speed level”.

✧ *ΔVmb*

The threshold for harsh braking at medium speed level.

If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within <Behavior Duration> seconds, harsh braking is detected at medium speed level.

If it is set to 0, it means “Do not monitor harsh braking behavior at medium speed level”.

✧ *ΔVma*

The threshold for harsh acceleration at medium speed level.

If the current speed is greater than the last known speed and the change of the speed is greater

than or equal to this value within <Behavior Duration> seconds, harsh acceleration is detected at medium speed level.
If it is set to 0, it means “Do not monitor harsh acceleration behavior at medium speed level”.

✧ *ΔVlb*
The threshold for harsh braking at low speed level.
If the current speed is less than the last known speed and the change of the speed is greater than or equal to this value within <Behavior Duration> seconds, harsh braking is detected at low speed level.
If it is set to 0, it means “Do not monitor harsh braking behavior at low speed level”.

✧ *ΔVla*
The threshold for harsh acceleration at low speed level.
If the current speed is greater than the last known speed and the change of the speed is greater than or equal to this value within <Behavior Duration> seconds, harsh acceleration is detected at low speed level.
If it is set to 0, it means “Do not monitor harsh acceleration behavior at low speed level”.

✧ *Output ID*
It specifies the ID of the output port to output specified wave shape when the harsh behavior is detected. If it is set to 0, there will be no output wave.

✧ *Cornering Threshold*
The threshold for the motion sensor to measure whether the device is in harsh cornering.

✧ *Cornering Duration*
A time parameter to measure whether the device enters harsh cornering. If the driving behavior is maintained for a period of time longer than <Cornering Duration>, the harsh cornering or harsh braking event will be triggered.

✧ *Acceleration Threshold*
The threshold for the motion sensor to measure whether the device is in harsh acceleration state.

✧ *Acceleration Duration*
A time parameter to measure whether the device enters harsh acceleration state. If the driving behavior is maintained for a period of time longer than <Acceleration Duration>, the harsh acceleration event will be triggered.

✧ *Brake Threshold*
The threshold for the motion sensor to measure whether the device is in harsh braking state.

✧ *Brake Duration*
A time parameter to measure whether the device enters harsh braking state. If the driving behavior is maintained for a period of time longer than <Brake Duration>, the harsh braking event will be triggered.

✧ *Report Mode*
Whether to report **+RESP:GTHBE** / **+RESP:GTHBM** to the backend server.

- **0** - Do not report **+RESP:GTHBE**, only report **+RESP:GTHBM**.

- **1** - Report **+RESP:GTHBE** and **+RESP:GTHBM**.
- **2** - Do not report **+RESP:GTHBM**, only report **+RESP:GTHBE**.

Note

The threshold for harsh driving should be smaller than the threshold for crash in the AT+GTCRA command.

3.5.7 IDL (Excessive Idling Detection)

The command **AT+GTIDL** is used to detect the engine excessive idling (vehicle stays stationary while ignition is on). To use this command, the device must be in the ignition state. If the vehicle enters the idle state, the device will report the event message **IDN** (ASCII)/(HEX) to the backend server. If the vehicle exits the idle state, the device will report the event message **IDF** (ASCII)/(HEX) to the backend server.

Example:

AT+GTIDL=gv350ceu,0,2,1,0,,,,0,0,0,0,,,,,000F$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	IDL	IDL
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1	0
	Time to Idling	<=2	1-30(min)	2
	Time to Movement	1	1-5(min)	1
	Debounce Distance	<=4	0| 25-9999(m)	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of this function.

- **0** - Disable.
- **1** - Enable.

✧ *Time to Idling*

If the vehicle is detected to be stationary with ignition on within the period specified by this parameter, it is considered to be idling.

✧ *Time to Movement*

After entering the idle state, if the vehicle moves again and the moving state is maintained for the time specified by this parameter or ignition off is detected, it is considered to exit the idle state.

✧ *Debounce Distance*

After entering the idle state, if the vehicle moves more than <Debounce Distance>, it is considered to exit the idle state.

✧ *Output ID*

It specifies the ID of the output port to output specified wave shape when the vehicle enters the idle state. If it is set to 0, there will be no output wave.

3.5.8 JBS (Jamming Behavior Setting)

The command **AT+GTJBS** is used for the Jamming Behavior Setting function. There are two modes of Jamming Behavior Setting, namely Jamming Behavior Setting Configure Mode and Jamming Behavior Setting Reset Mode. The output1 is used for "fuel cut-off" or used for "siren".

3.5.8.1 Jamming Behavior Setting Configure Mode

Example:

AT+GTJBS=gv350ceu,0,,10,10,1800,1,30,0,0,5,1,0,0,0,001A$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	JBS	JBS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0|1	0
	Reserved	0		
	Siren On Timer (T1)	<=3	1-600(x100ms)	10
	Siren Off Timer (T2)	<=3	1-600(x100ms)	10
	Ready Fuel Release Timer (T3)	<=5	1-65535(s)	1800
	Check Speed	1	0|1	1
	Speed Limit	<=3	0-999(km/h)	30
	Output 1 Init State	1	0|1	0
	Motion Sensor	1	0|1	0
	GNSS Fix Failure Timeout Timer (T4)	<=3	1-100(min)	5
	Enable Siren	1	0|1	1
	Release Fuel Cut-off Timer (T5)	<=4	0-1000(min)	0
	Check Jamming in T3	1	0|1	0
	Waiting Release Fuel Timer (T6)	<=5	0-65535(s)	0
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

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- *Password*
  The valid characters for the password include '0' - '9', 'a' - 'z', and 'A' - 'Z'. The default value is "gv350ceu".
- *Mode*
  A numeral to indicate the working mode of the Jamming Behavior Setting function.
  - **0** - Disable the JBS function.
  - **1** - Jamming Behavior Setting Configure Mode.
- *Siren On Timer (T1)*
  It specifies the length of time the siren is on.
- *Siren Off Timer (T2)*
  It specifies the length of time the siren is off.
- *Ready Fuel Release Timer (T3)*
  It indicates the length of time when the fuel is cut off and whether jamming state is checked every 2 seconds is determined according to the <Check Jamming in T3>.
- *Check Speed*
  Whether to check speed when the device enters jamming state.
  - **0** - Disable speed check.
  - **1** - Enable speed check.
- *Speed Limit*
  The speed limit to cut off fuel.
- *Output 1 Init State*
  It is used to set the initial state of output 1.
- *Motion Sensor*
  Whether the motion sensor needs to measure the motion state to cut off fuel when the GNSS fix failure timeout expires. If <Motion Sensor> is set to 0, the state machine will always measure the GNSS fix state.
  - **0** - Disable motion sensor.
  - **1** - Enable motion sensor.
- *GNSS Fix Failure Timeout Timer (T4)*
  It indicates the time length of GNSS timeout.
- *Enable Siren*
  It defines whether to control siren with digital output 2 in the current JBS state.
- *Release Fuel Cut-off Timer (T5)*
  If the device enters JBS and then cuts off fuel, it will check the current jamming state when the <Fuel Cut-off Timer (T3)> condition is met. If the device doesn't quit the jamming state and the value of <Release Fuel Cut-off Timer> is greater than 0, the device will release fuel cut-off and <Release Fuel Cut-off Timer> will start to work.
  When the <Release Fuel Cut-off Timer> condition is met, the device will check the current

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jamming state. If the device doesn't quit the jamming state, it will check the condition and decides whether to cut off fuel again. If the device doesn't quit the jamming state and the value of <Release Fuel Cut-off Timer> is 0, the device will keep fuel cut-off status until it quits the jamming state.

✧ *Check Jamming in T3*

It indicates whether the JBS state machine starts T3 timer to check jamming state and starts T6 timer if the device quits jamming state.

- **0** - Do not check jamming state (compatible with old JBS state machines).
- **1** - Check jamming state and start T6 timer.

✧ *Waiting Release Fuel Timer (T6)*

It indicates the length of time to be waited before releasing fuel and quitting JBS state machine.

3.5.8.2 Jamming Behavior Setting Reset Mode

Example:

AT+GTJBS=gv350ceu,2,,,,,001A$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	JBS	JBS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	2	2
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Mode*

A numeral to indicate the working mode of the JBS function.

- **2** - Jamming Behavior Setting Reset Mode.

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3.5.9 JDC (Network Jamming Detection)

The command **AT+GTJDC** is used to configure the parameters for jamming detection. When the detection condition is met, the device will report the event message **JDR** (ASCII)/(HEX) or **JDS** (ASCII)/(HEX) to the backend server according to the <Mode> setting.

Example:

AT+GTJDC=gv350ceu,2,15,70,,70,2,60,10,0,0,0,0,,001A$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	JDC	JDC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	LTE Threshold1	<=2	0-20	15
	LTE Threshold2	<=3	0-130	70
	Reserved	0		
	2G Threshold1	<=2	0-99	70
	2G Threshold2	1	0-6	2
	Enter Jamming Duration	<=4	0-3600(s)	60
	Exit Jamming Duration	<=4	0-3600(s)	10
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Sensitivity	1	1-5	5
	Warning Output	1	0| 1	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	

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Parts	Fields	Length	Range/Format	Default
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the jamming detection function.

- **0** - Disable jamming detection function.
- **1** - Enable jamming detection function.

  If jamming is detected, the device will report the **+RESP:GTJDR** message when it enters the jamming state.
- **2** - Enable jamming detection function.

  If jamming is detected, the device will report the **+RESP:GTJDS** message when it enters or exits the jamming state.

✧ *LTE Threshold1, LTE Threshold2*

The built-in LTE jamming detection algorithm uses these two parameters to measure whether the device is currently being jammed. The smaller the parameter value, the more sensitive the detection.

✧ *2G Threshold1, 2G Threshold2*

The built-in 2G jamming detection algorithm uses these two parameters to measure whether the device is currently being jammed. The smaller the parameter value, the more sensitive the detection.

✧ *Enter Jamming Duration*

When the device detects jamming, it will trigger the "enter jamming" event based on the <Enter Jamming Duration>.

✧ *Exit Jamming Duration*

When the device quits jamming, it will trigger the "quit jamming" event based on the <Exit Jamming Duration>.

Note

The device starts to judge jamming state only after it is disconnected from the network.

✧ *Sensitivity*

It is the sensitivity of jamming detection. The smaller the parameter value, the more sensitive the detection.

✧ *Warning Output*

- **0** - Disable this Output. Do not trigger output when the device is in Jamming Warning state.
- **1** - Enable this Output. Trigger output when the device is in Jamming Warning state.

Note

Once the device enters the jamming warning state, it will automatically exit this state if no

transition to the jamming state occurs within two minutes.

3.5.10 GPJ (GNSS Jamming Detection)

The command **AT+GTGPJ** is used to configure the parameters for GNSS jamming status detection. If GNSS jamming has been detected or suspected by the receiver, the device will report the **GPJ** (ASCII)/(HEX) event message to the backend server.

The hardware version 2.01 does not support this command. When using devices with the 2.01 hardware version, it is impossible to detect the GNSS jamming status and report the **GPJ** (ASCII)/(HEX) event message.

Example:

AT+GTGPJ=gv350ceu,1,15,3,,,,,0,0,0,0,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	GPJ	GPJ
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-1	0
	CW Threshold	<=2	0-31	15
	BB Threshold	<=2	0-15	3
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

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- *Password*
  The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".
- *Mode*
  The working mode of the GNSS jamming status detection function.
  - **0** - Disable this function.
  - **1** - Enable this function.
- *CW Threshold*
  Narrowband continuous wave (CW) jamming detection threshold (unit = dB).
- *BB Threshold*
  Broadband jamming detection threshold (unit = dB).

3.5.11 RMD (Roaming Detection)

The command **AT+GTRMD** is used to configure the parameters for roaming detection.

Example:

AT+GTRMD=gv350ceu,0,,,,,1,1,46003,,,2,2,46007,,,3,3,46001,,,7DEF,,,7DEF,,,,,0,0,0,0,,,0001$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	RMD	RMD
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-1	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Home Operator Start	<=2	1-10	1
	Home Operator End	<=2	1-10	1
	Home Operator List	<=6*10		
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Roaming Operator Start	<=3	1-100	1
	Roaming Operator End	<=3	1-100	1
	Roaming Operator List	<=6*100		
	Reserved	0		
	Reserved	0		
	Blocklist Operator Start	<=2	1-20	1
	Blocklist Operator End	<=2	1-20	1
	Blocklist Operator	<=6*20		
	Reserved	0		
	Reserved	0		
	Known Roaming Event Mask	<=6	000000-FFFFFF	7DEF
	Reserved	0		
	Reserved	0		
	Unknown Roaming Event Mask	<=6	000000-FFFFFF	7DEF
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*

The working mode of the roaming detection function.

- **0** - Disable this function.
- **1** - Enable this function.

✧ *Operator Start*

A numeral which indicates the first index of the allowlist operator numbers to be input.
For example, if the value is 1, the device will update the allowlist of operators from the first one. If the parameter is empty, there should be no allowlist number.

✧ *Operator End*

A numeral which indicates the last index of the allowlist operator numbers to be input.
For example, if the value is 2, the device will update the allowlist of operators until the second one. If the parameter is empty, there should be no allowlist number.

✧ *Home Operator List*

An allowlist of PLMN operator numbers. The numbers are composed of MCC and MNC, both of which consist of 3 digits. And the last digit of MNC can be omitted, for example, both "46001F" and "46001" are the PLMN of CHINA UNICOM.
The operators in this list will be considered as in "Home" state. Two adjacent operator numbers are separated with ",". The number of the operators in the list is determined by the parameters <Operator Start> and <Operator End>. For example, if <Operator Start> is 1 and <Operator End> is 2, the operator list should include 2 operator numbers (empty value acceptable) and the two numbers are separated with ",".
"MCCFF" type code is used to identify operators across a whole country, for example, "460FF" covers the mobile network operators across China.

✧ *Roaming Operator List*

It is mostly like <Home Operator List>, and the difference is that the operators in this list will be considered to be in "Known Roaming" state.

✧ *Blocklist Operator*

It is mostly like <Home Operator List>, and the difference is that the operators in this list will be considered to be in "Blocking Report" state. In this state, the device works properly but all reports will be buffered instead of being sent.

Note

Operators that are not in <Home Operator List>, <Roaming Operator List> or <Blocklist Operator> will be considered to be in "Unknown Roaming" state.

✧ *Known Roaming Event Mask*

Bitwise mask to configure which event report should be sent to the backend server when roaming state is detected. If the roaming state is "Known Roaming", <Known Roaming Event Mask> will be valid; if the roaming state is "Unknown Roaming", <Unknown Roaming Event Mask> will be valid.

- **Bit0** - for **PNA** (ASCII)/(HEX)
- **Bit1** - for **PFA** (ASCI)/(HEX)
- **Bit2** - for **MPN** (ASCII)/(HEX)
- **Bit3** - for **MPF** (ASCII)/(HEX)

- **Bit4** - Reserved
- **Bit5** - for **BPL** (ASCII)/(HEX)
- **Bit6** - for **BTC** (ASCII)/(HEX)
- **Bit7** - for **STC** (ASCII)/(HEX)
- **Bit8** - for **STT** (ASCII)/(HEX)
- **Bit9** - Reserved
- **Bit10** - for **PDP** (ASCII)/(HEX)
- **Bit11** - for the power on **RTL** (ASCII)/(HEX)
- **Bit12** - for the ignition report **IGN** (ASCII)/(HEX), **IGF** (ASCII)/(HEX), **VGN** (ASCII)/(HEX) and **VGF** (ASCII)/(HEX)
- **Bit13** - for the ignition on/off location reports **IGL**(ASCII)/(HEX) and **VGL** (ASCII)/(HEX)
- **Bit14** - for **EXP** (ASCII)/(HEX)
- **Bit15** - for **PNR** (ASCII)/(HEX)
- **Bit16** - for **PFR** (ASCII)/(HEX)
- **Bit17 - 23** Reserved

For each bit, set it to 1 to enable the corresponding event report, and set it to 0 to disable the corresponding event report.

✧ *Unknown Roaming Event Mask*

It is mostly like <Known Roaming Event Mask>.

✧ *Output ID, Output Status, Duration, Toggle Times*

If this function is enabled and roaming state is detected, the specified wave will be output on the specified output.

Note

If more operators are needed, please adjust <Operator Start> and <Operator End> for appropriate setup. If some operators in <Operator List> are empty, then the corresponding operators will be deleted. For example, to delete the 4th, 5th and 6th operators of the <Operator List>, please set <Operator Start> to 4 and set <Operator End> to 6 and keep those three operators of <Operator List> empty.

3.5.12 SIM (Binding SIM Card)

The **AT+GTSIM** command is used to bind SIM card function. If the current SIM card is replaced by another SIM card, then the digital output will be triggered.

Example: AT+GTSIM=gv350ceu,2,898600910909f0385552,,,0,0,0,0,,gv350ceu,,,0013$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	SIM	SIM
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	ICCID	20		
	Operation Mask	<=8	0-FFFFFFFF	0
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Independent Password Mode	1	0-1	0
	Independent Password	4 - 20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
	New Independent Password	4 - 20	'0' - '9' 'a' - 'z' 'A' - 'Z'	
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

A numeral that indicates whether to bind SIM card.

- **0** - Do not bind SIM card.
- **1** - Bind the current SIM card.
- **2** - Bind the specified SIM card by ICCID.

✧ *ICCID*

The ICCID of the SIM card to be bound.

✧ *Operation Mask*

Bitwise mask to configure which operation will be triggered when the current SIM card is replaced by another SIM card.

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- **Bit0** - Unregister on the network.
- **Bit1** - Command cannot be executed, except the command **AT+GTRTO-2** and **AT+GTRTO-3**, **AT+GTSIM**.
- **Bit2 - 31** Reserved

✧ *Output Status*

After detecting SIM card replacement, the digital output port <Output ID> will output a status signal.

✧ *Independent Password Mode*

It configures whether to enable independent password. To change the configuration of this command, the correct independent password is required. If independent password mode is set to 1, the configuration of independent password will be hidden.

- **0** - Disable independent password.
- **1** - Enable independent password.

✧ *Independent Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu". If independent password mode is enabled, independent password cannot be queried.

✧ *New Independent Password*

It is set to change the current independent password.

3.5.13 SOS (SOS Setting)

This command is used to configure a specified input port for emergency.

When an emergency occurs, the end user can use the specified input port to trigger the SOS function and the device will report the position message **SOS** (ASCII)/(HEX) to the backend server. A specified wave shape can be configured to output on a specified output port.

Example:

AT+GTSOS=gv350ceu,0,0,,0,0,0,0,,,1,,000D$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	SOS	SOS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 2| 4	0
	Digital Input ID	1	0-3| 9-C	0

Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	GNSS Position Type	1	1-3	1
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Mode*

The working mode of the SOS function.

- **0** - Disable SOS function.
- **2** - Send the current position to the backend server only.
- **4** - Send the current position to the SMS gateway via SMS.

✧ *Digital Input ID*

The ID of the digital input port which triggers the SOS function. 0 means "Disable the SOS function".

The digital input port should first be configured by the command AT+GTDIS for the SOS function. If a digital input port is configured to trigger the SOS function, there is no **DIS** (ASCII)/(HEX) report message for the specified digital input port.

✧ *GNSS Position Type*

A numeral to indicate the type of the GNSS position (last GNSS position or current GNSS position) to be reported to the backend server.

- **1** - Try to report the current GNSS location when the SOS event is triggered.
- **2** - Only report the last GNSS location immediately when the SOS event is triggered.
- **3** - Report the last GNSS location immediately when the SOS event is triggered and then the device tries to get the current GNSS location to be reported.

Note

If <GNSS Position Type> is set to 2, the **GSM** (ASCII)/(HEX) report will not be triggered.

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3.5.14 BZA (Buzzer Alarm)

This command is used to set buzzer alarm. There are four kinds of alarms, and each alarm outputs a different buzzer sound. Before using these alarms, the output ID connected to the buzzer should be configured and enabled.

The overspeed alarm event (refer to the command AT+GTSPA) can trigger the buzzer alarm defined by this command.

Example:

AT+GTBZA=gv350ceu,2,,,,1,0,0,,,0,10,1,,,2,0,0,,,1,2,10,,,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	BZA	BZA
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Output ID	1	0| 2-5	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Alarm 1 Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Alarm 2 Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Alarm 3 Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0

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Parts	Fields	Length	Range/Format	Default
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Alarm 4 Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*
The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Output ID*
The output port connected to the buzzer.

3.5.15 SPA (Overspeed Alarm)

This command is used to set the speed thresholds and bind an alarm type to each speed threshold for the buzzer alarm. If the current speed meets one of the thresholds, the buzzer will emit a sound corresponding to the alarm type.

Example:
AT+GTSPA=gv350ceu,1,50,,60,0,,,70,,60,0,,,90,,60,0,,,110,,60,0,,,,,,,,000C$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	SPA	SPA
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	Speed Threshold 1	<=3	0-400(km/h)	50
	Reserved	0		
	Validity	<=4	0-3600(s)	60
	Alarm Type	1	0| 1-4	0
	Reserved	0		
	Reserved	0		
	Speed Threshold 2	<=3	0-400(km/h)	70
	Reserved	0		
	Validity	<=4	0-3600(s)	60
	Alarm Type	1	0| 1-4	0
	Reserved	0		
	Reserved	0		
	Speed Threshold 3	<=3	0-400(km/h)	90
	Reserved	0		
	Validity	<=4	0-3600(s)	60
	Alarm Type	1	0| 1-4	0
	Reserved	0		
	Reserved	0		
	Speed Threshold 4	<=3	0-400(km/h)	110
	Reserved	0		
	Validity	<=4	0-3600(s)	60
	Alarm Type	1	0| 1-4	0
	Reserved	0		
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the overspeed alarm function.

- **0** - Disable this function.
- **1** - Strict standard mode. In this mode, the device will check the speed and trigger the buzzer alarm when accelerating or decelerating.
- **2** - Warning mode. In this mode, the device will only check the speed and trigger the buzzer alarm when accelerating.

✧ *Speed Threshold*

The minimum speed to trigger the buzzer alarm.

✧ *Validity*

If the speed meets the alarm condition and is maintained for a period longer than <Validity>, the buzzer alarm will be triggered.

✧ *Alarm Type*

The alarm type for each speed threshold. 0 means "No buzzer alarm".

3.5.16 SPD (Speed Alarm)

The command **AT+GTSPD** is used to set a speed range for the speed alarm function of the terminal. According to the working mode, the device will report the message **SPD** (ASCII)/(HEX) to the backend server when its moving speed is outside or within the range.

Example:

AT+GTSPD=gv350ceu,1,0,0,60,300,0,0,0,0,0,,,,,,,,,,000C$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	SPD	SPD
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-4	0
	Min Speed	<=3	0-400(km/h)	0
	Max Speed	<=3	0-400(km/h)	0
	Validity	<=4	0-3600(s)	60
	Send Interval	<=4	30-3600(s)	300
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Report ID	<=2	0-15	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*

The working mode of the speed alarm function.

- **0** - Disable speed alarm.
- **1** - Report speed alarm if the current speed is within the speed range specified by <Min Speed> and <Max Speed>.
- **2** - Report speed alarm if the current speed is outside the speed range specified by <Min Speed> and <Max Speed>.
- **3** - Report speed alarm only once if the current speed is within or outside the speed range specified by <Min Speed> and <Max Speed>. In this mode, <Send Interval> will be ignored.
- **4** - Report speed alarm if the current speed is within or outside the speed range specified by <Min Speed> and <Max Speed>. But the backend server will not receive the **+RESP:GTSPD** message that the speed is outside the speed range unless it first receives an alarm that the speed is in the speed range. In this mode, <Send Interval> will be ignored.

✧ *Min Speed*
The lower speed limit.

✧ *Max Speed*
The upper speed limit.

✧ *Validity*
If the speed meets the alarm condition and is maintained longer than <Validity>, the speed alarm will be triggered.

✧ *Send Interval*
The interval for sending the speed alarm message.

✧ *Report ID*
It indicates the type of speed alarm, and it is reported in the **+RESP:GTSPD** message.

3.5.17 SSR (Start/Stop Report)

The command **AT+GTSSR** is used to detect the state of vehicle. When the vehicle enters Start state, the device will report the event message **STR** (ASCII)/(HEX) to the backend server. When the vehicle exits the Start state and then enters Stop state, the device will report the event message **STP** (ASCII)/(HEX) to the backend server.

Example:
AT+GTSSR=gv350ceu,1,2,1,5,30,0,1,,000F$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT

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Parts	Fields	Length	Range/Format	Default
	Command Word	3	SSR	SSR
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1	0
	Time to Stop	<=4	0-30(minutes)| 0-1800(seconds)	2
	Time to Start	<=3	0-5(minutes)| 0-300(seconds)	1
	Start Speed	<=2	1-10(km/h)	5
	Long Stop	<=5	0-43200(min)	0
	Time Unit	1	0| 1	0
	Fast STP Mode	1	0| 1	1
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the Start/Stop report function.

- **0** - Disable this function.
- **1** - Enable this function.

✧ *Time to Stop*

After entering the Start state, if the vehicle is stationary again and remains stationary for the time specified in this parameter, it is considered to exit the Start state.

✧ *Time to Start*

If the vehicle is moving with ignition on for the period specified by this parameter, it is considered to be in Start state.

✧ *Start Speed*

The start speed threshold to determine whether the vehicle is started or not. When it is detected by the built-in motion sensor that the vehicle is moving with ignition on, the device will start to check the speed from GNSS.

If the device speed is maintained at a level higher than <Start Speed> for the time longer than <Time to Start>, the vehicle is considered to be in Start state, and the event message **+RESP:GTSTR**

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will be reported.
If the device speed stays at a level lower than or equal to <Start Speed> for the time longer than <Time to Stop>, the vehicle is considered to quit Start state and the event message **+RESP:GTSTP** will be reported.
If abnormal GNSS fix lasts more than 1 minute, the built-in motion sensor is used to detect the Start/Stop state only without checking the speed.

✧ *Long Stop*
After the vehicle enters Stop state and stays in Stop state for the time specified by this parameter, the **LSP** (ASCII)/(HEX) message will be reported. 0 means "Disable this parameter".

✧ *Time Unit*
It controls the time unit of <Time to Stop> and <Time to Start>.

- **0** - Unit: minute.
- **1** - Unit: second.

✧ *Fast STP Mode*
Whether to report **+RESP:GTSTP** message immediately when the engine is turned off.

- **0** - The event message **+RESP:GTSTP** will be reported when the engine is turned off and the time meets the <Time to Stop>.
- **1** - The event message **+RESP:GTSTP** will be reported immediately when the engine is turned off, but it only works when <Mode> is set to 1.

3.5.18 TOW (Tow Alarm)

The **AT+GTTOW** command is used to configure sensitivity setting of the motion sensor and the tow alarm parameters.

Example:
AT+GTTOW=gv350ceu,1,10,1,300,0,0,0,0,2,3,2,,,,,,,,000B$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TOW	TOW
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-1	0
	Engine Off to Tow	<=2	5-15(min)	10
	Fake Tow Delay	<=2	0-10(min)	1

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Parts	Fields	Length	Range/Format	Default
	Tow Interval	<=5	30-86400(s)	300
	Tow Output ID	1	0-5| 9-C	0
	Tow Output Status	1	0-2	0
	Tow Output Duration	<=3	0-255(x100ms)	0
	Tow Output Toggle Times	<=3	0-255	0
	Rest Duration	<=3	1-255(x15s)	2
	Motion Duration	<=2	1-10(x100ms)	3
	Motion Threshold	1	1-9	2
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

Enable/disable the tow alarm function.

- **0** - Disable.
- **1** - Enable.

✧ *Engine Off to Tow*

A time parameter used to measure whether the device is considered to be towed after the engine is turned off. If the motion sensor does not detect non-movement within the specified time after the engine is off, the device is being towed.

✧ *Fake Tow Delay*

If the motion sensor detects movement after engine off and non-movement are detected previously, the device enters a state called fake tow. If the device stays in fake tow longer than the time specified by <Fake Tow Delay>, it is considered to be towed.

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- *Tow Interval*
  The interval for sending the tow alarm message. If <Tow Interval> is less than 60 seconds, the GNSS will keep working.
- *Tow Output ID*
  The ID of the output port to output the specified wave shape when the tow event is detected.
- *Tow Output Status*
  Please refer to the parameter <Output Status> in AT+GTDOS.
- *Tow Output Duration*
  Please refer to the parameter <Duration> in **AT+GTDOS**.
- *Tow Output Toggle Times*
  Please refer to the parameter <Toggle Times> in **AT+GTDOS**.
- *Rest Duration*
  A time parameter to measure whether the device enters stationary state. The state of the device will be changed to rest if the motion sensor detects stationary and the stationary state is maintained for a period longer than the time specified by the parameter <Rest Duration>.
- *Motion Duration*
  A time parameter to measure whether the device enters moving state. The state of the device will be changed to motion if the motion sensor detects motion and the moving state is maintained for a period specified by the parameter <Motion Duration>.
- *Motion Threshold*
  The threshold for the motion sensor to measure whether the device is moving. The smaller the value, the more sensitive the motion detection. Please note that the default value is the ideal setting for motion and static detection. Therefore, exercise caution when modifying threshold parameters; otherwise, motion and static detection may be affected.

3.6 IO Applications

This section describes the commands related to Input and Output port settings. Please refer to the details below.

3.6.1 AIS (Analog Input Setting)

The command **AT+GTAIS** is used to configure the parameters of analog input ports.

Make sure there is an analog signal connected to the corresponding analog input port before enabling this function.

Example: AT+GTAIS=gv350ceu,1,0,10000,12000,1,,0,0,0,0,0,10,30,10,20,0,0,0,,0,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	AIS	AIS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	ID	1	1-3	1
	Mode	1	0-7	0
	Min Threshold	<=5	0-16000| 0-30000(mV)	0
	Max Threshold	<=5	0-16000| 0-30000(mV)	0
	Sample Rate	<=2	0| 1-12(x2s)	0
	Reserved	0		
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Sync with FRI	1	0| 1	0
	Fuel Level Debounce	<=3	0-149	10
	Fuel Sensor Delay Time	<=3	0-600(s)	30
	Fuel Loss Alarm	<=2	0-50	10
	Sampling Number	<=3	1-150	20
	Fuel Level Change Threshold	<=2	0-50(%)	0
	Voltage Margin Error	<=3	0-100(x10mV)	0
	IGF Fuel Update	1	0| 1	0
	Reserved	0		
	Last Position	1	0| 1	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *ID*

The port ID of analog input.

✧ *Mode*

The working mode of the analog input alarm **AIS** (ASCII)/(HEX).

- **0** - Disable analog input alarm.
- **1** - Enable analog input alarm. If the input voltage is within the range of (<Min Threshold>, <Max Threshold>), the alarm will be triggered.
- **2** - Enable analog input alarm. If the input voltage is outside the range of (<Min Threshold>, <Max Threshold>), the alarm will be triggered.
- **3** - Connect with special fuel level sensor to support fuel level reporting and monitoring.

Note

When the selected mode is 3, please do not choose the waveform 1 as the specified output waveform.

- **4** - No alarm mode. The range of the voltage will be ignored and no alarm will be triggered.
- **5** - Processed voltage mode. The range of the voltage will be ignored and no alarm will be triggered. However, the voltage will be processed before being reported.
- **6** - Enable analog input alarm. If the input voltage is within or outside the range of (<Min Threshold>, <Max Threshold>), the alarm will be triggered.
- **7** - Enable analog input alarm. If the input voltage is within or outside the range of (<Min Threshold>, <Max Threshold>), the alarm will be triggered, but the backend server will not receive the analog input alarm that the input voltage is outside the range of (<Min Threshold>, <Max Threshold>) unless it first receives an alarm that the input voltage is within the range of (<Min Threshold>, <Max Threshold>).

✧ *Min Threshold*

If <Mode> is set to 1 or 2, 6, 7, this parameter indicates the lower voltage limit of the analog input port to trigger the alarm. The threshold range can be set to 30000mV if <ID> is set to 3.

✧ *Max Threshold*

If <Mode> is set to 1 or 2, 6, 7, this parameter indicates the upper voltage limit of the analog input port to trigger the alarm. The threshold range can be set to 30000mV if <ID> is set to 3.

Note

When <Mode> is set to 1 or 2, 6, 7, the value of <Min Threshold> should be set less than the value of <Max Threshold>.

When <Mode> is set to 3, the value of <Min Threshold> should not be equal to the value of <Max Threshold>.

✧ *Sample Rate*

The sampling period for the analog input port.

✧ *Output ID*

It specifies the ID of the output port to output specified wave shape when the analog input alarm is triggered. If it is set to 0, there will be no output wave.

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✧ *Output Status*

It is used to set the final status of the output port.

- **0** - Inactive status.
- **1** - Active status.
- **2** - Gradual-progressive-wave-shape active status.

For detailed information, please refer to AT+GTGDO.

✧ *Toggle Times*

The rise and fall times of the square wave.

✧ *Sync with FRI*

The device can send the analog input voltage periodically along with FRI report. Set this field to 1 to enable the function and 0 to disable it. If the analog input port is used to work with a fuel sensor and the <Sync with FRI> is enabled, the device will report the fuel level together with the FRI report.

✧ *Fuel Level Debounce*

The number of the data discarded when calculating the fuel level.

✧ *Fuel Sensor Delay Time*

After power on or enabling the fuel level reporting and monitoring function, the fuel sensor needs to delay for the time specified by <Fuel Sensor Delay Time> before reporting correct fuel level.

✧ *Fuel Loss Alarm*

If the fuel level reduction after ignition off is greater than this value, an unusual fuel consumption alarm is sent with the event message **FLA** (ASCII)/(HEX).

✧ *Sampling Number*

This parameter defines the total number of samples from the fuel sensor for calculating the current fuel level. And it must be greater than <Fuel Level Debounce>.

✧ *Fuel Level Change Threshold*

This parameter defines the threshold for value changes. The value change must be greater than this threshold. And this value should be less than <Fuel Loss Alarm>, otherwise the **+RESP:GTFLA** may be reported incorrectly.

✧ *Voltage Margin Error*

This parameter is used together with parameters <Min Threshold> and <Max Threshold>. It indicates the voltage margin error of <Min Threshold> and <Max Threshold>.

If the voltage value detected is within the <Voltage Margin Error> of <Min Threshold> or <Max Threshold>, this voltage value will not be processed.

For example, if <Min Threshold> is set to 6000mV, <Max Threshold> is set to 12000mV, and <Voltage Margin Error> is set to ±100mV, the current voltage which meets the condition (5900mV < current voltage < 6100mV) or (11900mV < current voltage < 12100mV) will not be processed. This parameter improves the performance of the **+RESP:GTAIS** report.

✧ *IGF Fuel Update*

If it is set to 1, the fuel level will be updated in real time in **+RESP:GTFRI** after ignition off is

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detected.
If it is set to 0, the fuel level will not be updated in real time, but it will be updated when the device detects fuel loss alarm.

✧ *Last Position*
A numeral to indicate whether to include real-time position or last known position in the report **+RESP:GTAIS**.

- **0** - Include real-time position in the report **+RESP:GTAIS**. It takes time to get GNSS position before the report.
- **1** - Include the last known position in the report **+RESP:GTAIS**. The report can be sent to the backend server immediately after analog input state changes.

3.6.2 DIS (Digital Input Setting)

The command **AT+GTDIS** is used to configure the parameters of the digital input ports. The input <Ignition Detection> is dedicated to ignition detection, others can be customized. If the logic status is changed on one of the customized digital input ports, the device will report the message **DIS** (ASCII)/(HEX) to the backend server.

Example:
AT+GTDIS=gv350ceu,0,,5,0,1,0,2,0,2,0,2,0,3,0,2,0,,0,,,0005$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	DIS	DIS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Ignition Detection	1	0	0
	Reserved	0		
	Debounce Time	<=2	0-20(x10ms)	5
	Validity Time	<=2	0| 1-12(x2s)	0
	Input ID 1	1	1	1
	Mode1	1	0| 1	0
	Debounce Time1	<=2	0-20(x10ms)	2
	Validity Time1	<=2	0| 1-12(x2s)	0
	Input ID 2	1	2	2

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Parts	Fields	Length	Range/Format	Default
	Mode2	1	0| 1	0
	Debounce Time2	<=2	0-20(x10ms)	2
	Validity Time2	<=2	0| 1-12(x2s)	0
	Input ID 3	1	3	3
	Mode3	1	0| 1	0
	Debounce Time3	<=2	0-20(x10ms)	2
	Validity Time3	<=2	0| 1-12(x2s)	0
	Reserved	0		
	Last Position	1	0| 1	0
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

- *Password*
  The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".
- *Ignition Detection*
  The ID of the ignition detection port.
- *Debounce Time*
  The time for interruptible input port debouncing.
- *Validity Time*
  The validity time of the input port. 0 means "Do not check the validity time".
- *Input ID*
  The digital input port ID.
- *Mode*
  Enable/disable the interrupt input.
  - **0** - Disable.
  - **1** - Enable.
- *Last Position*
  A numeral to indicate whether to include real time position or last known position in the report **+RESP:GTDIS**.
  - **0** - Include real time position in the report **+RESP:GTDIS**. It takes time to get GNSS position before the report.

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- **1** - Include the last known position in the report **+RESP:GTDIS**. The report can be sent to the backend server immediately after digital input state changes.

3.6.3 DOS (Digital Output Setting)

The **AT+GTDOS** command is used to output specified wave shape from the digital output ports. The supported wave shapes are shown below. If it is set to wave shape 1, the device will maintain this wave shape at the specified output port after power reset.

The digital output 1 is a latched output. The final status of the output will be latched during power off.

If a specified output port is set to wave shape 4, then the port will output square wave. When the main power is off, the port will stop outputting the wave; if the main power is turned on again, the port will start to output the wave again. If the device is rebooted, the port will still output the wave.

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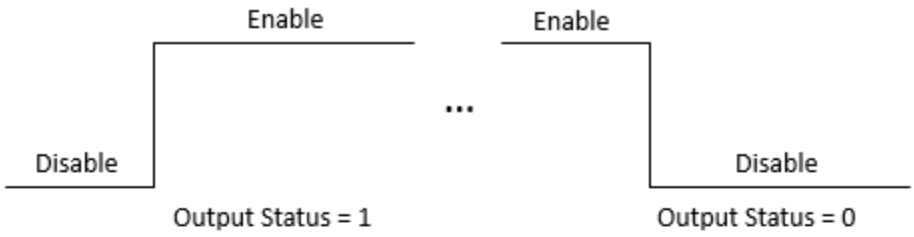
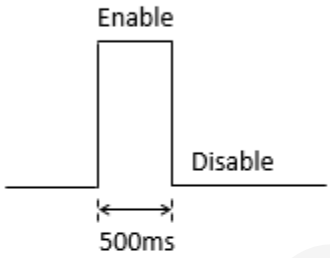
Wave Shape 1:

✓ <*Duration*> = 0ms, <*Toggle Times*> = 0



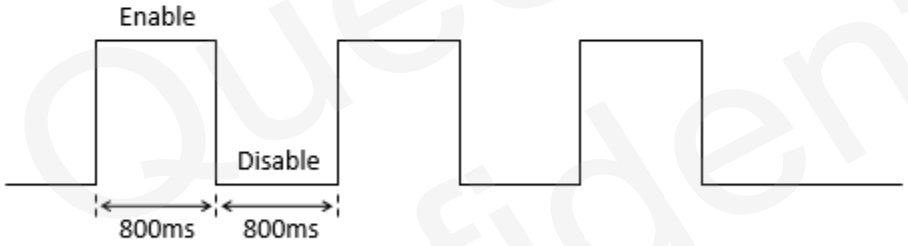
Wave Shape 2:

✓ <*Duration*> = 500ms, <*Toggle Times*> = 1



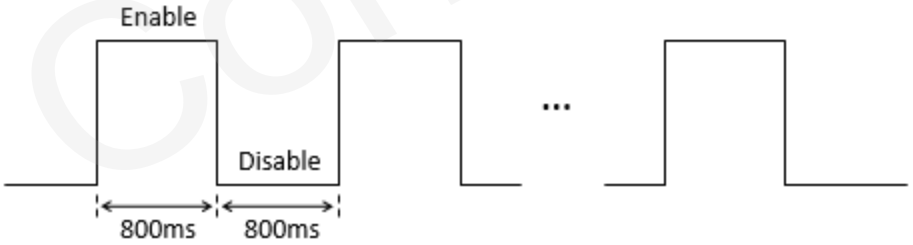
Wave Shape 3:

✓ <*Duration*> = 800ms, <*Toggle Times*> = 3



Wave Shape 4:

✓ <*Duration*> = 800ms, <*Toggle Times*> = 0



Example:

AT+GTDOS=gv350ceu,0,1,5,1,,20,0,,0,0,5,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT

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Parts	Fields	Length	Range/Format	Default
	Command Word	3	DOS	DOS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Command Frame Version	1	0	0
	Number of Output Ports	1	1-5	5
	Output ID	1	1-5	1
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Long Operation	<=3	0-120(min)	0
	Reserved	0		
	DOS Report	<=2	0-1F	0
	Overspeed Restrict Output	2	0| 1-60(km/h)	0
	Debounce Time	<=3	5-120(s)	5
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Command Frame Version*

It indicates the version of this command. Its value will be changed if this command needs to be extended.

✧ *Number of Output Ports*

The number of output ports to be set. The six parameters <Output ID>, <Output Status>, <Duration>, <Toggle Times>, <Long Operation> and <Reserved> following this parameter will repeat <Number of Output Ports> times.

✧ *Output ID*

It indicates the ID of output ports.

✧ *Output Status*

It is used to set the final status of the output port and valid only for wave shape 1.

- **0** - Inactive status.
- **1** - Active status.
- **2** - Gradual-progressive-high-wave-shape Active status.

For detailed information, please refer to AT+GTGDO.

✧ *Duration*

Please refer to the wave shapes shown above. Unit: 100ms.

✧ *Toggle Times*

Please refer to the wave shapes shown above. When <Duration> is set to 0, <Toggle Times> must be set to 0; otherwise, the command is invalid.

✧ *Long Operation*

The long operation time for output and it is valid only when the output wave shape is 1 or 4. The output wave will be stopped on the special output port after the length of time specified by the parameters.

✧ *DOS Report*

Whether to report **DOS** (ASCII)/(HEX) when the status of wave shape 1 output changes.

- **Bit0** - For output 1 (not) to report **+RESP:GTDOS**
- **Bit1** - For output 2 (not) to report **+RESP:GTDOS**
- **Bit2** - For output 3 (not) to report **+RESP:GTDOS**
- **Bit3** - For output 4 (not) to report **+RESP:GTDOS**
- **Bit4** - For output 5 (not) to report **+RESP:GTDOS**

For each bit, set it to 1 to enable the report, and set it to 0 to disable the report.

Note

This parameter is also valid for the Gradual-progressive-wave-shape function.

✧ *Overspeed Restrict Output*

Digital output will not be triggered when GNSS speed exceeds the set speed. 0 means “Disable this parameter”.

Note

- This function works only in the power saving mode 0 or the ignition state.
- Positioning failure blocks the output by default.
- The Debounce time will be re-timed from the time the command is sent when <Overspeed Restrict Output> is set.
- If **AT+GTDOS** is sent continuously, it will overwrite the previous **AT+GTDOS** command.
- Only support the wave shape 1 and gradual-progressive-wave-shape. The command **AT+GTDOS** will not be executed if the wave shape is set to 2, 3 or 4.

✧ *Debounce Time*

If the speed is lower than <Overspeed Restrict Output> for the time specified by <Debounce Time>, **AT+GTDOS** will be executed.

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3.6.4 EPS (External Power Monitoring)

The command **AT+GTEPS** is used to configure the parameters for external power supply monitoring. The device will measure and monitor the voltage of the external power supply. If the voltage of the external power supply meets the predefined alarm condition, the device will report an alarm message **EPS** (ASCII)/(HEX) to the backend server to notify the status of the external power supply. To ensure that this function works properly, switch on the internal battery in case the voltage of the external power supply drops to a very low level.

Example:
AT+GTEPS=gv350ceu,0,250,12000,0,0,0,0,0,0,0,0,0,0,0007$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	EPS	EPS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-3	0
	Min Threshold	<=5	0-32000(mV)	0
	Max Threshold	<=5	0-32000(mV)	0
	Sample Period	<=2	0| 1-12(x2s)	0
	Debounce Time	1	0-5(x1s)	0
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Sync with FRI	1	0| 1	0
	Voltage Margin Error	<=3	0-100(x10mV)	0
	Debounce Voltage Threshold	<=3	0-100(x100mV)	0
	MPN / MPF Validity Time	1	0-5(x1s)	0
	Last Position	1	0| 1	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	

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Parts	Fields	Length	Range/Format	Default
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the external power supply monitoring function.

- **0** - Disable.
- **1** - Enable. If the current voltage is within the range of (<Min Threshold>, <Max Threshold>), the **+RESP:GTEPS** alarm will be triggered.
- **2** - Enable. If the current voltage is outside the range of (<Min Threshold>, <Max Threshold>), the **+RESP:GTEPS** alarm will be triggered.
- **3** - Enable. If the current voltage is within or outside the range of (<Min Threshold>, <Max Threshold>), the **+RESP:GTEPS** alarm will be triggered.

✧ *Min Threshold*

The lower voltage limit of the external power supply to trigger the alarm.

✧ *Max Threshold*

The upper voltage limit of the external power supply to trigger the alarm.

✧ *Sample Period*

The time for sampling the external power supply.

✧ *Debounce Time*

The time for debouncing external power voltage to avoid false report caused by excessive voltage drop in a short period of time.

✧ *Output ID*

It specifies the ID of the output port to output specified wave shape when the **+RESP:GTEPS** alarm is triggered. If it is set to 0, there will be no output wave.

✧ *Sync with FRI*

Besides the **+RESP:GTEPS** alarm report, the device can also send the voltage of external power supply periodically along with the fixed report message.

- **0** - Do not report external power supply voltage with fixed report message.
- **1** - Report external power supply voltage with fixed report message.

✧ *Voltage Margin Error*

This parameter is used together with parameters <Min Threshold> and <Max Threshold>. It indicates the voltage margin error of <Min Threshold> and <Max Threshold>.

If the voltage value detected is within the <Voltage Margin Error> of <Min Threshold> or <Max Threshold>, it will not trigger the **+RESP:GTEPS** alarm report.

For example, if <Min Threshold> is set to 6000mV, <Max Threshold> is set to 12000mV, and <Voltage Margin Error> is set to ±100mV, the current voltage will not trigger **+RESP:GTEPS** alarm

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report when it meets the condition (5900mV < current voltage < 6100mV) or (11900mV < current voltage < 12100mV). This parameter improves the performance of **+RESP:GTEPS** alarm.

✧ *Debounce Voltage Threshold*
This parameter is used together with <Debounce Time>. If the voltage drops or bursts dramatically more than <Debounce Voltage Threshold>, the device will start to debounce voltage for the time specified by <Debounce Time>.

✧ *MPN / MPF Validity Time*
The validity time for detecting the device connected or disconnected from the main power supply. 0 means "Do not check the validity time".
If <MPN / MPF Validity Time> is not 0, and the device remains connected or disconnected from the main power supply for the time specified by this parameter, the device will report **MPN** (ASCII)/(HEX) or **MPF** (ASCII)/(HEX) to the backend server.
If <MPN / MPF Validity Time> is 0, the device will immediately report **MPN** (ASCII)/(HEX) or **MPF** (ASCII)/(HEX) to the backend server.

✧ *Last Position*
A numeral to indicate whether to include real-time position or last known position in the report **+RESP:GTEPS**.

- **0** - Include real-time position in the report **+RESP:GTEPS**. It takes time to get GNSS position before the report.
- **1** - Include the last known position in the report **+RESP:GTEPS**. The report can be sent to the backend server immediately after analog input state changes.

3.6.5 GDO (Gradual Digital Output)

The **AT+GTGDO** command is used to configure specified gradual progressive wave shape from the digital output ports.

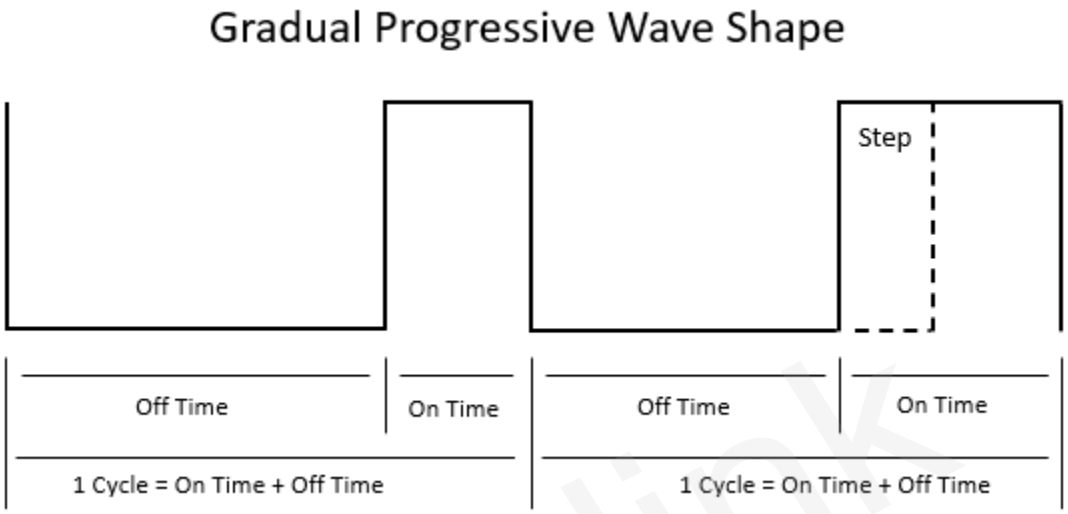
For progressive output, an increment step is added to the ON Time until the ON Time (including the time increment) is equal to or greater than the Cycle time. This phase is defined as progressive state. After the condition **On Time + Incremental Step >= Cycle Time** is reached, the output becomes steady until it is deactivated by the command AT+GTDOS. This phase in which the output is steady is defined as constant state. If the device reboots during constant state and the AT+GTPDS settings are configured and enabled, the device will restore the previous output state.

The next time the progressive output is activated, the cycle described above starts over regardless of the previous progressive state.

The figure below shows the components of an output cycle. Here are some notes:

- The time for one complete cycle is equal to OFF time plus ON time.
- For constant output, the ON time and the Cycle time should be the same.

- For progressive output, when the <Output Status> is set to 2, an incremental step will be added to the ON time at the end of a cycle before the start of the next.



Example:

AT+GTGDO=gv350ceu,0,30,1,,,,,0004$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	GDO	GDO
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	First ON Time	<=3	0-100	0
	Cycle Time	<=3	0-100	30
	Incremental Step	<=3	0-100	1
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *First ON Time*

The time that the output is in active state during the first cycle. Unit: 100ms.

✧ *Cycle Time*

The time that forms a complete cycle. Unit: 100ms.

✧ *Incremental Step*

The time that shall be added to the ON time before starting the next cycle. If this parameter value is 0, the cycles are equal. Unit: 100ms.

Note

The value of <First ON Time> cannot be greater than <Cycle Time>.

3.6.6 IOB (Input/Output Binding)

This command is used to configure the user defined output port actions triggered by input ports. If the I/O binding is configured and the corresponding condition is met, the device will output specified wave shape on the specified output port. Otherwise, the device will restore the initial state of the specified output port. The device will report the message **IOB** (ASCII)/(HEX) to the backend server when the logic state of the bound input ports changes.

Example:

AT+GTIOB=gv350ceu,0,3,3,0,0,0,0,0,,,,,0006$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	IOB	IOB
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	ID	1	0-3	0
	Input Mask	<=4	0000-0F0F	0
	Trigger Mask	<=4	0000-0F0F	0
	Input Sample Period	<=2	0| 1-12(x2s/x4s)	0
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0

Parts	Fields	Length	Range/Format	Default
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *ID*

The ID of the user defined IO binding.

✧ *Input Mask*

Bitwise mask for input ports composition. Each bit represents one digital input port. Set it to 1 to enable corresponding input port and set it to 0 to disable.

- **Bit0** - Ignition detection
- **Bit1** - Digital input 1
- **Bit2** - Digital input 2
- **Bit3** - Digital input 3
- **Bit4 - 7** Reserved
- **Bit8** - EIO100 input 9
- **Bit9** - EIO100 input A
- **Bit10** - EIO100 input B
- **Bit11** - EIO100 input C

✧ *Trigger Mask*

Bitwise mask for trigger condition composition of the corresponding input ports. Each bit represents the logic state of the corresponding input port to trigger the IOB event. Set it to 1 to use "Active state" as the trigger condition and 0 to use "Inactive state" as the trigger condition. Only when the logic state of all the input ports in one IO binding meets the trigger condition will the IOB event be triggered.

- **Bit0** - Ignition detection
- **Bit1** - Digital input 1
- **Bit2** - Digital input 2
- **Bit3** - Digital input 3
- **Bit4 - 7** Reserved
- **Bit8** - EIO100 input 9

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- **Bit9** - EIO100 input A
- **Bit10** - EIO100 input B
- **Bit11** - EIO100 input C

✧ *Input Sample Period*

The interval for checking the state of all the digital input ports in one IO binding. **AT+GTIOB** and AT+GTDIS use separate sample periods to check the input port state even for the same input port.

✧ *Output ID*

The ID of the output port to output specified wave when the trigger condition is met. 0 means "No wave will be output".

Note

If <Input Mask> includes EIO100 input, <Input Sample Period> should be multiplied by 4 seconds.

If <Output ID> indicates EIO100 output, only wave shape 1 is supported.

3.6.7 ROS (Restrict Output Setting)

The command **AT+GTROS** is used to restrict the OUTPUT when the corresponding event is triggered.

Example:

AT+GTROS=gv350ceu,0,0,0,,,0,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	ROS	ROS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Output ID	1	0-1	0
	Output Status	1	0| 1	0
	Reserved	0		
	Reserved	0		
	Event Mask	<=4	0 - FFFF	0
	Event Parameter (Optional)			
	Reserved	0		
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Output Status*

It is used to set the final status of the output port and valid only for wave shape 1.

- **0** - Inactive status.
- **1** - Active status.

✧ *Event Mask*

A mask bit used to indicate additional events for the output. When both Bit 0 and Bit 1 are selected simultaneously and one of the conditions is met, the output can be triggered.

- **Bit 0** - Over Speed.

Fields	Length	Range/Format	Default
Over Speed Value	<=3	0-400(km/h)	0
Debounce Count	<=2	0-20	0

– *Over Speed Value*

If the current speed is less than or equal to this value, output will be activated. If the current speed is greater than the value, output will not be activated until the speed is less than or equal to this value.

– *Debounce Count*

The debounce count for getting GNSS speed. If the GNSS fix is successful, **1 Debounce Count=1s**. If <Debounce Count> is set to 3, it means that the current speed is considered to be less than the configured speed only if there are three successful GNSS fix points and the speed is less than the configured speed. If fix fails during the period, the previously successful location point count will not be reset.

- **Bit 1** - Ignition Off.

Fields	Length	Range/Format	Default
Check IGF	1	0|1	0

– *Check IGF*

A numeral to indicate whether to check ignition state before activating output. It is recommended to enable the AT+GTPDS to avoid problems when the device reboots.

- **0** - Do not check ignition state, activate output immediately.
- **1** - Check ignition state first

If ignition is off, activate output immediately. If ignition is on, output is not activated unless the ignition is turned off.

3.7 Accessories Applications

This section describes the commands related to the configuration accessories which is connected by uart port. Please refer to the details below.

3.7.1 CDA (Configuration of DR Serial Accessory)

The command **AT+GTCDA** is used for setting DR Serial accessory.

Example:
AT+GTCDA=gv350ceu,0,6,FFFFFFFFFFFF,,,2,quec32_,st32,,,,,0011$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CDA	CDA
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Read Mode	1	0-3	0
	Data Block	<=2	0-62	6
	Key	12	'0' - '9' 'A' - 'F'	FFFFFFFFFFFF
	Reserved	0		
	Reserved	0		
	Prefix Number	<=2	0-10	
	Prefix String<n>	<=15	ASCII(not including '=' and ',')	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is

"gv350ceu".

✧ *Read Mode*

It configures the mode of DR Serial accessory reading card data.

- **0** - Do not check prefix string, output card ID directly.
- **1** - Do not check prefix string, output card memory data directly.
- **2** - Check prefix string with card memory data and output card ID.
- **3** - Check prefix string with card memory data and output card memory data.

✧ *Data Block*

It specifies which block of DR Serial accessory memory will be used to save the card key.

Note

The blocks for saving card key ranges from 0 to 62, but block (4n-1), such as block 3, 7, 11 cannot be used to save card key.

✧ *Key*

It is used as card key for checking.

✧ *Prefix Number*

It specifies the number of prefix string groups.

✧ *Prefix String<n>*

The prefix string is used to check card memory data. If the card memory data does not contain prefix string, the DR Serial accessory will not respond to the current card reading action.

Note

The value of <Prefix String <n>> cannot contain "=" and "," characters.

3.7.2 CDS (Configuration of DR100 State)

The command **AT+GTCDS** is used for setting buzzer and LED state of DR100 Card Reader.

Example:

AT+GTCDS=gv350ceu,,0,0,1,10,10,1,10,10,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CDS	CDS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Index	1	0| 1	0

Parts	Fields	Length	Range/Format	Default
	ID Classification	1	0| 1	0
	Buzzer Output State	1	0| 1	0
	Duration	<=3	0-255(x100ms)	
	Toggle Times	<=3	0-255	
	LED Output State	1	0-1	0
	Duration	<=3	0-255(x100ms)	
	Toggle Times	<=3	0-255	
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Index*

The index of setting method of DR100 Card Reader state.

✧ *ID Classification*

It configures the authentication status of DR100 ID.

- **0** - The ID which is unauthorized.
- **1** - The ID which is authorized.

✧ *Buzzer Output State*

It configures the output state of DR100 Card Reader Buzzer.

- **0** - Disable this output state.
- **1** - Enable this output state.

✧ *LED Output State*

It configures the output state of DR100 Card Reader's green LED light.

- **0** - Disable this output state.
- **1** - Enable this output state.

✧ *Duration*

Please refer to command AT+GTDOS, and both Buzzer Output and LED Output can set four wave shape digital output ports.

✧ *Toggle Times*

Please refer to command **AT+GTDOS**, and both Buzzer Output and LED Output can set four wave shape digital output ports.

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Note

When the values of parameters in command **AT+GTCDS** are the default values, the output state of DR100 Card Reader is its default output state, that is, the Buzzer sounds once and the green LED blinks once.

3.7.3 CMS (Camera Setting)

The **AT+GTCMS** command is used for setting camera parameters.

Before using this command, the <Mode> in the AT+GTURT command should be set to 9.

Example:

AT+GTCMS=gv350ceu,0,1,5,150,2,0,0003,0,0,0,0,0,0,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CMS	CMS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Camera ID	1	0-3	0
	Number	<=2	1-10	1
	Interval	<=2	1-60(s)	5
	Photo Compression Ratio	<=3	20-250	150
	Photo Resolution	1	1-3	2
	Digital Input ID	1	0| 1-3	0
	Attribute Mask	<=4	0000-FFFF	0003
	Server Type	1	0-1	0
	EHD Support	1	0| 1	0
	Output ID	1	0-5	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Number*

The number of pictures taken in one continuous shoot.

✧ *Interval*

The interval between two pictures in one continuous shoot.

✧ *Photo Compression Ratio*

The compression ratio of picture. The smaller the compression ratio, the better the picture quality.

✧ *Photo Resolution*

The resolution of picture.

- **1** - 160*120
- **2** - 320*240
- **3** - 640*480

✧ *Digital Input ID*

The input ID used to trigger photographing.

✧ *Attribute Mask*

The <Attribute Mask> in the messages **PHL** (ASCII)/(HEX) and **PHD** (ASCII)/(HEX) in HEX format.

Mask Bit	Item
Bit 0	<Camera ID>
Bit 1	<Photo Time>
Bit 2-15	Reserved

✧ *Server Type*

The server to which the picture is transferred.

- **0** - Backend server
- **1** - FTP server

✧ *EHD Support*

Whether to pack picture data by **+RESP:GTEHD** instead of **+RESP:GTPHD** in HEX format. **+RESP:GTEHD** can support a larger picture size in HEX format.

Note

The output settings are used to output special wave when the camera is photographing or trying

to photograph and data is being transmitted between the camera and the device.

3.7.4 TAP (Take-Picture)

The **AT+GTTAP** command is used for real-time photographing.

Before using this command, the <Mode> in the AT+GTURT command should be set to 9.

Example:

AT+GTTAP=gv350ceu,0,,,1,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TAP	TAP
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Camera ID	1	0-3	
	Reserved	0		
	Reserved	0		
	Photo Resolution	1	1-3	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

Note

When **AT+GTTAP** is used to take pictures, the basic settings of camera such as <Photo Compression Ratio>, <Attribute Mask>, <Output ID>, <Output Status>, <Duration> and <Toggle Times> are the same as those in AT+GTCMS.

3.7.5 DAT (Transparent Data)

The command **AT+GTDAT** is used to transmit data between the backend server and the equipment connected to the secondary serial port,Bluetooth of the device. Data to the backend server is wrapped into the message **DAT** (ASCII)/(HEX) and sent to the backend server while data to the equipment is directly output to the secondary serial port, Bluetooth unrestricted by the @Track protocol. And all data is transparent to the device. Before using this command, the parameters of the secondary serial port should be set in the command AT+GTURT.Or the parameters of the Bluetooth should be set in the command AT+GTBTS.

Example:
AT+GTDAT=gv350ceu,0,,wferyhtrhtrh,0,0,,,0017$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	DAT	DAT
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Command Type	1	0-5	
	Reserved	0		
	Data	<=1280	ASCII String	
	Need ACK	1	0-1	
	Hex Convert	1	0| 1	0
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*
The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Command Type*
The command type which indicates how to send data.

- **0** - Send message to the backend server with **DAT (Short Format)**.
- **1** - Send the raw data directly to the serial port.

- **2** - Send message to the backend server with **DAT (Long Format)**.
- **3** - Send the raw data directly to the serial port without CRLF.
- **4** - Send the raw data directly to the Bluetooth.
- **5** - Send the raw data directly to the Bluetooth without CRLF.

✧ *Data*

Data to be transferred between the backend server and the equipment connected to the secondary serial port or Bluetooth of the device. <Data> sent to the backend server cannot contain the character "$" when the value of <SACK Mode> in AT+GTSRI and AT+GTQSS is 1.

Note

The maximum length of the <Data> is 200 when the remote device sends data to the terminal device through Bluetooth.

✧ *Need ACK*

Whether to report **+ACK:GTDAT**.

- **0** - Do not need the ACK report.
- **1** - Need the ACK report.

✧ *Hex Convert*

If this parameter is set to 1, <Data> will be converted to HEX format before being sent to the serial port. This parameter is valid only when the <Command Type> is 1 or 3.

3.7.6 TKS (TPT2 Setting)

The **AT+GTTKS** command is used to query basic information via RS232, such as data, hour, GNSS fix and GPRS connection status. When the device receives this command by RS232 and <Mode> in AT+GTURT is 28, it needs to reply to TPT2 the +RESP:GTTKS message without sending any information to backend server.

Example:

AT+GTTKS=gv350ceu,1,,,0018$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TKS	TKS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Command Type	1	1-2	
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Command Type*

This parameter is used to set the query type, and different types will get different information.

- **1** - Short information type.

  In this type, the device will send <GNSS Accuracy>, <GPRS Signal>, <Digital Inputs> and <Digital Outputs> to TPT2 through RS232.

- **2** - Long information type.

  In this type, the device will not only send <GNSS Accuracy>, <GPRS Signal>, <Digital Inputs> and <Digital Outputs> and other information to TPT2 through RS232.

3.7.7 EFS (External Digital Fuel Sensor)

The command **AT+GTEFS** is used to configure the parameters of the external digital fuel sensor. If <Mode> in AT+GTURT is set to 4, the parameters of this command are used.

Example:

AT+GTEFS=gv350ceu,,,9999,,10,,0,10,0,0,300,,10,5,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	EFS	EFS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Reserved	0		
	Ex Full Value	<=5	0-65535	9999
	Reserved	0		
	Ex Fuel Loss Alarm IGF	<=2	0-50(%)	10
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Unsolicited Enable Ex	1	0| 1	0
	Ex Detection Frequency	<=3	5-600(s)	10
	Ex Filter Factor	1	0-9	0
	Report Sensor Data	1	0-1	0
	Ex Detection Frequency IGF	<=4	30-1800(s)	300
	Reserved	0		
	IGN Sample Count	<=2	3-30	10
	Ex Fuel Loss Alarm IGN	<=3	0-100(%)	5
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Ex Full Value*

The value read from the sensor when the fuel tank is full.

Note

This value now only needs to be set for UFSxxx and DUT-E SUM, while other sensors ignore this value. The unit of UFSxxx is 0.1mm. Set the unit of DUT-E sensor connected to DUT-E SUM to liter. If the **AT+GTEFS** command is executed and <Ex Full Value> is not set to the default value, DUT-E can use <Ex Full Value> to calculate the percentage of fuel level.

✧ *Ex Fuel Loss Alarm IGF*

If the difference between the current fuel level after ignition off and the last measured fuel level is greater than this value, an abnormal fuel consumption alarm is sent with the event message **FLA** (ASCII)/(HEX). 0 means "Disable this function".

✧ *Unsolicited Enable Ex*

If this parameter is enabled, the device will not send command to the fuel sensor, and the sensor must be set to periodic data output. QFS100 and UFS100 do not support this function.

✧ *Ex Detection Frequency*

If <Unsolicited Enable Ex> is disabled, the device will send READ command to the fuel sensor and read the data based on this parameter setting.

✧ *Ex Filter Factor*

The filter factor of the sensor. Now only QFS100 supports this factor, and for other sensors, this parameter is ignored.

- **0** - No filter
- **1** - 12 seconds

- **2** - 24 seconds
- **3** - 36 seconds
- **4** - 60 seconds
- **5** - 120 seconds
- **6** - 180 seconds
- **7** - 240 seconds
- **8** - 480 seconds
- **9** - 960 seconds

✧ *Report Sensor Data*

A numeral to indicate whether to report raw data from fuel sensor to the backend server with **FSD** (ASCII)/(HEX). Only report of the raw data from UFSxxx is supported now.

- **0** - Do not report raw data from fuel sensor.
- **1** - Report raw data from fuel sensor.

✧ *Ex Detection Frequency IGF*

If <Unsolicited Enable Ex> is disabled, the device will send READ command to the fuel sensor and read the data at this frequency while the ignition is off.

✧ *IGN Sample Count*

The count of readings of fuel level used for fuel alarm detection after ignition on.

Ignition-on fuel alarm detection time = <IGN Sample Count>* <Ex Detection Frequency>.

✧ *Ex Fuel Loss Alarm IGN*

If the difference between the current fuel level after ignition on and the last measured fuel level is greater than this parameter value during the time **<IGN Sample Count> * <Ex Detection Frequency>**, an abnormal fuel consumption alarm is sent via the event message **+RESP:GTFLA**. 0 means “Disable this function”.

3.7.8 FSC (Fuel Sensor Calibration)

The command **AT+GTFSC** is used to set the calibration table for fuel sensor.

Example:

AT+GTFSC=gv350ceu,,1,20,0,100,,3,16000,0,10000,50,250,100,,,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	FSC	FSC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu

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Parts	Fields	Length	Range/Format	Default
Body	Reserved	0		
	Table ID	1	0-4	1
	Sensor Type	<=2	0-6| 20-22	20
	Mode	1	0| 1	0
	Max Tank Volume	<=4	0-6000	100
	Reserved	0		
	Num of Node	<=2	0| 2-11	0
	Node 1 Value	<=5	0-99999	
	Node 1 Percentage	<=3	0-100	
	…			
	Node N Value	<=5	0-99999	
	Node N Percentage	<=3	0-100	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Table ID*

The ID of the currently set calibration table.

✧ *Sensor Type*

The sensor type for the currently set table.

- **0** - EPSILON ES2 or ES4
- **1** - LLS 20160

- **2** - DUT-E
- **3** - QFS100
- **4** - UFSxxx
- **5** - Reserved
- **6** - DUT-E SUM
- **20** - ADC1
- **21** - ADC2
- **22** - ADC3

✧ *Mode*
Enable/disable the table. If this table is disabled, the calculation of fuel level will be linearized.

✧ *Max Tank Volume*
The maximum volume of tank. Unit: liter.

✧ *Num of Node*
The number of the nodes.

✧ *Node N Value*
The value of the node.

✧ *Node N Percentage*
The corresponding percentage value of this node. This item must be arranged in ascending order, starting at 0% and ending at 100%.

3.7.9 IDA (ID Authentication)

The command **AT+GTIDA** is used to protect against unauthorized use. This is achieved by obtaining IDs from different accessories for driver identification, and connecting an external relay (normally closed relay is recommended) to cut off the starter or the fuel pump.
To use this command, the external relay must be connected to the device. When the device reads an ID, it will report the event message **IDA** (ASCII)/(HEX) to the backend server. If the ID is in the allowlist of the ID numbers, it will be authorized until next time the ignition is turned off. After the ignition is turned off again, the authentication will last for a settable short period of time, during which the driver can turn on the engine again without the need to re-identify himself.

Example:
AT+GTIDA=gv350ceu,0,1,2,D2C4FBC5,87654321,30,0,30,0,5,1,0,0,0,0,0,0,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	IDA	IDA

Parts	Fields	Length	Range/Format	Default
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2| 5	0
	Start Index	<=3	1-250	1
	End Index	<=3	1-250	1
	ID Number List	<=8*28	'0' - '9' 'a' - 'f' 'A' - 'F'	
	Timeout after Ignition Off	<=3	0| 15-600(s)	30
	Report Mask	1	0-7	0
	ID Validity Time	<=3	0| 15-600(s)	30
	IDC Mode	1	0| 1	0
	IDC Output	1	0-5	0
	IDC Timeout	1	1-5(min)	1
	Output ID	1	0-5	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	RFID Report Mode	1	0-3	0
	ID List Type	1	0-2	0
	ID Filter Mode	1	0| 1	0
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the ID authentication function.

- **0** - Disable this function.
- **1** - Authorized ID Unlock.

Only authorized ID cards can unlock the vehicle. When the vehicle is unlocked and ignition is ON, card swiping will not trigger **+RESP:GTIDA** reporting.

- **2** - Any ID Unlock.

Any ID card can unlock the vehicle.

- **5** - Authorized ID Unlock with New ID Reporting.

  Only authorized ID cards can unlock the vehicle, **+RESP:GTIDA** is reported if an ID is detected in the Ignition On state that differs from a previously authorized ID.

✧ *Start Index, End Index*

The index range of the allowlist to which the ID numbers are to be updated.

For example, if <Start Index> is set to 1 and <End Index> is set to 2, then the first two ID numbers in the allowlist will be updated by the numbers provided in the parameter <ID Number List>. <Start Index> and <End Index> determine the total amount of ID numbers that will be updated. If either one is empty, there should be no <ID Number List> following the empty value. A maximum of 8 numbers can be updated each time.

✧ *ID Number List*

A list of comma-separated ID numbers to be updated to the allowlist. The quantity of the ID numbers is determined by <Start Index> and <End Index>.

Note

If more ID numbers are needed, please adjust <Start Index> and <End Index> for appropriate setup. If some ID numbers in <ID Number List> are empty, the corresponding ID numbers will be deleted. For example, to delete the 4th, 5th and 6th ID numbers of the <ID Number List>, please set <Start Index> to 4 and set <End Index> to 6 and keep the three ID numbers of <ID Number List> empty.

✧ *Timeout after Ignition Off*

If the ignition is turned off, it will still be authorized for a short time. In this period, re-authentication is not needed. 0 means “Lock the vehicle when the ignition is turned off”.

✧ *Report Mask*

Bitwise mask to configure the reporting ID.

- **Bit0** - Report the authorized ID.
- **Bit1** - Report the unauthorized ID.
- **Bit2** - Report the ID which has logged out. If authorized ID meets the trigger conditions <ID Validity Time> and <Timeout after Ignition Off>, then the **+RESP:GTIDA** report will be sent to indicate the logout event.

For each bit, set it to 1 to enable the report, and set it to 0 to disable. If <Report Mask> is 0, no **+RESP:GTIDA** message will be reported.

✧ *ID Validity Time*

It will remain authorized for this period of time when the ID is valid.

✧ *IDC Mode*

It only works when <Mode> is set to 1 or 5 and <ID List Type> is set to 0. If this parameter is enabled and the target ID is not authorized, the device will send **+RESP:GTIDC** instead of **+RESP:GTIDA** to the server for authorization verification. If <Authorised> in the AT+GTIDC command is 1 which indicates that the target ID has been authorized, the target ID will be stored

in the first available position of the authorized ID number list. If the local ID number list is full, the target ID will be overwritten from the first position in the list until the end of the list.

✧ *IDC Output*

It specifies the output port to indicate the target ID is waiting for authorization. The specified output port will maintain output in the form of Wave Shape 1 until the authorization times out or authorization feedback information is received.

✧ *IDC Timeout*

It specifies the timeout period for authorization.

✧ *Output ID*

It specifies the ID of the output port to output specified wave shape when it is authorized.

✧ *RFID Report Mode*

The mode of reporting the RFID number in HEX format **+RSP** and **+EVT** messages.

- **0** - Report the latest RFID number after getting the card ID.
- **1** - Report the latest RFID number when the ignition is turned on and the card is authorized, or the ignition is turned off and the timeout period specified by <Timeout after Ignition Off> is not reached.
- **2** - Report the latest RFID number when in an authorized state except for the message **+RESP:GTIDA**.
- **3** - Report the latest authorization RFID number when in an authorized state.

Note

The messages +RESP:GTIDA, +RESP:GTIGF, +RESP:GTIGN, +RESP:GTVGF and +RESP:GTVGN in HEX format will always report RFID number after the device gets the card ID.

✧ *ID List Type*

This parameter indicates which ID List to use.

- **0** - Use <ID Number List> in the command **AT+GTIDA**.
- **1** - Use <MAC List> and <Organization Unique Identifier> in the command AT+GTBID.
  Please make sure the function AT+GTBID is configured properly.
  To enable this feature, the following conditions must be met:
  - WKF300 and WKF310: Set <Push Button Event> to 1 when the <Keyfob Detection Mode> is set to mode 1, 2 . If the <Keyfob Detection Mode> is set to mode 5, the ID with the strongest scanned signal is used for authorization without setting <Push Button Event>. And there is at least one MAC address in the <MAC List>.
  - ID ELA: Enable <ID ELA Detection Mode>, and there is at least one MAC address in the <MAC List>.
  - WID310 / WID330 : Enable <WID310 Detection Mode> , <WID330 Detection Mode> , and there is at least one MAC address in the <MAC List>.
- **2** - Use <ID Number List> in the command AT+GTIDS.

✧ *ID Filter Mode*

The mode of filtering ID.

- **0** - Each read ID will be checked by the device. The message **+RESP:GTIDA** will be reported when the device reads an ID.
- **1** -

The same read ID will be filtered out. The message **+RESP:GTIDA** will be reported only once when the same ID is read continuously.

3.7.10 IDS (ID Setting)

The command **AT+GTIDS** is used to set ID Numbers for driver authentication.

Example:
AT+GTIDS=gv350ceu,1,0,8,D2C4FBC58765432122222222,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	IDS	IDS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-1	0
	ID Type	1	0	0
	Length of ID Number	<=2	4-28	4
	ID Number List	<=700	'0' - '9' 'a' - 'f' 'A' - 'F'	
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the ID authentication function.

- **0** - Delete ID Number

If <ID Number List> is empty, all ID Number will be deleted. Otherwise, the given ID Numbers in <ID Number List> will be deleted.

- **1** - Append ID Number

In this mode, all given ID Numbers will be appended to the saved ID Numbers.

✧ *ID Type*

A numeral to indicate the ID type.

- **0** - Operator ID.

✧ *Length of ID Number*

A numeral to indicate the length of ID Numbers in <ID Number List>.

✧ *ID Number List*

A list of ID numbers. It is necessary to set <Length of ID Number> so that the quantity of the ID Numbers can be calculated.

Note

The ID numbers with different length cannot be issued together, and only a maximum of (1000/<Length of ID Number>) IDs can be stored at a time.This command can be issued multiple times, but it can only store a maximum of 700 IDs and the configured IDs are valid only if <ID List Type> is set to 2 in the AT+GTIDA command .

3.7.11 IDC (ID Check)

The command **AT+GTIDC** is sent to the device through the server. It is used to delete or verify the authorization status of the target ID.

Example:

AT+GTIDC=gv350ceu,ABC123456,1,0008$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	IDC	IDC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	ID Number	<=28	'0' - '9' 'a' - 'f' 'A' - 'F'	
	Authorised	1	0-4	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *ID Number*

Target ID number.

✧ *Authorised*

The authorization status of the target ID.

- **0** - Target ID is not authorized by the server.
- **1** - Target ID has been authorized by the server.
- **2** - Delete target ID locally.
- **3** - Target ID has been authorized by the server, and the ID will unlock the vehicle directly without swap again.
- **4** - The device will be revoked of authorization by the server, and the device will report a +RESP:GTIDA message with unauthorized to the server.This is only valid when AT+GTIDA mode is 5.

Note

The delete operation can only be used to delete the target ID. If the target ID is in an authorized state, the authorization operation will not be revoked immediately until the authorization ends.

3.7.12 TTR (Transparent THR100 Transmission)

The command **AT+GTTTR** is used to transfer data between the backend server and the terminal connected to THR_100 via the secondary serial port.

Data to the backend server is wrapped into the message **TTR** (ASCII)/(HEX) and sent to the backend server.

Before using this command, please set the parameters of the secondary serial port properly in AT+GTURT.

Example:

AT+GTTTR=gv350ceu,1,0001,,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TTR	TTR
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Command Type	<=2	0-10| 13	
	TTR Parameters(Optional)	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

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✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Command Type*

Command type to indicate the message that the server sends to the device. The <TTR Parameters> in different command type has different formats. The command type without <TTR Parameters> explain represents 5 reserved parameters.

- **0** - DDD file request.
- **1** - Send authorization APDU to the device.
- **2** - DDD file request cancel. Cancel the previous request.
- **3** - Debug mode.

Read the state of THR_100. Please do not send this command during the interaction of DDD file.

- **4** - To restart TachoReader manually.
- **5** - Inquiry Tachograph model.
- **6** - Inquiry status of the device.
- **7** - Inquiry Tachograph driver 1 ID, name and surname.
- **8** - Inquiry special status.
- **9** - Remote start the long press. After sending, there will be corresponding effect on the LED.
- **10** - Check the current TachoReader connection environment and if the device is ready to download DDD.
- **13** - Inquiry Tachograph driver 2 id, name and surname.

Note

Please do not issue the query command when requesting DDD file.

✧ *TTR Parameters(Optional)*

If the Command Type is **0** (DDD file request), The <TTR Parameters> are used as follows.

Fields	Length	Range/Format	Default
Request ID	4	0000-FFFF	
Report Mode	1	0|1	
Read File Type	1	1-7	
Start Time	14	YYYYMMDDHHMMSS	
End Time	14	YYYYMMDDHHMMSS	

- *Request ID*

  The identifier of the authorization request. The settings are different for each request.

- *Report Mode*

  It indicates how the DDD file is reported to the end user.

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– **0** - Through the message +RESP:GTTRD.
Through the message **+RESP:GTTRD**.
– **1** - Through FTP, and the command AT+GTFTP should be set.
Through FTP, and the command AT+GTFTP should be set.

- *Read File Type*
The DDD file needs to be read.
  – **Bit 0** - Request to read TACHOGRAPH memory.
  – **Bit 1** - Request to read driver card in slot 1.
  – **Bit 2** - Request to read driver card in slot 2.
- *Start Time*
Date and time at the beginning of the file to read from Tachograph. The value will transform in Unix Timestamp. If the memory of the Tachograph is not read, the data can be any value. If this parameter is not set, the memory of the Tachograph will be read from the date of the last reading. If this parameter is an invalid value, the memory of the tachograph will be read from the data when previous read is performed.
- *End Time*
Date and time at the end of the file to read from Tachograph. The value will transform in Unix Timestamp. If the memory of the Tachograph is not read, the data can be any value. If this parameter is not set or invalid value, the memory of the Tachograph will be read from the current date.

Note
If <Start Time> and <End Time> are set to the future time, the memory of the Tachograph will be read from the date of the last reading.

If the Command Type is **1** (Send authorization APDU to the device), The <TTR Parameters> are used as follows.

Fields	Length	Range/Format	Default
Sequence Number of APDU	4	0001-FFFF	
APDU DATA	<=512		
Reserved	0		
Reserved	0		
Reserved	0		

- *Sequence Number of APDU*
The serial number of reply APDU, it should keep the same as that sent from the terminal to server.
- *APDU DATA*
It is the APDU Data for THR_100.
And it is the ASCII form of hexadecimal value.

3.7.13 UDT (User-defined Data Transfer)

The command **AT+GTUDT** is used to transfer data to the destination specified by <Mode>. Data to the destination is wrapped into the message **UDT** (ASCII) and sent to the destination.

Example:

AT+GTUDT=gv350ceu,0,,0,0,,1,,00087FFF,,,,,,0000$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	UDT	UDT
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	Reserved	0		
	IGN Send Interval	<=3	0-250(s)	0
	IGF Sending Mode	1	0| 1	0
	Reserved	0		
	Event Mask	<=8	00000000-FFFFFFFF	1
	Reserved	0		
	Report Item Mask	8	00000000-FFFFFFFF	00087FFF
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

Enable/disable data transfer to the destination specified by <Mode> via the report message **+RESP:GTUDT**.

- **0** - Disable the data transfer.
- **1** - Enable the data transfer to the serial port.
- **2** - Enable data transfer to Bluetooth.

Note

To ensure the execution of mode 2, please set the parameter <Mode> in the AT+GTBTS command to 1.

✧ *IGN Send Interval*

The interval for sending related information when the ignition is on. The unit is second. 0 means "Disable the information transfer".

✧ *IGF Sending Mode*

Whether to send the related information when the ignition is off. If the device enters Ignition Off Rest state, it will work according to <IGF Report Interval> and <Mode> of AT+GTFRI. But if the device enters Tow state, it will work according to <Tow Interval> and <Enable Tow> of AT+GTTOW.

- **0** - Disable this parameter.
- **1** - Enable this parameter.

✧ *Event Mask*

Bitwise mask to configure which event triggered will send **+RESP:GTUDT** to the destination specified by <Mode>.

- **Bit0** - For activated GEO
- **Bit1** - For activated PEO
- **Bit2 - 31** Reserved

✧ *Report Item Mask*

Bitwise mask to configure which information should be sent to the destination specified by <Mode>.

- **Bit0** - for Full Protocol Version, Firmware Version
- **Bit1** - for Hardware Version
- **Bit2** - for Unique ID
- **Bit3** - for Device Name
- **Bit4** - for Speed
- **Bit5** - for Azimuth
- **Bit6** - for Altitude
- **Bit7** - for MCC, MNC, LAC, Cell ID.
- **Bit8** - for Mileage
- **Bit9** - for HMC
- **Bit10** - for GSV
- **Bit11** - for GEO State
- **Bit12** - for Analog Input

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- **Bit13** - for Digital Input, Digital Output, Motion Status
- **Bit14** - for External Power VCC, Backup Battery Level, Charging
- **Bit15** - for GEO Status Mask
- **Bit16** - for PEO State
- **Bit17** - for PEO Status Mask
- **Bit18** - Reserved
- **Bit19** - for Send Time, the time when the message is generated.
- **Bit20 - 31** Reserved

3.7.14 UFS (UFSxxx FOTA Upgrade)

The command **AT+GTUFS** is used to upgrade the firmware of UFSxxx fuel sensor over the air.

Example:

AT+GTUFS=gv350ceu,0,10,0,name,pw,http://220.178.67.210:8208/GV350CEU/deltabin/csb_des_07_build1116.bin,,,,,0001$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	UFS	UFS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Retry Times	1	0-3	0
	Timeout	2	10-30	10
	Protocol Type	1	0	0
	Server User Name	<=6	'0' - '9' 'a' - 'z' 'A' -'Z' '-' '_'	
	Server Password	<=6	'0' - '9' 'a' - 'z' 'A' -'Z' '-' '_'	
	Server URL	<=100	LegalURL	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		

Parts	Fields	Length	Range/Format	Default
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

- *Password*
  The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".
- *Retry Times*
  It specifies the maximum time of retries to download the update package upon download failure.
- *Timeout*
  It specifies the expiration timeout of one download. If the download expires, it is considered to be failure.
- *Protocol Type*
  The protocol used to download the package.
  - **0** - HTTP.

  Only HTTP is supported now.
- *Server User Name*
  If the file server uses authentication, the user name is specified here.
- *Server Password*
  If the file server uses authentication, the password is specified here.
- *Server URL*
  It specifies the URL to download the package.

3.7.15 URT (Serial Port Setting)

The serial port of the device is used to connect with external devices to extend the application of the device. The command **AT+GTURT** is used to configure the working mode of the serial port for different external devices and the parameters for the serial port communication.

Example:
AT+GTURT=gv350ceu,0,12,8,1,0,0,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	URT	URT
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu

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Parts	Fields	Length	Range/Format	Default
Body	Mode	<=2	0| 1| 3| 4| 6-9| 14| 20| 22| 24| 28| 41| 44| 46	0
	Baud Rate Index	<=2	1-12	12
	Data Bits	1	7| 8	8
	Stop Bits	1	1-3	1
	Parity Bits	1	0-2	0
	Sleep Mode	1	0-3	0
	Reserved	0		
	Reserved (Optional)	0		
	Reserved (Optional)	0		
	Reserved (Optional)	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

It configures the working mode of **AT+GTURT**.

- **0** - Disable UART.
- **1** - Use UART to transfer data via AT+GTDAT and other protocol commands. When the AT+GTDAT command is executed, the device will respond with the execution result to the secondary serial port. "OK" is returned when the command is executed successfully, and "Error" is returned when the command fails to be executed.
- **3** - Used for specific RFID card reader to communicate with UART of the terminal. The terminal will report the card ID received from the card reader to the backend server via the message **IDA** (ASCII)/(HEX).

Fields	Length	Range/Format	Default
RFID Type	1	2-4|8	4
Reserved	0		
Reserved	0		

– *RFID Type*

The type of RFID connected with serial port.

- **2** - MR2.

9600 baud rate, 8 data bits, 1 stop bit and no parity.

- **3** - VD RFID.

9600 baud rate, 8 data bits, 1 stop bit and no parity.

- **4** - DR100.

19200 baud rate, 8 data bits, 1 stop bit and no parity.

- **8** - UHF Reader

57600 baud rate, 8 data bits, 1 stop bit and no parity. The UHF RFID reader configuration can be set in the command **AT+GTUHF**.

Note

RFID Type 2, 3, 4 will report the card ID received from the card reader to the backend via the message **+RESP:GTIDA**. RFID Type 6 will report the RFID tag information received from the card reader to the backend via the message **+RESP:GTUHF**.

- **4** - Used for digital fuel sensor.

Fields	Length	Range/Format	Default
Digital Fuel Sensor Type	1	0-6	0
Data Mask	2	0000-FFFF	0000
Reserved	0		

– *Digital Fuel Sensor Type*

The type of the digital fuel sensor connected with serial port.

- **0** - EPSILON ES2 or ES4
- **1** - LLS 20160
- **2** - DUT-E
- **3** - QFS100
- **4** - UFSxxx
- **5** - Reserved
- **6** - DUT-E SUM

– *Data Mask*

This Mask is used to control the Data content of <Expand Digital Fuel Sensor Data(Optional)> in the **+RESP:GTERI** message.

- **Bit 0** - The raw data read from the digital fuel sensor.
- **Bit 1** - Real-time Fuel Level read from UFS300.

When the parameter <Digital Fuel Sensor Type> is set to 4, Bit 1 can be set to 1. Otherwise, Bit 1 cannot be set to 1.

- **Bit 2** - Reserved
- **Bit 3** - Reserved
- **Bit 4** - Reserved
- **Bit 5** - Reserved
- **Bit 6** - Reserved

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- **Bit 7** - Reserved
- **Bit 8** - Reserved
- **Bit 9** - Reserved
- **Bit 10** - Reserved
- **Bit 11** - Reserved
- **Bit 12** - Reserved
- **Bit 13** - Reserved
- **Bit 14** - Reserved
- **Bit 15** - Reserved

Note

Different fuel sensors support different baud rates, so make sure that the baud rate set is suited for the sensor.

- **6** - Used to transfer data from secondary serial port to the backend server. When the serial port receives a special byte defined in <Terminator Character>, the reserved parameters are used as follows. When the size of the data received exceeds 1280 bytes, it will also compose responses and send them to the server.

Fields	Length	Range/Format	Default
Format	1	0-1	0
Terminator Character	2	00-FF	0D
Reserved	0		

– *Format*

It controls the format of data transfer from secondary serial port to backend server when <Mode> is 6, 7, 8.

- **0** - Short format
- **1** - Long format

– *Terminator Character*

When secondary serial port receives this character, data in front of <Terminator Character> will be packed into the message **+RESP:GTDTT** and sent to the backend server. This parameter is valid when <Mode> is 6.

- **7** - Used for transparent transfer based on <Interval> and <Length>. The hexadecimal data in +RESP:GTDTT is packed in ASCII format codes. The reserved parameters are used as follows.

Fields	Length	Range/Format	Default
Interval	<=4	1-3600(s)	
Length	<=3	1-640	
Format	1	0|1	0

– *Interval*

If <Mode> is 7 or 8 and no data is received for a period longer than <Interval>, the data

in UART buffer will be sent.

– *Length*

The maximum length of data in the message **+RESP:GTDTT** when <Mode> is 7 or 8.

- **8** - Used for transparent transfer based on <Interval> and <Length>. The data in **+RESP:GTDTT** is packed in raw HEX format codes. The reserved parameters are used as follows.

Fields	Length	Range/Format	Default
Interval	<=4	1-3600(s)	
Length	<=4	1-1280	
Format	1	0-1	0

- **9** - Used for camera.
- **14** - Used for transferring specified reports via satellite terminal when GSM is not available.

Fields	Length	Range/Format	Default
SACK Mode	1	0|1	0
Satellite Terminal Type	1	1|2	1
Report Message Mask	<=8	0 - FFFFFFFF	3F

– *SACK Mode*

This parameter indicates whether to check SACK. This parameter is valid when <Working Mode> is 14.

- **0** - Terminal does not check SACK.

The terminal does not check SACK.

- **1** - The terminal will check the SACK and if it fails, it will resend the message up to three times.

The terminal will check the SACK and if it fails, it will resend the message up to three times.

– *Satellite Terminal Type*

- **1** - ST2100

In this mode, configure the following settings: 9600 baud rate, no parity, 1 start bit and 1 stop bit.

- **2** - Iridium

In this mode, configure the following settings: 19200 baud rate, no parity, 1 start bit and 1 stop bit.

Note

When the parameter <Satellite Terminal Type> is set to 2, the length of the message transmitted by this accessory cannot exceed 340 bytes.

– *Report Message Mask*

Bitwise mask to configure the composition of report messages:

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Report Format	Item
SOS	SOS, TOW, DIS, IOB, SPD, RTL, DOG, IGL, HBM
FRI	FRI
IGN	IGN, IGF
STT	STT
GIN	GIN, GOT
DAT	DAT, UDT
IO	DOS, EPS, AIS
BLE	BCS, BDS, BAA, BAR, BID, BIE
CAN	CAN, CLT

- **20** - Used for sending out NMEA sentences. All the following types of NMEA sentences are selectable.

Fields	Length	Range/Format	Default
NMEA Send Mask	<=4	0000-FFFF	7F
Reserved	0		
Reserved	0		

– *NMEA Send Mask*

The bitwise mask to configure whether to output the specific NMEA sentence:

- **Bit 0** - for $RMC
- **Bit 1** - for $GSV
- **Bit 2** - for $GSA
- **Bit 3** - for $GGA
- **Bit 4** - for $GLL
- **Bit 5** - for $VTG
- **Bit 6** - for $TXT

Note

GPGSV is the statement for GPS satellites in view; GLGSV is the statement for GLONASS satellites in view; GNGSV is the statement for more than one constellation, such as GPS+GLONASS; and BDGSV is the statement for Beidou satellites in view.

Note

When the parameter <Mode> is set to 20, the Baud Rate needs to be set to greater than or equal to 33900.

- **22** - Used for the WRT100 accessory. In this mode, configure the following settings: 9600 baud rate, 8 data bits, no parity and 1 stop bit.

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Fields	Length	Range/Format	Default
Reserved	0		
Reserved	0		
Reserved	0		

- **24** - Used for THR_100. In this mode, configure the following settings: 38400 baud rate, 8 bits, no parity, 1 stop bit.

Fields	Length	Range/Format	Default
Reserved	0		
Reserved	0		
Reserved	0		

- **28** - Used for communication with TPT2. When the TPT2 sends any AT protocol command to the terminal by RS232, the terminal needs to execute the AT command, reply the ACK confirmation to TPT2 by RS232, and then send the **+RESP:** message to the backend server.
  If TPT2 sends any other message that does not begin with AT command, the terminal will send the **DAT** (ASCII)/(HEX) message to the backend server.

Fields	Length	Range/Format	Default
Reserved	0		
Reserved	0		
Reserved	0		

- **41** - Used for the TPM (Tire Pressure Monitoring), the device will report the tire data to the server with the report **TPM** (ASCII)/(HEX).In this mode, the following settings are required: 9600 baud rate, 8 data bits, no parity bits, and 1 stop bit.

Fields	Length	Range/Format	Default
Accessory Type	1	0|1	0
Reserved	0		
Reserved	0		

  – *Accessory Type*
  The type of tire pressure sensor accessories.
  - **0** - RF433 internal TPMS suit, 9600 baud rate.

  RF433 internal TPMS suit. Including Tire Sensor ATP200, RF433 Truck Tractor Cordless Repeater, RF433 Truck Trailer Cordless Repeater, RF433 Receiver with RS232 connection.
  - **1** - PressurePRO TPMS, 9600 baud rate.

  PressurePRO TPMS, 9600 baud rate.

- **44** - Used for the ACL-303 (Alcohol Tester). The device will upload the detection results of ACL-303 to the server via **ATR** (ASCII)/(HEX). In this mode, the following settings are required: 9600 baud rate, 8 data bits, no parity bits, and 1 stop bit.

Fields	Length	Range/Format	Default
Reserved	0		
Reserved	0		
Reserved	0		

- **46** - Used for reporting **+RESP:GTTMR** messages to voice accessories. It needs to set <Mode> of the AT+GTTMT command to 1.

Fields	Length	Range/Format	Default
Reserved	0		
Reserved	0		
Reserved	0		

✧ *Baud Rate Index*

The index of the supported baud rate of the serial port. All supported baud rates are listed below:

Index	Baud Rate
1	1200
2	2400
3	4800
4	7200
5	9600
6	14400
7	19200
8	28800
9	33900
10	38400
11	57600
12	115200

✧ *Data Bits*

The data bits of the UART. The parameter value can be 7 or 8.

✧ *Stop Bits*

Stop bits of the UART. The parameter value can be 1, 2 or 3.

- **1** - 1 Stop bit
- **2** - 2 Stop bits
- **3** - 1.5 Stop bits

✧ *Parity Bits*

The parity bits of the UART. The parameter value can be 0, 1, 2.

- **0** - None parity
- **1** - Odd parity

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- **2** - Even parity

✧ *Sleep Mode*

The device supports the sleep mode which helps reduce power consumption. When the device enters the sleep mode, the response to the serial port will be very slow unless the device is waked up. This parameter is used to enable/disable the sleep mode of the device.

- **0** - Disable the sleep mode and enable automatic online mode.
- **1** - Enable the sleep mode and enable automatic online mode.
- **2** - Disable the sleep mode and disable automatic online mode.
- **3** - Enable the sleep mode and disable automatic online mode.

3.7.16 WRT (RF433 Accessory)

The command **AT+GTWRT** is used to configure the parameters for RF433 accessories.

Before using this command, the <Mode> in the AT+GTURT command should be set to 22.

Example:

AT+GTWRT=gv350ceu,1,0,2,1,4,5,,,,,0005$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	WRT	WRT
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Accessory Type ID	1	0-1	1
	Sample Interval	<=3	0| 3-255(x10s)	0
	Temperature Threshold	<=2	2-30(x1 ℃)	2
	Humidity Threshold	<=3	1-100(x1%)	1
	Pair Count	<=2	0-10	4
	Pair Time	<=2	1-30(min)	5
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	

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Parts	Fields	Length	Range/Format	Default
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Accessory Type ID*

The ID which indicates the type of the accessory.

- **0** - Wireless temperature sensor (WTS100)
- **1** - Wireless temperature & humidity sensor (WTH100)

✧ *Sample Interval*

It is used to set the sample interval. If sample interval is set to 0, the sensors will collect the data every 5 minutes and the data will be reported only when:

|Current temperature value - last reported temperature value| >=Temperature Threshold or **|Current humidity value - last reported humidity value| >= Humidity Threshold**

✧ *Temperature Threshold*

It is used to set the temperature change threshold. Temperature threshold will be ignored if <Sample Interval> is not 0.

✧ *Humidity Threshold*

It is used to set the humidity change threshold. Humidity threshold will be ignored if <Sample Interval> is not 0.

Note

It is only used when <Accessory Type ID> is 1.

✧ *Pair Count*

The count of accessories. When the count of pairing reaches <Pair Count>, the device will stop pairing.

✧ *Pair Time*

The time for pairing accessory. When the time of pairing reaches <Pair Time>, the device will stop pairing.

Note

All the parameters can be configured independently except <Pair Count> and <Pair Time>.

3.7.17 ACD (1-Wire Setting)

The command **AT+GTACD** is used to configure the parameters of 1-Wire devices.

Example:

AT+GTACD=gv350ceu,1,0,0,0,0,10,0,0,,0,0005$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	ACD	ACD
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	ID Read Timer	<=2	0| 1-10(s)	0
	Output ID	1	0-5	0
	Output status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Data Read Timer	<=3	0| 10-255(s)	0
	EIO100 Connection	1	0-1	0
	Fixed Temperature Report	<=4	0-1440(min)	0
	Reserved	0		
	ID Reader Type	1	0| 1	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *ID Read Timer*

The interval for searching the 1-wire ID, including iButton, DR200, DR200_V80 and WR200 and Keypad ID. A specified wave shape can be configured to the specified output port when the device reads 1-wire ID. And 1-Wire ID information is reported in the message **+RESP:GTIDA** (ASCII)/(HEX).

Note

The iButton ID number is in the reverse order of the number printed on iButton. The ID consists of **<1 Byte Family ID> + <6 Byte Serial Number> + <1 Byte CRC>**. And the first byte of ID number is family ID of iButton, DR200.

The DR200_V80/WR200 ID consists of **<1 byte family ID> + <7 byte serial number> + <1 byte CRC>**, but <1 byte family ID> and <1 byte CRC> are not reported in the **+RESP:GTIDA** (ASCII)/(HEX) message.

✧ *Data Read Timer*

The interval for reading the 1-wire sensor data. If more than one sensor is connected to 1-wire, the device will read the sensor data from the 1-wire sensors one by one at the interval specified by <Data Read Timer>. 0 means "Disable 1-wire sensor data detection".

✧ *EIO100 Connection*

A numeral to indicate whether EIO100 is connected to 1-Wire.

- **0** - EIO100 is not connected to 1-Wire.
- **1** - EIO100 is connected to 1-Wire.

✧ *Fixed Temperature Report*

Periodically report the temperature information in the message **+RESP:GTFRT** (ASCII)/(HEX). If the value of this parameter is 0, the device will not report the **+RESP:GTFRT** (ASCII)/(HEX) message.

✧ *ID Reader Type*

Specify which 1-wire type to use.

- **0** - iButton/DR200/WR200/DR200_V80.
- **1** - Keypad.

Note

The maximum number of 1-wire devices is one iButton/DR200/DR200_V80/WR200 and four temperature sensors. When the 1-wire is connected to the Keypad, the temperature sensor cannot be connected simultaneously.

3.7.18 IEX (Input Expansion)

The command **AT+GTIEX** is used to configure the parameters of expanded inputs. If the logic status is changed on one of the expanded input ports, the device will report the message **DIS** (ASCII)/(HEX) to the backend server.

Example:

AT+GTIEX=gv350ceu,0,,1,9,0,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	IEX	IEX
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Input Expansion Type	1	0-1	0
	Bind BAS Index	1	0-9	0
	Input Number	1	1-4	
	Input ID	1	8-C	
	Sample Period	<=2	0| 1-12(x4s)	0

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Input Expansion Type*

It is used to indicate which extended device the following parameters are used for.

- **0** - EIO100 Setting. In this mode, it's necessary to enable EIO100 device.
- **1** - Bluetooth Accessory Input Setting. In this mode, it's necessary to enable external Input/Output Bluetooth Accessory.

Note

Due to the limitation of the detection mechanism, changing the input state in a short time may not be detected.

✧ *Bind BAS Index*

It is used to bind the specific configuration in AT+GTBAS when <Input Expansion Type> is set to 1, and it will be ignored if <Input Expansion Type> is set to 0.

✧ *Input Number*

The total number of the configured inputs.

If <Input Expansion Type> is set to 0, it indicates the number of configured EIO100 inputs. In one configuration, <Input ID> and <Sample Period> are included.

If <Input Expansion Type> is set to 1, it indicates the number of configured Bluetooth Input Setting. In one configuration, <Input ID> is included and others are reserved.

✧ *Input ID*

The ID of the configured inputs.

The ID ranges from 9 to C in HEX format is EIO100 input.

The ID of 8 is Bluetooth accessory input and the parameters <Accessory Type> and <Accessory Model> should be set in **AT+GTBAS**.

✧ *Sample Period*

The sampling period for reading EIO100 input status. It will be ignored if the <Input Expansion Type> is set to 1.

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3.7.19 OEX (Output Expansion)

The **AT+GTOEX** command is used to output wave shape 1 on expanded output.

Example:

AT+GTOEX=gv350ceu,0,,1,9,0,0,0,,,0,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	OEX	OEX
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Output Expansion Type	1	0-1	0
	Bind BAS Index	1	0-9	0
	Output Number	1	1-4	4
	Output ID	1	7-C	9
	Status	1	0| 1	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	DOS Report	1	0-F	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Output Expansion Type*

It’s used to indicate which extended device the following parameters are used for.

- **0** - EIO100 Setting. In this mode, it's necessary to enable EIO100 device.
- **1** - Bluetooth Output Accessory Setting. In this mode, it's necessary to enable external Input/Output Bluetooth Accessory.

✧ *Output Number*

It is used to indicate the number of the following special parameters.

If <Output Expansion Type> is set to 0, it indicates the number of configured EIO100 outputs. In one set of output configuration, <Output ID>, <Status>, <Duration> and <Toggle Times> are included and others are reserved.

If <Output Expansion Type> is set to 1, it indicates the number of configured Bluetooth Output Setting. In one configuration, <Bind BAS Index>, <Output ID>, <Status>, <Duration>, <Toggle Times>, <Reserved>, <Reserved> and <DOS Report> are included and others are reserved.

✧ *Output ID*

The ID of the configured outputs.

The ID ranges from 9 to C in HEX format is EIO100 output.

The ID ranges from 7 to 8 is Bluetooth accessory output and the parameters <Accessory Type> and <Accessory Model> should be set in AT+GTBAS.

✧ *DOS Report*

Whether to report **DOS** (ASCII)/(HEX) when the state of output wave shape 1 changes. 1 means "Report **+RESP:GTDOS**", and 0 means "Do not report **+RESP:GTDOS**".

If <Output Expansion Type> is set to 0:

- **Bit 0 -** For EIO100 output 9 (not) to report **+RESP:GTDOS**.
- **Bit 1 -** For EIO100 output A (not) to report **+RESP:GTDOS**.
- **Bit 2 -** For EIO100 output B (not) to report **+RESP:GTDOS**.
- **Bit 3 -** For EIO100 output C (not) to report **+RESP:GTDOS**.

If <Output Expansion Type> is set to 1:

- **Bit 0 -** For Bluetooth Accessory output 7 (not) to report **+RESP:GTDOS**.
- **Bit 1 -** For Bluetooth Accessory output 8 (not) to report **+RESP:GTDOS**.

3.7.20 TMP (Temperature Alarm)

The command **AT+GTTMP** is used to set a temperature alarm range for the terminal. According to the working mode, the terminal will report the event message **TMP** (ASCII)/(HEX) to the backend server when the temperature outside or within the range is detected.

Example: AT+GTTMP=gv350ceu,0,1,28131A4103000056,,,-20,50,,,2,10,,,0,0,0,0,,,,,000C$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TMP	TMP
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Alarm ID	1	0-3	0
	Mode	1	0-3	0
	Sensor ID	16	'0' - '9' 'a' - 'f' 'A' - 'F'	
	Reserved	0		
	Reserved	0		
	Low Temperature	<=3	-55-125(℃)	0
	High Temperature	<=3	-55-125(℃)	0
	Reserved	0		
	Reserved	0		
	Validity	<=2	1-10	2
	Send Interval	<=2	0-60	10
	Reserved	0		
	Reserved	0		
	Output ID	1	0-5	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Alarm ID*

The ID of the temperature alarm. A total of four samples (0-3) are supported.

✧ *Mode*

The working mode of the temperature alarm.

- **0** - Disable temperature alarm.
- **1** - Report temperature alarm if the current temperature is within the temperature range defined by <Low Temperature> and <High Temperature>.
- **2** - Report temperature alarm if the current temperature is outside the temperature range defined by <Low Temperature> and <High Temperature>.
- **3** - Report temperature alarm only once if the current temperature is within or outside the temperature range defined by <Low Temperature> and <High Temperature>. In this mode, <Send Interval> will be ignored.

✧ *Sensor ID*

The ID of the temperature sensor. A total of four sensors are supported.

✧ *Low Temperature*

The lower temperature limit.

✧ *High Temperature*

The upper temperature limit.

✧ *Validity*

If the temperature sensor detects that the ambient temperature meets the alarm condition, it will continuously check the temperature based on the reading timer <Data Read Timer> set in the command AT+GTACD. If the temperature keeps meeting the alarm condition for <Validity> times, the temperature alarm will be triggered.

✧ *Send Interval*

After <Validity> checking, the device will report temperature alarm every <Send Interval> times of temperature reading based on temperature sensor's reading timer. If <Send Interval> is set to 0, it will only report the temperature alarm once.

3.7.21 CAN (CAN Bus Setting)

The command **AT+GTCAN** is used to set the CAN bus device configuration for reporting CAN bus device information in **CAN** (ASCII)/(HEX), which includes VIN, vehicle speed, engine speed, engine coolant temperature and other information.

Example:

AT+GTCAN=gv350ceu,1,5,5,F00FFFFF,0,,801FFFFF,0,C0,,,B,,,158,FFFFFFFF,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT

Parts	Fields	Length	Range/Format	Default
	Command Word	3	CAN	CAN
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0| 1| 6	0
	CAN Report Interval	<=5	0| 5-86400(s)	0
	CAN Report Interval IGF	<=5	0| 5-86400(s)	0
	CAN Report Mask	<=8	0-FFFFFFFF	C00FFFFF
	Additional Event Mask	<=2	0-FF	0
	Reserved	0		
	CAN Report Expansion Mask	<=8	0-FFFFFFFF	1FFFFF
	GNSS Assisted Mode	1	0| 1	0
	Electric Report Mask	<=8	0-FFFFFFFF	C0
	Reserved	0		
	Reserved	0		
	CAN Report Expansion Mask1	<=8	0-FFFFFFFF	1
	Reserved	0		
	Reserved	0		
	Machine Model	<=5	158	158
	E-GENSET Report Mask	<=8	0-FFFFFFFF	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*

The working mode of this function.

- **0** - Disable this function.
- **1** - Enable the CAN chip. In this mode, only CAN bus device information will be reported.
- **6** - Enable the CAN chip. In this mode, the CAN chip will work according to <Machine Model>.

✧ *CAN Report Interval*

The interval for sending the message **+RESP:GTCAN** to the backend server when the ignition is on. 0 means "Do not report the message **+RESP:GTCAN**".

✧ *CAN Report Interval IGF*

The interval for sending the message **+RESP:GTCAN** to the backend server when the ignition is off. 0 means "Do not report the message **+RESP:GTCAN**".

✧ *CAN Report Mask*

Bitwise mask to configure the composition of CAN report message.

Mask Bit	Item	Description
Bit 0	<VIN>	Vehicle identification number.
Bit 1	<Ignition Key>	Ignition status.
Bit 2	<Total Distance>	Vehicle total distance.
Bit 3	<Total Fuel Used>	The number of liters of fuel used since vehicle manufacture or device installation. Total fuel or energy used - read from vehicle.
Bit 4	<Vehicle Speed>	The speed of vehicle.
Bit 5	<Engine RPM>	Revolutions per minute of the engine.
Bit 6	<Engine Coolant Temperature>	The temperature of the engine coolant.
Bit 7	<Fuel Consumption>	The fuel consumption of the engine.
Bit 8	<Fuel Level>	The level of fuel in vehicle's tank (in liter or percentage).
Bit 9	<Range>	The number of kilometers to drive on remaining fuel.
Bit 10	<Accelerator Pedal Pressure>	The pressure applied on acceleration pedal.
Bit 11	<Total Engine Hours>	Time of engine running since vehicle manufacture or device installation.
Bit 12	<Total Driving Time>	Time of engine running during driving (non-zero speed) since vehicle manufacture or device installation.
Bit 13	<Total Engine Idle Time>	Time of engine running during idle state since vehicle manufacture or device installation.
Bit 14	<Total Idle Fuel Used>	Number of liters of fuel used since vehicle manufacture or device installation. Total idle fuel or energy used - with vehicle speed 0 km/h.
Bit 15	<Axle Weight 2nd>	Weight of vehicle's second axle.

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Mask Bit	Item	Description
Bit 16	<Tachograph Information>	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 17	<Detailed Information/Indicators>	A hexadecimal number. Each bit indicates information of one indicator.
Bit 18	<Lights>	An 8-bit hexadecimal number. Each bit contains information of one light.
Bit 19	<Doors>	An 8-bit hexadecimal number. Each bit contains information of one door.
Bit 20	<Total Vehicle Overspeed Time>	The total time when the vehicle speed is greater than the limit defined in CAN Module configuration.
Bit 21	<Total Vehicle Engine Overspeed Time>	The total time when the vehicle engine speed is greater than the limit defined in CAN Module configuration.
Bit 22	<Total Distance Impulses>	Vehicle total distance measured in Impulses if distance from dashboard is not available.
Bit 23	<Engine Cold Starts Count>	Number of cold Engine starts.
Bit 24	<Engine All Starts Count>	Total number of Engine starts.
Bit 25	<Engine Starts by Ignition Count>	Total number of Engine starts by ignition.
Bit 26	<Total Engine Cold Running Time>	Total driving time with cold engine (engine coolant temperature below 70 degrees centigrade).
Bit 27	<Handbrake Applies During Ride Count>	Counts events when handbrake is pulled-up while driving (speed is greater than 5 km/h).
Bit 28	<Electric Report Mask>	If this bit is set to 1, the parameter <Electric Report Mask> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <Electric Report Mask> in **AT+GTCAN** is invalid.

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Mask Bit	Item	Description
Bit 29	<CAN Report Expansion Mask>	If this bit is set to 1, the parameter <CAN Report Expansion Mask> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <CAN Report Expansion Mask> in **AT+GTCAN** is invalid.
Bit 30	<GNSS Information>	Including <GNSS Accuracy>, <Speed>, <Azimuth>, <Altitude>, <Longitude>, <Latitude>, <GNSS UTC Time>.
Bit 31	<GSM Information>	Including <MCC>, <MNC>, <LAC>, <Cell ID>.

Note

Bit 31 (for <GSM Information>) and Bit 30 (for <GNSS Information>) of the <CAN Report Mask> only control the composition of **+RESP:GTCAN** in ASCII format.

<+CAN Mask> in AT+GTHRM controls the GSM and GNSS information in HEX format **+RESP:GTCAN**.

Bit 22 of this parameter only controls <Total Distance Impulses> in HEX format **+RESP:GTCAN**.

✧ *Additional Event Mask*

A bitwise numeral to control whether to send the message **+RESP:GTCAN** by additional event mask. 0 means "Ignore all additional events".

- **Bit0** - By ignition on/off event.
- **Bit1** - When the value of <Tachograph Driver 1 Card Number> changes.
- **Bit2** - When the value of <Tachograph Driver 2 Card Number> changes.
- **Bit3** - When the Driver1 working status in the parameter <Tachograph Information> changes.
- **Bit4** - When the Driver2 working status in the parameter <Tachograph Information> changes.
- **Bit5** - When the value of <Ignition Key> changes.
- **Bit6** - When the "Out of Scope" condition in the parameter <Tachograph Information Expand> changes.
- **Bit7** - Reserved.

✧ *CAN Report Expansion Mask*

Bitwise mask to configure the composition of expanded CAN bus information of the **+RESP:GTCAN** message.

Mask Bit	Item	Description
Bit 0	<Ad-Blue Level>	The level of Ad-Blue
Bit 1	<Axle Weight 1st>	Weight of vehicle's first axle
Bit 2	<Axle Weight 3rd>	Weight of vehicle's third axle
Bit 3	<Axle Weight 4th>	Weight of vehicle's fourth axle
Bit 4	<Tachograph Overspeed Signal>	Tachograph overspeed signal for the vehicle

Mask Bit	Item	Description
Bit 5	<Tachograph Vehicle Motion Signal>	Vehicle motion signal from tachograph
Bit 6	<Tachograph Driving Direction>	Vehicle driving direction from tachograph
Bit 7	<Analog Input Value>	Analog input value
Bit 8	<Engine Braking Factor>	It measures how often the driver brakes with brake pedal or engine and stores both counts, which are always increasing. Decreasing speed with no pedal pressed causes increase of engine braking factor.
Bit 9	<Pedal Braking Factor>	It measures how often the driver brakes with brake pedal or engine and stores both counts, which are always increasing. Decreasing speed with brake pedal pressed causes increase of pedal braking factor.
Bit 10	<Total Accelerator Kick-downs>	Count of accelerator pedal kick-downs (with the pedal pressed over 90%)
Bit 11	<Total Effective Engine Speed Time>	Total time when the vehicle engine speed is effective
Bit 12	<Total Cruise Control Time>	Total time when the vehicle speed is controlled by cruise-control module
Bit 13	<Total Accelerator Kick-down Time>	Total time when accelerator pedal is pressed over 90%
Bit 14	<Total Brake Applications>	Count of applying brake pedal (braking process initiated by brake pedal)
Bit 15	<Tachograph Driver 1 Card Number>	The card number of tachograph driver 1
Bit 16	<Tachograph Driver 2 Card Number>	The card number of tachograph driver 2
Bit 17	<Tachograph Driver 1 Name>	The name of tachograph driver 1
Bit 18	<Tachograph Driver 2 Name>	The name of tachograph driver 2
Bit 19	<Registration Number>	The vehicle registration number
Bit 20	<Expansion Information>	A hexadecimal number. Each bit represents the information of one indicator.

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Mask Bit	Item	Description
Bit 21	<Rapid Brakings>	The number of total rapid brakings since installation and it is calculated based on CAN Module settings of speed decrease time and value.
Bit 22	<Rapid Accelerations>	The number of total rapid accelerations since installation and it is calculated based on CAN Module settings of speed increase time and value.
Bit 23	<Engine Torque>	The engine torque. Unit: Percentage.
Bit 24	<Service Distance>	It describes distance left to diagnostic car review.
Bit 25	<Ambient Temperature>	
Bit 26	Reserved	
Bit 27	Reserved	
Bit 28	<DTC Codes>	
Bit 29	<Gaseous Fuel Level>	The alternative fuel levels.
Bit 30	<Tachograph Information Expand>	A 4-byte hexadecimal number. It is an expansion of the parameter <Tachograph Information>.
Bit 31	<CAN Report Expansion Mask1>	If this bit is set to 1, the parameter <CAN Report Expansion Mask1> in **AT+GTCAN** is valid. If this bit is set to 0, the parameter <CAN Report Expansion Mask1> in **AT+GTCAN** is invalid.

✧ *GNSS Assisted Mode*

It specifies whether to use GNSS to calculate total distance when the communication between the device and CAN Module is abnormal.

- **0** - Disable.
- **1** - Enable.

  When the communication between the device and CAN Module is abnormal, the device will use GNSS to calculate total distance and report <Total Distance> in **+RESP:GTCAN**. This parameter works only when the unit of total distance is hectometer.

✧ *Electric Report Mask*

Bitwise mask to configure the composition of electric vehicle information in the **+RESP:GTCAN** message.

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Mask Bit	Item	Description
Bit 0	<Battery Instantaneous Voltage>	For electric vehicles, it represents instantaneous high voltage of battery cells (Read from BMS).
Bit 1	<Battery Charging Cycles Count>	For electric vehicles, it counts cycles of battery charging (increments at every finished cycle of charging).
Bit 2	<Total Energy Recuperated>	Sum of energy transmitted to battery with no charger connected.
...	Reserved	
Bit 6	<Vehicles Battery Charge Level>	The battery charge level.
Bit 7	<Charging State>	The status of battery charging and charging cable connection.
Bit 8	<Battery Temperature>	It indicates the battery temperature.
Bit 9	<Battery Charging Current>	It indicates the electric vehicle's battery charging current.
Bit 10	<Battery Instantaneous Power>	For electric vehicles, it represents instantaneous power used by (positive values) or recuperated from (negative values) the vehicle.
Bit 11	<Battery State of Health (SoH)>	For electric vehicles, it represents the battery general condition. 100% means brand new, 0% means totally damaged.
Bit 12	<Total Energy Used>	Sum of energy used by vehicle's engine and equipment; recuperated energy does not affect this parameter.
Bit 13	<Total Energy Used When Idling>	With vehicle speed 0 km/h.
Bit 14	<Total Energy Charged>	Sum of energy transmitted to battery from external charger.
Bit 15	Reserved	
Bit 16	<Charge State Optimization>	Use <Charging State> if available or "Speed = 0 and Engine speed = 0 and (Battery Charging Current > 0 or Battery Level keep increasing within 3 minutes)" or "Ignition off and (Battery Charging Current > 0 or Battery Level keep increasing within 3 minutes)"

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Mask Bit	Item	Description
Bit 17-31	Reserved	

✧ *CAN Report Expansion Mask1*

It expands CAN bus information in **+RESP:GTCAN**. Bitwise report mask to configure the composition of expanded CAN bus information of **+RESP:GTCAN**.

Mask Bit	Item	Description
Bit 0	<Retarder Usage>	The usage of Retarder.
Bit 1	<Power Mode>	Power mode.
Bit 2	Reserved	
Bit 3	<E-GENSET Report Mask>	Data from special equipment "Etteplan Thriatlon e-GENSET", <Machine Model> must be set to machine 158 through **AT+GTCAN** command. (automatic synchronization would lose effectiveness at that time). If this bit is set to 1, the parameter <E-GENSET Report Mask> in **AT+GTCAN** is d. If this bit is set to 0, the parameter <E-GENSET Report Mask> in **AT+GTCAN** is not d.
Bit 4	<Oil Temperature>	Oil temperature.
Bit 5	<Oil Level>	Engine oil level, 100% is the maximum level allowed by producer.
Bit 6	<Axle Weight 5th>	Weight of vehicle's fifth axle.
Bit 7	<Axle Weight 6th>	Weight of vehicle's sixth axle.
Bit 8	<Axle Weight 7th>	Weight of vehicle's seventh axle.
Bit 9	<Current Gear Number>	Current Gear Number.
Bit 10	<DPF Soot Level>	DPF soot level.
Bit 11	<VIN of Trailer>	Vehicle identification number.
Bit 12	<Expansion2 Information>	A hexadecimal number. Each bit contains information of one indicator.
Bit 13	<Total Fuel or Idle Fuel Used Expand>	If this bit is enabled, <Total Fuel Used Expand> and <Total Idle Fuel Used Expand> will be reported in the message instead of <Total Fuel Used> and <Total Idle Fuel Used>.
Bit 14	<Vehicle Gross Weight>	Vehicle gross weight.
Bit 15	<Tyres Pressures and Tyres Temperatures>	Tyres pressures and Tyres temperatures.

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Mask Bit	Item	Description
Bit 16	<Remaining Time to Maintenance Service>	Remaining time to maintenance service.
Bit 17	<Total Fuel Read from Vehicle's Computer>	Total Fuel Read from Vehicle's Computer
Bit 18	<Total Gaseous Fuel Usage>	Total Gaseous Fuel Usage
Bit 19	<DTC Status>	DTC Status
Bit 20-31	Reserved	

✧ *Machine Model*

A number indicates the model of the machine to be set from the machine list. This parameter is valid when <Mode> is set to 6.

- **158** - Indicates that the machine model is Etteplan Thriatlon e-GENSET.

✧ *E-GENSET Report Mask*

Bitwise mask to configure the composition of E-GENSET information in the **CAN**(ASCII)/(HEX) report message.

Mask Bit	Item	Description
Bit 0	<Hours Until Service>	Time to service. Unit: hour.
Bit 1	<System Status Health>	The status that describes system health.
Bit 2	<Status Inverter Mode>	The status that describes inverter mode.
Bit 3	<Remaining Runtime>	The time that describes the remaining running in hours.
Bit 4	<Battery Temperature>	
Bit 5	<BMS Board Temperature>	
Bit 6	<Battery Voltage>	
Bit 7	<Minimum Cell Voltage>	
Bit 8	<Maximum Cell Voltage>	
Bit 9	<Maximum Cell Temperature>	
Bit 10	<Minimum Cell Temperature>	
Bit 11	<Module/Battery Pre-warning>	
Bit 12	<CECU-Error>	

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Mask Bit	Item	Description
Bit 13	<Cumulative charging hours>	
Bit 14	<Inverter AC current L1>	
Bit 15	<Inverter AC current L2>	
Bit 16	<Inverter AC current L3>	
Bit 17	<Inverter Ambient Temperature>	
Bit 18	<Inverter / OBC Temperature>	
Bit 19	<Inverter AC Voltage L1>	
Bit 20	<Inverter AC Voltage L2>	
Bit 21	<Inverter AC Voltage L3>	
Bit 22	<Inverter State>	
Bit 23	<Shut Down Reason>	
Bit 24	<Cumulative Usage Time>	
Bit 25	<Cumulative Idle Time>	
Bit 26-31	Reserved	

3.7.22 CLT (CAN Bus Alarm Setting)

The command **AT+GTCLT** is used to set alarm threshold of CAN bus data. It supports a maximum of 20 CAN bus alarm groups. Each CAN alarm trigger condition consists of <Alarm Mask 1>, <Alarm Mask 2> and <Alarm Mask 3>.

For the CAN alarm trigger event information, please refer to <Detailed Information / Indicators>, <Lights>, <Doors> and <Engine RPM> of the message **CAN** (ASCII)/(HEX). If <Alarm Mask 1>, <Alarm Mask 2> and <Alarm Mask 3> meet each trigger condition at the same time, and the trigger event duration time is longer than <Debounce Time>, the alarm message **CLT** (ASCII)/(HEX) will be sent.

Note

The **AT+GTCLT** and AT+GTCAN commands are used together. Only when all of <Alarm Mask 1>, <Alarm Mask 2> and <Alarm Mask 3> meet trigger condition and the trigger event duration time is longer than <Debounce Time> will the **+RESP:GTCLT** alarm message be sent.

Example:
AT+GTCLT=gv350ceu,0,0,0,000FFFFF,0,0,0,30,8,001FFFFF,0,60,15,0,0,0,0,90,0,1,100,30,0006$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CLT	CLT
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Group ID	<=2	0-19	0
	Mode	1	0-1	0
	Debounce Time	<=3	0-255(x1s)	0
	CAN Data Mask	8	00000000-FFFFFFFF	000FFFFF
	Alarm Mask 1	<=8	0-FFFFFFFF	0
	Alarm Mask 2	<=8	0-FFFFFFFF	0
	Alarm Mask 3	<=8	0-FFFFFFFF	0
	High RPM Threshold	<=3	1-100(x100 rpm)	30
	Low RPM Threshold	<=3	0-99(x100 rpm)	8
	CAN Report Expansion Mask	<=8	0-FFFFFFFF	001FFFFF
	Inverse Alarm Mask 1	<=8	0-FFFFFFFF	0
	Vehicle Speed High Threshold	<=3	1-455(km/h)	60
	Vehicle Speed Low Threshold	<=3	0-454(km/h)	15
	Output ID	1	0-5| 9-C	0
	Output Status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0

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Parts	Fields	Length	Range/Format	Default
	Accelerator Pedal Pressure High Threshold	<=3	1-100(%)	90
	Electric Report Mask	<=8	0-FFFFFFFF	0
	CAN Report Expansion Mask1	<=8	0-FFFFFFFF	1
	High Retarder Usage	<=3	1-125(%)	100
	Low Retarder Usage	<=3	0-124(%)	30
	Accelerator Pedal Pressure Low Threshold	<=3	1-100(%)	30
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Group ID*

The ID of the CAN bus alarm group. A total of 20 groups are supported.

✧ *Mode*

The CAN bus alarm working mode for each group.

- **0** - Disable the CAN alarm function.
- **1** - Enable the CAN alarm function.

✧ *Debounce Time*

The time for CAN bus alarm trigger event debouncing.

✧ *CAN Data Mask*

Bitwise mask to configure the CAN data composition of the **+RESP:GTCLT** message. <CAN Data Mask> only works in **CLT** ASCII message.

Mask Bit	Item	Description
Bit 0	<VIN>	Vehicle identification number
Bit 1	<Ignition Key>	Ignition state
Bit 2	<Total Distance>	Vehicle total distance
Bit 3	<Total Fuel Used>	The number of liters of fuel used since vehicle manufacture or device installation
Bit 4	<Vehicle Speed>	Vehicle road speed
Bit 5	<Engine RPM>	Revolutions per minute of the engine

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Mask Bit	Item	Description
Bit 6	<Engine Coolant Temperature>	The temperature of the engine coolant
Bit 7	<Fuel Consumption>	The fuel consumption of the engine
Bit 8	<Fuel Level>	The level of fuel in vehicle's tank in liters or percentage.
Bit 9	<Range>	The number of kilometers to drive on remaining fuel
Bit 10	<Accelerator Pedal Pressure>	The pressure applied on acceleration pedal
Bit 11	<Total Engine Hours>	Time of engine running since vehicle manufacture or device installation
Bit 12	<Total Driving Time>	Time of engine running during driving (non-zero speed) since vehicle manufacture or device installation
Bit 13	<Total Engine Idle Time>	Time of engine running during idling status (vehicle at a standstill) since vehicle manufacture or device installation
Bit 14	<Total Idle Fuel Used>	Number of liters of fuel used since vehicle manufacture or device installation
Bit 15	<Axle Weight 2nd>	Weight of vehicle's second axle
Bit 16	<Tachograph Information>	Two bytes. The higher byte describes driver 2 (the one whose card is inserted in tachograph slot 2), and the lower byte describes driver 1.
Bit 17	<Detailed Information/Indicators>	A hexadecimal number. Each bit contains information of one indicator.
Bit 18	<Lights>	An 8-bit hexadecimal number. Each bit contains information of a light.
Bit 19	<Doors>	An 8-bit hexadecimal number. Each bit contains information of one door.
Bit 20	<Total Vehicle Overspeed Time>	The total time when the vehicle speed is greater than the limit defined in CAN Module configuration.
Bit 21	<Total Vehicle Engine Overspeed Time>	The total time when the vehicle engine speed is greater than the limit defined in CAN Module configuration.

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Mask Bit	Item	Description
Bit 22	Reserved	
Bit 23	<Engine Cold Starts Count>	Number of cold Engine starts.
Bit 24	<Engine All Starts Count>	Total number of Engine starts.
Bit 25	<Engine Starts by Ignition Count>	Total number of Engine starts by ignition.
Bit 26	<Total Engine Cold Running Time>	Total driving time with cold engine (engine coolant temperature below 70 degrees Centigrade).
Bit 27	<Handbrake Applies During Ride Count>	Counts events when handbrake is pulled-up while driving (speed is greater than 5 km/h).
Bit 28	<Electric Report Mask>	If this bit is set to 1, the parameter <Electric Report Mask> in **AT+GTCLT** is valid. If this bit is set to 0, the parameter <Electric Report Mask> in **AT+GTCLT** is invalid.
Bit 29	<CAN Report Expansion Mask>	If this bit is set to 1, the parameter <CAN Report Expansion Mask> in **AT+GTCLT** is valid. If this bit is set to 0, the parameter <CAN Report Expansion Mask> in **AT+GTCLT** is invalid.
Bit 30-31	Reserved	

✧ *Alarm Mask 1*

Bitwise setting of the alarm mask. The alarm mask information is based on <Detailed Information / Indicators> and <Expansion Information> of the **+RESP:GTCAN** message.

Mask Bit	Item
Bit 0	FL - fuel low indicator (1 - indicator on, 0 - off).
Bit 1	DS - driver seatbelt indicator (1 - indicator on, 0 - off).
Bit 2	AC - air conditioning (1 - on, 0 - off)
Bit 3	CC - cruise control (1 - active, 0 - inactive)
Bit 4	B - brake pedal (1 - pressed; 0 - released)
Bit 5	C - clutch pedal (1 - pressed; 0 - released)
Bit 6	H - handbrake (1 - pulled-up, 0 - released)
Bit 7	CL - central lock (1 - locked, 0 - unlocked)

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Mask Bit	Item
Bit 8	R - reverse gear (1 - on, 0 - off)
Bit 9	RL - running lights (1 - on, 0 - off)
Bit 10	LB - low beams (1 - on, 0 - off)
Bit 11	HB - high beams (1 - on, 0 - off)
Bit 12	RFL - rear fog lights (1 - on, 0 - off)
Bit 13	FFL - front fog lights (1 - on, 0 - off)
Bit 14	D - doors (1 - any door open, 0 - all doors closed)
Bit 15	T - trunk (1 - open, 0 - closed)
Bit 16	Reserved
Bit 17	BFL - brake fluid low indicator (1 - on, 0 - off or not available)
Bit 18	CLL - coolant level low indicator (1 - on, 0 - off or not available)
Bit 19	BAT - battery indicator (1 - on, 0 - off or not available)
Bit 20	BF - brake system failure indicator (1 - on, 0 - off or not available)
Bit 21	OP - oil pressure indicator (1 - on, 0 - off or not available)
Bit 22	EH - engine hot indicator (1 - on, 0 - off or not available)
Bit 23	ABS - ABS failure indicator (1 - on, 0 - off or not available)
Bit 24	ESP - ESP failure indicator (1 - on, 0 - off or not available)
Bit 25	CHK - “check engine” indicator (1 - on, 0 - off or not available)
Bit 26	AIR - airbags indicator (1 - on, 0 - off or not available)
Bit 27	SC - service call indicator (1 - on, 0 - off or not available)
Bit 28	OLL - oil level low indicator (1 - on, 0 - off or not available)
Bit 29	CHG - battery charging for electric cars (1 - battery is being charged, 0 - no charging)
Bit 30-31	Reserved

✧ *Alarm Mask 2*

Bitwise setting of the alarm mask. The alarm mask information is based on <Lights> and <Doors> of the **+RESP:GTCAN** message.

Mask Bit	Item
Bit 0	Running Lights (1 - on, 0 - off)
Bit 1	Low Beam (1 - on, 0 - off)
Bit 2	High Beam (1 - on, 0 - off)
Bit 3	Front Fog Light (1 - on, 0 - off)
Bit 4	Rear Fog Light (1 - on, 0 - off)
Bit 5	Hazard Lights (1 - on, 0 - off)
...	Reserved

Mask Bit	Item
Bit 16	Driver Door (1 - open, 0 - closed)
Bit 17	Passenger Door (1 - open, 0 - closed)
Bit 18	Rear Left Door (1 - open, 0 - closed)
Bit 19	Rear Right Door (1 - open, 0 - closed)
Bit 20	Trunk (1 - open, 0 - closed)
Bit 21	Hood (1 - open, 0 - closed)
Bit 22-31	Reserved

✧ *Alarm Mask 3*

Bitwise setting of the alarm mask. The alarm mask information is based on <Engine RPM> , <Vehicle Speed>, <Accelerator Pedal Pressure> and <Charging State> of the **+RESP:GTCAN** message.

Mask Bit	Item
Bit 0	Under Low RPM Event (1 - Triggered, 0 - not triggered).
Bit 1	Over Low RPM Event (1 - Triggered, 0 - not triggered).
Bit 2	Under High RPM Event (1 - Triggered, 0 - not triggered).
Bit 3	Over High RPM Event (1 - Triggered, 0 - not triggered).
Bit 4	Under Vehicle Speed Low Threshold Event (1 - Triggered, 0 - not triggered).
Bit 5	Over Vehicle Speed Low Threshold Event (1 - Triggered, 0 - not triggered).
Bit 6	Under Vehicle Speed High Threshold Event (1 - Triggered, 0 - not triggered).
Bit 7	Over Vehicle Speed High Threshold Event (1 - Triggered, 0 - not triggered).
Bit 8	Over Accelerator Pedal Pressure High Threshold Event (1 - Triggered, 0 - not triggered).
Bit 9	Battery Charge State Changed (1-Enable, 0-Disable), If this bit is enabled and <Charging State> is changed, an alarm will be triggered.
Bit 10	Under Low Retarder Usage Event (1 - Triggered, 0 - not triggered).
Bit 11	Over Low Retarder Usage Event (1 - Triggered, 0 - not triggered).
Bit 12	Under High Retarder Usage Event (1 - Triggered, 0 - not triggered).
Bit 13	Over High Retarder Usage Event (1 - Triggered, 0 - not triggered).
Bit 14	Under Accelerator Pedal Pressure Low Threshold Event(1 - Triggered, 0 - not triggered).
Bit 15-31	Reserved

✧ *High RPM Threshold*

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This is the threshold of the high engine RPM. If the current engine RPM is greater than <High RPM Threshold>, it will trigger over high RPM event.

✧ *Low RPM Threshold*

This is the threshold of the low engine RPM. If the current engine RPM is less than <Low RPM Threshold>, it will trigger under low RPM event.

✧ *CAN Report Expansion Mask*

Bitwise mask to configure the composition of CAN bus expansion information of the **+RESP:GTCLT** message.

Mask Bit	Item	Description
Bit 0	<Ad-Blue Level>	The level of Ad-Blue
Bit 1	<Axle Weight 1st>	Weight of vehicle's first axle
Bit 2	<Axle Weight 3rd>	Weight of vehicle's third axle
Bit 3	<Axle Weight 4th>	Weight of vehicle's fourth axle
Bit 4	<Tachograph Overspeed Signal>	Tachograph overspeed signal for the vehicle
Bit 5	<Tachograph Vehicle Motion Signal>	Vehicle motion signal from tachograph
Bit 6	<Tachograph Driving Direction>	Vehicle driving direction from tachograph
Bit 7	<Analog Input Value>	Analog input value
Bit 8	<Engine Braking Factor>	It measures how often the driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with no pedal pressed causes increase of engine braking factor.
Bit 9	<Pedal Braking Factor>	It measures how often the driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes increase of pedal braking factor.
Bit 10	<Total Accelerator Kick-downs>	Count of accelerator pedal kick-downs (with the pedal pressed over 90%)
Bit 11	<Total Effective Engine Speed Time>	Total time when the vehicle engine speed is effective
Bit 12	<Total Cruise Control Time>	Total time when the vehicle speed is controlled by cruise-control module

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Mask Bit	Item	Description
Bit 13	<Total Accelerator Kick-down Time>	Total time when accelerator pedal is pressed over 90%
Bit 14	<Total Brake Applications>	Count of applying brake pedal (braking process initiated by brake pedal)
Bit 15	<Tachograph Driver 1 Card Number>	The card number of tachograph driver 1
Bit 16	<Tachograph Driver 2 Card Number>	The card number of tachograph driver 2
Bit 17	<Tachograph Driver 1 Name>	The name of tachograph driver 1
Bit 18	<Tachograph Driver 2 Name>	The name of tachograph driver 2
Bit 19	<Registration Number>	The vehicle registration number
Bit 20	<Expansion Information>	A hexadecimal number. Each bit represents information of one indicator.
Bit 21	<Rapid Brakings>	The number of total rapid brakings since installation and it is calculated based on CAN Module settings of speed decrease time and value.
Bit 22	<Rapid Accelerations>	The number of total rapid accelerations since installation and it is calculated based on CAN Module settings of speed increase time and value.
Bit 23	<Engine Torque>	The engine torque. Unit: Percentage.
Bit 24	<Service Distance>	The parameter describes distance left to diagnostic car review.
Bit 25	<Ambient Temperature>	
Bit 26	Reserved	
Bit 27	Reserved	
Bit 28	<DTC Codes>	
Bit 29	Reserved	
Bit 30	Reserved	
Bit 31	<CAN Report Expansion Mask1>	If this bit is set to 1, the parameter <CAN Report Expansion Mask1> in **AT+GTCAN** is valid.

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Mask Bit	Item	Description
		If this bit is set to 0, the parameter <CAN Report Expansion Mask1> in **AT+GTCAN** is invalid.

✧ *Inverse Alarm Mask 1*

Bitwise setting of the alarm mask. The alarm mask information is based on <Detailed Information / Indicators> and <Expansion Information> of the **+RESP:GTCAN** message. This parameter is inverse mask for <Alarm Mask 1>.

Mask Bit	Item
Bit 0	Reserved
Bit 1	DS - driver seatbelt indicator (1 - indicator off, 0 - on).
...	Reserved
Bit 6	H - handbrake (1 - released, 0 - pulled-up)
Bit 7	Reserved
Bit 8	R - reverse gear (1 - off, 0 - on)
...	Reserved
Bit 29	CHG - battery charging for electric cars (1 - no charging, 0 - battery is being charged)
Bit 30-31	Reserved

✧ *Vehicle Speed High Threshold*

This parameter is for high threshold of CAN bus speed alarm. If the current CAN bus speed is higher than or equal to the value of <Vehicle Speed High Threshold> and lasts for <Debounce Time>, it will trigger Over Vehicle Speed High Threshold Event. On the contrary, if the current CAN bus speed is lower than <Vehicle Speed High Threshold> and lasts for <Debounce Time>, it will trigger Under Vehicle Speed High Threshold Event.

✧ *Vehicle Speed Low Threshold*

This parameter is for low threshold of CAN bus speed alarm. If the current CAN bus speed is higher than or equal to the value of <Vehicle Speed Low Threshold> and lasts for <Debounce Time>, it will trigger Over Vehicle Speed Low Threshold Event. On the contrary, if the current CAN bus speed is lower than <Vehicle Speed Low Threshold> and lasts for <Debounce Time>, it will trigger Under Vehicle Speed Low Threshold Event.

✧ *Accelerator Pedal Pressure High Threshold*

This is the threshold of the high Accelerator Pedal Pressure. If the current Accelerator Pedal Pressure is greater than <Accelerator Pedal Pressure High Threshold>, it will trigger over Accelerator Pedal Pressure event.

✧ *Electric Report Mask*

Bitwise mask to configure the composition of electric vehicle information in the **+RESP:GTCLT** message.

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Mask Bit	Item	Description
...	Reserved	
Bit 7	<Charging State>	The status of battery charging and charging cable connection.
Bit 8-31	Reserved	

✧ *CAN Report Expansion Mask1*

It expands CAN bus information in **+RESP:GTCLT**. Bitwise report mask to configure the composition of expanded CAN bus information of **+RESP:GTCLT**.

Mask Bit	Item	Description
Bit 0	<Retarder Usage>	The usage of Retarder.
Bit 1-32	Reserved	

✧ *High Retarder Usage*

This is the threshold of the high retarder usage. If the current retarder usage is greater than <High Retarder Usage>, it will trigger over high retarder usage event.

✧ *Low Retarder Usage*

This is the threshold of the low retarder usage. If the current retarder usage is less than <Low Retarder Usage>, it will trigger under low retarder usage event.

✧ *Accelerator Pedal Pressure Low Threshold*

This is the threshold of the low Accelerator Pedal Pressure. If the current Accelerator Pedal Pressure is lower than <Accelerator Pedal Pressure Low Threshold>, it will trigger Under Accelerator Pedal Pressure event.

3.7.23 CFU (CAN Module or THR100 FOTA Upgrade)

The command **AT+GTCFU** is used to upgrade the firmware of CAN Module over the air.

Note

This feature is deprecated and will be gradually replaced by GTUPD (Update Type: 5) in future protocol versions.

Example:

AT+GTCFU=gv350ceu,0,10,0,name,pw,http://220.178.67.210:8208/ROOT/deltabin/csb_des_07_build1116.bin,0,0,,,0001$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CFU	CFU
	Leading Symbol	1	=	=

Parts	Fields	Length	Range/Format	Default
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Retry Times	1	0-3	0
	Timeout	2	10-30(min)	10
	Protocol Type	1	0	0
	Server User Name	<=6	'0' - '9' 'a' - 'z' 'A' -'Z' '-' '_'	
	Server Password	<=6	'0' - '9' 'a' - 'z' 'A' -'Z' '-' '_'	
	Server URL	100	LegalURL	
	Update Type	1	0-2	0
	Mode	<=1	0| 1	0
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Retry Times*

It specifies the maximum number of retries to download the update package upon download failure.

✧ *Timeout*

It specifies the expiration timeout of one download. If the download expires, it is considered to be a failure.

✧ *Protocol Type*

The protocol used to download the package.

- **0** - HTTP.

  Only HTTP is supported now.

✧ *Server User Name*

If the file server uses authentication, the user name is specified here.

✧ *Server Password*

If the file server uses authentication, the password is specified here.

✧ *Server URL*

It specifies the URL to download the package.

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✧ *Update Type*

It specifies the type of CAN Module update over the air.

- **0** - CAN Module firmware update.
- **1** - CAN Module configuration update.
- **2** - THR_100 update.

✧ *Mode*

It indicates whether to cancel the CAN Module upgrade process.

- **0** - Start the CAN Module upgrade process.
- **1** - Cancel CAN Module upgrade process.

3.7.24 TPM (Tire Pressure Monitoring)

The command **AT+GTTPM** is used to configure the parameters of tire pressure monitoring system. The tire pressure could be from different accessories. The message **TPM** (ASCII)/(HEX) will be reported to the backend server.

Before using this command, the corresponding <Mode> in the AT+GTURT command or the AT+GTRAS command should be enabled. If the tire pressure accessory is connected via RS232 interface, before using this command, the <Mode> in the AT+GTURT command should be set to 41.

Example:

AT+GTTPM=gv350ceu,1,,,,,,60,,3F,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TPM	TPM
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-1	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		

Parts	Fields	Length	Range/Format	Default
	Send Interval	<=5	10-86400(s)	60
	Reserved	0		
	Append Mask	<=4	0-FFFF	3F
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of the tire pressure monitoring.

- **0** - Disable the tire monitoring function.
- **1** - Fixed Time Report.

  The tire monitoring message **+RESP:GTTPM** is sent to the backend server periodically according to the parameter <Send Interval>.

✧ *Send Interval*

The report interval for tire monitoring message **+RESP:GTTPM**.

✧ *Append Mask*

Bitwise mask to configure the composition of appended items in the **+RESP:GTTPM** message. Each bit represents a field to be appended in the **+RESP:GTTPM** message. If a bit is set to 1, the corresponding field will be present in the message **+RESP:GTTPM**.

Mask Bit	Item
Bit 0	Tire Position (Optional)
Bit 1	Sensor ID (Optional)
Bit 2	Sensor Bat Vol (Optional)
Bit 3	Tire Pressure (Optional)
Bit 4	Tire Temperature (Optional)
Bit 5	Tire Status (Optional)
Bit 6	Time Out (Optional)
Bit 7	RF Quality (Optional)
Bit 8	Reference Pressure (Optional)
Bit 9-15	Reserved

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3.7.25 CAS (CAN Module Settings)

The command **AT+GTCAS** is used to configure the CAN Module and get it running when needed. Each configuration change results in a re-initialization of the CAN Module and may affect the calculation of logistic parameters.

Example:
AT+GTCAS=gv350ceu,,,130,62,0,12,33,12,33,,0001$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	CAS	CAS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Reserved	0		
	Speed Limit	<=3	1-250(km/h)	130
	Over Engine Speed Limit	<=3	1-250(x64 rpm)	62
	Lower Engine Speed Limit	<=3	0-249(x64 rpm)	0
	AT	<=2	0-20	12
	AS	<=3	1-255	33
	BT	<=2	0-20	12
	BS	<=3	1-255	33
	Disable CAN1 Tx	1	0| 1	0
	Disable CAN2 Tx	1	0| 1	0
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*
The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Speed Limit*
This speed limit refers to over-speed value. For example, if the vehicle speed exceeds the <Speed Limit>, it will count the over-speed time to <Total Vehicle Overspeed Time>.

- *Over Engine Speed Limit, Lower Engine Speed Limit*

  This engine speed limit refers to engine speed value. For example, if the vehicle engine speed exceeds the <Speed Limit>, it will count the engine over-speed time to <Total Vehicle Engine Overspeed Time>.

  The <Total Effective Engine Speed Time> is defined as time when engine speed is between <Over Engine Speed Limit> and <Lower Engine Speed Limit>.

  Note

  Lower engine speed limit (RL) must not be greater than Over engine speed limit (R).

- *AT*

  maximum measured acceleration time (resolution 0.25s). If AT is 0, rapid accelerations will not be counted (function disabled).

- *AS*

  minimum vehicle speed increase, which will be considered as rapid acceleration.

- *BT*

  maximum measured braking time (resolution 0.25s). If BT is 0, rapid braking will not be counted (function disabled).

- *BS*

  minimum vehicle speed decrease, which will be considered as rapid braking.

  The default setting for rapid acceleration and braking is 3 m/s2 (~0.3 G) in a time of 3 seconds (AT=12, AS=33, BT=12, BS=33).

  Note

  <AT> and <AS> affect the parameter <Rapid Accelerations>. The pair <AT> and <AS> define parameters of rapid acceleration. This is when vehicle speed increases at least the value of <AS> during time <AT> or less.

  <BT> and <BS> affect the parameter <Rapid Brakings>. The pair <BT> and <BS> define parameters of rapid braking. This is when vehicle speed decreases at least the value of <BS> during time <BT> or less.

- *Disable CAN1 Tx, Disable CAN2 Tx*

  This option is disabled by default and recommended to remain disabled unless CANBUS connection is made using contactless reader (in this case enabling the option may improve reception reliability). Transmissions may be disabled on one CANBUS and remain enabled on another. This should be set according to installation (like if one CANBUS is connected with contactless reader and another not).

  Note

  To ensure that this **AT+GTCAS** command can be executed successfully, it is recommended to issue this command after the car is engine off and stationary.

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3.7.26 UHF (UHF RFID Reader Setting)

The command **AT+GTUHF** is used to configure the reading parameter of UHF RFID reader. The RFID tag information received from the card reader will be reported to the backend via the message **UHF** (ASCII)/(HEX).

Before using this command, the <Mode> in the AT+GTURT command should be set to 3.

Example:

AT+GTUHF=gv350ceu,0,1,0,1,,,,6,0,,,1,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	UHF	UHF
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Accessory Type	1	0| 1	0
	Accessory Parameters(Optional)			
	Reserved	0		
	Q-Value	<=2	1-15	6
	Session	1	0-3	0
	Reserved	0		
	Reserved	0		
	Trigger Output ID	1	1-5	1
	Reserved	0		
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Accessory Type*

The type of UHF Reader.

- **0** - AUHF-Reader-8P
- **1** - AUHF-Reader-D06

✧ *Accessory Parameters(Optional)*

Some parameters for UHF Reader. For different Readers, there are different definitions.

If Accessory Type is **0** (AUHF-Reader-8P), the following parameters are used:

Fields	Length	Range/Format	Default
Antenna Select Mask	<=2	1-FF	1
Reader Working Mode	1	0-2	0
Filter Time	<=3	1-255(s)	1
Reserved	0		
Reserved	0		

- *Antenna Select Mask*

  Bitwise mask to enable antenna. Setting a bit to 1 enables the corresponding antenna. At least one antenna must be enabled. If antennas enabled by the <Antenna Select Mask> are not connected, enabling them will fail and they will not scan tags. If no antennas are connected, the last successfully enabled antenna remains active.

  – **Bit 0** - for antenna channel 1
  – **Bit 1** - for antenna channel 2
  – **Bit 2** - for antenna channel 3
  – **Bit 3** - for antenna channel 4
  – **Bit 4** - for antenna channel 5
  – **Bit 5** - for antenna channel 6
  – **Bit 6** - for antenna channel 7
  – **Bit 7** - for antenna channel 8

- *Reader Working Mode*

  The working mode for the UHF Reader to read card.

  – **0** - Answering mode

  In this mode, the device will report a message **+RESP:GTUHF** after sending the command **AT+GTRTO-41** with command type 1.

  – **1** - Real-time inventory mode

  In this mode, the device will report the message **+RESP:GTUHF** automatically after receiving RFID tag information.

  – **2** - Real-time inventory mode with trigger

  In this mode, UHF Reader will only perform inventory when the TTL level of UHF Reader GPI1 port is low. Once TTL level of UHF Reader GPI1 rise high, UHF Reader will enter standby mode.

- *Filter Time*

  In real-time inventory mode and real-time inventory mode with trigger, if the UHF reader

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detects a particular tag for more than 1 time, the UHF reader will only upload RFID tag information of this tag once within the filter time. 0 means disable tag filtering function.

If Accessory Type is **1** (AUHF-Reader-D06), the following parameters are used:

Fields	Length	Range/Format	Default
Antenna Select Mask	1	1	1
Reader Working Mode	1	0	0
Inventory Interval	<=3	0-255(s)	0
Reserved	0		
Reserved	0		

- *Inventory Interval*
  The time interval of performing inventory. 0 means the device will not inventory automatically.

✧ *Q-Value*
The original Q-value of the EPC tag inventory, the setting of Q-value should follow the rule: $2^Q \approx$ total amount of tags within the effective field.

✧ *Session*
The Session-value of the EPC tag inventory.

- **0** - apply S0 as Session value
- **1** - apply S1 as Session value
- **2** - apply S2 as Session value
- **3** - apply S3 as Session value

✧ *Trigger Output ID*
Specify the output ID for enabling the UHF reader in <Reader Operating Mode> 2, the <Output Status> of specified output ID should be set to 1.

3.7.27 ATS (Alcohol Tester Setting)

The command **AT+GTATS** is used to configure the parameters of ACL-303. After enabling this function, the message **ATR** (ASCII)/(HEX) will be reported to the backend server.
Before using this command, the <Mode> in the AT+GTURT command should be set to 44.

Example:
AT+GTATS=gv350ceu,,1,20,80,1,1,0,0,,,,,0005$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT

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Parts	Fields	Length	Range/Format	Default
	Command Word	3	ATS	ATS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Mode	1	0-2	0
	DUI Threshold	<=8	0.000-3999.000(mg/L)	200.000
	DWI Threshold	<=8	1.000-4000.000(mg/L)	800.000
	Output ID	1	0-5| 9-C	0
	Output status	1	0-2	0
	Duration	<=3	0-255(x100ms)	0
	Toggle Times	<=3	0-255	0
	Validity Time	<=3	0| 15-600(s)	30
	Timeout after Ignition Off	<=3	0| 15-600(s)	30
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*

- **0** - Disable this function.
- **1** - Strict Mode.

When the alcohol concentration is below the DUI (Driving Under the Influence) threshold, the device will turn off its output.

- **2** - Loose Mode.

When the alcohol concentration is below the DWI (Driving While Intoxicated) threshold, the device will turn off its output.

✧ *DUI Threshold*

When the alcohol concentration exceeds this threshold, the driver will be detected as Driving Under the Influence.

✧ *DWI Threshold*

When the alcohol concentration exceeds this threshold, the driver will be detected as Driving While Intoxicated. The parameter <DWI Threshold> must be greater than <DUI Threshold>.

✧ *Validity Time*

After successful blowing, the authorization remains valid during this time period. If the ignition does not occur after this time, a new blow test is required.

✧ *Timeout after Ignition Off*

If the ignition is turned off, it will still be authorized for a short time. In this period, re-authentication is not needed. 0 means “Lock the vehicle when the ignition is turned off”.

3.7.28 TMC (Thin Message Configure)

The **AT+GTTMC** command is used to configure the parameter content included in the **TMR** (ASCII).

Example:

AT+GTTMC=gv350ceu,,F,,0,,,0,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TMC	TMC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	TMR ASCII Mask	<=4	0 - FFFF	F
	Reserved	0		
	Report Message Mask	<=8	0 - FFFFFFFF	0
	Reserved	0		
	Reserved	0		
	SOS Mask(Optional)	<=8	0 - FFFFFFFF	0
	TOW Mask(Optional)	<=8	0 - FFFFFFFF	0
	DIS Mask(Optional)	<=8	0 - FFFFFFFF	0
	IOB Mask(Optional)	<=8	0 - FFFFFFFF	0
	SPD Mask(Optional)	<=8	0 - FFFFFFFF	0
	RTL Mask(Optional)	<=8	0 - FFFFFFFF	0
	DOG Mask(Optional)	<=8	0 - FFFFFFFF	0

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Parts	Fields	Length	Range/Format	Default
	IGL Mask(Optional)	<=8	0 - FFFFFFFF	0
	HBM Mask(Optional)	<=8	0 - FFFFFFFF	0
	IGN Mask(Optional)	<=8	0 - FFFFFFFF	0
	IGF Mask(Optional)	<=8	0 - FFFFFFFF	0
	STT Mask(Optional)	<=8	0 - FFFFFFFF	0
	GIN Mask(Optional)	<=8	0 - FFFFFFFF	0
	GOT Mask(Optional)	<=8	0 - FFFFFFFF	0
	DAT Mask(Optional)	<=8	0 - FFFFFFFF	0
	UDT Mask(Optional)	<=8	0 - FFFFFFFF	0
	DOS Mask(Optional)	<=8	0 - FFFFFFFF	0
	EPS Mask(Optional)	<=8	0 - FFFFFFFF	0
	AIS Mask(Optional)	<=8	0 - FFFFFFFF	0
	BCS Mask(Optional)	<=8	0 - FFFFFFFF	0
	BDS Mask(Optional)	<=8	0 - FFFFFFFF	0
	BAA Mask(Optional)	<=8	0 - FFFFFFFF	0
	BAR Mask(Optional)	<=8	0 - FFFFFFFF	0
	BID Mask(Optional)	<=8	0 - FFFFFFFF	0
	BIE Mask(Optional)	<=8	0 - FFFFFFFF	0
	CAN Mask(Optional)	<=8	0 - FFFFFFFF	0
	CLT Mask(Optional)	<=8	0 - FFFFFFFF	0
	FRI Mask(Optional)	<=8	0 - FFFFFFFF	0
	ERI Mask(Optional)	<=8	0 - FFFFFFFF	0
	JDR Mask(Optional)	<=8	0 - FFFFFFFF	0
	JDS Mask(Optional)	<=8	0 - FFFFFFFF	0
	Protocol Format	1	0| 1	0
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *TMR ASCII Mask*

The bitmask configures the messages that compose the TMR.

- **Bit0** - for Full Protocol Version.
- **Bit1** - for Unique ID.
- **Bit2** - for Device Name.
- **Bit3** - for Send Time.
- **Bit4 - 15** Reserved

✧ *Report Message Mask*

Bitwise mask to configure the composition of report messages.

- **Bit0** - SOS
- **Bit1** - TOW
- **Bit2** - DIS
- **Bit3** - IOB
- **Bit4** - SPD
- **Bit5** - RTL
- **Bit6** - DOG
- **Bit7** - IGL
- **Bit8** - HBM
- **Bit9** - IGN
- **Bit10** - IGF
- **Bit11** - STT
- **Bit12** - GIN
- **Bit13** - GOT
- **Bit14** - DAT
- **Bit15** - UDT
- **Bit16** - DOS
- **Bit17** - EPS
- **Bit18** - AIS
- **Bit19** - BCS
- **Bit20** - BDS
- **Bit21** - BAA
- **Bit22** - BAR
- **Bit23** - BID
- **Bit24** - BIE
- **Bit25** - Reserved
- **Bit26** - CAN
- **Bit27** - CLT
- **Bit28** - FRI
- **Bit29** - ERI

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- **Bit30** - JDR
- **Bit31** - JDS

✧ *SOS Mask(Optional)*

TOW, DIS, IOB, SPD, RTL, DOG, IGL, and HBM share the same mask settings as SOS.

- **Bit0** - Report ID/Report Type
- **Bit1** - Number
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10** - Mileage
- **Bit11 - 31** Reserved

✧ *IGN Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10** - Mileage
- **Bit11** - Hour Meter Count
- **Bit12** - Duration of Ignition off
- **Bit13 - 31** Reserved

✧ *IGF Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID

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- **Bit9** - Position Append Mask
- **Bit10** - Mileage
- **Bit11** - Hour Meter Count
- **Bit12** - Duration of Ignition on
- **Bit13 - 31** Reserved

✧ *STT Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Motion Status
- **Bit13 - 31** Reserved

✧ *GIN Mask(Optional)*

GOT share the same mask settings as GIN.

- **Bit0** - Reserved
- **Bit1** - Number
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10** - Mileage
- **Bit11** - Reserved
- **Bit12** - ID Report Format
- **Bit13 - 31** Reserved

✧ *DAT Mask(Optional)*

- **Bit0** - Report Type
- **Bit1** - Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed

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- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9 - 11** Reserved
- **Bit12** - Data to the Backend Server
- **Bit13 - 31** Reserved

✧ *UDT Mask(Optional)*

- **Bit0** - Report ID/Report Type
- **Bit1** - Number
- **Bit2** - GNSS Accuracy
- **Bit3 - 5** Reserved
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - Reserved
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Report Item Mask
- **Bit13 - 31** Reserved

✧ *DOS Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Wave1 Output ID
- **Bit13** - Wave1 Output Active
- **Bit14 - 31** Reserved

✧ *EPS Mask(Optional)*

AIS share the same mask settings as EPS.

- **Bit0** - Report ID/Report Type
- **Bit1** - Number
- **Bit2** - GNSS Accuracy

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- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10** - Mileage
- **Bit11** - Reserved
- **Bit12** - External Power Voltage/ Analog Input VCC
- **Bit13 - 31** Reserved

✧ *BCS Mask(Optional)*

BDS share the same mask settings as BCS.

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Bluetooth Report Mask
- **Bit13 - 31** Reserved

✧ *BAA Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Index
- **Bit13** - Accessory Type
- **Bit14** - Accessory Model/Beacon ID Model

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- **Bit15** - Alarm Type
- **Bit16** - Reserved
- **Bit17** - Append Mask
- **Bit18 - 31** Reserved

✧ *BAR Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Index
- **Bit13** - Accessory Type
- **Bit14** - Accessory Model
- **Bit15 - 16** Reserved
- **Bit17** - Accessory Append Mask
- **Bit18 - 31** Reserved

✧ *BID Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 14** Reserved
- **Bit15** - Beacon Number
- **Bit16** - Beacon ID Model
- **Bit17** - Accessory Append Mask
- **Bit18 - 31** Reserved

✧ *BIE Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy

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- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Detected Count
- **Bit13** - Total Frame
- **Bit14** - Frame Index
- **Bit15** - Beacon Number
- **Bit16** - Beacon ID Model
- **Bit17** - Append Mask
- **Bit18 - 31** Reserved

✧ *CAN Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Distance Type/Report Type
- **Bit13** - CANBUS Device State
- **Bit14 - 31** Reserved

✧ *CLT Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask

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- **Bit10 - 11** Reserved
- **Bit12** - Group ID
- **Bit13** - Combined Alarm Mask 1
- **Bit14** - Alarm Mask 2
- **Bit15** - Alarm Mask 3
- **Bit16 - 31** Reserved

✧ *FRI Mask(Optional)*

- **Bit0** - Report ID/Report Type
- **Bit1** - Number
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10** - Mileage
- **Bit11** - Hour Meter Count
- **Bit12** - Reserved
- **Bit13** - External Power Voltage
- **Bit14** - Analog Input 1, Analog Input 2, Analog Input 3
- **Bit15** - Backup Battery Percentage
- **Bit16** - Device Status
- **Bit17 - 31** Reserved

✧ *ERI Mask(Optional)*

- **Bit0** - Report ID/Report Type
- **Bit1** - Number
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10** - Mileage
- **Bit11** - Hour Meter Count
- **Bit12** - ERI Mask, UART Device Type

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- **Bit13** - External Power Supply
- **Bit14** - Analog Input 1, Analog Input 2, Analog Input 3
- **Bit15** - Backup Battery Percentage
- **Bit16** - Device Status
- **Bit17 - 31** Reserved

✧ *JDR Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 12** Reserved
- **Bit13** - Jamming Net
- **Bit14 - 31** Reserved

✧ *JDS Mask(Optional)*

- **Bit0 - 1** Reserved
- **Bit2** - GNSS Accuracy
- **Bit3** - Speed
- **Bit4** - Azimuth
- **Bit5** - Altitude
- **Bit6** - Longitude, Latitude
- **Bit7** - GNSS UTC Time
- **Bit8** - MCC, MNC, LAC, Cell ID
- **Bit9** - Position Append Mask
- **Bit10 - 11** Reserved
- **Bit12** - Jamming Status
- **Bit13** - Jamming Net
- **Bit14 - 31** Reserved

Note

Bit 15 is set by default if bit 16 or 17 is set in the BID/BIE Mask. Bit 1 is set by default if any bit from 2 to 9 is set in the FRI/ERI Mask.

✧ *Protocol Format*

This parameter defines the format of the report messages sent from the device to the RS232.

- **0** - ASCII format
- **1** - Reserved

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Note

For messages such as UDT, BCS, BDS, BAA, BAR, BID, BIE, CAN, CLT, and ERI, parameters not listed in the above description are controlled by the mask in the corresponding AT commands.

3.7.29 TMT (Thin Message Transmission Settings)

The **AT+GTTMT** command is used to configure the reporting of the messages **TMR** (ASCII). When using this command, the <Mode> of the **AT+GTURT** command needs to be set to 46.

When the <Mode> of **AT+GTURT** is set to 46, the RS232 port is used to connect voice accessories.

Example:

AT+GTTMT=gv350ceu,1,,,,,,0,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	TMT	TMT
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0-2	0
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Message Interval Mask	<=4	0 - FFFF	0
	Report Message Interval(Optional)			
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*

This parameter defines the communication method between RS232 and the terminal. Supported reporting modes are as follows:

- **0** - Disable.
- **1** - Always communicate with RS232. At this time, the **AT+GTURT** mode must be set to 46.
- **2** - Reserved

✧ *Message Interval Mask*

Bit mask to configure scheduled messages. For the enabled bits in <Message Interval Mask>, its reporting behavior is controlled by the parameter <Report Message Interval>. For any bit that is not enabled in the <Message Interval Mask>, its reporting behavior is governed by the logic of the corresponding function.

- **Bit 0** - FRI/ERI

Fields	Length	Range/Format	Default
FRI/ERI	<=5	0-86400(s)	0

- **Bit 1** - CAN

Fields	Length	Range/Format	Default
CAN	<=5	0-86400(s)	0

✧ *Report Message Interval(Optional)*

The interval for sending the message information. When the **+RESP:GTTMR-FRI/ERI** message is set to be reported according to <Report Message Interval>, the GNSS information in the message uses the last point.

3.8 OTA Update Service

This section describes the commands related to the OTA update service. Please refer to the details below.

3.8.1 FVR (Configuration File Version Record)

The command **AT+GTFVR** is used to record information of the configuration file generated by Manage Tool for AT+GTUPC.

Example:

AT+GTFVR=gv350ceu,name,0000,,,,,00000000000000000000000000000000,,,,,20190415172349,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT

Parts	Fields	Length	Range/Format	Default
	Command Word	3	FVR	FVR
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Configuration Name	<=40	'0' - '9' 'a' - 'z' 'A' -'Z' '-' '_'	
	Configuration Version	4	0000-9999	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Digital Signature	32	'0' - '9' 'a' - 'z' 'A' - 'Z'	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Generation Time	14	YYYYMMDDHHMMSS	
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Configuration Name*

The name of the configuration file.

✧ *Configuration Version*

The version number of the configuration file. The first two characters indicate the major version number, and the last two characters indicate the minor version number.

✧ *Digital Signature*

It is used to confirm the validity of subsequent commands.

✧ *Generation Time*

The time when the configuration file is generated.

Note

The **AT+GTFVR** command must be the first command in the configuration file.

3.8.2 UPC (Update Configuration)

The command **AT+GTUPC** is used to download configuration file over the air for the update of the local configuration.

Example:
AT+GTUPC=gv350ceu,0,10,0,1,0,http://www.queclink.com/configure.ini,1,,0,00000000,,3,0001$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	UPC	UPC
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Max Download Retry	1	0-3	0
	Download Timeout	<=2	5-30(min)	10
	Download Protocol	1	0| 2	0
	Report Mode	1	0| 1	0
	Update Interval	<=4	0-8760(h)	0
	Download URL	<=100	Legal URL	
	Mode	1	0-1	0
	Reserved	0		
	Extended Status Report	1	0| 1	0
	Identifier Number	8	00000000 - FFFFFFFF	0
	Reserved	0		
	Update Status Mask	1	0-F	3
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Max Download Retry*

It specifies the maximum number of retries to download the configuration file upon download failure.

✧ *Download Timeout*

It specifies the expiration timeout of one download. If the download expires, it is considered to be failure.

✧ *Download Protocol*

The protocol used to download the file.

- **0** - HTTP
- **2** - HTTPS with TLS 1.2

✧ *Report Mode*

A numeral to indicate whether to report the message **UPC** (ASCII)/(HEX) or **EUC** (ASCII)/(HEX) when the configuration is updated over the air.

- **0** - Do not report the message **+RESP:GTUPC** or **+RESP:GTEUC**.
- **1** - Report the message **+RESP:GTUPC** or **+RESP:GTEUC**.

✧ *Update Interval*

The interval for updating the configuration over the air.

✧ *Download URL*

It specifies the URL to download the configuration file. If <Download URL> ends with "/" which means the URL is just a path without file name, the <IMEI>.ini will be added as the default file name to complete the URL. If it is greater than 100 bytes in length, error will be returned.

✧ *Mode*

A numeral that indicates the working mode of downloading configuration over the air.

- **0** - Disable this function.
- **1** - Enable this function.

✧ *Extended Status Report*

A numeral to indicate the message to be reported for the configuration update status when <Report Mode> is 1.

- **0** - Report the message **UPC** (ASCII)/(HEX).
- **1** - Report the message **EUC** (ASCII)/(HEX) to include more information. If the <Protocol Format> in AT+GTSRI is set to HEX format, it is strongly recommended to enable this mode to avoid overflow if the value of parameter <Command ID> in **+RESP:GTUPC** is bigger than 255.

✧ *Identifier Number*

A numeral to identify the configuration update request. It will be included in the message **+RESP:GTEUC** to indicate the request it is related to.

✧ *Update Status Mask*

Bitwise mask to configure the status in which the device can update the configuration.

- **Bit0** - for ignition off
- **Bit1** - for ignition on

Note

- **1** - Make sure there is only one command per line in the configuration file and there is a "\r\n" between each two commands.
- **2** - There should be no space before each command.
- **3** - The configuration file should be a plain text file.

3.8.3 UPD (Firmware Update)

3.8.3.1 Start the Firmware Update

To start the firmware update, the backend server sends the **AT+GTUPD** (sub:0) command to the device. Upon receiving this command, the device is informed of where to download the update package and how to download the package.

Example:
AT+GTUPD=gv350ceu,0,0,20,0,,,http://60.174.225.173:10050/GV350CEU/deltabin/GV350CEU_00307_00307.bin,,0,0,,0001$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	UPD	UPD
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Sub Command	1	0	
	Max Download Retry	1	0-3	0
	Download Timeout	2	10-30(min)	20
	Download Protocol	1	0|2	0
	Download Username	<=6	'0'-'9' 'a'-'z' 'A'-'Z'	
	Download Password	<=6	'0'-'9' 'a'-'z' 'A'-'Z'	
	Download URL	<=100	legal URL	

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Update Type	<=2	0|4-6|9|10	0
	Extended Status Report	1	0|1	0
	Identifier Number	8	00000000 - FFFFFFFF	
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Sub Command*

The sub command of **AT+GTUPD**.

- **0** - Start the firmware update

✧ *Max Download Retry*

It specifies the maximum number of retries to download the update package upon download failure.

✧ *Download Timeout*

It specifies the expiration timeout of one download. If the download expires, it is considered to be failure.

✧ *Download Protocol*

The protocol used to download the package.

- **0** - HTTP
- **2** - HTTPS with TLS 1.2

✧ *Download Username*

If the file server uses authentication, the user name is specified here.

✧ *Download Password*

If the file server uses authentication, the password is specified here.

✧ *Download URL*

It specifies the URL to download the package.

✧ *Update Type*

It specifies the firmware type to be updated.

- **0** - BB firmware update
- **4** - BLE firmware update
- **5** - CAN Module firmware update

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Note

When the update type is 5, the wildcard '%CSN%' will be replaced with CAN100 serial number.

- **6** - UFS xxx fuel sensor update
- **9** - CAN Module configuration update
- **10** - THR_100 update

✧ *Extended Status Report*

A numeral to indicate the message type to be reported for firmware update status.

- **0** - Report the **UPD** (ASCII)/(HEX) message to indicate the firmware update status.
- **1** - Report the **EUD** (ASCII) message to indicate the firmware update status.

✧ *Identifier Number*

A numeral to identify the firmware update request. It will be included in the **+RESP:GTEUD** message to indicate the request it is related to.

✧ *Serial Number*

The exact serial number will be sent back to the platform in ACK. It is in hexadecimal format. It should begin from 0000 and increases by 1 every time. It rolls back after "FFFF".

Note

+RESP:GTEUD in hex format has the same message format as **+RESP:GTUPD**.

3.8.3.2 Stop the Firmware Update

Before the device finishes downloading the update package, the backend server could use the **AT+GTUPD** (sub:1) command to cancel the current firmware update. If the package is downloaded successfully, this command is ignored.

Example:

AT+GTUPD=gv350ceu,1,,,,,0001$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	UPD	UPD
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Sub Command	1	1	1
	Reserved	0		
	Reserved	0		

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Parts	Fields	Length	Range/Format	Default
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Sub Command*

The Sub Command of **AT+GTUPD**.

- **1** - Cancel the current firmware update process

3.8.3.3 Firmware Update Process

3.8.3.3.1 Initiation of the Update Process

The backend server sends the **AT+GTUPD** (sub: 0) command to the device to initiate the update process. Along with this command, the backend server sends necessary information for the device to start the update process.

It is the backend server's duty to decide when and how to initiate the firmware update process to all the devices it controls. As the response message collector and the controller, the backend server has all the information it needs to start an update process including the current firmware versions of the devices it controls (retrieved with the AT+GTRTO command), the version of the latest available firmware and the location of the proper update packages.

3.8.3.3.2 Confirmation of the Update Process

Upon receiving the **AT+GTUPD** (sub: 0) command, the device will first check the current battery capacity. If the battery capacity cannot support the update process, it will report **+RESP:GTUPD** (code: 103) to notify the backend server that the update process is to be aborted because of low battery. If the battery capacity is ample, the device will send **+RESP:GTUPD** with confirmation information to the backend server. Then the update process proceeds to the next step.

If the update command is confirmed, the device will go into non-interactive mode. That is, the end user can no longer make phone call, and all incoming calls are rejected automatically until the update process finishes. In the meantime, the device will ignore all the commands received from the backend server if they are not related to the update process. Also the device will stop all the reports that are not related to the update process.

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3.8.3.3.3 Download of the Update Package

If the update command is confirmed, the device will use the information sent by the backend server to download the update package. If the download fails, the device will retry the specified times. If all attempts fail, the update process is aborted and the device will automatically reboot to go back to the normal working mode. If the download succeeds, the update process proceeds to the next step. Either way, the device will send **+RESP:GTUPD** with download information to the backend server. Before the package is downloaded, the backend server could send the **AT+GTUPD** (sub: 1) command to cancel the current update process. This is the only chance to abort during the update process.

3.8.3.3.4 Update of the Firmware

After downloading the package successfully, the device will check the battery capacity again. If the battery cannot support the update process, the device will report **+RESP:GTUPD** (code: 303) to notify the backend server that the update process is to be aborted because of low battery. If the battery capacity is ample, the device will send **+RESP:GTUPD** (code: 300) to the backend server to indicate the start of the update. Then it uses the update package to update the firmware. After the update, whether it succeeds or fails, the device will reboot automatically. After the device boots up, it sends **+RESP:GTUPD** with update information to the backend server and works as usual.

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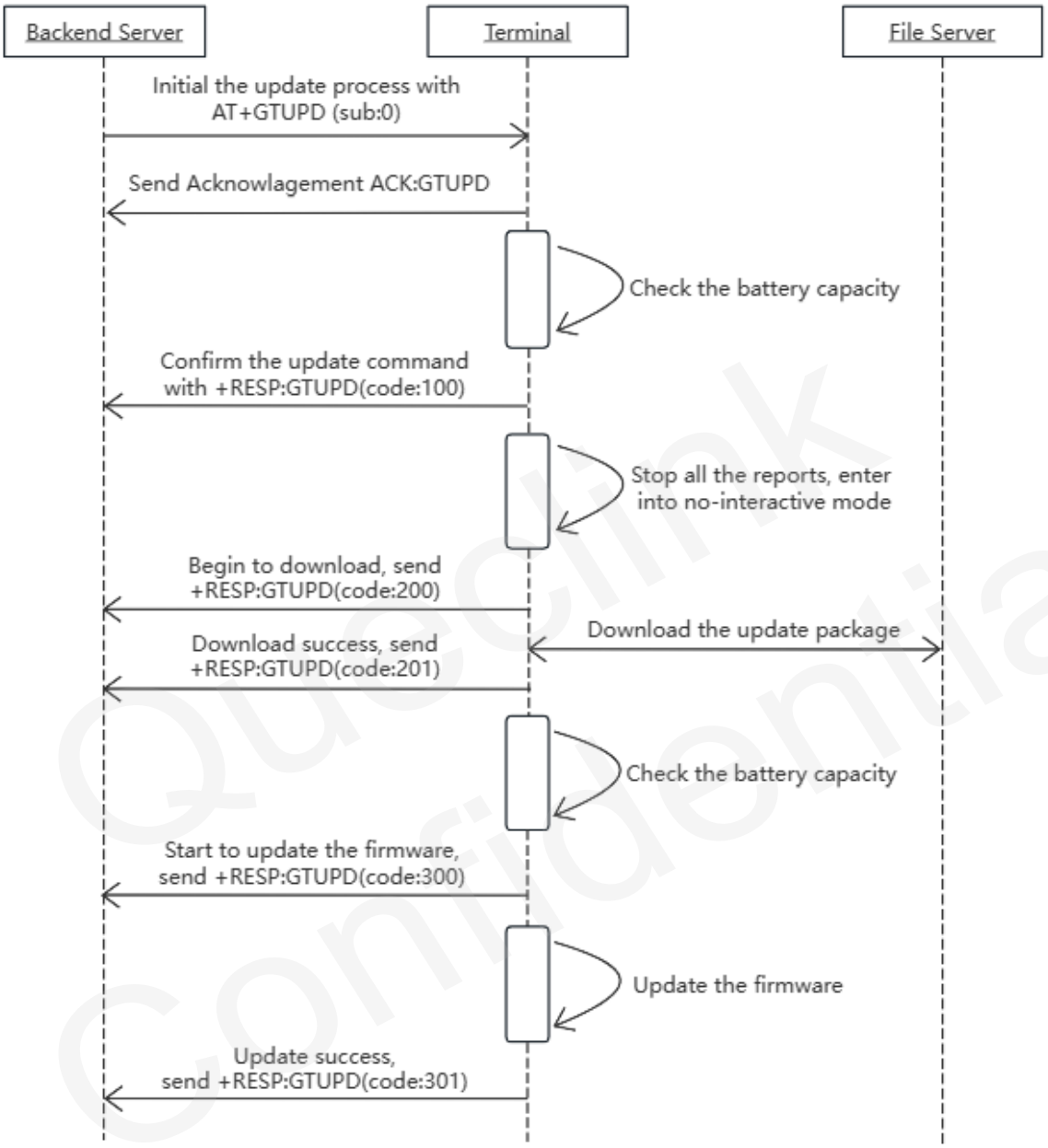
3.8.3.3.5 An Example of Successful Update



3.9 Real Time Operation

This section describes the commands related to the runtime operations. Please refer to the details below.

3.9.1 RTO (Real Time Operation)

The command **AT+GTRTO** is used to retrieve information from the terminal or control the terminal when it executes certain actions.

Example:
AT+GTRTO=gv350ceu,3,,,,,,0015$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	RTO	RTO
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Sub Command	<=2	0-E| 10-12| 14| 16| 1C| 1D| 22| 25| 27| 2B| 2F| 31| 38| 3A| 3C| 41| 44| 46	0
	Parameter 1			
	Parameter 2			
	Parameter 3			
	Parameter 4			
	Parameter 5			
Tail	Serial Number	4	0000-FFFF ('0'-'9', 'A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Sub Command*

A HEX value which indicates the sub command of **AT+GTRTO**. The Parameter 1–5 are different when the sub command is different.

- **0** - GNSS

  Get the GNSS related information via the message **GPS**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *Output Direction*

It determines the destination that the response message of the RTO command will be reported to and is invalid for <Sub Command> 2(READ), 3(REBOOT), 4(RESET), 5(PWROFF),31(DELBUF), 3A(RLY).

- **0** - Backend Server.

The message will be output to the backend server.

- **1** - Main Serial Port

The message will be output to the main serial port.

- **2** - Second Serial Port.

The message will be output to the secondary serial port.

- **3** - SMS number Or Backend Server

If the command is received via SMS, the message will be output to the original SMS number; otherwise the message will be output to the backend server.

- **4** - The message will be output to the ble channel

The message will be output to the Bluetooth.

- **1** - RTL

Request the terminal to report its current position immediately via the message **RTL**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **2** - READ

Get the current configuration of the terminal via the message **ALM** (ASCII).

Fields	Length	Range/Format	Default
AT Command	3-79	SRI	
Reserved	0		
Format Version	<=3	0-999	0
Index	<=2	0-19	
Reserved	0		

– *AT Command*

To get AT command configuration when <Sub Command> is set to **2**, please follow the format in the following example.

For instance, to get the configuration of AT+GTFRI, set **AT+GTRTO=gv350ceu,2,FRI,,,,,0015$**, and get it via **ALM** (ASCII). To get more than one AT command configuration, the neighbouring commands are separated by the ASCII character ":".

For example, to get configuration of the commands AT+GTFRI, AT+GTOWH, AT+GTSRI, set **AT+GTRTO=gv350ceu,2,FRI:OWH:SRI,,,,,0015$**, and get it via **ALM**(ASCII). Supports up to 20 commands to query at the same time.

– *Format Version*

A numeral to indicate the format of the **+RESP:GTALM** message.

– *Index*

It controls which group of CLT commands configuration to be reported via the message **+RESP:GTALM**. For example, if <Index> is set to 1, the first group of CLT commands configuration will be reported.

Note

The parameter <Index> takes effect only if <Sub Command> is set to 2 and <AT Command> is set to CLT.

- **3** - REBOOT

Reboot the terminal.

Fields	Length	Range/Format	Default
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

- **4** - RESET

Reset all parameters to factory settings.

Fields	Length	Range/Format	Default
AT Command|Reset Level	3 - 79|1	SRI|0 - 1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

– *AT Command|Reset Level*

- *AT Command*

Set <Sub Command> to **4** to specify the configuration to be reset. To specify a configuration, use the last three letters of the protocol command.

For example, to reset configuration of the **AT+GTFRI** command, send the command **AT+GTRTO=gv350ceu,4,FRI,,,,,000F$**. To reset more than one AT command configuration, the neighbouring commands are separated by the ASCII character ":". For example, to reset configuration of the commands **AT+GTFRI**, **AT+GTOWH**, **AT+GTTOW**, send the command **AT+GTRTO=gv350ceu,4,FRI:OWH:TOW,,,,,0015$**. The buffered messages saved can be deleted with the command **AT+GTRTO=gv350ceu,4,BUF,,,,,000F$**.

The mileage value saved during <GNSS Assisted Mode> enabling can be reset with the command **AT+GTRTO=gv350ceu,4,DST,,,,,000F$**.

Configuration of the commands AT+GTBSI, AT+GTSRI, AT+GTQSS, AT+GTMQT, AT+GTMSI, AT+GTCFG, AT+GTTMA and AT+GTPIN cannot be reset by this command.

- *Reset Level*

If <Sub Command> is **4**, this parameter works as follows.

0 - Light Reset. Reset all configuration parameters, except parameters configured by AT+GTBSI, AT+GTSRI, AT+GTMQT, AT+GTMSI, AT+GTCFG, AT+GTPIN and AT+GTTMA , AT+GTSIM, AT+GTIDS, AT+GTGNA.

1 - Heavy Reset. Reset all configuration parameters, except the <New Password> of the AT+GTCFG and the commands AT+GTPIN, AT+GTSIM and AT+GTIDS.

- **5** - PWROFF

Power off the device.

Fields	Length	Range/Format	Default
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

- **6** - CID

Get the ICCID of the SIM card which is being used by the terminal via the message **CID**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **7** - CSQ

Get the current GSM signal level of the terminal via the message **CSQ**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		

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Fields	Length	Range/Format	Default
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **8** - VER

Get the version information of the device via the message **VER**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **9** - BAT

Get the power supply and adapter status of the terminal via the message **BAT**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **A** - IOS

Get status of all the IO ports via the message **IOS**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **B** - TMZ

Get the time zone settings via the message **TMZ**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		

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Fields	Length	Range/Format	Default
Reserved	0		

- **C** - GIR

Get cell information via the message **GSM**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **D** - AIF

Get APN, ICCID, base station ID, RSSI, cell ID, IP and DNS server via the message **AIF**(ASCII).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **E** - GSV/BSV/RSV/ASV

Request the device to report the GNSS satellites information via the message **GSV**(ASCII)/(HEX)/**RSV**(ASCII)/(HEX)/**BSV**(ASCII)/(HEX)/**ASV**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Satellite Information Mask	2	00-FF	
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *Satellite Information Mask*

If <Sub Command> is set to **E**, please get the satellite information message according to the following bitwise mask. The satellite information mask must be 2 bytes.

If it is less than 2 bytes, add 0 to the high bytes of the satellite information mask. If this field is reserved, the device will report **GSV**(ASCII)/(HEX) / **RSV**(ASCII)/(HEX)/ **BSV**(ASCII)/(HEX) / **ASV** (ASCII)/ (HEX).

Mask Bit	Item	Description
Bit 0	+RESP:GTGSV	Report GPS satellite information

Mask Bit	Item	Description
Bit 1	+RESP:GTRSV	Report GLONASS satellite information
Bit 2	+RESP:GTBSV	Report Beidou satellite information
Bit 3	+RESP:GTASV	Report Galileo satellite information

- **10** - CAN

Get CAN information via the message **CAN**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **11** - UVN

Get the version number information of UFSxxx fuel sensor via the message **UVN**(ASCII)/(HEX). Only when the working mode of AT+GTURT is 4 and <Digital Fuel Sensor Type> is 4, the **+RESP:GTUVN** message is valid.

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **12** - CVN

Get the version number information of CAN Module via the message **CVN**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **14** - BLE

Commands for Bluetooth.

Fields	Length	Range/Format	Default
Bluetooth Command	3	BTI	

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Fields	Length	Range/Format	Default
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *Bluetooth Command*

It specifies the Bluetooth command to be executed when <Sub Command> is set to **14**.

- **BTI** - Request the device to report the Bluetooth information and list of paired devices via the message **BTI** (ASCII)/(HEX).

- **16** - GTS

Get the device state via the message **GTS**(ASCII).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **1C** - ATI

Get basic device information via the message **ATI**(ASCII).

Fields	Length	Range/Format	Default
ATI Mask	8	00000000-FFFFFFFF	
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *ATI Mask*

If <Sub Command> is set to **1C**, the basic information will be reported via the message **ATI** (ASCII)/(HEX) according to chosen <ATI Mask>.

ATI Mask Table

Mask Bit	Item
Bit 0	Firmware Version
Bit 1	Reserved for SW
Bit 2	Reserved for SW
Bit 3	Reserved for SW
Bit 4	BT Firmware Version
Bit 5	BT Boot Firmware Version
Bit 6	Reserved for SW

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Mask Bit	Item
Bit 7	Reserved for SW
Bit 8	Reserved
Bit 9	Reserved
Bit 10	Reserved for MCU
Bit 11	Reserved for MCU
Bit 12	Hardware Version
Bit 13	Reserved for HW
Bit 14	Reserved for HW
Bit 15	Reserved for HW
...	Reserved
Bit 19	Sensor ID
Bit 20	Modem IMEI
...	Reserved

- **1D** - QDA

Get DR100 accessory information via the message **QDA**(ASCII).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **22** - CAN Module

Set car model for CAN Module or read car model from CAN Module.

Fields	Length	Range/Format	Default
CAN Module Operation Mode	1	0-4	
CAN Module Car Model ID | Erased Counters Mask	1 | 1-5 | <=2	0-4 | 1 - 65535 | 00 - FF	0
Reserved	0		
Reserved	0		
Reserved	0		

– *CAN Module Operation Mode*

If the sub command is **22**, this parameter will work as follows.

- **0** - Read the current car model and report it via the message +RESP:GTCML.

Read the current car model and report it via the message **CML** (ASCII)/(HEX).

- **1** - Set car model. Please use the <CAN Module Car Model ID> parameter to set car model.

Set car model. Please use the <CAN Module Car Model ID> parameter to set car model.

- **2** - Start CAN Module automatic synchronization.

Start CAN Module automatic synchronization. The synchronization result is reported via the **+RESP:GTCML** message.

Note

The entire synchronization takes about 10-40s, and CAN Module will restart immediately after the end of the synchronization regardless of the result. If automatic sync is enabled, please wait for the synchronization to finish before reading the current car model. If automatic synchronization has not ended, the subsequent synchronization command will be ignored.

- **3** - Clear current supported car model.

Clear current supported car model.

- **4** - Erasing the counters.

Erasing the counters. Some of "total" logistic values are read directly from vehicle data bus, others are counted by CAN Module. After the device receives this command, it clears counters values, including total fuel used, engine times. The counters are set to value "unavailable" and become available when the value is updated according to messages read from CAN-bus and J1708.

– *CAN Module Car Model ID | Erased Counters Mask*

- *CAN Module Car Model ID*

  It works only when the sub command is **22** and the <CAN Module Operation Mode> is set to **1**. This parameter value should be car model ID described in supported car model list.

- *Erased Counters Mask*

  It works only when the sub command is **22** and the <CAN Module Operation Mode> is set to **4**. Bitwise mask to configure which counters will be erased.

  Erased Counters MASK Table:

Mask Bit	Item
Bit 7	Reserved For Extend
Bit 6	Maintenance related counters, such as <Engine Cold Start Count>, <Engine Full Start Count>, <Engine Ignition Start Count>, and <Server Distance>.
Bit 5	Accelerations/Brakings Counters (<Rapid Accelerations>, <Rapid Brakings>, <Total Brake Applications>, <Total Accelerator Kick-downs> and <Handbrake Applies During Ride Count> will be erased.)
Bit 4	Braking Factors (<Pedal Braking Factor> and <Engine Braking Factor> will be erased.)

Mask Bit	Item
Bit 3	Duration counters
Bit 2	Total Distance Since Installation and Distance Pulses (<Total Distance Impulses> will be erased.)
Bit 1	Engine Time Counters (<Total Engine Hours> and <Total Engine Idle Time> will be erased.)
Bit 0	Total Fuel and Total Energy Counters (<Total Fuel Used>, <Total Idle Fuel Used> and <Total Energy Used> will be erased.)

- **25** - SCS

Get the self-calibration status of the acceleration data via the message **SCS**(ASCII)/(HEX) or clear the self-calibration status. It is used together with <SCS Action> below.

Fields	Length	Range/Format	Default
SCS Action	1	0-1	
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *SCS Action*

If <Sub Command> is set to **25**, Read or Clear action is controlled by this parameter.

- **0** - Read self-calibration status.
- **1** - Clear self-calibration status.

- **27** - RF433

Set the working mode for the RF433 accessories.

Fields	Length	Range/Format	Default
RF433 Accessory Working Mode	1	0-2	
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *RF433 Accessory Working Mode*

If the sub command is **27**, this parameter will work as follows.

- **0** - Start learning mode.
- **1** - Read the RF433 accessories which are paired.
- **2** - Clear the current paired list of RF433 accessories.

- **2B** - TVN

Get the version number information of THR_100 via the message **TVN**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **2F** - CAN Query Mode

Query the information related to CAN and report them via **CIF**(ASCII)/(HEX) message. When querying CAN Car Name and CAN Car Model ID, it also needs to enable the <Mode> of AT+GTCAN.

Fields	Length	Range/Format	Default
CAN Information Mask	<=4	0000-FFFF	
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *CAN Information Mask*

If <Sub Command> is set to **2F**, configuration information for a specific CAN information mask can be obtained via the message **CIF** (ASCII)/(HEX). The Configuration Mask must be 1 byte.

CAN Information Mask Table

Mask Bit	Item
Bit 0	CAN Version Number
Bit 1	CAN Serial Number
Bit 2	CAN Car Name
Bit 3	CAN Car Model ID
Bit 4	Extended Debug Information
Bit 5	Standard Debug Information
Bit 6	Hardware Information
Bit 7	Reserved For Extend
Bit 8	CAN Configure Deep Sleep Mode Switch
Bit 9	CAN Configure Version
Bit 10	Reserved
Bit 11	Reserved
Bit 12	Machine Model Debug Information
Bit 13	Reserved
Bit 14	Reserved

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Mask Bit	Item
Bit 15	Reserved For Extend

- **31** - DELBUF

Delete all the buffered reports.

Fields	Length	Range/Format	Default
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

- **38** - DUC

Get the statistics of data usage via the message **DUC**(ASCII)/(HEX).

Fields	Length	Range/Format	Default
Reserved	0		
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

- **3A** - RLY

Set the state of the WRL300.

Fields	Length	Range/Format	Default
RLY Operation Mode	1	0-1	
Bind BAS Index	1	0-9	
Reserved	0		
Reserved	0		
Reserved	0		

– *RLY Operation Mode*

If the sub command is **3A**, this parameter will work as follows.

- **0** - Disable relay of WRL300, switch relay pin from NC to COM.
- **1** - Enable relay of WRL300, switch relay pin from NO to COM.

– *Bind BAS Index*

It is used to bind the specific configuration in AT+GTBAS when the <Sub Command> is set to **3A**. The value is the same as the index in **AT+GTBAS**.

- **3C** - TPMS

Get the tire data via the message **+RESP:GTTPM**.

Fields	Length	Range/Format	Default
TPMS Working Mode	1	1-2	

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Fields	Length	Range/Format	Default
Output Direction	1	0|1|3|4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *TPMS Working Mode*

If the sub command is **3C**, this parameter will work as follows.

- **1** - Read the TPMS accessories which are paired.
- **2** - Clear the current paired list of TPMS accessories.

- **41** - UHF

Get the UHF data via the message **+RESP:GTUHF**.

Fields	Length	Range/Format	Default
UHF Command Type	1	1-6	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		

– *UHF Command Type*

If the sub command is 41, this parameter will work as follows.

- **1** - Tags inventory. Command with unconnected antenna ID will not be executed.

If <UHF Command Type> is **1**, <Parameter 1> to <Parameter 5> represent the following meanings:

Parameter	Length	Range/Format	Default
UHF Command Type	1	1	1
Inventory Antenna ID	1	1 - 8	1
Reserved	0		
Reserved	0		
Reserved	0		

- *Inventory Antenna ID*

Antenna ID to be scanned. UHF acc type 1 supports only Inventory Antenna ID 1.

- **2** - Obtain the reader information.
- **3** - Obtain the reader GPIO state.
- **4** - Obtain the reader unique serial number.
- **5** - Obtain the reader working mode.
- **6** - Modify working frequency, this command only works when <Reader Working Mode> is set to 0.

If <UHF Command Type> is **6**, <Parameter 1> to <Parameter 5> represent the following meanings:

Parameter	Length	Range/Format	Default
UHF Command Type	1	6	6
Maximum Frequency	<=2	0 - FF	0
Minimum Frequency	<=2	0 - FF	0
Reserved	0		
Reserved	0		

- *Maximum Frequency*
  bit7 - bit6 - frequency band configuration
  bit5 - bit0 - maximum frequency point
- *Minimum Frequency*
  bit7 - bit6 - frequency band configuration
  bit5 - bit0 - minimum frequency point

Note
Maximum frequency point must be greater than or equal to the minimum frequency point. Reader will return a parameter error status in the response frame if other value is delivered in this field.

Frequency band configuration table:

MaxFre(bit7)	MaxFre(bit6)	MinFre(bit7)	MinFre(bit6)	FreqBand
0	0	0	0	Reserved
0	0	0	1	Chinese band2
0	0	1	0	US band
0	0	1	1	Korean band
0	1	0	0	EU band
0	1	0	1	Reserved
0	1	1	0	Ukraine band
0	1	1	1	Peru band
1	0	0	0	Chinese band1
1	0	0	1	EU3 band
1	0	1	0	Taiwan band
1	1	0	0	US band3
…	…	…	…	…
1	1	1	1	Reserved

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Formulae for different frequency bands:

Chinese band2: Fs = 920.125 + N * 0.25 (MHz) where N ∈ [0, 19].

US band: Fs = 902.75 + N * 0.5 (MHz) where N ∈ [0,49].

Korean band: Fs = 917.1 + N * 0.2 (MHz) where N ∈ [0, 31].

EU band: Fs = 865.1 + N*0.2(MHz) where N ∈ [0, 14].

Ukraine band: Fs = 868.0 + N*0.1(MHz) where N ∈ [0, 6].

Peru band: Fs = 916.2 + N*0.9(MHz) where N ∈ [0, 11].

Chinese band1: Fs = 840.125 + N * 0.25 (MHz) where N ∈ [0, 19].

EU3 band: Fs = 865.7 + N * 0.6(MHz) where N ∈ [0, 3].

US band3: Fs = 902 + N * 0.5 (MHz) where N ∈ [0,52].

Taiwan band: Fs = 922.25 + N * 0.5 (MHz) where N ∈ [0, 11].

- **44** - FRI

Report **FRI** (ASCII)/(HEX) messages on demand. After issuing this command, the device will update GNSS information and report **+RESP:GTFRI** messages according to <Interval>. When the time set in <Timeout> is reached, the device will return to reporting **+RESP:GTFRI** messages according to the configuration of the AT+GTFRI command.

Fields	Length	Range/Format	Default
Interval	<=5	1-86400(s)	5
Timeout	<=4	1-1440(min)	15
Reserved	0		
Reserved	0		
Reserved	0		

– *Interval*

Reporting interval for **+RESP:GTFRI** message. The device will report **+RESP:GTFRI** messages at this interval after RTO-44 is sent.

– *Timeout*

The **+RESP:GTFRI** message reports working time based on the parameter <Interval>. After the time set by this parameter is reached, the device will revert to the reporting mode set by the **AT+GTFRI** command.

- **46** - CBS

Get CAN bus via the message **CBS** (ASCII)/(HEX).

Fields	Length	Range/Format	Default
CAN Report Mask	<=2	0-FF	
Output Direction	1	0-4	0
Reserved	0		
Reserved	0		
Reserved	0		

– *CAN Report Mask*

If <Sub Command> is set to 46, configuration information for a specific CAN information

mask can be obtained via the message **CBS** (ASCII)/(HEX). The Configuration Mask must be 1 byte.

- **Bit 0** - CAN2-bus or J1708-bus Status
- **Bit 1** - CAN1-bus Status
- **Bit 2** - Reserved
- **Bit 3** - Reserved
- **Bit 4** - Reserved
- **Bit 5** - Reserved
- **Bit 6** - Reserved
- **Bit 7** - Reserved for Extend

3.9.2 SMS (SMS Text Sending)

The command **AT+GTSMS** is used to send SMS text to a target phone number.

Example:

AT+GTSMS=gv350ceu,,,0,"http://www.queclink.com",13812341234,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	SMS	SMS
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Reserved	0		
	SMS Message Format	1	0	0
	SMS Text	<=160		
	Target Number	<=20		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *SMS Message Format*
It defines the format of the SMS content.

- **0** - ASCII format.

✧ *SMS Text*
A string including quotes. This string will be sent to the <Target Number> via SMS. This field cannot be empty and the parameter value cannot be a string which represents a command of this protocol.

✧ *Target Number*
The phone number that the SMS text will be sent to. This field cannot be empty.

3.9.3 SMS Location Request

This command can only be sent via SMS. The device will send SMS report with Google maps hyperlink and the current location to corresponding phone number or report **LBC** (ASCII)/(HEX) to the backend server immediately. For more detail please refer to the parameter <Location Request Mask> of the command AT+GTCFG.

Item	Format
Command	Get Position

✧ *Command*
The detailed command string received via SMS.
Get Position": This command is used to query the current location, Case is ignored.

3.9.4 RTP (Remote File Transfer)

The command **AT+GTRTP** is used to obtain files from the backend server.

Example:
AT+GTRTP=gv350ceu,0,0,0,http://60.174.225.173:20581/ROOT/deltabin/server2.crt,,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	RTP	RTP
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Mode	1	0	
	Protocol Type	1	0	

Parts	Fields	Length	Range/Format	Default
	File Type	1	0-2	
	URL	<=100	ASCII(not including '=')	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include '0' - '9', 'a' - 'z' and 'A' - 'Z'. The default value is "gv350ceu".

✧ *Mode*

The working mode of file transfer.

- **0** - Download file.

✧ *Protocol Type*

The type of communication protocol used to obtain data from the backend server.

- **0** - HTTP

✧ *File Type*

It defines the type of file to download from the server.

- **0** - CA certificate.
- **1** - Client certificate.
- **2** - Client key.

✧ *URL*

It specifies the URL to download the configuration file.

3.9.5 LTP (Local File Transfer)

The command **AT+GTLTP** is used to write the file to the device by subcontracting.

Example:

AT+GTLTP=gv350ceu,,1,1,0,0,***Data***,***CRC***,,,,,FFFF$

Parts	Fields	Length	Range/Format	Default
Head	Header	5	AT+GT	AT+GT
	Command Word	3	LTP	LTP
	Leading Symbol	1	=	=
	Password	4-20	'0' - '9' 'a' - 'z' 'A' - 'Z'	gv350ceu
Body	Reserved	0		
	Mode	1	0-1	
	File Type	1	0-2	
	Current Number	<=3	0-100	
	Total Number	<=3	0-100	
	Data	<=512	HEX	
	CRC	<=4	0-FFFF	
	Reserved	0		
	Reserved	0		
	Reserved	0		
	Reserved	0		
Tail	Serial Number	4	0000-FFFF('0'-'9','A'-'F')	
	Tail	1	$	$

✧ *Password*

The valid characters for the password include ‘0’ - ‘9’, ‘a’ - ‘z’ and ‘A’ - ‘Z’. The default value is “gv350ceu”.

✧ *Mode*

The working mode of the file.

- **0** - Delete file.
- **1** - Write file.

✧ *File Type*

It defines the type of file to download from the server.

- **0** - CA certificate
- **1** - Client certificate
- **2** - Client key

✧ *Current Number*

The location where the current data is written to the file.

✧ *Total Number*

Total serial number of write file data.

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- *Data*
  Data written to file.
- *CRC*
  CRC verification data of <Data> is used to determine whether the data is correct.

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4 Report(Ascii)

This section defines the ASCII formats of the report messages. Due to the size limit of an SMS message (160 bytes), it is recommended to carefully set <Report Item Mask> in AT+GTCFG to limit the length of the report which contains GNSS position information in the case of SMS transmission. Otherwise the report will be truncated to fit the length of SMS message.

4.1 ACK (Acknowledgement)

The frame format of ACK is as follows:

Example:
The Option field is not included.

+ACK:GTXXX,740D01,864292043426376,,0000,20200613114927,FFFF$

The Option field is included.

+ACK:GTGEO,740D01,135790246811220,GV350CEU,0,000A,20090214093254,11F0$

+ACK:GTPEO,740D01,135790246811220,GV350CEU,0,000B,20090214093254,11F0$

+ACK:GTPEG,740D01,135790246811220,GV350CEU,0,000B,20090214093254,11F0$

+ACK:GTIOB,740D01,135790246811220,GV350CEU,0,0006,20090214093254,11F0$

+ACK:GTTMP,740D01,135790246811220,GV350CEU,0,000C,20090214093254,11F0$

+ACK:GTCLT,740D01,135790246811220,GV350CEU,0,000D,20090214093254,FFFF$

+ACK:GTCMD,740D01,135790246811220,GV350CEU,0,0005,20100310172830,11F0$

+ACK:GTUDF,740D01,135790246811220,GV350CEU,0,0005,20100310172830,11F0$

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+ACK:GTROS,740D01,135790246811220,GV350CEU,1,0018,20090214093254,11F0$

+ACK:GTFSC,740D01,135790246811220,GV350CEU,0,0004,20090214093254,11F0$

+ACK:GTTTR,740D01,135790246811220,GV350CEU,0,FFFF,20090214093254,11F0$

+ACK:GTBAS,740D01,135790246811220,GV350CEU,0,0005,20090214093254,11F0$

+ACK:GTBTD,740D01,135790246811220,GV350CEU,0,0005,20090214093254,11F0$

+ACK:GTRTO,740D01,135790246811220,GV350CEU,GPS,0015,20090214093254,11F1$

+ACK:GTIDC,740D01,862524060205859,GV350CEU,2AF77376,2,0574,20240226154445,25BF$

+ACK:GTIDS,740D01,862170013895931,,0,FFFF,20110101000009,0088$

Parts	Fields	Length	Range/Format
Head	Header	4	+ACK
	Leading Symbol	1	:
	Command Word	5	'A'-'Z', '0'-'9'
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Option	N	Please see below.
Tail	Serial Number	4	0000-FFFF
	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Command Word*

The “Command Word” in the configuration command. For example, it is **GTXXX**.

✧ *Full Protocol Version*

The protocol version that the device conforms to. It is separated into 3 parts. The first two or four characters represent the device type. As shown in the example above, 74 means GV350CEU. The second part consists of two characters that represent the major version number of the protocol, and the last part consists of two characters that indicate the minor version

number of the protocol. Both version numbers are hex digits. For example, 0A01 means version 10.01.

✧ *Unique ID*
The International Mobile Equipment Identity for the terminal device.

✧ *Device Name*
The name of terminal device.

✧ *Option*
The Acknowledgement of commands that contain the Option field are as follows:

- **AT+GTGEO** - This field represents the GEO command ID.

Parts	Fields	Length	Range/Format
Body	GEO ID	<=2	0 - 19

- **AT+GTPEO** - This field represents the PEO command ID.

Parts	Fields	Length	Range/Format
Body	GEO ID	<=3	0 - 199

- **AT+GTPEG** - This field represents the PEG command ID.

Parts	Fields	Length	Range/Format
Body	Group ID	<=2	0 - 9

- **AT+GTIOB** - This field represents the IOB command ID.

Parts	Fields	Length	Range/Format
Body	IOB ID	1	0 - 3

- **AT+GTTMP** - This field represents the TMP alarm ID.

Parts	Fields	Length	Range/Format
Body	Alarm ID	1	0 - 3

- **AT+GTCLT** - This field represents the CLT group ID.

Parts	Fields	Length	Range/Format
Body	Group ID	<=2	0 - 19

- **AT+GTCMD** - This field represents the stored command ID.

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Parts	Fields	Length	Range/Format
Body	Stored Command ID	<=2	0 - 31

- **AT+GTUDF** - This field represents the UDF group ID.

Parts	Fields	Length	Range/Format
Body	Group ID	<=2	0 - 31

- **AT+GTROS** - This field represents the ROS output ID.

Parts	Fields	Length	Range/Format
Body	Output ID	1	0 - 1

- **AT+GTFSC** - This field represents the FSC table ID.

Parts	Fields	Length	Range/Format
Body	Table ID	1	0 - 4

- **AT+GTTTR** - This field represents the TTR command Type.

Parts	Fields	Length	Range/Format
Body	Command Type	1	0-9 | 10 | 13

- **AT+GTBAS** - This field represents the BAS index.

Parts	Fields	Length	Range/Format
Body	Index	1	0 - 9

- **AT+GTBTD** - This field represents the BTD index.

Parts	Fields	Length	Range/Format
Body	Index	1	0 - 9

- **AT+GTRTO** - This field represents the RTO sub-command ID.

Parts	Fields	Length	Range/Format
Body	Sub Command	<=6	Sub Command String

- **AT+GTIDC** - This field represents the IDC ID Number and Authorised.

Parts	Fields	Length	Range/Format
Body	ID Number	<=28	'0'-'9' 'a'-'f' 'A'-'F'
	Authorised	1	0-4

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- **AT+GTIDS** - This field represents the IDS group ID.

Parts	Fields	Length	Range/Format
Body	Result Code	<=2	0 - 2
	Additional Number(optional)	<=4	0 - 5000

- *Result Code*
  A numeral to indicate the result of issuing AT+GTIDS.
  - **0** - Successful. <Additional Number> indicates the number of IDs that are configured.
  - **1** - ID Number list is full. <Additional Number> indicates the number of IDs that are discarded.
  - **2** - Many duplicate IDs are discarded. <Additional Number> indicates the number of duplicated IDs.
- For other commands, it is not included.

✧ *Serial Number*
The serial number in the configuration command.

✧ *Send Time*
The local time when the frame is generated in the format **YYYYMMDDHHMMSS**.
For example, "20191120135807" means 13:58:07 on November 20, 2019.

✧ *Count Number*
A self-increasing count number in each acknowledgement message. It begins from "0000" and increases by 1 for each acknowledgement message. And it rolls back after "FFFF".

Note

1. The ACK frame only indicates that the terminal device has received the command, but does not mean that the command has been successfully executed; the terminal device will send a report to inform the backend server of the execution result of the command when necessary.
2. Only after both the commands AT+GTBSI and AT+GTSRI are properly set can the ACK messages and other report messages be received by the backend server.

4.2 Position Related Report

This section describes the format of positioning related messages. Please refer to the details below.

4.2.1 Generic Location Report

- **TOW** (Tow Alarm Information)
  If the tow alarm is enabled by the command AT+GTTOW, the device will send the message **+RESP:GTTOW** to the backend server when the motion sensor detects tow.

- **DIS** (Digital Input Alarm)
  If the status change of digital inputs is detected, the device will send the message **+RESP:GTDIS** to the backend server.
- **IOB** (IO Ports Bind Alarm)
  If the IO combination is set and the corresponding condition is met, the device will report the message **+RESP:GTIOB** to the backend server.
- **SPD** (Speed Alarm Information)
  If the speed alarm is enabled, the device will send the message **+RESP:GTSPD** to the backend server when the speed of the device within the alarm range is detected .
- **SOS** (Digital Input Port Triggers SOS)
  If the SOS function is enabled, the device will send the message **+RESP:GTSOS** to the backend server when the corresponding digital input port triggers SOS.
- **RTL** (Realtime Location Information)
  After the device receives the command AT+GTRTO, it will start GNSS to get the current position and then send the message **+RESP:GTRTL** to the backend server.
- **DOG** (Watchdog Reboot Alarm)
  The protocol watchdog reboot message **+RESP:GTDOG**.
- **IGL** (Ignition Location Information)
  The location message **+RESP:GTIGL** for ignition on/off.
- **VGL** (Virtual Ignition Location Information)
  The location message **+RESP:GTVGL** for virtual ignition on/off.
- **HBM** (Harsh Behavior Alarm)
  If harsh behavior is detected, the message **+RESP:GTHBM** will be sent to the backend server.

Example:

+RESP:GTTOW,740904,866775050904226,GV350CEU,,00,1,1,0.0,178,101.1,117.129286,31.838971,20230624082832,0460,0001,DE11,05FE6667,01,12,0.1,20230624162833,2249$

+RESP:GTDIS,740904,862524060205859,GV350CEU,,21,1,1,0.0,0,114.7,117.129163,31.839269,20230926013434,0460,0000,550B,B7B1,01,12,0.0,20230926013434,01E4$

+RESP:GTIOB,740904,866775050904226,GV350CEU,,01,1,1,0.0,178,101.1,117.129286,31.838971,20230624083034,0460,0001,DE10,027A4F1F,01,12,0.1,20230624163035,2261$

+RESP:GTSPD,740904,862524060205859,GV350CEU,,01,1,1,0.0,0,114.7,117.129163,31.839269,202309260

13514,0460,0000,550B,B7B1,01,12,0.0,20230926013514,01EA$

+RESP:GTSOS,740904,862524060205859,GV350CEU,,10,1,1,0.0,0,114.7,117.129163,31.839269,20230926013244,0460,0000,550B,B7B1,01,12,0.0,20230926013245,01DF$

+RESP:GTRTL,740904,866775050904226,GV350CEU,,00,1,1,0.0,178,101.1,117.129286,31.838971,20230624083224,0460,0001,DE10,027A4F1F,01,12,0.1,20230624163225,226F$

+RESP:GTDOG,740904,862524060205859,GV350CEU,,23,1,1,0.0,0,114.7,117.129163,31.839269,20230926013552,0460,0000,550B,B7B1,01,12,0.0,20230926013552,01EF$

+RESP:GTIGL,740904,866775050904226,GV350CEU,,01,1,1,0.0,178,101.1,117.129286,31.838971,20230624083209,0460,0001,DE10,027A4F1F,01,12,0.1,20230624163210,226B$

+RESP:GTVGL,740904,866775050904226,GV350CEU,,40,1,1,0.0,0,88.3,117.129269,31.839224,20230624083715,0460,0001,DE11,05FE6667,01,12,0.1,20230624163716,2291$

+RESP:GTHBM,740904,866775050904226,GV350CEU,,11,1,1,3.2,0,100.1,117.129320,31.839237,20230624083423,0460,0001,DE11,05FE6667,01,12,0.1,20230624163424,227E$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TOW | DIS | IOB | SPD | SOS | RTL | DOG | IGL | VGL | HBM
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Report ID / Report Type	2	X(0 - F)Y(0 - 9)
	Number	1	1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)

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Parts	Fields	Length	Range/Format
	Azimuth	<=3	0 - 359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Report ID / Report Type*

It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

Report ID has different meanings in different messages as follows:

- The ID of digital input port which triggers the report message **+RESP:GTDIS** and **+RESP:GTSOS**.
- The ID of the bound IO which triggers the report message **+RESP:GTIOB**.
- The ID of the digital input port which triggers the reboot message **+RESP:GTDOG**.
- The speed level at which the harsh behavior is detected in the message **+RESP:GTHBM**. "3" indicates high speed, "2" indicates medium speed and "1" indicates low speed. If <Mode> in AT+GTHBM is set to 2, the value will always be 0 which indicates unknown speed.
- The value of <Virtual Ignition Mode> which indicates the trigger source of the message **+RESP:GTVGL**.
- The type of speed alarm which triggers the report message **+RESP:GTSPD**.
- For other messages, it will always be 0.

Report Type has different meanings in different messages as follows:

In the +RESP:GTDIS report message generated by the digital input

- **0** - The current logic status of the input port is “Inactive status”.
- **1** - The current logic status of the input is “Active status”.

In the +RESP:GTIOB report message generated by bound IO

- **0** - The current logic status of the bound IO does not meet the alarm condition.
- **1** - The current logic status of the bound IO meets the alarm condition.

In the speed alarm message +RESP:GTSPD

- **0** - Outside the predefined speed range
- **1** - Within the predefined speed range

In the protocol watchdog reboot message +RESP:GTDOG

- **1** - Reboot device message for time based working mode
- **2** - Reboot device message for ignition on working mode
- **3** - Reboot device message for input triggered reboot
- **4** - Reboot device message for network watchdog reboot
- **5** - Reboot device message for EGPRS/GSM and LTE watchdog reboot
- **6** - Reboot device message for send failure watchdog
- **7** - Reboot RF message for network watchdog
- **8** - Reboot RF message for EGPRS/LTE watchdog
- **9** - Reboot RF message for send failure watchdog

In the (virtual) ignition on/off message +RESP:GTIGL/+RESP:GTVGL

- **0** - Ignition on
- **1** - Ignition off

In the harsh behavior monitoring message +RESP:GTHBM

- **0** - Harsh braking behavior
- **1** - Harsh acceleration behavior
- **2** - Harsh cornering behavior
- **3** - Harsh braking and cornering behavior
- **4** - Harsh acceleration and cornering behavior
- **5** - Unknown harsh driving behavior

For other messages, it will always be 0.

✧ *Number*

The number of the GNSS positions included in the report message. Generally, it is 1.

✧ *GNSS Accuracy*

A numeral to indicate the GNSS fix status and HDOP of the GNSS position. 0 means the current GNSS fix fails and the last known GNSS position is used. A non-zero value (1 - 50) means the current GNSS fix is successful and represents the HDOP of the current GNSS position.

✧ *Speed*

The current speed. Unit: km/h.

✧ *Azimuth*

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An angle degree to indicate the horizontal direction from the north pole.

- *Altitude*
  The height above the sea level.
- *Longitude*
  The longitude of the current position.
- *Latitude*
  The latitude of the current position.
- *GNSS UTC Time*
  The UTC time obtained from the GNSS chip.
- *MCC*
  Mobile country code. It is 3 digits in length and the range is from 000 to 999.
- *MNC*
  Mobile network code. It is 3 digits in length and the range is from 000 to 999.
- *LAC*
  Location area code in hex format.
- *Cell ID*
  The cell ID in hex format.
- *Position Append Mask*
  A bitwise numeral to control whether to include the corresponding fields in each position after <Cell ID>.
- *Satellites in Use*
  If bit 0 of <Position Append Mask> is enabled, this part will be displayed with the number of satellites in use for the current position.
- *GNSS Jamming State(Optional)*
  If bit 4 of <Position Append Mask> is enabled, this part will be displayed with the current jamming state.
  - **0** - Unknown.
  - **1** - (OK) No significant jamming.
  - **2** - (Warning) Potential for interference.
  - **3** - (Critical) Interference visible and no fix.
- *Mileage*
  The current total mileage.

4.2.2 FRI (Fixed Report Information)

If fixed report is enabled, the device will send the message **+RESP:GTFRI** to the backend server according to the working mode.

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Example:
+RESP:GTFRI,740D01,864696060004173,GV350CEU,11985,10,1,1,0.0,0,118.5,117.129306,31.839197,20230808033438,0460,0001,DF5C,05FE6667,03,15,0,123.5,00123:04:44,9232,5,82,100,210000,,,,20230808033438,01B3$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	FRI
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	External Power Voltage	<=5	0-32000(mV)
	Report ID / Report Type	2	X(1-5)Y(0-8 | A)
	Number	<=2	1-15
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00-FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Trigger Type(Optional)	1	0-4
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)

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Parts	Fields	Length	Range/Format
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Analog Input1 Voltage	<=5	0 - 16000(mV)| F(0 - 100)
	Analog Input2 Voltage	<=5	0 - 16000(mV)| F(0 - 100)
	Analog Input3 Voltage	<=5	0 - 30000(mV)| F(0 - 100)
	Backup Battery Percentage	<=3	0-100
	Device Status	6 | 10	000000-0F0FFFFFFF
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *External Power Voltage*

The voltage of the external power supply. If the command AT+GTEPS is configured for the device to report the external power supply voltage periodically with fixed report, the device will send the current voltage along with the **+RESP:GTFRI** message to the backend server. If the **AT+GTEPS** command is not configured, this field will be empty.

✧ *Report ID / Report Type*

It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

Report ID has several meanings as follows.

- **1** - Fixed time report
- **2** - Fixed distance report
- **3** - Fixed mileage report
- **4** - Fixed time and mileage report
- **5** - Fixed time or mileage report

Report Type has the following meanings.

- **0** - Normal fixed report
- **1** - Normal corner report If <Wrap Corner Point> is 0, this message indicates a turning point. If <Wrap Corner Point> is 1, this message indicates that the number of collected GNSS points reaches 15 or GNSS points collection stops.
- **2** - FFC fixed report This message indicates that the device enters the state pre-configured

by <Mode> in AT+GTFFC, such as Geo-Fence state, roaming state, etc.

- **3** - FFC corner report If <Wrap Corner Point> is 0, this message means a turning point in condition of FRI report frequency changes by AT+GTFFC. If <Wrap Corner Point> is 1, it indicates the number of collected GNSS points reaches 15 or GNSS points collection stops.
- **4 -** Mileage report when <Mode> in AT+GTFRI is set to 5.
- **5** - Reserved.
- **6 -** Mileage report when <Mode> in AT+GTFRI is set to 5 and FFC works.
- **7** - On demand reporting when using RTO-44.
- **8** - Speed delta report.
- **A -** FFC speed delta report. This message means that the speed delta has exceeded the threshold under the condition of FRI report frequency changes by AT+GTFFC.

✧ *Number*

The number of the GNSS positions included in the report message. In the message **+RESP:GTFRI**, there may be one or several GNSS positions. If there are multiple positions in one **+RESP:GTFRI** message, the parameter between <Number> and <Mileage> will be repeated.

✧ *Position Append Mask*

A bitwise numeral to control whether to include the corresponding fields in each position after <Cell ID>.

✧ *Satellites in Use*

If bit 0 of <Position Append Mask> is enabled, this part will be displayed with the number of satellites in use for the current position.

✧ *GNSS Trigger Type*

The trigger type of GNSS point has the following meanings.

- **0** - Time point
- **1** - Corner point
- **2** - Distance point
- **3** - Mileage point
- **4** - Optimum point (time and mileage)

✧ *GNSS Jamming State*

If bit 4 of <Position Append Mask> is enabled, this part will be displayed with the current jamming state.

- **0** - Unknown.
- **1** - (OK) No significant jamming.
- **2** - (Warning) Potential for interference.
- **3** - (Critical) Interference visible and no fix.

✧ *Hour Meter Count*

If the hour meter count function is enabled by the command AT+GTHMC, total hours the meter counts when the engine is on will be reported in this field. It consists of three parts separated by

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":", the first part is the hour digit and the length of it is between 5 to 7 bytes, the second part is the 2-byte minute digit, and the last part is the 2-byte second digit. And it ranges from 00000:00:00 to 1193000:00:00. If the function is disabled, this field will be empty.

✧ *Analog Input1 Voltage*
Analog Input 2 Voltage
Analog Input 3 Voltage
The voltage of the analog input or the fuel level measured by the fuel sensor connected to the corresponding analog input port. If the command AT+GTAIS is configured for the device to report the analog input information periodically with fixed report, the device will send the current voltage of the analog input or the fuel level in the format of "FXX" along with the **+RESP:GTFRI** message to the backend server. If **AT+GTAIS** is not configured, this field will be empty.

✧ *Backup Battery Percentage*
The current level of the backup battery in percentage.

✧ *Device Status*
The status of the device.
From left to right, the first two bytes indicate EIO100 input status, the second two bytes indicate EIO100 output status, the third two bytes indicate the current motion status of the device, the fourth two bytes indicate the status of input ports, and the last two bytes indicate the status of output ports.
The current motion status of the device:

- **16 (Tow)** - The device attached vehicle is ignition off and it is towed.
- **1A (Fake Tow)** - The device attached vehicle is ignition off and it might be towed.
- **11 (Ignition Off Rest)** - The device attached vehicle is ignition off and it is motionless.
- **12 (Ignition Off Motion)** - The device attached vehicle is ignition off and it is moving before it is considered as being towed.
- **21 (Ignition On Rest)** - The device attached vehicle is ignition on and it is motionless.
- **22 (Ignition On Motion)** - The device attached vehicle is ignition on and it is moving.
- **41 (Sensor Rest)** - The device attached vehicle is motionless without ignition signal detected.
- **42 (Sensor Motion)** - The device attached vehicle is moving without ignition signal detected.

The input status: A bitwise hex integer to represent the logic status of digital input. The low bit represents the ignition detection input and the high bit represents the digital input.
The output status: A bitwise hex integer to represent the logic status of digital output. The low bit represents digital output.
If EIO100 device is not connected or <EIO100 Connection> in command AT+GTACD is 0, the optional bit 24 - bit 35 will not be included.

Mask Bit	Item
Bit 0	Digital output 1
Bit 1	Digital output 2
Bit 2	Digital output 3

Mask Bit	Item
Bit 3	Digital output 4
Bit 4	Digital output 5
...	Reserved
Bit 8	Ignition detection
Bit 9	Digital input 1
Bit 10	Digital input 2
Bit 11	Digital input 3
...	Reserved
Bit 16	Motion status of the device
Bit 17	Motion status of the device
Bit 18	Motion status of the device
Bit 19	Motion status of the device
Bit 20	Motion status of the device
Bit 21	Motion status of the device
Bit 22	Motion status of the device
Bit 23	Motion status of the device
Bit 24	EIO100 output 9
Bit 25	EIO100 output A
Bit 26	EIO100 output B
Bit 27	EIO100 output C
...	Reserved
Bit 32	EIO100 input 9
Bit 33	EIO100 input A
Bit 34	EIO100 input B
Bit 35	EIO100 input C

4.2.3 ERI (Expand Fixed Report Information)

If **+RESP:GTERI** is enabled, the device will send the message **+RESP:GTERI** to the backend server instead of **+RESP:GTFRI**.

Example:

+RESP:GTERI,740904,862524060204589,GV350CEU,00000100,,10,1,1,0.0,355,97.7,117.129252,31.839388,20240415054037,0460,0000,550B,085BE2AA,01,11,3.6,,,,,0,210100,0,1,00,11,0,0000001E,100F,,D325C2B2A2F8,1,2967,0,15,0,20240415154438,405C$

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Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	ERI
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	ERI Mask	8	00000000 - FFFFFFFF
	External Power Voltage	<=5	0-32000(mV)
	Report ID / Report Type	2	X(1-5)Y(0-8 | A)
	Number	<=2	1-15
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00-FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Trigger Type(Optional)	1	0-4
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Analog Input1 Voltage	<=5	0 - 16000(mV)| F(0 - 100)
	Analog Input2 Voltage	<=5	0 - 16000(mV)| F(0 - 100)

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Parts	Fields	Length	Range/Format
	Analog Input3 Voltage	<=5	0 - 30000(mV)| F(0 - 100)
	Backup Battery Percentage	<=3	0-100
	Device Status	6|10	000000-0F0FFFFFFF
	UART Device Type	1	0| 1| 7
	Digital Fuel Sensor Data(Optional)	<=20	
	Expand Digital Fuel Sensor Data (Optional)		
	1-Wire Data (Optional)		
	CAN Data (Optional)	<=1000	
	Fuel Sensor Data (Optional)		
	RF433 Accessory Data (Optional)		
	Bluetooth Accessory Data (Optional)		
	RAT and Band data (Optional)		
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Position Append Mask*

A bitwise numeral to control whether to include the corresponding fields in each position after <Cell ID>.

✧ *Satellites in Use*

If bit 0 of <Position Append Mask> is enabled, this part will be displayed with the number of satellites in use for the current position.

✧ *GNSS Jamming State*

If bit 4 of <Position Append Mask> is enabled, this part will be displayed with the current jamming state.

- **0** - Unknown.
- **1** - (OK) No significant jamming.
- **2** - (Warning) Potential for interference.
- **3** - (Critical) Interference visible and no fix.

✧ *UART Device Type*

The type of device connected to the secondary serial port.

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- **0** - No device connected
- **1** - Digital fuel sensor
- **7** - WRT100 accessory

✧ *Digital Fuel Sensor Data(Optional)*

The raw data read from the digital fuel sensor. If Bit 0 of <ERI Mask> in AT+GTFRI is enabled, this field will be displayed; otherwise, it will not be displayed.

✧ *Expand Digital Fuel Sensor Data (Optional)*

Fields	Length	Range/Format
Reserved	0	
Reserved	0	
Data Mask	2	0000 - FFFF
Digital Fuel Sensor Data (Optional)	<=20	
Real-time Fuel Level (Optional)	<=5	0-99999(x0.1mm)

✧ *1-Wire Data (Optional)*

Fields	Length	Range/Format
1-wire Device Number	<=2	0-19
1-wire Device ID	16	
1-wire Device Type	1	1
1-wire Device Data	<=40	

- *1-wire Device Number*

  The number of 1-wire devices.

  If it is 0, the following fields <1-wire Device ID>, <1-wire Device Type> and <1-wire Device Data> will not be displayed.

  If there are more than one 1-wire devices connected, the following fields <1-wire Device ID>, <1-wire Device Type> and <1-wire Device Data> will appear repeatedly showing the information of all connected 1-wire devices.

  If Bit 1 of <ERI Mask> in AT+GTFRI is enabled, the information contained in the <1-wire Data> field will be displayed; otherwise, <1-wire Data> related information will not be displayed.
- *1-wire Device ID*

  It indicates the device ID read from the 1-wire device.
- *1-wire Device Type*

  It indicates the type of the 1-wire device.
  - **1** - Temperature sensor.
- *1-wire Device Data*

  It indicates the data read from the 1-wire devices.

  If <1-wire Device Type> is 1, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix). To get the real temperature in degrees Centigrade,

please convert the data to a decimal value according to the calculation in Appendix first and then multiply the decimal value by 0.0625.

✧ *CAN Data (Optional)*

If Bit 2 of <ERI Mask> in AT+GTFRI is set to 1, the data got from CAN device will be displayed.

✧ *Fuel Sensor Data (Optional)*

Fields	Length	Range/Format
Sensor Number	<=3	0-100
Sensor Type	<=2	0-6|20-22
Percentage (Optional)	<=5	0-100.0
Volume (Optional)	<=6	0-6000.0
Fuel Temperature (Optional)	<=3	-40-85(x1 ℃)

- *Sensor Type*

  The sensor type for the currently set table.

  - **0** - EPSILON ES2 or ES4
  - **1** - LLS 20160
  - **2** - DUT-E
  - **3** - QFS100
  - **4** - UFSxxx (RS232)
  - **5** - Reserved
  - **6** - DUT-E SUM
  - **20** - ADC1
  - **21** - ADC2
  - **22** - ADC3

- *Fuel Temperature (Optional)*

  The real-time temperature detected by the digital fuel sensor.

  If Bit 10 of <ERI Mask> in AT+GTFRI is set to 1 and <Sensor Type> is 2 or 6 , <Fuel Temperature> will be present.

✧ *RF433 Accessory Data (Optional)*

Fields	Length	Range/Format
Accessory Number	<=2	0-10
Accessory Serial Number	5	00001-FFFFE
Accessory Type	1	1|2
Temperature	<=3	-20-60(x1 ℃)
Humidity (Optional)	<=3	0-100(x1%)

- *Accessory Number*

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The number of paired RF433 accessories.

- *Accessory Serial Number*
  The serial number of WPB100, WTS100 or WTH100.
- *Accessory Type*
  It indicates the type of the accessory.
  - **1** - Wireless temperature sensor (WTS100)
  - **2** - Wireless temperature & humidity sensor (WTH100)
- *Temperature*
  The real-time temperature detected by the sensor.
- *Humidity (Optional)*
  The real-time humidity detected by the sensor. If <Accessory Type> is 2, <Humidity> will be present.

✧ *Bluetooth Accessory Data (Optional)*

Fields	Length	Range/Format
Bluetooth Accessory Number	<=2	0-10
Index	2	0-9
Accessory Type	<=2	0-2|6-8|10-15|23
Accessory Model	1	0-5
Raw Data	<=18	
Accessory Append Mask	<=4|8	0-7FFFFFFF
Accessory Name(Optional)	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Accessory MAC(Optional)	12	000000000000 - FFFFFFFFFFFF
Accessory Status(Optional)	1	0|1
Accessory Battery Voltage(Optional)	<=4	0-5000(mV)
Accessory Temperature(Optional)	<=3	-40-80(℃)
Accessory Humidity(Optional)	<=3	0-100(%RH)
Accessory Output Status(Optional)	2	00 - 03
Accessory Digital Input Status(Optional)	2	00 - 01
Accessory Analog Input Voltage(Optional)	<=5	0-32000(mV)
Accessory Mode(Optional)	<=2	0-12
Accessory Event(Optional)	<=3	0-255
Tire pressure(Optional)	<=3	0-500(kPa)
Timestamp(Optional)	14	YYYYMMDDHHMMSS

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Fields	Length	Range/Format
Enhanced Temperature(Optional)	<=5	-40.00-80.00(℃)
Magnet ID(Optional)	2	00 - FF
MAG Event Counter(Optional)	<=5	0-32767
Magnet State(Optional)	1	0|1
Accessory Battery Percentage(Optional)	<=3	0-100(%)
Relay State(Optional)	1	0|1
Tri-axial Acceleration Data (Optional)	12	(HEX)
Angle Values (Optional)	6	(HEX)
Event Mask (Optional)	2	(HEX)
Tilt Event (Optional)	4	(HEX)
Motion Event (Optional)	4	(HEX)
Crash Event (Optional)	4	(HEX)
Falling Event (Optional)	4	(HEX)
Move Event (Optional)	4	(HEX)
Accessory RSSI (Optional)	<=4	-128-127
Device Serial Number (Optional)	6	HEX
Sensor Identifier (Optional)	4	HEX

- *Bluetooth Accessory Number*
  It indicates the number of Bluetooth accessories connected with the device.
- *Index*
  The Index of the Bluetooth accessory.
- *Accessory Type*
  The type of the Bluetooth accessory.
  - **0** - No Bluetooth accessory
  - **1** - Escort sensor
  - **2** - Beacon temperature sensor
  - **6** - Beacon multi-functional sensor
  - **7** - Techonoton accessory
  - **8** - External Input Output Bluetooth accessory
  - **10** - Mechatronics Bluetooth accessory
  - **11** - Magnet sensor
  - **12** - BLE TPMS sensor

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- **13** - Relay sensor
- **14** - Smart Cap sensor
- **15** - Movement-angle BLE sensor
- **23** - Epsilon sensor

- *Accessory Model*
  The model of the Bluetooth accessory.
- *Raw Data*
  The raw data is read from Bluetooth accessory. It varies depending on <Accessory Type> and <Accessory Model>.
  - **WTH300** - It is a four-byte hexadecimal value. The higher 2 bytes of the hexadecimal value indicate temperature, the lower 2 bytes indicate humidity. The high byte is the integer part and the low byte is the fractional part.

    Temperature is equal to the low byte divided by 256 plus the high byte, in degree Centigrade. Humidity is equal to the low byte divided by 256 plus the high byte, and the unit is rh.
  - **WRL300** - It is a four-byte hexadecimal value. It indicates the current state of the relay.
  - **WMS301/WTH301** - It is a four-byte hexadecimal value. The lower 2 bytes of the hexadecimal value indicate temperature, the higher 2 bytes indicate humidity.

    Humidity is equal to the higher 2 bytes divided by 100, and the unit is rh. Temperature is equal to the lower 2 bytes divided by 100, in degree Centigrade.
  - **Fuel sensor** - For Mechatronics fuel sensor, if the value starts with the character “F” (“FXX”), it indicates the fuel percentage, otherwise it indicates the original fuel level value.

    Note

    For more details, please refer to parameter <Fuel Level Format> in AT+GTBAS.
  - **WTS300** - It is a four-byte hexadecimal value. The higher 2 bytes of the hexadecimal value indicate battery voltage in millivolt, the lower 2 bytes indicate temperature. The high byte is the integer part and the low byte is the fractional part.

    Temperature is equal to the low byte divided by 256 plus the high byte, in degree Centigrade.
  - **TEMP ELA** - It is a two-byte hexadecimal Temperature value.
  - **Escort Angle Sensor** -

Fields	Length	Range/Format	Description
Reserved	1	00	Reserved
Event Notification/RPM	1	00 - FF	Event notification. If mode 4/5 is chosen, there are 2 transmission data formats, namely **direction only** and **speed and RPM**. For “direction only”, a notification event is transmitted depending on the direction of rotation around the axis. For “speed and RPM”, revolutions per minute within the range

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Fields	Length	Range/Format	Description
			-50 to 50. And the range from 0 to 50 for the rotation to the right, from -50 to 0 for the rotation to left.
Tilt Angle/Total Revolutions Counter	2	0000 - FFFF	If mode 4/5 is chosen, for "speed and RPM" data format, the sensor will transmit the number of complete revolutions.
Angle Sensor Mode	1	00 - FF	Operating modes

- **Mechatronics Angle Sensor** - It is an eight-byte hexadecimal value.

Fields	Length	Range/Format
Reserved	1	00
X-plane angle	1	-90 - 90
Y-plane angle	1	-90 - 90
Z-plane angle	1	-90 - 90
Sensor status	1	0 - FF
Single events	2	0 - FFFF
Complex events	2	0 - FFFF

- **DDS Sensor** - It is a seven-byte hexadecimal value.

Fields	Length	Range/Format	Description
Reserved	1	00	N/A
Status	1	0 - FF	Status flags(locked or no lock)
Angle	2	0 - FFFF	Current angle value. Resolution 0.001 rad/bit
Weight	2	0 - FFFF	Current weight. Resolution 1kg/bit
Axle Load	1	0 - FF	Current axle load. Resolution 1%/bit

- **DPS Sensor** - It is a seven-byte hexadecimal value.

Fields	Length	Range/Format	Description
Reserved	1	00	N/A
Status	1	0 - FF	Status flags(locked or no lock)
Pressure	2	0 - FFFF	Current pressure. Resolution 0.1 KPa per bit
Weight	2	0 - FFFF	Current weight. Resolution 1kg/bit
Load	1	0 - FF	The current load. Resolution 1% per bit.

- **RHT ELA** - It is a four-byte hexadecimal value. The lower 2 bytes of the hexadecimal value indicate temperature, the higher 2 bytes indicate humidity.

- **ATP100/ATP102** - It is a four-byte hexadecimal value.

From left to right, the first byte is reserved(0x00).

The second byte includes pressure value. Tire pressure is equal to the second byte multiply by 2.5.

The third byte includes temperature and low power alarm. Temperature is equal to the third byte subtract by 40.

The higher 4 bits of last byte includes the product model, and the lower 4 bits of last byte includes the firmware version.

- **MAG ELA** - It is a four-byte hexadecimal value. The lower 2 bytes of the hexadecimal value indicate MAG data, the higher 2 bytes indicate MAG ID.
- **TR21** - It is a four-byte hexadecimal value.

From left to right, the first byte includes battery percentage.

The second byte includes temperature value.

The third byte includes unlocked state. For example, 0x75 means cap is unlocked, and 0x6c means cap is locked.

The last byte includes the rotation state. For example, 0x72 means cap has been rotated recently, and 0x73 means cap is steady.

- *Accessory Append Mask*

This parameter indicates which Bluetooth accessory data needs to be reported in the message. If Bit 15 is set to 0, only Bit 0 - Bit 14 are valid.

If Bit 15 is set to 1, the mask will be expanded, and Bit 16 - Bit 31 are valid.

Mask Bit	Item	Description
Bit 0	<Accessory Name>	Accessory Name
Bit 1	<Accessory MAC>	Accessory MAC
Bit 2	<Accessory Status>	Accessory Bluetooth Connection Status
Bit 3	<Accessory Battery Voltage>	Accessory Battery Voltage
Bit 4	<Accessory Temperature>	Accessory Temperature
Bit 5	<Accessory Humidity>	Accessory Humidity
Bit 6	Reserved	Reserved

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Mask Bit	Item	Description
Bit 7	<Accessory Input Output Data>	Including <Accessory Output status>, <Accessory Digital Input status>, <Accessory Analog Input Voltage>
Bit 8	<Accessory Event Notification Data>	Including <Accessory Mode>, <Accessory Event>
Bit 9	<Tire pressure>	Tire pressure
Bit 10	<Timestamp>	Timestamp
Bit 11	<Enhanced Temperature>	Enhanced temperature
Bit 12	<Magnet Data>	Including <Magnet ID>, <MAG Event Counter>, <Magnet State>
Bit 13	<Accessory Battery Percentage>	Accessory Battery Percentage
Bit 14	<Relay Data>	Including <Relay Config Result>, <Relay State>
Bit 15	<Expansion Mask>	Expansion Mask for Bit 16 - Bit 31
Bit 16	<Tri-axial Acceleration Data>	Tri-axial Acceleration Data
Bit 17	<Angle Values>	Angle Values
Bit 18	<Sensor Event Mask>	Including <Event Mask>, <Tilt Event>, <Motion Event>, <Crash

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Mask Bit	Item	Description
		Event>, <Falling Event>
Bit 19	<MOV ELA Data>	Move Event
Bit 20	Reserved	Reserved
Bit 21	<Accessory RSSI>	Accessory RSSI
Bit 22	Reserved	Reserved
Bit 23	<ER2 Info Mask>	Including <Device Serial Number>, <Sensor Identifier>
Bit 24	Reserved	Reserved
Bit 25	Reserved	Reserved
Bit 26	Reserved	Reserved
Bit 27	Reserved	Reserved
Bit 28	Reserved	Reserved
Bit 29	Reserved	Reserved
Bit 30	Reserved	Reserved
Bit 31	Reserved	Reserved

Note

In the message bit 0 - bit 15 precedes bit 16- bit 31. Here is an example: <Accessory Append Mask> = 0x881F0007, 0x881F indicates Bit 15 - Bit 0, 0x0007 indicates Bit 31 - Bit 16.

- *Accessory Name(Optional)*

  The name of the Bluetooth accessory.

- *Accessory MAC(Optional)*

  The MAC address of the Bluetooth accessory.

- *Accessory Status(Optional)*

  It indicates the connection status of the Bluetooth accessory.

  - **0** - Disconnected

- **1** - Connected

- *Accessory Battery Voltage(Optional)*

  It indicates the voltage of the battery in Bluetooth accessory.

- *Accessory Temperature(Optional)*

  It indicates the temperature measured by Bluetooth accessory.

- *Accessory Humidity(Optional)*

  It indicates the humidity measured by the Bluetooth accessory.

- *Accessory Output Status(Optional)*

  The status of Bluetooth accessory output. Each bit indicates the status of one output.

  For example, 0X01 indicates that Output ID 7 is enabled and Output ID 8 is disabled.

- *Accessory Digital Input Status(Optional)*

  The status of Bluetooth accessory digital input.

- *Accessory Analog Input Voltage(Optional)*

  The status of Bluetooth accessory analog input voltage.

- *Accessory Mode(Optional)*

  The working mode of Angle sensor.

- *Accessory Event(Optional)*

  The event is generated by the Angle sensor.

- *Timestamp(Optional)*

  Timestamp of the tire pressure value collection.

- *Enhanced Temperature(Optional)*

  It instructs Bluetooth accessories to measure temperature with high precision.

  Note

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Temperature alarm uses integer value.

- *Magnet ID(Optional)*

  ID corresponding to different magnet sensors.

- *MAG Event Counter(Optional)*

  The total number of times detected by the magnet sensor.

- *Magnet State(Optional)*

  The state of the two parts of the magnet sensor.

  - **0** - Separate
  - **1** - Closed

- *Accessory Battery Percentage(Optional)*

  Percentage of Bluetooth accessory's battery power.

- *Relay State(Optional)*

  The current state of the relay sensor.

- *Tri-axial Acceleration Data (Optional)*

  The values are coded on 16 bits (signed) in mg (+8g/-8g).

  For example, **0xFFFE0005FF04**:

	X-axis		**Y-axis**		**Z-axis**	
HEX	D[0]	D[1]	D[2]	D[3]	D[4]	D[5]
Binary	0xFF	0xFE	0x00	0x05	0xFF	0x04

  - **X-axis** - 0xFFFE => -2mg acceleration on X-axis
  - **Y-axis** - 0x0005 => 5mg acceleration on Y-axis
  - **Z-axis** - 0xFF04 => -252mg acceleration on Z-axis

- *Angle Values (Optional)*

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Angle values are coded on 8 bits(unsigned). The values are expressed in degree (0-180 degree) based on the direction of gravity.

For example, **0x5A5A00**:

	X-axis	**Y-axis**	**Z-axis**
HEX	D[0]	D[1]	D[2]
Binary	0x5A	0x5A	0x00

- **X-axis** - 0x5A => 90deg, X-axis state is horizontal
- **Y-axis** - 0x5A => 90deg, Y-axis state is horizontal
- **Z-axis** - 0x00 => 0deg, Z-axis state is vertical up

Note

If the angle value cannot be obtained, then use 0xFF to represent an invalid angle value.

- *Event Mask (Optional)*

  This is event alarm mask.

  - **Bit 0** - Tilt mask, it controls Angle Tilt zone.
  - **Bit 1** - Motion mask, it controls motion state zone.
  - **Bit 2** - Crash mask, it controls Crash value zone.
  - **Bit 3** - Falling mask, it controls Falling value zone.

  If tilt function is enabled, the tilt mask will be set to 1, otherwise it will be set to 0.

  If motion function is enabled, the motion mask will be set to 1, otherwise it will be set to 0.

  If crash function is enabled, the crash mask will be set to 1, otherwise it will be set to 0.

  If falling function is enabled, the falling mask will be set to 1, otherwise it will be set to 0.

- *Tilt Event (Optional)*

  Tilt Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: tilt/0: normal) on LSB.

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	Tilt[0]		Tilt[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: **0x000A**

- **0** - Tilt state (normal)
- **0000 0000 0000 101** - Event counter value on 15 bits, count 5

- *Motion Event (Optional)*

  Motion Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: move/0: still) on LSB.

	Motion[0]		Motion[1]	
HEX	0	0	0	B
Binary	0000	0000	0000	1011

  For example: **0x000B**

  - **1** - Motion state (move)
  - **0000 0000 0000 101** - Event counter value on 15 bits, count 5

- *Crash Event (Optional)*

  Crash Event (state change) counter on the 16 (unsigned) bits.

	Crash[0]		Crash[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

  For example: **0x000A**

  - **0000 0000 0000 1010** - Event counter value on 16 bits, count 10

- *Falling Event (Optional)*

  Fall Event (state change) counter on the 16 (unsigned) bits.

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	Falling[0]		Falling[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: **0x000A**

- **0000 0000 0000 1010** - Event counter value on 16 bits, count 10

- *Move Event (Optional)*

  Move Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: move/0: still) on LSB.

	Motion[0]		Motion[1]	
HEX	0	0	0	B
Binary	0000	0000	0000	1011

For example: **0x000B**

- **1** - Move state (move)
- **0000 0000 0000 101** - Event counter value on 15 bits, count 5

- *Accessory RSSI (Optional)*

  Signal strength RSSI value for the Bluetooth accessory.

- *Device Serial Number (Optional)*

  A hexadecimal value representing the device serial number of ER2-BLE sensor.

- *Sensor Identifier (Optional)*

  A hexadecimal value representing the sensor identifier (sensor number in the group) of ER2-BLE sensor.

✧ *RAT and Band data (Optional)*

Fields	Length	Range/Format
RAT	<=2	0|1|4

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Fields	Length	Range/Format
Band	<=4	0- 5|7|8|20|28|850|900|1800|1900

- *RAT*

  Radio Access Technology.

  - **0** - NO SERVICE mode
  - **1** - EGPRS mode
  - **4** - LTE Cat1 mode

- *Band*

  0 means invalid band, 1-5/7-8/20/28 means band number and others means GSM number.

Note

The word “Optional” means the item is controlled by the parameter <ERI Mask> of the AT+GTFRI command.

4.2.4 EPS | AIS

- **+RESP:GTEPS**

  If the external power supply monitoring is enabled by the command AT+GTEPS, the device will send the message **+RESP:GTEPS** to the backend server when the voltage of the external power supply enters the alarm range.

- **+RESP:GTAIS**

  If the analog input alarm is enabled by the command AT+GTAIS, the device will send the message **+RESP:GTAIS** to the backend server when analog input voltage enters the alarm range.

Example:

+RESP:GTEPS,740D01,135790246811220,GV350CEU,13500,00,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,01,15,2000.0,20090214093254,11F0$

+RESP:GTAIS,740D01,135790246811220,GV350CEU,1980,11,1,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,01,15,2000.0,20090214093254,11F0$

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Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	EPS | AIS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	External Power Voltage/Analog Input Voltage	<=5	0-32000| 0-30000(mV)
	Report ID / Report Type	2	X(0-3 | 5)Y(0 | 1)
	Number	1	1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *External Power Voltage/Analog Input Voltage*

The value of the external power supply voltage or the analog input voltage.

When the voltage meets the alarm condition as set by the command **AT+GTEPS** or **AT+GTAIS**, the

device will send the current voltage with the **+RESP:GTEPS** or **+RESP:GTAIS** message to the backend server.

✧ *Report ID / Report Type*

It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

- Report ID has different meanings as follows:
  - The value of Report ID for the report message **+RESP:GTEPS** is 0.
  - The ID of the analog input port which triggers the report message **+RESP:GTAIS**, the range is 1 - 3 or 5.
- Report type has the following meanings:
  - **0** - Outside the predefined range.
  - **1** - Within the predefined range.

✧ *Number*

The number of the GNSS positions included in the report message. Generally, it is 1.

4.2.5 LBC (Location By Call Alarm)

If the parameter <Location Request Mask> is enabled by the command AT+GTCFG, the device will get and send the current position to the backend server via the message **+RESP:GTLBC** when there is an SMS.

Example:

+RESP:GTLBC,740D01,135790246811220,GV350CEU,13275605061,1,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,01,1,20090214093254,008E$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	LBC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Call Number	<=20	phone number
	GNSS Accuracy	<=2	0-50

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Parts	Fields	Length	Range/Format
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Call Number*

The phone number of the incoming call which triggers the report message.

4.2.6 IDA (ID Authentication Alarm)

If <Mode> in AT+GTIDA is set to 1 , 2 or 5, **+RESP:GTIDA** will be reported according to the setting.

If <Mode> in **AT+GTIDA** is set to 0, **+RESP:GTIDA** will always be reported without checking the status of ID authorization.

Example:

+RESP:GTIDA,740D01,862170013895931,GV350CEU,,D2C4FBC5,1,1,1,0.8,0,22.2,117.198630,31.845229,20120802121626,0460,0000,5663,2BB9,01,15,0.0,,,,,20120802121627,008E$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	IDA

Parts	Fields	Length	Range/Format
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	ID	<=28	ASCII (not including '=' and ',')
	ID Report Type	1	0-3
	Number	1	0-1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

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✧ *ID*

The ID that is read currently.

✧ *ID Report Type*

A numeral to indicate the type of reported ID.

- **0** - IDA function is disabled.
- **1** - The ID is authorized.
- **2** - The ID has logged out.
- **3** - The ID is unauthorized.

4.2.7 GES (Parking-Fence Information)

The **+RESP:GTGES** message is reported according to <Trigger Mode> and <Trigger Report> in AT+GTGEO after the ignition is turned off.

Example:

+RESP:GTGES,740D01,864696060004173,GV350CEU,,01,21,500,5,1,1,0.0,0,98.1,117.129366,31.839314,20230808070315,0460,0001,DF5C,05FE6667,01,15,4.0,20230808070316,0064$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	GES
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Report ID / Report Type	<=3	X(0 - 13)Y(0 - 1)
	Trigger Mode	<=2	0 | 21 | 22
	Radius	<=7	50-6000000(m)
	Check Interval	<=5	0| 5-86400(s)
	Number	1	0-1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359

Parts	Fields	Length	Range/Format
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	0XXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Report ID / Report Type*

It is a hexadecimal value represented by three ASCII bytes. The first two bytes indicates Report ID and the last byte indicates Report Type.

- Report ID
  The ID of Geo Fence in HEX format.
- Report Type
  - **0** - The current Parking-Fence is inactive.
  - **1** - The current Parking-Fence is active.

4.2.8 GIN | GOT (Geo-Fence Information)

- **+RESP:GTGIN**

  If Geo-Fence is configured and enabled, the device will send the message **+RESP:GTGIN** to the backend server according to settings when the device enters the Geo-Fence.

- **+RESP:GTGOT**

  If Geo-Fence is configured and enabled, the device will send the message **+RESP:GTGOT** to the backend server according to settings when the device leaves the Geo-Fence.

Example:

+RESP:GTGIN,740D01,866775051509693,GV350CEU,,0,1,00000001,,,,,1,2,0.0,128,87.2,117.129397,31.838586,20240129091900,0460,0001,DF5C,05FE6667,01,12,0.0,20240129171901,B3B3$

+RESP:GTGOT,740D01,866775051509693,GV350CEU,,0,1,00000001,,,,,1,2,0.0,128,87.2,117.129397,31.838586,20240129092014,0460,0001,DF5C,05FE6667,00,0.0,20240129172014,B3BF$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	GIN | GOT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	ID Report Format	1	0| 1
	Parameter 1	0	
	Parameter 2	0	
	Parameter 3	0	
	Parameter 4	0	
	Parameter 5	0	
	Reserved	0	
	Number	1	1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX

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Parts	Fields	Length	Range/Format
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *ID Report Format*

A numerical value to indicate the format of GEO ID. The following five parameters have different definitions for each format.

- **0** - Mask Format.

Each Geo ID will be indicated as a bit of <Area Mask>.

Fields	Length	Range/Format
Area Type	1	1
Area Mask 1	8	00000000 - 000FFFFF
Area Mask 2	8	HEX
Area Mask 3	8	HEX
Area Mask 4	8	HEX

- **1** - Group Format.

Using <Group ID>, <Start GEO ID> and <End GEO ID> to indicate reported Geo Fence.

Fields	Length	Range/Format
Area Type	1	0
Area Mask	8	00000000-000FFFFF
Group ID	1	0 - 9
Start GEO ID	<=3	0 - 199
End GEO ID	<=3	0 - 199

– *Area Type*

This message is for polygon or circular area. 0 means “Polygon”, and 1 means “Circular”.

– *Area Mask*

For polygon area, it indicates the report message is for a single polygon or multiple polygons overlapping.

- **Bit 0** - For Polygon ID 0

- **Bit 1** - For Polygon ID 1
- …
- **Bit 199** - For Polygon ID 199

For circular area, it indicates the report message is for a single circle or multiple circles overlapping.

- **Bit 0** - For Circular ID 0
- **Bit 1** - For Circular ID 1
- …
- **Bit 19** - For Circular ID 19

For example, if the Area Mask is 03, it indicates entering or exiting events of GEO-ID0/PEO-ID0 and GEO-ID1/PEO-ID1 occur at the same time.

4.2.9 SPE (Speed Alarm inside the Geo-Fence)

If the <Speed Threshold> in command AT+GTPEG is greater than 0, the message **+RESP:GTSPE** will be sent to the backend server when the device speed is higher than <Speed Threshold> if it is inside the Geo-Fence.

Example:

+RESP:GTSPE,740D01,868589060166249,GV350CEU,3,,,01,1,1,78.0,147,57.5,116.981043,31.964032,20230426032558,0460,0001,DF5C,027A4F1F,01,1,0.0,20230426032559,0432$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	SPE
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Group ID	1	0-9
	Reserved	0	
	Reserved	0	
	Report ID / Report Type	2	X(0) | Y(0 | 1)
	Number	1	1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)

Parts	Fields	Length	Range/Format
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Group ID*

A numeral to indicate in which group the speed alarm is triggered.

✧ *Report ID / Report Type*

It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

- *Report Type*

  Report type in the speed alarm message **+RESP:GTSPE** has the following meanings:

  - **0** - The value of the current speed is below the <Speed Threshold> or the device is outside the current Polygon Geo-Fence.
  - **1** - The value of the current speed exceeds the <Speed Threshold> when the device is inside the Polygon Geo-Fence.

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4.2.10 Google Maps Hyperlink

If the Google Maps hyperlink reporting feature in parameter <Location Request Mask> of the command AT+GTCFG is enabled, the device will send its current position to the mobile phone which makes the call request or SMS request via SMS with a Google Maps hyperlink.

Example:
LBC: GV350CEU
http://maps.Google.com/maps?q=31.222073,121.354335
F1 D2009/01/01 T00:00:00 B0 I1 V0.0

Parts	Fields	Length	Range/Format
Body	Type Name	<=10	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Device Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Google Maps Hyperlink Header	30	http://maps.google.com/maps?q=
	Latitude	<=10	(-)xx.xxxxxx
	Longitude	<=11	(-)xxx.xxxxxx
	GNSS Fix	<=3	F[0 - 50]
	GNSS UTC Time	20	DYYYY/MM/DDTHH:MM:SS
	Battery Percentage	<=4	B[0 - 100]
	Ignition Status	2	0| 1
	Speed	<=6	V0.0-V999.9(km/h)

- *Type Name*
  A string that includes the device name and GNSS positioning type. (“SOS”, “IN GEO-i”, “OUT GEO-i”, “LBC”)
- *Google Maps Hyperlink*
  A string of a Google Maps hyperlink.
- *GNSS Fix*
  The accuracy of the location information. F0 means “No GNSS fix”.
- *Battery Percentage*
  The percentage of the backup battery.
- *Ignition Status*
  The status of ignition.
  - **0** - Ignition off
  - **1** - Ignition on

✧ *Speed*
The current speed. Unit: km/h.

4.2.11 TRL (Tachographer Real Location)

This message is used to report location position and DDD information before reporting DDD data, and it can only be sent via GPRS even if the report mode is forced SMS mode.

Example:
+RESP:GTTRL,740D01,867995030090222,GV350CEU,0002,C_20190712_0700_DARIUS_TAMASAUSKAS_V1
00000108084000.DDD,0,0.0,0,101.1,117.129125,31.839185,20190712065656,0460,0000,550B,B969,01,1,,,
,,20190712145659,1802$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TRL
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	File Download Count	4	0001-FFFF
	DDD File Name	<=128	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX

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Parts	Fields	Length	Range/Format
	Position Append Mask	2	00-FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *File Download Count*
A number that marks the messages between **+RESP:GTTRD** and **+RESP:GTTRL**.

✧ *DDD File Name*
The file name of DDD.

4.2.12 GSM (Cells Information)

The report for the information of the serving cell and the neighboring cells.

Example:
+RESP:GTGSM,740904,866775051508042,FRI,0460,0011,691D,06919805,42,,0460,0011,DE10,027A4F1F,17,,0460,0011,691D,0690271C,52,,0460,0011,691D,0DE98A34,38,,0460,0011,691D,0DE98A34,27,,0460,0011,691D,0DE98A34,29,,0460,0011,691D,6919837,43,00,20220630061500,30AD$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	GSM
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
Body	Fix Type	3	SOS| RTL| LBC| TOW| FRI| GIR| ERI

Parts	Fields	Length	Range/Format
	MCC1	4	0XXX
	MNC1	4	0XXX
	LAC1	4	XXXX
	Cell ID1	4|8	XXXX| XXXXXXXX
	RX Level1	<=3	0-31| 99| 0-97| 255
	Reserved	0	
	MCC2	4	0XXX
	MNC2	4	0XXX
	LAC2	4	XXXX
	Cell ID2	4|8	XXXX| XXXXXXXX
	RX Level2	<=3	0-31| 99| 0-97| 255
	Reserved	0	
	MCC3	4	0XXX
	MNC3	4	0XXX
	LAC3	4	XXXX
	Cell ID3	4|8	XXXX| XXXXXXXX
	RX Level3	<=3	0-31| 99| 0-97| 255
	Reserved	0	
	MCC4	4	0XXX
	MNC4	4	0XXX
	LAC4	4	XXXX
	Cell ID4	4|8	XXXX| XXXXXXXX
	RX Level4	<=3	0-31| 99| 0-97| 255
	Reserved	0	
	MCC5	4	0XXX
	MNC5	4	0XXX
	LAC5	4	XXXX
	Cell ID5	4|8	XXXX| XXXXXXXX
	RX Level5	<=3	0-31| 99| 0-97| 255
	Reserved	0	

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Parts	Fields	Length	Range/Format
	MCC6	4	0XXX
	MNC6	4	0XXX
	LAC6	4	XXXX
	Cell ID6	4|8	XXXX| XXXXXXXX
	RX Level6	<=3	0-31| 99| 0-97| 255
	Reserved	0	
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	RX Level	<=3	0-31| 99| 0-97| 255
	Reserved	2	00
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Fix Type*

A string to indicate the type of GNSS fix for which this cell information is used.

- **SOS** - This cell information is for SOS request.
- **RTL** - This cell information is for RTL request.
- **LBC** - This cell information is for LBC request.
- **TOW** - This cell information is for TOW request.
- **FRI** - This cell information is for FRI request.
- **GIR** - This cell information is for sub command "**C**" in the AT+GTRTO command.
- **ERI** - This cell information is for ERI request.

✧ *MCC(i)*

MCC of the neighboring cell i (i is the index of the neighboring cell).

✧ *MNC(i)*

MNC of the neighboring cell i.

✧ *LAC(i)*

LAC in hex format of the neighboring cell i.

✧ *Cell ID(i)*

Cell ID in hex format of the neighboring cell i.

✧ *RX Level(i)*

The signal strength of the neighboring cell i. This parameter is a 6-bit value coded in 1 dB steps:
For 2G/3G network:

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 - 30	-109 - -53
31	>-51
99	Unknown

For 4G network:

CSQ RSRP	Signal Strength (dBm)
0	<-140
1	-140
2 - 96	-139 - -44
97	>= -44
255	Unknown

✧ *MCC*
MCC of the serving cell.

✧ *MNC*
MNC of the serving cell.

✧ *LAC*
LAC in hex format of the serving cell.

✧ *Cell ID*
Cell ID in hex format of the serving cell.

✧ *RX Level*
The signal strength of the serving cell.

Note

- **1** - It may include information of several neighboring cells or even no neighboring cell information. If no neighboring cell is found, all the fields of the neighboring cell will be empty.
- **2** - The “ffff” in the fields of <LAC(i)> and <Cell ID(i)> means the terminal does not know the value.
- **3** - This message cannot be sent via SMS.

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4.2.13 ETI (Electronic Toll Information Report)

Example:
+RESP:GTETI,741306,867488060297461,,,,,1,0.0,0,58.2,21.012200,52.229700,20251117070732,0460,0001,DF5C,05FE6667,00,,4450.0,0000001:00:06,,,,,210102,,,,20251117070732,0088$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	ETI
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Reserved	0	
	Number	<=2	0-15
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Reserved	0	

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Parts	Fields	Length	Range/Format
	Mileage	<=9	0.0-4294967.0(km)
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Device Status	6 | 10	000000 - 0F0FFFFFFF
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *Number*
- *Position Append Mask*

  A bitwise numeral to control whether to include the corresponding fields in each position after <Cell ID>.

- *Satellites in Use (Optional)*

  If bit 0 of <Position Append Mask> is enabled, this part will be displayed with the number of satellites in use for the current position.

- *Hour Meter Count*

  If the hour meter count function is enabled by the command AT+GTHMC, total hours the meter counts when the engine is on will be reported in this field. It consists of three parts separated by ":", the first part is the hour digit and the length of it is between 5 to 7 bytes, the second part is the 2-byte minute digit, and the last part is the 2-byte second digit. And it ranges from 00000:00:00 to 1193000:00:00. If the function is disabled, this field will be empty.

- *Device Status*

  The status of the device.

  From left to right, the first two bytes indicate EIO100 input status, the second two bytes indicate EIO100 output status, the third two bytes indicate the current motion status of the device, the fourth two bytes indicate the status of input ports, and the last two bytes indicate the status of output ports.

  The current motion status of the device:

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- **16 (Tow)** - The device attached vehicle is ignition off and it is towed.
- **1A (Fake Tow)** - The device attached vehicle is ignition off and it might be towed.
- **11 (Ignition Off Rest)** - The device attached vehicle is ignition off and it is motionless.
- **12 (Ignition Off Motion)** - The device attached vehicle is ignition off and it is moving before it is considered as being towed.
- **21 (Ignition On Rest)** - The device attached vehicle is ignition on and it is motionless.
- **22 (Ignition On Motion)** - The device attached vehicle is ignition on and it is moving.
- **41 (Sensor Rest)** - The device attached vehicle is motionless without ignition signal detected.
- **42 (Sensor Motion)** - The device attached vehicle is moving without ignition signal detected.

The input status: A bitwise hex integer to represent the logic status of digital input. The low bit represents the ignition detection input and the high bit represents the digital input.
The output status: A bitwise hex integer to represent the logic status of digital output. The low bit represents digital output.
If EIO100 device is not connected or <EIO100 Connection> in command AT+GTACD is 0, the optional bits will not be included.
If EIO100 device is not connected or the mode of AT+GTURT is not for EIO100, the optional bit 24 - bit 35 will not be included.

Mask Bit	Item
Bit 0	Digital output 1
Bit 1	Digital output 2
Bit 2	Digital output 3
...	Reserved
Bit 8	Ignition detection
Bit 9	Digital input 1
Bit 10	Digital input 2
Bit 11	Digital input 3
Bit 12	Digital input 4
...	Reserved
Bit 16	Motion status of the device
Bit 17	Motion status of the device
Bit 18	Motion status of the device
Bit 19	Motion status of the device
Bit 20	Motion status of the device
Bit 21	Motion status of the device
Bit 22	Motion status of the device
Bit 23	Motion status of the device
Bit 24	EIO100 output 9
Bit 25	EIO100 output A

Mask Bit	Item
Bit 26	EIO100 output B
Bit 27	EIO100 output C
...	Reserved
Bit 32	EIO100 input 9
Bit 33	EIO100 input A
Bit 34	EIO100 input B
Bit 35	EIO100 input C

4.3 Device Information Reports

This section describes the message related to device generic information. Please refer to the details below.

4.3.1 INF (Device Information)

If the device information report function is enabled by the command AT+GTCFG, the device will send the device information via the message **+RESP:GTINF** to the backend server periodically.

Example:
+RESP:GTINF,740D00,135790246811220,GV350CEU,16,898600810906F8048812,16,0,1,12000,1,4.40,0,0,,,20230214013254,,15097,100,19922,0000,0001,+0800,0,20230214093254,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	INF
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Motion Status	2	11| 12| 16| 1A| 21| 22| 41| 42
	ICCID	20	
	CSQ RSSI|RSRP	<=3	0-31| 99| 0-97| 255

Parts	Fields	Length	Range/Format
	CSQ BER	<=2	0-7| 99
	External Power Supply	1	0| 1
	External Power Voltage	<=5	0-32000(mV)
	Network Type	1	0-3
	Backup Battery Voltage	4	0.00-4.50(V)
	Charging	1	0| 1
	LED State	1	0| 1
	Reserved	0	
	Reserved	0	
	Last Fix UTC Time	14	YYYYMMDDHHMMSS
	Reserved	0	
	Analog Input1 Voltage	0	F(0 - 100)| 0 - 16000(mV)
	Analog Input2 Voltage	0	F(0 - 100)| 0 - 16000(mV)
	Analog Input3 Voltage	0	F(0 - 100)| 0 - 30000(mV)
	Digital Input	<=4	0000-0F0F
	Digital Output	<=4	0000-0F1F
	Time Zone Offset	5	+| -HHMM
	Daylight Saving	1	0| 1
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Motion Status*

The current motion status of the device.

- **16** - Tow

The device attached vehicle is ignition off and it is towed.

- **1A** - Fake Tow

The device attached vehicle is ignition off and it might be towed.

- **11** - Ignition Off Rest

The device attached vehicle is ignition off and it is motionless.

- **12** - Ignition Off Motion

The device attached vehicle is ignition off and it is moving before it is considered as being towed.

- **21** - Ignition On Rest

  The device attached vehicle is ignition on and it is motionless.

- **22** - Ignition On Motion

  The device attached vehicle is ignition on and it is moving.

- **41** - Sensor Rest

  The device attached vehicle is motionless without ignition signal detected.

- **42** - Sensor Motion

  The device attached vehicle is moving without ignition signal detected.

✧ *ICCID*

The ICCID of the SIM card.

✧ *CSQ RSSI|RSRP*

The signal strength level.

For 2G/3G network:

CSQ RSSI	Signal Strength (dBm)
0	< -113
1	-111
2 - 30	-109 - -53
31	> -51
99	Unknown

For 4G network:

CSQ RSRP	Signal Strength (dBm)
0	<-140
1	-140
2 - 96	-139 - -44
97	>= -44
255	Unknown

✧ *CSQ BER*

The quality of the GSM signal. The range is 0-7, and 99 is for unknown strength of signal.

✧ *External Power Supply*

Whether the external power supply is connected.

- **0** - Not connected.
- **1** - Connected.

✧ *External Power Voltage*

The voltage of the external power supply.

✧ *Network Type*

The type of the mobile network the device is currently registered on.

- **0** - Unregistered
- **1** - EGPRS

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- **2** - Reserved
- **3** - LTE

✧ *Backup Battery Voltage*

The voltage of the backup battery. The value of this field is valid only when the external power is not connected.

✧ *Charging*

Whether the backup battery is charging when the main power supply is connected.

- **0** - Not charging.
- **1** - Charging.

✧ *LED State*

A numeral to indicate the working status of all LED lights.

- **0** - All LED lights are turned off.
- **1** - At least one of the LED lights is on.

✧ *Last Fix UTC Time*

The UTC time of the latest successful GNSS fix.

✧ *Digital Input*

A bitwise hex integer to represent the logic status of the digital input.

If EIO100 device is not connected or the <EIO100 Connection> of AT+GTACD is 0, the optional bit 8 - bit 15 will not be included.

Mask Bit	Item
Bit 0	Ignition detection
Bit 1	Digital input 1
Bit 2	Digital input 2
Bit 3	Digital input 3
...	Reserved
Bit 8	EIO100 input 9
Bit 9	EIO100 input A
Bit 10	EIO100 input B
Bit 11	EIO100 input C
Bit 12-15	Reserved

✧ *Digital Output*

A bitwise hex integer to represent the logic status of the digital output.

If EIO100 device is not connected or the <EIO100 Connection> of AT+GTACD is 0, the optional bit 8 - bit 15 will not be included.

Mask Bit	Item
Bit 0	Digital output 1
Bit 1	Digital output 2

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Mask Bit	Item
Bit 2	Digital output 3
Bit 3	Digital output 4
Bit 4	Digital output 5
...	Reserved
Bit 8	EIO100 output 9
Bit 9	EIO100 output A
Bit 10	EIO100 output B
Bit 11	EIO100 output C
Bit 12-15	Reserved

✧ *Time Zone Offset*
The time offset of the local time zone from the UTC time.

✧ *Daylight Saving*
The current setting of the daylight saving.

- **0** - Daylight saving is disabled.
- **1** - Daylight saving is enabled.

4.4 RTO Reports

This section describes the message related to certain events. Please refer to the details below.

4.4.1 GPS (GNSS Information)

After the device receives the command AT+GTRTO to read the GNSS information, it will send the GNSS information to the backend server via the message **+RESP:GTGPS**.

Example:
+RESP:GTGPS,740D01,135790246811220,GV350CEU,,,,003F,,,20230524051345,20230524051346,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	GPS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI

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Parts	Fields	Length	Range/Format
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Reserved	0	
	Reserved	0	
	Report Item Mask	4	0000-FFFF
	Reserved	0	
	Reserved	0	
	Last Fix UTC Time	14	YYYYMMDDHHMMSS
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Report Item Mask*

Please refer to <Report Item Mask> of the command AT+GTCFG.

4.4.2 ALM (Command Configuration Information)

After the device receives the command AT+GTRTO to read the configurations, it will send corresponding configuration information to the backend server via the message **+RESP:GTALM** according to the configuration mask. This message is only sent via GPRS even if the report mode is forced SMS mode, and it does not support HEX format.

Example:

+RESP:GTALM,740D01,866775051629715,GV350CEU,1,1,1,BSI,cmnet,cmnet_name,cmnet_password,3gnet,3gnet_name,3gnet_password,1,,,\^,20231218071618,71C5$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	ALM
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'

Parts	Fields	Length	Range/Format
Body	Format Version	<=3	0-999
	Total Packets	<=2	1-99
	Current Packet	<=2	1-99
	BSI	3	BSI
	APN	<=64	
	APN User Name	<=30	
	APN Password	<=30	
	Backup APN	<=64	
	Backup APN User Name	<=30	
	Backup APN Password	<=30	
	Network Mode	1	0| 1| 3
	Reserved	0	
	Reserved	0	
	Cutoff Character(Optional)	2	\^
	...	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Total Packets*

The total number of **+RESP:GTALM**.

✧ *Current Packet*

The sequence number of the current message.

✧ *Network Mode*

- **0** - Auto (LTE & GSM/EGPRS)
- **1** - GSM/EGPRS Only
- **3** - LTE Only

✧ *Cutoff Character(Optional)*

It is controlled by the parameter <Format Version> in AT+GTRTO. If <Format Version> is 1, these two characters are appended to the end of each command configuration, otherwise this field will not exist.

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4.4.3 CID (ICCID Information)

After the device receives the command AT+GTRTO to read the ICCID of the SIM card, it will send the ICCID to the backend server via the message **+RESP:GTCID**.

Example:
+RESP:GTCID,740D01,864696060004173,GV350CEU,89860118801541301090,20230810112751,04EA$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CID
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	ICCID	20	'0' - '9', 'a' - 'z' 'A' - 'Z'
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.4.4 CSQ (Network Signal Information)

After the device receives the command AT+GTRTO to read the GSM signal level, it will send the GSM signal level to the backend server via the message **+RESP:GTCSQ**.

Example:
+RESP:GTCSQ,740D01,135790246811220,GV350CEU,16,0,20090214093254,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CSQ
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF

Parts	Fields	Length	Range/Format
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	CSQ RSSI|RSRP	<=3	0-31| 99| 0-97| 255
	CSQ BER	<=2	0-7| 99
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *CSQ RSSI|RSRP*

The signal strength level.

For 2G/3G network:

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 - 30	-109 - -53
31	>-51
99	Unknown

For 4G network:

CSQ RSRP	Signal Strength (dBm)
0	<-140
1	-140
2 - 96	-139 - -44
97	>= -44
255	Unknown

✧ *CSQ BER*

The quality of the GSM signal. The range is 0-7, and 99 is for unknown strength of signal.

4.4.5 VER (Firmware Version Information)

After the device receives the command AT+GTRTO to get the software version and hardware version, it will send the version information to the backend server via the message **+RESP:GTVER**.

Example:

+RESP:GTVER,740D01,135790246811220,GV350CEU,74,0100,0101,20090214093254,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	VER
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Device Type	2	74
	Software Version	4	0000 - FFFF
	Hardware Version	4	0000 - FFFF
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *Device Type*
  The type of the device.
- *Software Version*
  The software version of the device. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.
- *Hardware Version*
  The hardware version of the device. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.

4.4.6 BAT (Battery Information)

After the device receives the command AT+GTRTO to read the power supply information, it will send the power supply information to the backend server via the message **+RESP:GTBAT**.

Example:
+RESP:GTBAT,740D01,135790246811220,GV350CEU,1,12000,,4.40,0,0,20230524052049,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BAT
	Leading Symbol	1	,

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Parts	Fields	Length	Range/Format
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	External Power Supply	1	0 | 1
	External Power Voltage	<=5	0-32000(mV)
	Reserved	0	
	Backup Battery Voltage	4	0.00-4.50(mV)
	Charging	1	0| 1
	LED State	1	0| 1
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.4.7 IOS (IO Status Information)

After the device receives the command AT+GTRTO to get the status of all the IO ports, it will send the status to the backend server via the message **+RESP:GTIOS**.

Example:
+RESP:GTIOS,740D01,135790246811220,GV350CEU,,64,61,55,01,00,20090214093254,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	IOS
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Analog Input1 Voltage	<=5	0 - 16000(mV)| F(0 - 100)
	Analog Input2 Voltage	<=5	0 - 16000(mV)| F(0 - 100)

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Parts	Fields	Length	Range/Format
	Analog Input3 Voltage	<=5	0 - 30000(mV)| F(0 - 100)
	Digital Input	<=4	0000-0F0F
	Digital Output	<=4	0000-0F1F
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.4.8 TMZ (Time Zone Information)

After the device receives the command AT+GTRTO to get the time zone settings, it will send the time zone information via the message **+RESP:GTTMZ** to the backend server.

Example:

+RESP:GTTMZ,740D01,866775051508042,GV350CEU,+0000,0,0,20220630032656,2B45$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TMZ
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Time Zone Offset	5	+| -HHMM
	Daylight Saving	1	0| 1
	Network Time Checking	1	0| 1
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

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4.4.9 AIF (Basic Device Information)

After the device receives the command AT+GTRTO to get the basic device information, it will send the information via the message **+RESP:GTAIF** to the backend server.

Example:
+RESP:GTAIF,740D01,866775051629715,GV350CEU,cmnet,cmnet_name,cmnet_password,3gnet,3gnet_name,3gnet_password,898600e0123955608398,24,0,B7B1,10.57.5.91,211.138.180.4,211.138.180.5,,,,,20231218061747,714A$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	AIF
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	APN	<=64	
	APN User Name	<=30	
	APN Password	<=30	
	Backup APN	<=64	
	Backup APN User Name	<=30	
	Backup APN Password	<=30	
	ICCID	20	
	CSQ RSSI|RSRP	<=3	0-31| 99| 0-97| 255
	CSQ BER	<=2	0-7| 99
	Cell ID	4|8	XXXX| XXXXXXXX
	IP Address	<=15	0.0.0.0
	Main DNS	<=15	0.0.0.0
	Backup DNS	<=15	0.0.0.0
	Reserved	0	
	Reserved	0	

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Parts	Fields	Length	Range/Format
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *CSQ RSSI|RSRP*

The signal strength level.

For 2G/3G network:

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 - 30	-109 - -53
31	>-51
99	Unknown

For 4G network:

CSQ RSRP	Signal Strength (dBm)
0	<-140
1	-140
2 - 96	-139 - -44
97	>= -44
255	Unknown

✧ *CSQ BER*

The quality of GSM signal. Its range is from 0 to 7, and 99 indicates unknown signal strength.

✧ *Cell ID*

The serving cell ID in HEX format.

✧ *IP Address*

The IP address of the device.

✧ *Main DNS*

The main DNS server.

✧ *Backup DNS*

The backup DNS server.

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4.4.10 GSV (GPS Satellite Information)

After the device receives the command AT+GTRTO to get the satellite information, it will send the GPS satellite information via the message **+RESP:GTGSV** to the backend server.

Example:
+RESP:GTGSV,740D01,359464036001111,GV350CEU,11,30,24,31,30,32,28,32,29,12,0,14,17,16,18,20,0,22,24,24,0,25,0,20230524052627,000F$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	GSV
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	SV Count	<=2	0-24
	SV ID	<=3	>=0
	SV Power	<=2	>=0
	…		
	SV ID	<=3	>=0
	SV Power	<=2	>=0
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *SV Count*
  The count of satellites found by GPS.
- *SV ID*
  Satellite ID. If there is no satellite, the field is filled with zero.
- *SV Power*
  Satellite power. If there is no satellite, the field is filled with zero.

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4.4.11 RSV (GLONASS Satellite Information)

After the device receives the command AT+GTRTO to get the satellite information, it will send the GLONASS satellite information via the message **+RESP:GTRSV**.

Example:
+RESP:GTRSV,740D01,867995030082104,GV350CEU,6,3,43,16,25,22,11,25,39,29,40,31,40,20190417011932,000E$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	RSV
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	SV Count	<=2	0-24
	SV ID	<=3	>=0
	SV Power	<=2	>=0
	…		
	SV ID	<=3	>=0
	SV Power	<=2	>=0
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *SV Count*
  The count of satellites found by GLONASS.
- *SV ID*
  Satellite ID. If there is no satellite, this field is filled with zero.
- *SV Power*
  Satellite power. If there is no satellite, this field is filled with zero.

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4.4.12 BSV (Beidou Satellite Information)

After the device receives the command AT+GTRTO to get the satellite information, it will send the Beidou satellite information via the message **+RESP:GTBSV** to the backend server.

Example:
+RESP:GTBSV,740D01,359464036001111,GV350CEU,11,30,24,31,30,32,28,32,29,12,0,14,17,16,18,20,0,22,24,24,0,25,0,20230524052627,000F$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BSV
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	SV Count	<=2	0-24
	SV ID	<=3	> =0
	SV Power	<=2	> =0
	...		
	SV ID	<=3	> =0
	SV Power	<=2	> =0
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *SV Count*
  The count of satellites found by Beidou.
- *SV ID*
  Satellite ID. If there is no satellite, the field is filled with zero.
- *SV Power*
  Satellite power. If there is no satellite, the field is filled with zero.

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4.4.13 GTS (Device State Information)

After the device receives the command AT+GTRTO to get the network registration status information of the device, it will send the message **+RESP:GTGTS**. This report does not support the HEX format.

Example:

+RESP:GTGTS,740D01,867995030082104,GV350CEU,1,1,2|2,27|0,0|0,,,20190416093016,0A54$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	GTS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	CS State	1	0-5
	PS State	1	0-5
	Send State | PDP State	2	0 - 6 | 0 - 3
	CSQ RSSI/RSRP | BER	<=5	0-31| 99| 0-97| 255| 0-7| 99
	Message Queued Number | Message Buffered Number	<=6	0-100| 0-10000
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *CS State*

The state of Circuit Switching Domain network.

- **0** - Not registered, not searching for a new operator
- **1** - Registered
- **2** - Not registered, searching for a new operator
- **3** - Registering
- **4** - Unknown
- **5** - Registered, roaming

✧ *PS State*

The state of Packet Switching Domain network.

- **0** - Not registered, not searching for a new operator
- **1** - Registered
- **2** - Not registered, searching for a new operator
- **3** - Registering
- **4** - Unknown
- **5** - Registered, roaming

✧ *Send State | PDP State*

Send State - The state of sending data.

- **0** - Initial state
- **1** - No service
- **2** - Idle state
- **3** - Activating GPRS
- **4** - Establishing TCP or UDP connection
- **5** - Sending data to the backend server
- **6** - Reset

PDP State - The state of PDP context activation.

- **0** - PDP context is deactivated
- **1** - PDP context is being activated
- **2** - PDP context is activated
- **3** - PDP context is being deactivated

✧ *CSQ RSSI/RSRP | BER*

- *CSQ RSSI/RSRP*

  The signal strength level.

  For 2G/3G network:

CSQ RSSI	Signal Strength (dBm)
0	<-113
1	-111
2 - 30	-109 - -53
31	>-51
99	Unknown

  For 4G network:

CSQ RSRP	Signal Strength (dBm)
0	<-140
1	-140
2 - 96	-139 - -44

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CSQ RSRP	Signal Strength (dBm)
97	>= -44
255	Unknown

- *CSQ BER*
  The quality of the GSM signal. The range is 0-7, and 99 is for unknown strength of signal.

✧ *Message Queued Number | Message Buffered Number*

- *Message Queued Number*
  It represents the number of messages in the queue to be sent.
- *Message Buffered Number*
  It represents the number of messages to be buffered.

4.4.14 UVN (UFSxxx Version Information)

After the device receives the command AT+GTRTO to get the version number of the UFSxxx fuel sensor, it will send the information to the backend server via the message **+RESP:GTUVN**.

Example:
+RESP:GTUVN,740D01,869158008709145,GV350CEU,2,02,B,,,,,20150323013012,2153$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	UVN
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Sensor Protocol Version	1	
	Sensor SW Version	2	
	Sensor HW Version	1	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS

Parts	Fields	Length	Range/Format
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Sensor Protocol Version*
The protocol version of the UFSxxx fuel sensor.

✧ *Sensor SW Version*
The software version of the UFSxxx fuel sensor.

✧ *Sensor HW Version*
The hardware version of the UFSxxx fuel sensor.

4.4.15 CVN (CAN Version Information)

After the device receives the command AT+GTRTO to get the version number of the CAN Module, it will send the information to the backend server via the message **+RESP:GTCVN**.

Example:
+RESP:GTCVN,740D01,869158008709145,GV350CEU,2.2.1d,,,,,20150323013841,2166$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CVN
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	CAN Module SW Version	<=7	'0' - '9' 'a' - 'z'
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *CAN Module SW Version*

The software version of the CAN Module device.

4.4.16 ATI (Version Information)

After the device receives the command AT+GTRTO to get the basic device information, it will send the information to the backend server via the message **+RESP:GTATI**.

Example:
+RESP:GTATI,740904,866775051512176,GV350CEU,00181031,0418,0105,0300,0203,67,867488060596284,20230926172802,0BE6$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	ATI
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	ATI Mask	<=8	00000000-FFFFFFFF
	Firmware Version	4	'0' - '9' 'a' - 'z' 'A' - 'Z
	Hardware Version	4	'0' - '9' 'a' - 'z' 'A' - 'Z
	BT Firmware Version	4	'0' - '9' 'a' - 'z' 'A' - 'Z
	BT Boot Firmware Version	4	'0' - '9' 'a' - 'z' 'A' - 'Z
	Sensor ID	2	'0' - '9' 'a' - 'z'
	Modem IMEI	15	IMEI
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *ATI Mask*
This mask is set by the AT+GTRTO command and used to control parameter fields in the **+RESP:GTATI** message.

✧ *Firmware Version*
The firmware version of the device. The first two characters represent the branch number, the middle two characters represent the major version and the last two characters represent the

minor version. For example, **000101** means version **R00A01V01**.

- *Hardware Version*
  The hardware version of the device. The first two characters represent the major version and the last two characters represent the minor version. For example, **0101** means version **1.01**.
- *BT Firmware Version*
  The Bluetooth firmware version. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.
- *BT Boot Firmware Version*
  The Bluetooth Boot firmware version. The first two characters represent the major version and the last two characters represent the minor version. For example, **010A** means the version **1.10**.
- *Sensor ID*
  It indicates the sensor type used by the device.
- *Modem IMEI*
  The Modem IMEI of the terminal device.

4.4.17 QDA (DR100 Accessory Information)

After the device receives the command AT+GTRTO to get the DR100 accessory information, it will send the information to the backend server via the message **+RESP:GTQDA**.

Example:
+RESP:GTQDA,740D01,869158008709145,GV350CEU,0,6,FFFFFFFFFFFF,,,1,quec_,,,,,20150323013841,2166
$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	QDA
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	DR100 Read Mode	1	0-3
	Data Block	<=2	
	Key	12	'0' - '9' | 'A' - 'F'
	Reserved	0	

Parts	Fields	Length	Range/Format
	Reserved	0	
	Prefix Number	<=2	0-10
	Prefix String <n>	<=15	ASCII (not including '=' and ',')
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.4.18 CML (CAN Module Synchronization)

After the device receives the command AT+GTRTO to get the car model ID of the CAN Module, it will send the information to the backend server via the message **+RESP:GTCML**.

Example:
+RESP:GTCML,740D01,866775051508042,GV350CEU,1,Citroen Berlingo (08-),,,,20220630054315,302D$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CML
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	CAN Module Car Model ID	<=5	0-65535
	CAN Module Car Name	<=50	ASCII
	CAN Module Sync Status	1	1-4
	Reserved	0	
	Reserved	0	

Parts	Fields	Length	Range/Format
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *CAN Module Car Model ID*
The car model ID of the CAN Module device. If the value is 0, it means that no model has been obtained.

✧ *CAN Module Car Name*
Car Name is human-readable make and model of the car. If this string value is equal to “sync”, the queried <CAN Module Car Model ID> is the synchronized class ID.

✧ *CAN Module Sync Status*
- **1** - The synchronization is successful.
- **2** - CAN Module is not properly connected to the CAN-bus or ignition is switched off.
- **3** - The car is not supported by the firmware version of CAN Module or CAN-bus codes has not been recognized.
- **4** - CAN Module is not responding.

4.4.19 BTI (Bluetooth Peripheral Information)

After the device receives the command AT+GTRTO to get the Bluetooth peripheral information and the list of connected peripherals, it will send the information to the backend server via the message **+RESP:GTBTI**. If the connection between the Primary device and the Ghost device is successful, the battery percentage of the Ghost device will be reported periodically via the message **+RESP:GTBTI** according to the <BTI Report Interval> in AT+GTSVR.

Example:
+RESP:GTBTI,740D01,866775051512598,GV350CEU,GV350CEU_BT,6DD71F403C84,1,1,CAN,F2BB08A268E6,1,0,1,01E8,,,,,,20221208094538,1C02$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BTI
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI

Parts	Fields	Length	Range/Format
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Bluetooth Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Bluetooth Mac Address	12	000000000000 - FFFFFFFFFFFF
	Bluetooth State	1	0| 1
	Connected Device Number	<=2	0-11
	Connected Device Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Connected Device Mac	12	000000000000 - FFFFFFFFFFFF
	Role	1	0
	Real-Time State	1	0| 1
	Ghost Battery Percentage	<=3	0-100
	Ghost Status	4	0000-FFFF
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Bluetooth State*

The connection status of the Bluetooth when the device is the Primary device.

- **0** - The Bluetooth is not connected.
- **1** - The Bluetooth is connected.

✧ *Connected Device Number*

The number of the connected peripheral device. If there is more than one device connected, the information for the parameters <Connected Device Name>, <Connected Device Mac> and <Role> will be displayed repeatedly.

✧ *Connected Device Name*

The name of the connected peripheral device.

✧ *Connected Device Mac*

The Mac address of the connected peripheral device.

✧ *Role*

The role type of the peripheral device.

- **0** - Ghost device

✧ *Real-Time State*

It indicates the data type of <Ghost Battery Percentage> and <Ghost Status> read from the Ghost device.

- **0** - Historical data
- **1** - Real-time data

✧ *Ghost Battery Percentage*

The current capacity of the backup battery in percentage.

Note

The parameter <Connected Device Name> will be empty if the terminal device is the Primary device.

✧ *Ghost Status*

Bitwise mask to define status of the Ghost device. 0 indicates "The corresponding abnormal status is not detected", and 1 indicates "The corresponding abnormal status is detected".

- **Bit0** - Reserved
- **Bit1** - GNSS fix failure
- **Bit2** - Detected fake cell
- **Bit3** - Battery low warning
- **Bit4** - Fail to get RTC time
- **Bit5** - SIM card error
- **Bit6** - GSM unavailable
- **Bit7** - GPRS unavailable
- **Bit8** - Fail to connect to the backend server
- **Bit9 - 14** Reserved
- **Bit15** - Communication error between BLE and BB

Note

The parameters <Real-Time State>, <Ghost Battery Percentage> and <Ghost Status> are empty if <Mode> in the command **AT+GTSVR** is 0 .

4.4.20 WRT (RF433 Accessory Information)

After the device receives the command AT+GTRTO to read information of the paired RF433 accessories, it will send the information to the backend server via the message **+RESP:GTWRT**.

Example: +RESP:GTWRT,740D01,866775051508042,GV350CEU,3,1,000D5,2,0003D,1,000B8,20220629110943,1775$

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Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	WRT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Accessory Number	<=2	0-10
	Accessory Type	1	1| 2
	Accessory Serial Number	5	00001 - FFFFE
	…		
	Accessory Type	1	1| 2
	Accessory Serial Number	5	00001 - FFFFE
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.4.21 SCS (Acceleration Calibration Information)

After the device receives the command AT+GTRTO to get the calibration data, it will send the calibration data via the message **+RESP:GTSCS** to the backend server.

Example:
+RESP:GTSCS,740D01,865585040006649,GV350CEU,2,-0.06,0.88,-0.48,-0.97,0.05,0.22,0.22,0.48,0.85,20230524132442,1F59$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	SCS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI

Parts	Fields	Length	Range/Format
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Self Calibration Status	1	0-2
	X_Forward	<=5	-1.00-1.00
	Y_Forward	<=5	-1.00-1.00
	Z_Forward	<=5	-1.00-1.00
	X_Side	<=5	-1.00-1.00
	Y_Side	<=5	-1.00-1.00
	Z_Side	<=5	-1.00-1.00
	X_Vertical	<=5	-1.00-1.00
	Y_Vertical	<=5	-1.00-1.00
	Z_Vertical	<=5	-1.00-1.00
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Self Calibration Status*

The status of the self-calibration for Acceleration Data.

- **0** - Self-calibration is disabled.
- **1** - Self-calibration is not done.
- **2** - Self-calibration is successful.

✧ *X_Forward, Y_Forward, Z_Forward*

The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is **Xnew = <X_Forward> * X + <Y_Forward> * Y + <Z_Forward> * Z**.

✧ *X_Side, Y_Side, Z_Side*

The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in Side direction Ynew is **Ynew = <X_Side> * X + <Y_Side> * Y + <Z_Side> * Z**.

✧ *X_Vertical, Y_Vertical, Z_Vertical*

The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in Vertical direction Znew is **Znew = <X_Vertical> * X + <Y_Vertical> * Y + <Z_Vertical> * Z**.

Note

When <Self Calibration Status> is 0 or 1, no calibration factor of the acceleration data will be included in the **+RESP:GTSCS** message. When <Self Calibration Status> is 2, the calibration factors of the acceleration data will be included in the **+RESP:GTSCS** message.

4.4.22 CIF (CAN Bus Information)

After the device receives the command AT+GTRTO to get the CAN information, it will send the CAN data via the message **+RESP:GTCIF** to the backend server.

Example:
+RESP:GTCIF,740D01,866775051512176,GV350CEU,F,3.0.5c,3800883,Citroen Berlingo (08-),1,,,,2,,,20230927094009,4B21$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CIF
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	CAN Information Mask	2	00 - FF
	CAN Version Number(optional)	<=7	ASCII
	CAN Serial Number(optional)	<=10	'0' - '9' 'a' - 'z'
	CAN Car Name(optional)	<=50	ASCII
	CAN Car Model ID(optional)	<=5	0-65535
	Extended Debug Information(optional)	<=500	'0' - '9' 'A' - 'F'
	Standard Debug Information(optional)	<=500	'0' - '9' 'A' - 'F'
	Hardware Information(optional)	<=500	'0' - '9' 'A' - 'F'
	CAN Info Mask Extend(optional)	<=2	00 - FF
	CAN Configure Deep Sleep Mode Switch(optional)	1	0| 1
	CAN Configure Version(optional)	<=7	ASCII
	Machine Model Debug Information(optional)	<=128	ASCII
	Reserved	0	

Parts	Fields	Length	Range/Format
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *CAN Information Mask*
The configuration information of the specific CAN information mask that can be obtained.

✧ *CAN Version Number(optional)*
The firmware version of the CAN device.

✧ *CAN Serial Number(optional)*
The serial number of the CAN device.

✧ *CAN Car Name(optional)*
The car name is human-readable make and model of the car.

✧ *CAN Car Model ID(optional)*
The car model ID of the CAN device. If the value is 0, it means that no models have been obtained.

✧ *Extended Debug Information(optional)*
It is intended to be sent to producer for expanded diagnostics when requested.

Note

As <Hardware Information>, <Standard Debug Information> and <Extended Debug Information> contain many bytes, it is recommended to query only one set of debug message at a time.

✧ *Standard Debug Information(optional)*
The standard debug information is accessible for developer.

✧ *Hardware Information(optional)*
The related hardware information of CAN.

✧ *CAN Info Mask Extend(optional)*
When bit7 of <CAN Information Mask> is set to 1, this mask is obtained and represents the high byte portion of the <CAN Information Mask> in AT+GTRTO.

✧ *CAN Configure Deep Sleep Mode Switch(optional)*
It is used to control whether CAN configuration has enabled deep-sleep mode.

- **0** - CAN Module will enter deep sleep (very low power consumption mode) when vehicle's CAN bus (and entire car) goes sleep. CAN-Logistic uses very little energy in deep-sleep mode, but it takes more time to wake it up and some information may be lost in some cases.
- **1** - CAN Module will not enter deep-sleep mode.

✧ *CAN Configure Version(optional)*
The configure version of the CAN device.

✧ *Machine Model Debug Information(optional)*
Raw data is reported according to the <Machine Model> set by **AT+GTCAN**.

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4.4.23 TVN (THR100 Version Information)

After the device receives the command AT+GTRTO to get the version number of the THR_100, it will send the information to the backend server via the message **+RESP:GTTVN**.

Example:
+RESP:GTTVN,740D01,866775051508042,GV350CEU,2.0.9.3,2.0,,,,,20220630054948,3044$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TVN
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	THR_100 SW Version	<=7	'0' - '9' 'a' - 'z'
	THR_100 HW Version	<=7	'0' - '9' 'a' - 'z'
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *THR_100 SW Version*
  The software version of the THR_100 device.
- *THR_100 HW Version*
  The hardware version of the THR_100 device.

4.4.24 ASV (Galileo Satellite Information)

After the device receives the command AT+GTRTO to get the Galileo satellite information, it will send the satellite information via the message **+RESP:GTASV** to the backend server.

Example:
+RESP:GTASV,740D01,359464036001111,GV350CEU,11,30,24,31,30,32,28,32,29,12,0,14,17,16,18,20,0,22,24,24,0,25,0,20120305101643,000F$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	ASV
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	SV Count	<=2	0-24
	SV ID	<=3	> =0
	SV Power	<=2	> =0
	…		
	SV ID	<=3	> =0
	SV Power	<=2	> =0
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *SV Count*
  The count of satellites found by Galileo.
- *SV ID*
  Satellite ID. If there is no satellite, the field is filled with zero.
- *SV Power*
  Satellite power. If there is no satellite, the field is filled with zero.

4.4.25 CBS (CANBUS Status Information)

After the device receives the command AT+GTRTO to get the CANbus status, it will send the information to the backend server via the message **+RESP:GTCBS**.

Example:
+RESP:GTCBS,740C07,860000000099993,GV350CEU,3,3,3,,,,,20251114062016,05DD$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CBS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	CAN Report Mask	<=2	0-FF
	CAN2-bus or J1708-bus Status(Optional)	1	0-3
	CAN1-bus Status(Optional)	1	0-3
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *CAN2-bus or J1708-bus Status(Optional)*
It indicates the status of the CAN2-bus or J1708-bus.

- **0** - bus in sleep mode.
- **1** - bus active.
- **2** - bus error.
- **3** - 2nd CANbus or J1708-bus not used.

✧ *CAN1-bus Status(Optional)*
It indicates the status of the CAN1-bus.

- **0** - bus in sleep mode.
- **1** - bus active.
- **2** - bus error.
- **3** - 1st CANbus not used.

4.5 Event Reports

This section describes the message related to certain events. Please refer to the details below.

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4.5.1 Generic Event Report

- PNA: Power-on Report
- PFA: Power-off Report
- PDP: GPRS Connection Establishment Report

Example:

+RESP:GTPNA,740D01,135790246811220,GV350CEU,20230524052727,11F0$

+RESP:GTPFA,740D01,135790246811220,GV350CEU,20230524052727,11F0$

+RESP:GTPDP,740D01,135790246811220,GV350CEU,20230524052727,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	PNA | PFA | PDP
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.2 Power Event Report

- MPN(Main Power Connection)

  The report for connecting the main power supply.
- MPF(Main Power Disconnection)

  The report for disconnecting the main power supply.
- BTC(Battery Starts Charging)

  Report when backup battery starts charging.

Example:

+RESP:GTMPN,740904,866775051508042,GV350CEU,0,4.3,92,70.0,121.354335,31.222073,20230214013254,0460,0011,691D,0DE98A34,01,0,20230629052119,12E9$

+RESP:GTMPF,740904,866775051508042,GV350CEU,1,0.0,0,112.7,117.129089,31.839037,20230629040408,0460,0011,691D,06919837,01,11,20230629040409,12D7$

+RESP:GTBTC,740904,866775051508042,GV350CEU,2,0.0,0,130.4,117.129525,31.838251,20230629052412,0460,0011,691D,06919837,01,9,20230629052413,12F9$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	MPN | MPF | BTC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS

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Parts	Fields	Length	Range/Format
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.3 JDR (Network Jamming Indication Notification)

If the <Mode> in the AT+GTJDC command is set to 1, the device will report the **+RESP:GTJDR** message when jamming is detected.

Example:
+RESP:GTJDR,740904,866775050902253,GV350CEU,3,0,0.0,261,97.3,117.129168,31.839455,20230328053756,0460,0000,691D,6141,01,1,20230328054040,003B$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	JDR
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Jamming Net	1	1-3
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX

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Parts	Fields	Length	Range/Format
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Jamming Net*

The network mode.

- **1** - EGPRS/GSM
- **2** - LTE-Cat1
- **3** - EGPRS/GSM and LTE

4.5.4 JDS (Network Jamming Indication Notification)

If the <Mode> in the AT+GTJDC command is set to 2, the device will report the **+RESP:GTJDS** message when jamming is detected.

Example:

+RESP:GTJDS,740904,866775051508042,GV350CEU,1,3,0,15.1,211,73.4,117.128992,31.838193,20230630105738,0460,0011,691D,06919805,01,0,20230630110123,39FE$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	JDS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Jamming Status	1	1| 2| 5| 6
	Jamming Net	1	1-3
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)

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Parts	Fields	Length	Range/Format
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Jamming Status*

The current jamming status of the device.

- **1** - Quit the jamming state.
- **2** - Enter the jamming state.
- **5** - Quit the jamming warning state.
- **6** - Enter the jamming warning state.

✧ *Jamming Net*

Please refer to the message **+RESP:GTJDR** for details.

Note

1. It may include information of only several neighbor cells or even no neighbor cell. If no neighbor cell is found, all the fields of the neighbor cell will be empty.
2. “ffff” in the fields <LAC(i)> and <Cell ID(i)> means the device does not know the value.
3. This message cannot be sent via SMS.

4.5.5 GPJ (GNSS Jamming Indication Notification)

If GNSS jamming has been detected or suspected by the receiver, the device will report the **+RESP:GTGPJ** event message to the backend server.

Example:
+RESP:GTGPJ,740904,860000000099993,GV350CEU,10,1,1,0.0,10,132.2,117.129293,31.836561,20241231090847,0460,0000,550B,05DB052C,01,6,20241231090848,0176$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	GPJ
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	CW Jamming Value	<=3	0-255
	GNSS Jamming State	1	0| 1| 3
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *CW Jamming Value*

The current continuous wave jamming value.

✧ *GNSS Jamming State*
The current jamming state.

- **0** - Unknown.
- **1** - (OK) No significant jamming.
- **3** - (Critical) Interference visible and no fix.

4.5.6 STC (Battery Stops Charging)

Report when backup battery stops charging.

Example:
+RESP:GTSTC,740904,866775051508042,GV350CEU,,4,0.0,0,116.7,117.129455,31.838194,20230629052435,0460,0011,691D,06919837,01,9,20230629052437,12FB$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	STC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX

Parts	Fields	Length	Range/Format
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.7 BPL (Backup Battery Low Alarm)

Example:
+RESP:GTBPL,740904,866775051508042,GV350CEU,3.62,1,0.0,0,112.7,117.129089,31.839037,20220629040454,0460,0011,691D,06919837,01,12,20220629040455,12DA$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BPL
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Backup Battery Voltage	<=4	0.00-4.50(V)
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX

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Parts	Fields	Length	Range/Format
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.8 STT (Device Status Notification)

Report when the device motion status changes.

Example:
+RESP:GTSTT,740904,866775051508042,GV350CEU,11,1,0.0,245,87.8,117.129378,31.838603,20230630054857,0460,0011,691D,06919837,01,11,20230630054858,3040$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	STT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Motion Status	2	11| 12| 16| 21| 22| 41| 42
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx

Parts	Fields	Length	Range/Format
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Motion Status*

The current motion status of the device.

- **16** - Tow

The device attached vehicle is ignition off and it is towed.

- **11** - Ignition Off Rest

The device attached vehicle is ignition off and it is motionless.

- **12** - Ignition Off Motion

The device attached vehicle is ignition off and it is moving before it is considered as being towed.

- **21** - Ignition On Rest

The device attached vehicle is ignition on and it is motionless.

- **22** - Ignition On Motion

The device attached vehicle is ignition on and it is moving.

- **41** - Sensor Rest

The device attached vehicle is motionless without ignition signal detected.

- **42** - Sensor Motion

The device attached vehicle is moving without ignition signal detected.

4.5.9 IGN (Ignition-on Report)

Example:

+RESP:GTIGN,740904,866775051508042,GV350CEU,2670,1,0.0,0,124.5,117.129481,31.839144,20230630060156,0460,0011,691D,06919837,01,11,12345:12:34,0.2,20230630060158,306A$

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Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	IGN
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Duration of Ignition Off	<=6	0-999999(s)
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Duration of Ignition Off*

The duration since last time the ignition is turned off. If it is greater than 999999 seconds, it will be reported as 999999 seconds.

✧ *Hour Meter Count*

If the hour meter count function is enabled by the command AT+GTHMC,total hours the meter counts when the engine is on will be reported in this field. It is formatted with 5 to 7 hour digits, 2 minute digits and 2 second digits. If the function is disabled, this field will be empty.

4.5.10 VGN (Virtual Ignition-on Report)

Example:

+RESP:GTVGN,740904,866775051508042,GV350CEU,00,2,140,1,0.0,0,105.0,117.129466,31.838996,20230630060439,0460,0011,691D,06919805,01,9,12345:12:34,0.2,20231230060440,307E$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	VGN
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	2	00
	Report Type	1	0| 2| 4| 7
	Duration of Ignition Off	<=6	0-999999(s)
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF

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Parts	Fields	Length	Range/Format
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Report Type*

This parameter indicates the trigger source of the ignition event.

- **0** - Reserved
- **2** - External power voltage mode (virtual ignition detection)
- **4** - Accelerometer mode (virtual ignition detection)
- **7** - Combined detection mode

  In this mode, ignition on/off trigger conditions can be selected using parameters <Virtual Ignition On Mask> and <Virtual Ignition Off Mask> in the command AT+GTVMS.

Note

<Virtual Ignition off Mask> must contain <Virtual Ignition On Mask> to prevent logic errors.

✧ *Duration of Ignition Off*

Duration since last time the ignition is off. If it is greater than 999999 seconds, it is reported as 999999 seconds.

✧ *Hour Meter Count*

If the hour meter count function is enabled by the command AT+GTHMC, total hours the meter has counted when the engine is on will be reported in this field. It is formatted with 5 to 7 hour digits, 2 minute digits and 2 second digits. If the function is disabled, this field will be empty.

4.5.11 IGF (Ignition-off Report)

Example:

+RESP:GTIGF,740904,866775051508042,GV350CEU,10,1,0.0,320,99.0,117.129470,31.838955,20230630060206,0460,0011,691D,06919837,01,11,12345:12:34,0.2,20230630060208,306D$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT

Parts	Fields	Length	Range/Format
	Message Name	3	IGF
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Duration of Ignition On	<=6	0-999999(s)
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Duration of Ignition On*

The duration since last time the ignition is turned on. If it is greater than 999999 seconds, it will be reported as 999999 seconds.

✧ *Hour Meter Count*

If the hour meter count function is enabled by the command AT+GTHMC, total hours the meter

counts when engine is on will be reported in this field. It is formatted with 5 to 7 hour digits, 2 minute digits and 2 second digits. If the function is disabled, this field will be empty.

4.5.12 VGF (Virtual Ignition-off Report)

Example:

+RESP:GTVGF,740904,866775051508042,GV350CEU,00,2,446,1,0.0,0,102.0,117.129455,31.838977,20230630061204,0460,0011,691D,06919837,01,12,12345:12:34,0.2,20230630061206,3095$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	VGF
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	2	00
	Report Type	1	0| 2| 4| 7
	Duration of Ignition On	<=6	0-999999(s)
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72

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Parts	Fields	Length	Range/Format
	GNSS Jamming State(Optional)	1	0-3
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Duration of Ignition On*

Duration since last time the ignition is turned on. If it is greater than 999999 seconds, it is reported as 999999 seconds.

✧ *Hour Meter Count*

If the hour meter count function is enabled by the command AT+GTHMC, total hours the meter has counted when the engine is on will be reported in this field. It is formatted with 5 to 7 hour digits, 2 minute digits and 2 second digits. If the function is disabled, this field will be empty.

4.5.13 IDN (Enter Idle State)

Report when the vehicle enters the idle state.

Example:

+RESP:GTIDN,740904,866775051508042,GV350CEU,,,0,0.0,0,102.0,117.129455,31.838977,20220630061609,0460,0011,691D,06919837,01,12,0.2,20220630061610,30BD$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	IDN
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Reserved	0	
	GNSS Accuracy	<=2	0-50

Parts	Fields	Length	Range/Format
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.14 IDF (Exit Idle State)

Report when the vehicle exits the idle state.

Example:
+RESP:GTIDF,740904,866775051508042,GV350CEU,12,24,1,0.0,0,102.0,117.129455,31.838977,20230630061633,0460,0011,691D,06919837,01,12,0.2,20230630061634,30C4$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	IDF
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF

Parts	Fields	Length	Range/Format
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Motion Status	2	11| 12| 16| 1A| 22
	Duration of Idling Status	<=6	0-999999(s)
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Motion Status*

The current motion status when the vehicle exits the idle state.

✧ *Duration of Idling Status*

The period of time during which the vehicle stays in idle state. If it is greater than 999999 seconds, it will be reported as 999999 seconds.

4.5.15 GSS (GNSS Signal Status)

Example:
+RESP:GTGSS,740904,866775051508042,GV350CEU,0,0,11,,0,0.0,0,102.0,117.129455,31.838977,20230630061839,0460,0011,691D,06919837,01,0,20231223061939,30D0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	GSS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	GNSS Signal Status	1	0| 1
	Satellite Number	<=2	0-72
	Motion Status	2	11| 12| 16| 1A| 21| 22| 41| 42
	Reserved	0	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72

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Parts	Fields	Length	Range/Format
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *GNSS Signal Status*

- **0** - GNSS signal is lost or GNSS fix fails
- **1** - GNSS signal is recovered and GNSS fix is successful

✧ *Satellite Number*

The number of satellites used for tracking, the high nibble is reserved and the low nibble is valid.

✧ *Motion Status*

The current motion status of the device.

- **16** - Tow

The device attached vehicle is ignition off and it is towed.

- **1A** - Fake Tow

The device attached vehicle is ignition off and it might be towed.

- **11** - Ignition Off Rest

The device attached vehicle is ignition off and it is motionless.

- **12** - Ignition Off Motion

The device attached vehicle is ignition off and it is moving before it is considered as being towed.

- **21** - Ignition On Rest

The device attached vehicle is ignition on and it is motionless.

- **22** - Ignition On Motion

The device attached vehicle is ignition on and it is moving.

- **41** - Sensor Rest

The device attached vehicle is motionless without ignition signal detected.

- **42** - Sensor Motion

The device attached vehicle is moving without ignition signal detected.

4.5.16 Travel State Report

- STR: Enter Start State
- STP: Enter Stop State
- LSP: Enter Long Stop State

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Example:

+RESP:GTSTR,740904,866775051508042,GV350CEU,,,3,1.5,224,49.0,117.129342,31.838122,20220630062129,0460,0011,691D,06919837,01,7,0.2,20220630062131,30DA$

+RESP:GTSTP,740904,866775051508042,GV350CEU,,,3,0.0,0,58.8,117.129376,31.838259,20220630062134,0460,0011,691D,06919837,01,7,0.2,20220630062136,30DD$

+RESP:GTLSP,740904,866775051508042,GV350CEU,,,3,0.0,163,75.2,117.129352,31.838342,20230630062349,0460,0011,691D,06919837,01,7,0.2,20230630062351,30F4$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	STR | STP | LSP
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Reserved	0	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72

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Parts	Fields	Length	Range/Format
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.17 FLA (Unusual Fuel Consumption Alarm)

Example:
+RESP:GTFLA,740D01,135790246811220,GV350CEU,2,92,70,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,01,1,20090214093254,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	FLA
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Input ID	1	0-3
	Last Fuel Level	<=3	0-100
	Current Fuel Level	<=3	0-100
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX

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Parts	Fields	Length	Range/Format
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Input ID*

The ID of the input to which the fuel sensor is connected. 0 means “Connected with serial port”.

✧ *Last Fuel Level*

The fuel level saved before the fuel loss alarm event occurs.

✧ *Current Fuel Level*

The current fuel level when the fuel loss alarm event occurs.

4.5.18 DOS (Wave Shape 1 Output Status)

Example:

+RESP:GTDOS,740904,866775051508042,GV350CEU,3,0,1,0.0,0,105.2,117.129382,31.838764,20230630063635,0460,0011,691D,06919805,01,9,20230630063636,3150$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	DOS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Wave1 Output ID	1	1-5| 7-C
	Wave1 Output Active	1	0-2

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Parts	Fields	Length	Range/Format
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Wave1 Output ID*

The ID of the wave shape 1 output.

✧ *Wave1 Output Active*

The status of wave shape 1 output. If it is 2, it means that it is currently in the status of gradual wave shape 1 .

4.5.19 TMP (Temperature Alarm)

Example:

+RESP:GTTMP,740D01,862170013894694,GV350CEU,,12183,01,1,2,0.0,266,88.9,117.129568,31.837759,20230628081232,0460,0000,550B,085B,01,1,0.0,12345:12:34,11038,10496,61,01,01,,,,28131A4103000056,,28,20130627054009,0028$

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Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TMP
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	External Power Voltage	<=5	0-32000(mV)
	Report ID / Report Type	2	X(0 - 3)X(0 - 1)
	Number	1	0-1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Analog Input1 Voltage	<=5	0 - 16000(mV)| F(0 - 100)
	Analog Input2 Voltage	<=5	0 - 16000(mV)| F(0 - 100)
	Analog Input3 Voltage	<=5	0 - 30000(mV)| F(0 - 100)

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Parts	Fields	Length	Range/Format
	Digital Input	<=4	0000 - 0F0F
	Digital Output	<=4	0000 - 0F1F
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Temperature Sensor Device ID	16	'0'-'9' 'a'-'f' 'A'-'F'
	Reserved	0	
	Temperature Sensor Device Data	<=3	-55-125(℃)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Report ID / Report Type*

It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Report ID and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

Report ID: The ID of the temperature alarm.

Report Type:

– **Bit 0 -** 0 means “Outside the predefined temperature range”. 1 means “Within the predefined temperature range”.

✧ *Temperature Sensor Device ID*

The ID of the temperature sensor.

✧ *Temperature Sensor Device Data*

The current temperature the sensor detects.

4.5.20 RMD (Roaming State Report)

If the GSM roaming state of the device changes, the current roaming state will be reported in the **+RESP:GTRMD** message.

Example:

+RESP:GTRMD,740904,866775051508042,GV350CEU,2,1,0.0,0,105.2,117.129382,31.838764,20230630063807,0460,0011,691D,06919805,01,9,20230630063808,3155$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	RMD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Roaming State	1	0-3
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Roaming State*

A numeral to indicate the roaming state.

- **0** - Home
- **1** - Known roaming
- **2** - Unknown roaming
- **3** - Blocking report

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4.5.21 PHL (Location Information for CMS)

This message is used for reporting location information before reporting photo data, and it is only sent via GPRS even if the report mode is forced SMS mode.

Example:
+RESP:GTPHL,740D01,862170019025640,GV350CEU,0,,20131018075847,0,0.0,0,69.4,117.201431,31.833073,20131018075848,0460,0000,5678,2D7E,01,1,,,,,20131018075849,0058$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	PHL
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Camera ID	1	0-3
	Reserved	0	
	Photo Time	14	YYYYMMDDHHMMSS
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72

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Parts	Fields	Length	Range/Format
	GNSS Jamming State(Optional)	1	0-3
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.22 FTP (Transfer File Alarm)

Report location information after transferring a file to FTP server.

Example:
+RESP:GTFTP,740D01,862170011507322,GV350CEU,,862170011507322_20140606080837.jpg,0,1.3,0,87.6,117.201577,31.832981,20230606080843,0460,0000,5678,2D7E,01,1,20230606080903,002B$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	FTP
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	File Name	<=100	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx

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Parts	Fields	Length	Range/Format
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *File Name*

The name of the file transferred to FTP server. It is combined with <File Name Prefix>, "_" and time information.

For example:

If <File Name Prefix> is **GV350CEU**, <File Name> is **GV350CEU_20230723120304.jpg**.

The Suffix	Description
.jpg	A picture file
.DDD	A Tachograph file

4.5.23 EXP (Information of Digital Fuel Sensor)

This message is used for reporting the malfunction information of digital fuel sensor.

Example:

+RESP:GTEXP,740904,866775050902253,GV350CEU,4,,3,0001,1,0.0,0,138.0,117.129400,31.839702,20230803084114,0460,0000,550B,B7B1,01,12,20230803084116,3EF5$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	EXP
	Leading Symbol	1	,

Parts	Fields	Length	Range/Format
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Digital Fuel Sensor Type	1	2| 4
	Reserved	0	
	Reserved Parameters	<=3	
	HW Fault Code	4	0000-FFFF
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0 - 359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Digital Fuel Sensor Type*

For details, please refer to <Digital Fuel Sensor Type> in AT+GTURT.

- **2** - DUT-E
- **4** - UFSxxx

✧ *HW Fault Code*

The malfunction code has different meanings for different digital fuel sensors.

For DUT-E:

- **Bit 0** - Sensor is not calibrated. The difference between calibration frequencies of signal generator for minimum and maximum fuel levels is 100 Hz.
- **Bit 1** - Sensor is not calibrated for maximum fuel level.
- **Bit 2** - Signal generator is not functioning. Possible short circuit in measuring probe tubes.
- **Bit 3** - The difference between calibration values for minimum and maximum fuel levels in the sensor is less than 5 Hz.
- **Bit 4** - EEPROM error. Hardware failure of the sensor.
- **Bit 5** - Current frequency of the signal generator is more than fixed one when calibrating for minimum fuel level, and the difference is more than 100 Hz.
- **Bit 6-15** - Reserved

For UFSxxx:

- **Bit 0** - The detector of the fuel sensor is not connected or the signal extension cable is broken.
- **Bit 1** - The detector of the fuel sensor is detached from the fuel tank.
- **Bit 2** - The input power source is too low.
- **Bit 3** - Abnormal reset of the system.
- **Bit 4** - The value of analog output is abnormal.
- **Bit 5** - The current fuel level is in the blind zone.
- **Bit 6-15** - Reserved

4.5.24 CLT (CAN Bus Information Alarm)

If the CAN bus Alarm report function is enabled by the command AT+GTCLT, <Alarm Mask 1>, <Alarm Mask 2> and <Alarm Mask 3> meet each trigger condition at the same time, and the trigger event duration time is longer than <Debounce Time>, the **+RESP:GTCLT** alarm message will be sent.

Example:

+RESP:GTCLT,740904,866775051508042,GV350CEU,0,00000000,00000000,00000002,,,2FFFFFFF,1G1BL52P7TR115520,0,H5000,999999.06,5000,60,210,H999.9,P6.00,99999990,100,9999.99,9999.99,9999.99,999999.06,4498,3b3e,FFFF,3F,3F,99999.00,99999.00,10000,20000,30000,3600,40000,13FFFFFF,P99.60,32125,32125,32125,1,0,1,11760,999999,999999,999999,99999.99,99999.99,99999.99,999999,DE1820625133460000,DE1820625133460000,CAR1NAME,CAR2NAME,05663,1FFE,999999,999999,100,-160000,210,1,010807,,,1,0.0,9,142.2,117.129030,31.838744,20221124035256,0460,0011,691D,02A90916,01,6,20221124035257,00A8$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT

Parts	Fields	Length	Range/Format
	Message Name	3	CLT
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Group ID	<=2	0-19
	Combined Alarm Mask 1	8|16	00000000 - FFFFFFFF| 0000000000000000 - FFFFFFFFFFFFFFFF
	Alarm Mask 2	<=8	0 - FFFFFFFF
	Alarm Mask 3	<=8	0 - FFFFFFFF
	Reserved	0	
	Reserved	0	
	CAN Bus Data Mask	<=8	0 - FFFFFFFF
	VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'
	Ignition Key	1	0-2
	Total Distance	<=12	H(0 - 99999999)/I(0 - 2147483647)
	Total Fuel Used	<=9	0.00-999999.99(L)
	Engine RPM	<=5	0-16383(rpm)
	Vehicle Speed	<=3	0-455(km/h)
	Engine Coolant Temperature	<=4	-40-+215(℃)
	Fuel Consumption	<=6	L/100km(0.0 - 999.9)| L/H(0.0 - 999.9)
	Fuel Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
	Range	<=8	0-99999999(hm)
	Accelerator Pedal Pressure	<=3	0-100(%)
	Total Engine Hours	<=10	0.00-9999999.99(h)
	Total Driving Time	<=10	0.00-9999999.99(h)

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Parts	Fields	Length	Range/Format
	Total Engine Idle Time	<=10	0.00-9999999.99(h)
	Total Idle Fuel Used	<=9	0.00-999999.99(L)
	Axle Weight 2nd	<=5	0-65535(kg)
	Tachograph Information	<=4	00 - FFFF
	Detailed Information|Indicators	<=4	00-FFFF
	Lights	<=2	0-FF
	Doors	<=2	0-FF
	Total Vehicle Overspeed Time	<=10	0.00-9999999.99(h)
	Total Vehicle Engine Overspeed Time	<=10	0.00-9999999.99(h)
	Engine Cold Starts Count	<=8	0-16449535
	Engine All Starts Count	<=8	0-16449535
	Engine Starts by Ignition Count	<=8	0-16449535
	Total Engine Cold Running Time	<=9	0-421108120(s)
	Handbrake Applies During Ride Count	<=5	0-64255
	CAN Report Expansion Mask	<=8	0 - FFFFFFFF
	Ad-Blue Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
	Axle Weight 1st	<=5	0-65535(kg)
	Axle Weight 3rd	<=5	0-65535(kg)
	Axle Weight 4th	<=5	0-65535(kg)
	Tachograph Overspeed Signal	1	0| 1
	Tachograph Vehicle Motion Signal	1	0| 1
	Tachograph Driving Direction	1	0| 1
	Analog Input Value	<=5	0-99999(mV)
	Engine Braking Factor	<=10	0-4278190079
	Pedal Braking Factor	<=10	0-4278190079
	Total Accelerator Kick-downs	<=6	0-999999

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Parts	Fields	Length	Range/Format
	Total Effective Engine Speed Time	<=10	0.00-9999999.99(h)
	Total Cruise Control Time	<=10	0.00-9999999.99(h)
	Total Accelerator Kick-down Time	<=10	0.00-9999999.99(h)
	Total Brake Applications	<=6	0-999999
	Tachograph Driver 1 Card Number	<=40	ASCII
	Tachograph Driver 2 Card Number	<=40	ASCII
	Tachograph Driver 1 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Tachograph Driver 2 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Registration Number	<=40	ASCII
	Expansion Information	<=4	00-FFFF
	Rapid Brakings	<=8	0-16711679
	Rapid Accelerations	<=8	0-16711679
	Engine Torque	<=3	0-100(%)
	Service Distance	<=8	-160635-327675(km)
	Ambient Temperature	<=4	-40-+215(℃)
	DTC Number	<=2	0-99
	DTC 1	<=6	'0'-'9' 'a'-'z' 'A'-'Z'
	…		
	DTC N	<=6	'0'-'9' 'a'-'z' 'A'-'Z'
	CAN Report Expansion Mask1	<=8	0 - FFFFFFFF
	Retarder Usage	<=3	0-125(%)
	Electric Report Mask	<=8	0 - FFFFFFFF
	Charging State	<=2	0 - FF
	Reserved	0	
	Reserved	0	
	GNSS Accuracy	<=2	0-50

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Parts	Fields	Length	Range/Format
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Combined Alarm Mask 1*

The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Detailed Information/Indicators> of the **+RESP:GTCAN** message. If an alarm event satisfies the triggering condition and the <Inverse Alarm Mask 1> is checked in the bitwise, the parameter <Combined Alarm Mask 1> in the message **+RESP:GTCLT** will be composed of <Alarm Mask 1> and <Inverse Alarm Mask 1>. Besides, Bit31 of parameter <Alarm Mask 1> is automatically set to 1 to prompt the information of <Inverse Alarm Mask 1>. If the trigger conditions for the **+RESP:GTCLT** alarm event report are met and all bits of the <Inverse Alarm Mask 1> are set to 0, the parameter <Combined Alarm Mask 1> will only include <Alarm Mask 1> and Bit 31 of the parameter <Alarm Mask 1> is automatically set to 0.

For example:

- <Alarm Mask 1> = 0x00000000, <Inverse Alarm Mask 1> = 0x00000020

1. Not trigger seatbelt on alarm
2. If the trigger seatbelt off alarm: <Combined Alarm Mask 1> = 0x8000000000000020

- <Alarm Mask 1> = 0x00000020, <Inverse Alarm Mask 1> = 0x00000000

1. If the trigger seatbelt on alarm: <Combined Alarm Mask 1> = 0x00000020

2. Not trigger seatbelt off alarm

✧ *Alarm Mask 2*

The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Lights> and <Doors> of the **+RESP:GTCAN** message.

✧ *Alarm Mask 3*

The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Engine RPM> of the **+RESP:GTCAN** message.

4.5.25 CFU (CAN Module FOTA Upgrade Report)

The device will send the message **+RESP:GTCFU** to the backend server during the upgrade process.

Example:

+RESP:GTCFU,740D01,862170011507322,GV350CEU,301,2.2.3b,20140723021417,0014$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CFU
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Code	3	
	New Version (Optional)	<=10	'0' - '9', 'a' - 'z', '.'
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Code*

Information code.

- **1x0** - Confirm ok. Start to upgrade.
- **1x1** - CAN Module or THR_100 does not work. Stop upgrade.
- **1x2** - The download process is refused because of low power or an incorrect URL.
- **1x3** - Other upgrade commands are being executed. Stop upgrade.
- **1x4** - CAN chipsetor THR_100 response is abnormal.
- **1x5** - The backend server cancels this update process.
- **2x0** - Start to download package.

- **2x1** - Package download succeeds.
- **2x2** - Package download fails.
- **3x0** - Start to upgrade.
- **3x1** - Upgrade succeeds. The reserved parameter is used as follows.

Fields	Length	Range/Format
New Version	<=10	'0' - '9' 'a' - 'z'

- **3x2** - Upgrade fails.
- **3x3** - Serial Number does not match, firmware upgrade fails.
- **3x4** - The upgrade process is refused because of low power.

Note

x here means <Update Type> defined in the command AT+GTCFU.

✧ *New Version (Optional)*

The version of the new firmware in the CAN Module or THR_100.

4.5.26 SVR (Stolen Vehicle Recovery)

Stolen vehicle recovery message reported by the Primary device.

Example:

+RESP:GTSVR,740D01,866775051512598,GV350CEU,1,78054125E8F7,70000000000000000000,,1,0.0,0,56.8,117.129404,31.839378,20221201021215,0460,0000,550B,30A5,01,12,20221201021216,003D$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	SVR
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	SVR Working State	1	0-2
	Ghost MAC Address	12	000000000000 - FFFFFFFFFFFF
	SVR Appending Information	<=30	
	Reserved	0	
	GNSS Accuracy	<=2	0-50

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Parts	Fields	Length	Range/Format
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *SVR Working State*

It indicates the status in which the **+RESP:GTSVR** alert message is generated.

- **0** - Primary loses connection with Ghost.
- **1** - Primary regains connection with Ghost normally.
- **2** - Primary fails to match Ghost during installation phase.

✧ *SVR Appending Information*

It indicates additional Bluetooth information.

4.5.27 RTP (Remote File Transfer)

Report file transfer information.

Example:

+RESP:GTRTP,740D01,862170019025640,GV350CEU,0,0,1,100,20231207063729,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT

Parts	Fields	Length	Range/Format
	Message Name	3	RTP
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Mode	1	0
	Protocol Type	1	0
	File Type	1	0-2
	Code	3	100| 101| 200-202| 301| 302
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Mode*

The working mode of file transfer.

- **0** - Download file

✧ *Protocol Type*

The type of communication protocol used to obtain data from the backend server.

- **0** - HTTP

✧ *File Type*

It defines the type of file to download from the server.

- **0** - CA certificate
- **1** - Client certificate
- **2** - Client key

✧ *Code*

It indicates the download information.

- **100** - The update command is starting.
- **101** - The update command is refused by the device.
- **200** - The device starts to download the file.
- **201** - The device finishes downloading the file successfully.
- **202** - The device fails to download the file.
- **301** - The device finishes updating the file successfully.
- **302** - The device fails to update the file.

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4.5.28 FRT (1-Wire Temperature Sensor)

Example:
+RESP:GTFRT,740D01,001068000000006,GV350CEU,12228,1,1,0.0,0,111.6,117.129263,31.839288,20230614111132,0460,0000,550B,085BE2AA,01,1,0.0,12345:12:34,0,0,0,01,00,2,281405F70A0000D6,24,28FF6402F1653E63,23,,,20230614111133,0034$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	FRT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	External Power Voltage	<=5	0-32000(mV)
	Number	1	0-1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)

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Parts	Fields	Length	Range/Format
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Analog Input1 Voltage	<=5	0-16000(mV)
	Analog Input2 Voltage	<=5	0-16000(mV)
	Analog Input3 Voltage	<=5	0-30000(mV)
	Digital Input	<=4	0000 - 0F0F
	Digital Output	<=4	0000 - 0F1F
	Num of Temperature	1	0-4
	Temperature Sensor ID	16	'0'-'9' 'a'-'f' 'A'-'F'
	Temperature Sensor Data	<=3	-55-125(℃)
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *Num of Temperature*
  The number of temperature.
- *Temperature Sensor ID*
  The ID of the temperature sensor.
- *Temperature Sensor Data*
  The current temperature detected by the sensor.

4.5.29 TRD (DDD Data Report)

This message is used to report DDD data and can only be sent via GPRS even if the report mode is forced SMS mode.

Example:

+RESP:GTTRD,740D01,867995030090222,GV350CEU,000A,,,0,18,490,303834303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F5631303030303031303830383430303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0208015D1205395D12E4E1011F5631303030303031303830383430303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F5631303030303031303830383430303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0108015D1339F75D1587A9011F5631303030303031303830383430303030FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF011F563130

303030303130383038343030 30FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF0108015D15DFB15D196460011F5
63130303030,,,,,20190710153859,0956$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TRD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	File Download Count	4	0001-FFFF
	Reserved	0	
	Reserved	0	
	File Frame End flag	1	0| 1
	Current Frame Index	<=4	
	DDD Data Length	<=3	
	DDD Data	<=684	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *File Download Count*

A number that marks the messages between **+RESP:GTTRD** and **+RESP:GTTRL**.

✧ *File Frame End flag*

The flag of last frame.

- **0** - Not the last frame of file.
- **1** - The last frame of file.

✧ *Current Frame Index*

The index of frames.

✧ *DDD Data Length*

The length of DDD data in current frame.

4.5.30 PNR (Power-on Reason)

This message indicates the reason for power on.

Example:

+RESP:GTPNR,740D01,863835020303983,GV350CEU,0,,,,,20150407094557,0633$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	PNR
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Power On Reason	1	0-3| 5| 6
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Power On Reason*

It indicates the reason for power on.

- **0** - Normal power on
- **1** - FOTA reboot
- **2** - RTO reboot
- **3** - Watchdog reboot
- **5** - System watchdog reboot
- **6** - Configuration upgrade reboot

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4.5.31 PFR (Power-off Reason)

This message indicates the reason for power off.

Example:

+RESP:GTPFR,740D01,863835020303983,GV350CEU,0,,,,,20150407094557,0633$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	PFR
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Power Off Reason	1	0-3
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Power Off Reason*

It indicates the reason for power off.

- **0** - RTO power off
- **1** - Low battery voltage
- **2** - RTO reboot
- **3** - Watchdog reboot

4.5.32 LBA (Low Power Alarm for RF433)

The low power alarm (less than 2.4V) event message for the RF433 accessories.

Example:

+RESP:GTLBA,740D01,135790246811220,GV350CEU,1,00001,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,01,1,20090214093254,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	LBA
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Accessory Type	1	1-3
	Accessory Serial Number	5	0001-FFFFE
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Accessory Type*

It indicates the type of the accessory.

- **1** - Wireless temperature sensor (WTS100)
- **2** - Wireless temperature & humidity sensor (WTH100)
- **3** - Wireless panic button (WPB100)

Note

The **+RESP:GTLBA** message will be reported according to the parameter <Sample Interval> when the parameter <Accessory Type> is 1 or 2. When <Accessory Type> is 3, the **+RESP:GTLBA** message will be reported according to the trigger event of the button.

4.5.33 WPB (Button Alarm for WPB100)

The button alarm event message for WPB100 accessory.

Example:

+RESP:GTWPB,740D01,135790246811220,GV350CEU,00001,0,4.3,92,70.0,121.354335,31.222073,20090214013254,0460,0000,18d8,6141,01,1,20090214093254,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	WPB
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Accessory Serial Number	5	00001-FFFFE
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX

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Parts	Fields	Length	Range/Format
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.34 CRA (Crash Alarm)

Example:
+RESP:GTCRA,740904,866775051508042,GV350CEU,01,0,0.0,0,83.4,117.129371,31.839207,20220630082656,0460,0011,691D,0DE98A34,01,9,20220630082657,348A$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CRA
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Crash Counter	2	00-FF
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX

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Parts	Fields	Length	Range/Format
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Crash Counter*

It indicates the crash sequence, combining the report of **+RESP:GTCRA** and **+RESP:GTCRD** into one crash event. It rolls from 0x00 to 0xFF.

4.5.35 BCS (Bluetooth Connection Report)

Example:

+RESP:GTBCS,740904,866775051508042,GV350CEU,,0,0.0,0,83.1,117.129356,31.839166,20220630082937,0460,0011,691D,0DE98A34,01,12,0D03,GV350CEU_KA,7F0FF49F0DB1,0,1,617CE7F57BEF,,,,,20220630082938,34C0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BCS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359

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Parts	Fields	Length	Range/Format
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Bluetooth Report Mask	4	0000-FFFF
	Bluetooth Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_' '%'
	Bluetooth Mac Address	12	000000000000 - FFFFFFFFFFFF
	Peer Role	1	0| 1
	Peer Address Type	1	0| 1
	Peer MAC Address	12	000000000000-FFFFFFFFFFFF
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Peer Role*

The role type of the peripheral device.

- **0** - Master
- **1** - Slave

✧ *Peer Address Type*

The address type of the peripheral device.

- **0** - Public Device Address or Public Identity Address

- **1** - Random Device Address or Random (static) Identity

4.5.36 BDS (Bluetooth Disconnection Report)

Example:
+RESP:GTBDS,740904,866775051508042,GV350CEU,,0,0.0,0,83.1,117.129356,31.839166,20220630082942,0460,0011,691D,0DE98A34,01,12,0D03,GV350CEU_KA,7F0FF49F0DB1,0,1,617CE7F57BEF,0,,,,20220630082944,34C2$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BDS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3

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Parts	Fields	Length	Range/Format
	Bluetooth Report Mask	4	0000-FFFF
	Bluetooth Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_' '%'
	Bluetooth Mac Address	12	000000000000 - FFFFFFFFFFFF
	Peer Role	1	0| 1
	Peer Address Type	1	0| 1
	Peer MAC Address	12	000000000000 - FFFFFFFFFFFF
	Reason	1	0| 4
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Peer Role*

The role type of the peripheral device.

- **0** - Master
- **1** - Slave

✧ *Peer Address Type*

The address type of the peripheral device.

- **0** - Public Device Address or Public Identity Address
- **1** - Random Device Address or Random (static) Identity

✧ *Reason*

This parameter indicates the reason of Bluetooth disconnection.

- **0x00** - Normal disconnection.
- **0x04** - Bluetooth peripheral device pairing fails.

4.5.37 ASC (Acceleration Calibration Alarm)

The report for calibration data.

Example:

+RESP:GTASC,740904,866775050902253,GV350CEU,0.20,0.98,0.10,-0.96,0.20,-0.03,-0.05,-0.08,0.97,0,0.0,86,48.3,117.082728,31.831993,20220624070302,0460,0011,691D,0DE28134,01,12,20220624150303,0DAA$

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Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	ASC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	X_Forward	<=5	-1.00-1.00
	Y_Forward	<=5	-1.00-1.00
	Z_Forward	<=5	-1.00-1.00
	X_Side	<=5	-1.00-1.00
	Y_Side	<=5	-1.00-1.00
	Z_Side	<=5	-1.00-1.00
	X_Vertical	<=5	-1.00-1.00
	Y_Vertical	<=5	-1.00-1.00
	Z_Vertical	<=5	-1.00-1.00
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS

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Parts	Fields	Length	Range/Format
	Count Number	4	0000-FFFF
	Tail	1	$

- *X_Forward, Y_Forward, Z_Forward*
  The factors to calculate the new acceleration in forward direction.
  The formula to calculate the acceleration in Forward direction Xnew is **Xnew = <X_Forward> * X + <Y_Forward> * Y + <Z_Forward> * Z**.
- *X_Side, Y_Side, Z_Side*
  The factors to calculate the new acceleration in side direction.
  The formula to calculate the acceleration in Side direction Ynew is **Ynew = <X_Side> * X + <Y_Side> * Y + <Z_Side> * Z**.
- *X_Vertical, Y_Vertical, Z_Vertical*
  The factors to calculate the new acceleration in vertical direction.
  The formula to calculate the acceleration in Vertical direction Znew is **Znew = <X_Vertical> * X + <Y_Vertical> * Y + <Z_Vertical> * Z**.

4.5.38 HBE (Acceleration Information for HBM)

If harsh behavior is over in Mode 5 of the AT+GTHBM command, this message will be sent to the backend server.

Example:
+RESP:GTHBE,740904,866775050902881,GV350_B,,2,1,0,0.0,89,36.7,117.082760,31.832001,20230624070300,0460,0001,DE10,05A0BC65,01,12,000900080055,000700000051,16,1038.7,20230624070301,1A8C$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	HBE
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Self Calibration Status	1	0-2
	Harsh Behavior Type	1	0-4

Parts	Fields	Length	Range/Format
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	0000 - FFFF| 00000000 - FFFFFFFF
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Max Acceleration Data	12	'0'-'9' 'a'-'f'
	Average Acceleration Data	12	'0'-'9' 'a'-'f'
	Harsh Behavior Duration	<=6	0-999999(x10ms)
	Mileage	<=9	0.0-4294967.0(km)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Self Calibration Status*

The status of the self-calibration for Acceleration Data.

- **0** - Self-calibration is disabled.
- **1** - Self-calibration is not done.
- **2** - Self-calibration is successful.

✧ *Harsh Behavior Type*

The type of the harsh behavior.

- **0** - Harsh braking behavior.
- **1** - Harsh acceleration behavior.
- **2** - Harsh cornering behavior.

- **3** - Harsh braking and cornering behavior.
- **4** - Harsh acceleration and cornering behavior.

✧ *Max Acceleration Data*

A string made up of 12 characters. It is a set of the maximal values of each axis collected during the occurrence of the harsh driving behavior.

The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data.

The ASCII "0001" indicates HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" indicates HEX value 0xFFFD which is the compliment of -3, so it means the acceleration is -3. This value is only valid in Mode 5 of the **AT+GTHBM** command.

✧ *Average Acceleration Data*

There are 12 characters in a group of acceleration data. It is the average value of acceleration data which triggers this harsh behavior report.

The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data.

The ASCII "0001" indicates HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" indicates HEX value 0xFFFD which is the compliment of -3, so it means the acceleration is -3. This value is only valid in Mode 5 of the **AT+GTHBM** command.

✧ *Harsh Behavior Duration*

The duration of the harsh behavior event. This value is only valid in Mode 5 of the **AT+GTHBM** command.

4.5.39 BAA (Bluetooth Accessory Alarm)

Example:

+RESP:GTBAA,740904,862524060636111,GV350CEU,00,2,1,03,081F,P T EN 12345,E1E779754A76,1,2650,19,19.25,0,0.0,0,143.2,117.129387,31.839301,20240226023024,0460,0000,550B,085BE2AA,00,20240226103025,35DD$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BAA
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI

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Parts	Fields	Length	Range/Format
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Index	<=2	00-09| FE-FF
	Accessory Type	<=2	0-3| 6| 11-15| 23
	Accessory Model|Beacon ID Model	<=2	0-5| 7| 10
	Alarm Type	2	0-4| 7-A| C-1E
	Append Mask	4|8	0 - FFFF7FFF
	Accessory Name(Optional)	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '
	Accessory MAC(Optional)	12	'0' - '9' 'A' - 'F'
	Accessory Status(Optional)	1	0| 1
	Accessory Battery Voltage(Optional)	<=4	0-5000(mV)
	Accessory Temperature(Optional)	<=3	-40-80(℃)
	Accessory Humidity(Optional)	<=3	0-100(%RH)
	Accessory Mode(Optional)	<=2	0-12
	Accessory Event(Optional)	<=3	0-255
	Tire Pressure(Optional)	<=3	0-500(kPa)
	Timestamp(Optional)	14	YYYYMMDDHHMMSS
	Enhanced Temperature(Optional)	<=5	-40.00-80.00(℃)
	Magnet ID(Optional)	2	00-FF
	MAG Event Counter(Optional)	<=5	0-32767
	Magnet State(Optional)	1	0| 1
	Accessory Battery Percentage(Optional)	<=3	0-100(%)
	Relay Config Result(Optional)	1	0-4
	Relay State(Optional)	1	0| 1
	Tri-axial Acceleration Data (Optional)	12	HEX

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Parts	Fields	Length	Range/Format
	Angle Values (Optional)	6	HEX
	Event Mask (Optional)	2	HEX
	Tilt Event (Optional)	4	HEX
	Motion Event (Optional)	4	HEX
	Crash Event (Optional)	4	HEX
	Falling Event (Optional)	4	HEX
	Move Event (Optional)	4	HEX
	Accessory RSSI (Optional)	<=4	-128-127
	Device Serial Number (Optional)	6	HEX
	Sensor Identifier (Optional)	4	HEX
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Index*

The index of the Bluetooth accessory defined in AT+GTBAS which triggers the **+RESP:GTBAA** message.

For WKF300 and WKF310, it is 0xFF. For other Beacon, it is 0xFE.

✧ *Accessory Type*

The type of the Bluetooth accessory which is defined in the <Index>.

- **0** - No Bluetooth accessory
- **1** - Escort sensor
- **2** - Beacon temperature sensor
- **3** - Bluetooth beacon accessory
- **6** - Beacon Multi-functional sensor
- **11** - Magnet sensor
- **12** - BLE TPMS sensor
- **13** - Relay sensor
- **14** - Smart Cap Bluetooth accessory
- **15** - Movement-angle BLE sensor
- **23** - Epsilon sensor

✧ *Accessory Model|Beacon ID Model*

The model of the Bluetooth accessory which is defined in AT+GTBAS or the model of the Bluetooth beacon accessory which is defined in AT+GTBID.

✧ *Alarm Type*

The type of the alarm which is generated by the Bluetooth accessory specified by <Accessory Type> and <Accessory Model> in the command **AT+GTBAS**.

- **0** - The voltage of the Bluetooth accessory is low.
- **1** - Temperature alarm: The current temperature value is lower than <Low Temperature> set in the command **AT+GTBAS**.
- **2** - Temperature alarm: The current temperature value is higher than <High Temperature> set in the command **AT+GTBAS**.
- **3** - Temperature alarm: The current temperature value is within the range defined by <Low Temperature> and <High Temperature> set in the command **AT+GTBAS**.
- **4** - Push button event for WKF300 or WKF310 is detected.
- **7** - Humidity alarm: The current humidity value is lower than <Low Humidity> set in the command **AT+GTBAS**.
- **8** - Humidity alarm: The current humidity value is higher than <High Humidity> set in the command **AT+GTBAS**.
- **9** - Humidity alarm: The current temperature value is within the range defined by <Low Humidity> and <High Humidity> set in the command **AT+GTBAS**.
- **A** - Angle event notification.
- **C** - Magnet event notification.
- **D** - Beacon event notification.
- **E** - Tire pressure alarm: The current Tire pressure value is lower than <Low Tire pressure> set in the **AT+GTBAS** command.
- **F** - Tire pressure alarm: The current Tire pressure value is higher than <High Tire

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pressure> set in the **AT+GTBAS** command.

- **10** - Tire pressure alarm: The current Tire pressure value is within the range defined by <Low Tire pressure> and <High Tire pressure> set in the command **AT+GTBAS**.
- **11** - No available Bluetooth accessory is detected.
- **12** - An available Bluetooth accessory is detected.
- **13** - Door open.
- **14** - Door closed.
- **15** - Relay event notification.
- **16** - Cap is on neck and locked.
- **19** - Tilt event.
- **1A** - Motion event(Both MOV BLE and WID320G will report event).
- **17** - Cap is removed from neck.
- **18** - Cap is rotated.
- **1B** - Crash event.
- **1C** - Fall event.
- **1D** - Tilt normal event.
- **1E** - Still event.

✧ *Append Mask*

Bitwise mask defined in the command AT+GTBAS or AT+GTBID to indicate the reported Bluetooth accessory data fields.

- **Bit0** - <Accessory Name>
- **Bit1** - <Accessory MAC>
- **Bit2** - <Accessory Status>
- **Bit3** - <Accessory Battery Voltage>
- **Bit4** - <Accessory Temperature>
- **Bit5** - <Accessory Humidity>
- **Bit7** - <Accessory Input Output Data>, including <Accessory Output Status>, <Accessory Digital Input Status>, <Accessory Analog Input Voltage>
- **Bit8** - <Accessory Event Notification Data>, including <Accessory Mode>, <Accessory Event>
- **Bit9** - <Tire Pressure>
- **Bit10** - <Time stamp>
- **Bit11** - <Enhanced Temperature>
- **Bit12** - <MAG Notification Data>, including <Magnet ID>, <MAG Event Counter>, <Magnet State>
- **Bit13** - <Accessory Battery Percentage>
- **Bit14** - <Relay Data>, including <Relay Config Result>, <Relay State>
- **Bit15** - <Expansion Mask>, if Bit 15 is set to 1, Bit 16 - Bit 31 will be valid.
- **Bit16** - <Tri-axial Acceleration Data>
- **Bit17** - <Angle Values>

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- **Bit18** - <Sensor Event Mask>, including <Event Mask>, <Tilt Event>, <Motion Event>, <Crash Event>, <Falling Event>
- **Bit19** - <MOV ELA Data>
- **Bit21** - <Accessory RSSI>
- **Bit23** - <ER2 Info Mask>, including <Device Serial Number>, <Sensor Identifier>

Note

In the message bit 0 - bit 15 precedes bit 16 - bit 31. Here is an example: <Accessory Append Mask> = 0x081F0007, 0x081F indicates bit 15 - bit 0, 0x0007 indicates bit 31 - bit 16.

✧ *Accessory Name(Optional)*
The name of the Bluetooth accessory.

✧ *Accessory MAC(Optional)*
The MAC address of the Bluetooth accessory.

✧ *Accessory Status(Optional)*
A numeral to indicate whether the accessory is available.

- **0** - The accessory is not available.
- **1** - The accessory is available.

✧ *Accessory Battery Voltage(Optional)*
The battery voltage of the Bluetooth accessory.

✧ *Accessory Temperature(Optional)*
Temperature data for the Bluetooth accessory.

✧ *Accessory Humidity(Optional)*
Humidity data for the Bluetooth accessory.

✧ *Accessory Mode(Optional)*
The operating mode of angle sensor.

✧ *Accessory Event(Optional)*
The event is generated by the angle sensor.

✧ *Timestamp(Optional)*
Timestamp of the tire pressure value collection.

✧ *Enhanced Temperature(Optional)*
High-precision temperature data of Bluetooth accessories.

✧ *Magnet ID(Optional)*
ID corresponding to different magnet sensors.

✧ *MAG Event Counter(Optional)*
The total number of times detected by the magnet sensor.

✧ *Magnet State(Optional)*
The state of the magnet sensor's two parts.

- **0** - Separate

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- **1** - Closed

✧ *Accessory Battery Percentage(Optional)*

Percentage of Bluetooth accessory's battery power.

✧ *Relay Config Result(Optional)*

The number representing the response result of the relay, which is controlled and reported by Bit14 of the AT+GTBAS parameter <Accessory Append Mask>.

- **0** - Configuration updated successfully.
- **1** - Error in connecting.
- **2** - The current password is incorrect.
- **3** - Password update error.
- **4** - Relay open or close error.

✧ *Relay State(Optional)*

The current state of the WRL300 sensor.

✧ *Tri-axial Acceleration Data (Optional)*

The values are coded on 16 bits (signed) in mg (+8g/-8g).

For example, **0xFFFE0005FF04**:

	X-axis		**Y-axis**		**Z-axis**	
HEX	D[0]	D[1]	D[2]	D[3]	D[4]	D[5]
Binary	0xFF	0xFE	0x00	0x05	0xFF	0x04

- **X-axis** - 0xFFFE => -2mg acceleration on X-axis
- **Y-axis** - 0x0005 => 5mg acceleration on Y-axis
- **Z-axis** - 0xFF04 => -252mg acceleration on Z-axis

✧ *Angle Values (Optional)*

Angle values are coded on 8 bits(unsigned). The values are expressed in degree (0-180 degree) based on the direction of gravity.

For example, **0x5A5A00**:

	X-axis	**Y-axis**	**Z-axis**
HEX	D[0]	D[1]	D[2]
Binary	0x5A	0x5A	0x00

- **X-axis** - 0x5A => 90deg, X-axis state is horizontal
- **Y-axis** - 0x5A => 90deg, Y-axis state is horizontal
- **Z-axis** - 0x00 => 0deg, Z-axis state is vertical up

Note

If the angle value cannot be obtained, then use 0xFF to represent an invalid angle value.

✧ *Event Mask (Optional)*

This is event alarm mask.

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- **Bit 0** - Tilt mask, it controls Angle Tilt zone.
- **Bit 1** - Motion mask, it controls motion state zone.
- **Bit 2** - Crash mask, it controls Crash value zone.
- **Bit 3** - Falling mask, it controls Falling value zone.

If tilt function is enabled, the tilt mask will be set to 1, otherwise it will be set to 0.
If motion function is enabled, the motion mask will be set to 1, otherwise it will be set to 0.
If crash function is enabled, the crash mask will be set to 1, otherwise it will be set to 0.
If falling function is enabled, the falling mask will be set to 1, otherwise it will be set to 0.

✧ *Tilt Event (Optional)*

Tilt Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: tilt/0: normal) on LSB.

	Tilt[0]		**Tilt[1]**	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: **0x000A**

- **0** - Tilt state (normal)
- **0000 0000 0000 101** - Event counter value on 15 bits, count 5

✧ *Motion Event (Optional)*

Motion Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: move/0: still) on LSB.

	Motion[0]		**Motion[1]**	
HEX	0	0	0	B
Binary	0000	0000	0000	1011

For example: **0x000B**

- **1** - Motion state (move)
- **0000 0000 0000 101** - Event counter value on 15 bits, count 5

✧ *Crash Event (Optional)*

Crash Event (state change) counter on the 16 (unsigned) bits.

	Crash[0]		**Crash[1]**	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: **0x000A**

- **0000 0000 0000 1010** - Event counter value on 16 bits, count 10.

✧ *Falling Event (Optional)*

Fall Event (state change) counter on the 16 (unsigned) bits.

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	Falling[0]		Falling[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: **0x000A**

- **0000 0000 0000 1010** - Event counter value on 16 bits, count 10

✧ *Move Event (Optional)*

Move Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: move/0: still) on LSB.

	Motion[0]		Motion[1]	
HEX	0	0	0	B
Binary	0000	0000	0000	1011

For example: **0x000B**

- **1** - Move state (move)
- **0000 0000 0000 101** - Event counter value on 15 bits, count 5.

✧ *Accessory RSSI (Optional)*

Signal strength RSSI value for the Bluetooth accessory.

✧ *Device Serial Number (Optional)*

A hexadecimal value representing the device serial number of ER2-BLE sensor.

✧ *Sensor Identifier (Optional)*

A hexadecimal value representing the sensor identifier (sensor number in the group) of ER2-BLE sensor.

4.5.40 BID (Bluetooth Beacon ID Report)

Example:

+RESP:GTBID,740D01,867488060284402,GV350CEU,1,2,00CA,780541295AF5,2935,-57,1,FDA50693A4E24FB1AFCFC6EB07647825,2A94,283B,00CA,1,0.0,0,47.0,117.129132,31.839405,20230613111241,0460,0001,DF5C,027A4F1F,01,12,20230613191242,08FF$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BID
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF

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Parts	Fields	Length	Range/Format
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Number	<=2	0-3| 0-15
	Beacon ID Model	<=2	0-2| 4| 7| 10
	Accessory Append Mask	4	0000-FFFF
	Accessory Name(Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '
	Accessory MAC (Optional)	12	'0' - '9' 'A' - 'F'
	Accessory Battery Level (Optional)	<=4	0-5000(mV)
	Accessory Signal Strength (Optional)	<=4	-120-0
	Beacon Type (Optional)	1|3	0-2| 255
	Beacon Data (Optional)	<=100	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

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✧ *Number*

The number of the Bluetooth beacon accessories.

From <Number> to <GNSS Accuracy>, excluding the series of parameters including <GNSS Accuracy>, the subsequent content will be repeated <Number> times.

- **WKF300 and WKF310** - The maximum value is 3.
- **iBeacon E6** - The maximum value is 15.
- **ID ELA** - The maximum value is 15.
- **WID310** - The maximum value is 15.
- **WID330** - The maximum value is 15.

✧ *Beacon ID Model*

The model of the Bluetooth beacon accessory which is defined in AT+GTBID.

✧ *Accessory Append Mask*

Bitwise mask defined in the **AT+GTBID** command to configure which data item is reported.

- **Bit0** - <Accessory Name>
- **Bit1** - <Accessory MAC>
- **Bit2** - Reserved
- **Bit3** - <Accessory Battery Level>
- **Bit4 - 5** Reserved
- **Bit6** - <Accessory Signal Strength>
- **Bit7** - <Beacon Type> and <Beacon Data>

✧ *Accessory Name(Optional)*

The name of the Bluetooth accessory.

✧ *Accessory MAC (Optional)*

The MAC address of the Bluetooth accessory.

✧ *Accessory Battery Level (Optional)*

The voltage of Bluetooth accessory.

✧ *Accessory Signal Strength (Optional)*

The signal strength of Bluetooth accessory.

✧ *Beacon Type (Optional)*

Types of beacons.

- **0** - “ID” Format
- **1** - “iBeacon” Format
- **2** - “Eddystone” Format
- **255** - “Unknown” Format, no beacon data reporting

✧ *Beacon Data (Optional)*

Select the data format according to <Beacon Type>:

If <Beacon Type> is 0, the data format is as follows:

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Fields	Length	Range/Format
ID_Mfr_Data	12	(HEX)

If <Beacon Type> is 1, the data format is as follows:

Fields	Length	Range/Format
UUID	32	(HEX)
Major	4	(HEX)
Minor	4	(HEX)

If <Beacon Type> is 2, the data format is as follows:

Fields	Length	Range/Format
NID	20	(HEX)
BID	12	(HEX)

4.5.41 BIE (Expand BID Report)

Example:

+RESP:GTBIE,740D01,867488060284402,GV350CEU,1,2,00CA,780541295AF5,2935,-57,1,FDA50693A4E24FB1AFCFC6EB07647825,2A94,283B,00CA,1,0.0,0,47.0,117.129132,31.839405,20230613111241,0460,0001,DF5C,027A4F1F,01,12,20230613191242,08FF$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BIE
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Detected Count	<=4	0-9999
	Total Frame	1	1-5
	Frame Index	1	1-5
	Beacon Number	<=2	0-20
	Beacon ID Model	<=2	0-2| 4| 7| 10

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Parts	Fields	Length	Range/Format
	Append Mask	4	0000-FFFF
	Accessory Name (Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '
	Accessory MAC (Optional)	12	'0'-'9' 'A'-'F'
	Accessory Battery Level (Optional)	<=4	0-5000(mV)
	Accessory Signal Strength (Optional)	<=4	-120-0(dBm)
	Beacon Type(Optional)	1|3	0-2| 255
	Beacon Data(Optional)	<=100	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Detected Count*

It indicates the sequence number of beacons that have been detected in each index. And it starts at 0 if the value exceeds 9999.

✧ *Total Frame*

A numeral to indicate the total number of frames that the following data takes up.

✧ *Frame Index*

A numeral to indicate the index of the current frame.

✧ *Beacon Number*

The number of the Bluetooth beacon accessories.

From <Number> to <GNSS Accuracy>, excluding the series of parameters including <GNSS Accuracy>, the subsequent content will be repeated <Number> times.

✧ *Beacon ID Model*

The model of the Bluetooth beacon accessory which is defined in AT+GTBID.

✧ *Append Mask*

Bitwise mask defined in the AT+GTBID command to configure which data item is reported.

- **Bit0** - <Accessory Name>
- **Bit1** - <Accessory MAC>
- **Bit2** - Reserved
- **Bit3** - <Accessory Battery Level>
- **Bit4 - 5** Reserved
- **Bit6** - <Accessory Signal Strength>
- **Bit7** - <Beacon Type> and <Beacon Data>

✧ *Accessory Name (Optional)*

The name of the Bluetooth accessory.

✧ *Accessory MAC (Optional)*

The MAC address of the Bluetooth accessory.

✧ *Accessory Battery Level (Optional)*

The voltage of Bluetooth accessory.

✧ *Accessory Signal Strength (Optional)*

The signal strength of Bluetooth accessory.

✧ *Beacon Type(Optional)*

Types of beacons.

- **0** - "ID" Format
- **1** - "iBeacon" Format
- **2** - "Eddystone" Format
- **255** - "Unknown" Format, no beacon data reporting.

✧ *Beacon Data(Optional)*

It is used to select the data format according to <Beacon Type>.

If <Beacon Type> is 0, the data format is as follows:

Fields	Length	Range/Format
ID_Mfr_Data	12	HEX

If <Beacon Type> is 1, the data format is as follows:

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Fields	Length	Range/Format
UUID	32	HEX
Major	4	HEX
Minor	4	HEX

If <Beacon Type> is 2, the data format is as follows:

Fields	Length	Range/Format
NID	20	HEX
BID	12	HEX

4.5.42 BAR (Bluetooth Accessory Report)

The device reports the data controlled by <Accessory Type> and <Accessory Model> in AT+GTBAS from the peripheral Bluetooth devices to it via message **+RESP:GTBAR**.

Example:
+RESP:GTBAR,740904,862524060636111,GV350CEU,04,7,2,0007,DFM250DS7,0036F2C300E0,1,04,37F7,D007816009900101 4B37000001000001000000 5A,38F7,18D67A0064B90F000AA1540084A2240000530700,39F7,60823B00600D100010552200E093040050C30000,52F7,0487010088D501001A4F000044C5000070110100,0,0.0,178,135.8,117.129358,31.839330,20240226064713,0460,0000,550B,085BE2AA,00,20240226144714,44DE$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BAR
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Index	2	00-09
	Accessory Type	1	7
	Accessory Model	1	0-4
	Accessory Append Mask	<=4	0000 - FFFF
	Accessory Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'

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Parts	Fields	Length	Range/Format
	Accessory MAC	12	(HEX)
	Accessory Status	1	0| 1
	Accessory Data	<=1300	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Accessory Type*

The type of the Bluetooth accessory which is defined in the <Index>. The following is supported now:

- **7** - Technoton accessory.

✧ *Accessory Data*

There are accessory data para according <Accessory Type> and <Accessory Model>:

If the <Accessory Type> is 7 and <Accessory Model> is 0 (DUT-E S7), <Accessory Model> is 3 (GNOM DDE S7) or <Accessory Model> is 4(GNOM DP S7):

Fields	Length	Range/Format
Version	2	(HEX)
PGN	4	(HEX)
PGN Data	<=42	(HEX)

If the <Accessory Type> is 7 and <Accessory Model> is 1 (DFM 100 S7):

Fields	Length	Range/Format
Version	2	(HEX)
PGN1	4	(HEX)
PGN Data1	<=42	(HEX)
PGN2	4	(HEX)
PGN Data2	<=42	(HEX)
PGN3	4	(HEX)
PGN Data3	<=42	(HEX)

If the <Accessory Type> is 7 and <Accessory Model> is 2 (DFM 250D S7):

Fields	Length	Range/Format
Version	2	(HEX)
PGN1	4	(HEX)
PGN Data1	<=42	(HEX)
PGN2	4	(HEX)
PGN Data2	<=42	(HEX)
PGN3	4	(HEX)
PGN Data3	<=42	(HEX)
PGN4	4	(HEX)
PGN Data4	<=42	(HEX)

- *Version*
  It indicates the version of accessory software.
- *PGNx*
  It means parameter group number.
- *PGN Datax*
  Different PGN, PGN Data have different data frame formats. It needs to parse according to the TECHNOTON S7 BUS Protocol.

Note

If the total number of characters in a single message is too long, **+RESP:GTBAR** will be divided into multiple messages.

4.5.43 UFS (UFSxxx FOTA Upgrade Report)

The device will send the message **+RESP:GTUFS** to the backend server during the upgrade process.

Example:

+RESP:GTUFS,740D05,863286020866449,GV350CEU,101,,20160817190550,0A3A$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	UFS
	Leading Symbol	1	,
	Full Protocol Version	6	000000 - FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Code	3	100-103| 200-202| 300-302
	Expand Parameters (Optional)	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Code*

Information code.

- **100** - Confirm ok. Start to upgrade.
- **101** - Mode error. UART does not work for UFSxxx. Stop upgrade.
- **102** - The upgrading process is refused because of low power or an incorrect URL.
- **103** - Another upgrade command is being executed. Stop upgrade.
- **200** - Start to download package.
- **201** - Package download succeeds.
- **202** - Package download fails.
- **300** - Start to upgrade.
- **301** - Upgrade succeeds. The reserved parameter is used as follows.
- **302** - Upgrade fails.

✧ *Expand Parameters (Optional)*

When <Code> is 301, the extended parameter is <New Version>; otherwise, it is <Reserved>.

If <Code> is **301**, the following parameters are used:

Fields	Length	Range/Format
New Version	2	

- *New Version*

  The version of the new firmware in the UFSxxx sensor.

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4.5.44 IDC (ID Check Report)

If the parameter <IDC Enable> in AT+GTIDA is enabled, the device will send the message **+RESP:GTIDC** to the server.

Example:
+RESP:GTIDC,740D01,862524060205859,2AF77376,20240226155722,25E6$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	IDC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	ID Number	<=28	'0' - '9' 'a' - 'f' 'A' - 'F'
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *ID Number*
Target ID number.

4.5.45 TPM (Tire Pressure Monitoring)

The report is used for the TPMS (Tire Pressure Monitoring System).

Example:
+RESP:GTTPM,740904,866775051512176,GV350CEU,10,1,0.0,199,39.9,117.129139,31.838945,20250313104911,0460,0011,DF5C,0DD0833A,00,01FB,16,19,331101,40,21,00,12,43,40,99,331102,40,16,00,12,44,37,13,114413,57,110,48,1,57,40,AA,3344AA,40,16,00,12,44,37,A1,3344A1,40,16,00,12,44,37,B0,3344B0,40,16,00,12,44,37,C3,3344C3,40,16,00,12,44,37,D1,3344D1,40,16,00,12,44,37,97,334497,40,16,00,12,44,37,24,334424,40,16,00,12,44,37,35,334435,40,16,00,12,44,37,45,334445,40,16,00,12,44,37,65,334465,40,16,00,12,44,37,78,334478,40,16,00,12,44,37,33,334433,40,16,00,12,44,37,88,334488,40,110,08,17,45,40,20250313104912,085A$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TPM
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Accessory Type/Report Type	2	0-1| 0-2
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Append Mask	4	0000 - FFFF
	Tire Number	<=2	0-24
	Tire Position (Optional)	2	00 - FF
	Sensor ID (Optional)	6	xxxxxx
	Sensor Bat Vol (Optional)	3	1.9-3.4(V)
	Tire Pressure (Optional)	<=5	0.00 - 25.57 (Bar) | 0 - 255 (PSI)
	Tire Temperature (Optional)	<=3	-50-205(℃)
	Tire Status (Optional)	2	00 - FF
	Time Out(Optional)	<=3	0-255(min)

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Parts	Fields	Length	Range/Format
	RF Quality(Optional)	<=3	0-100
	Reference Pressure(Optional)	<=3	0-255(PSI)
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Accessory Type/Report Type*

It is a one-byte hexadecimal value represented by two ASCII bytes. The first byte (4 higher bits of the hexadecimal value) indicates Accessory type and the second byte (4 lower bits of the hexadecimal value) indicates Report Type.

Accessory type has several meanings as follows.

- **0 -** Saftire D21.
- **1 -** PressurePRO TPMS.

Report Type has the following meanings.

- **0 -** Tire data changes.
- **1 -** Fixed time report.
- **2 -** Trigger by **AT+GTRTO** command.

✧ *Tire Number*

Total number of tires in the message. The fields from <Tire Position> to <Tire Status> will be displayed for each tire.

✧ *Tire Position (Optional)*

A numerical to indicate the tire position in vehicle.

The top 3 bits (bit 7-5) mean trailer number, low 5 bits (bit 4-0) mean tire serial number.

Note

The details can be seen in the example below, which represents the tire positions of a 3-axle truck and a 3-axle trailer.

Truck						Trailer					
0X						2X					
		3		7			1		5		9
1		4		8			2		6		A
Heading left						Heading left					
2		5		9			3		7		B
		6		A			4		8		C

✧ *Sensor ID (Optional)*

Tire pressure sensor ID.

✧ *Sensor Bat Vol (Optional)*

Tire pressure sensor battery voltage.

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✧ *Tire Pressure (Optional)*
Tire pressure value. If the accessory type is Saftire D21, the unit is Bar. If the accessory type is PressurePRO TPMS, the unit is PSI.

✧ *Tire Temperature (Optional)*
Tire temperature value.

✧ *Tire Status (Optional)*
Tire pressure sensor status. If the accessory type is Saftire D21:

- **Bit 7** - Sensor battery voltage status, 0 means normal, 1 means low battery voltage.
- **Bit 6** - When there is no data received from the sensor for a long time (60 minutes), this bit is set to 1.
- **Bit 5** - 1 means automatic positioning on, 0 means off.
- **Bit 4** - 1 means high air pressure.
- **Bit 3** - 1 means low air pressure.
- **Bit 2** - 1 means high temperature, 0 means normal.
- **Bit 1 - 0**:
  - **00** - Normal state.
  - **01** - Emergency air leakage.
  - **10** - Slow air leakage.
  - **11** - Gas filling.

If the accessory type is PressurePRO TPMS:

- **Bit 7** - 1 means delta pressure alarm.
- **Bit 6** - 1 means over pressure.
- **Bit 5** - 1 means extreme under pressure.
- **Bit 4** - 1 means under pressure.
- **Bit 3** - 1 means over temperature.
- **Bit 2** - 1 means low battery.
- **Bit 1** - 1 means missing.
- **Bit 0** - 1 means missing.

✧ *Time Out(Optional)*
Time since last contact.

✧ *RF Quality(Optional)*
RF quality value.

✧ *Reference Pressure(Optional)*
Reference pressure value.

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4.5.46 BFS (Bluetooth Fields Setting Report)

Example:
+RESP:GTBFS,740B05,860000000099993,GV350CEU,1,C30000322719,32E15EDA0966421CA7B93B646C028231,0007,20E2,100,1,0.0,0,65.7,117.129191,31.839292,20250801084010,0460,0011,DF5C,02A90902,11,12,0,20250801084011,0C98$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BFS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Number	<=2	0-10
	MAC	12	(HEX)
	UUID	32	(HEX)
	Major	4	(HEX)
	Minor	4	(HEX)
	Battery Level	<=3	0-100
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX

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Parts	Fields	Length	Range/Format
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State (Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Battery Level*

The remaining battery level of beacon in percentage.

4.5.47 SOT (Server LOGOUT)

This message indicates that the current server session has been logged out.

Example:

+RESP:GTSOT,740A01,860000000099993,GV350CEU,,20250219082841,010A$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	SOT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.5.48 UHF (UHF RFID Reader Report)

If the RFID tag information of UHF RFID reader received or inventory command is sent, the device will send the message **+RESP:GTUHF** to the server.

Example:

+RESP:GTUHF,740904,867488060284402,GV350CEU,7,,,,,,,,1,0.0,0,47.0,117.129132,31.839405,20230613111241,0460,0001,DF5C,027A4F1F,01,12,20230613191242,08FF$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	UHF
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Message Type	1	1-7
	Parameter(Optional)		
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Message Type*

- **1** - Scanned tag data report.

- **2** - Reader information report.
- **3** - Obtain the reader GPIO state.
- **4** - Obtain the reader unique serial number.
- **5** - Obtain the reader working mode.
- **6** - Antenna disconnected.
- **7** - UHF Reader disconnected.

✧ *Parameter(Optional)*

If the Message Type is **1** (Scanned tag data report), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Tag Number	1	1-8
Read Tag Antenna ID	1	1-8
Tag Data	<=128	HEX
RSSI	<=3	0-255
Reserved	0	
Reserved	0	
Reserved	0	

- *Read Tag Antenna ID*

  A numeral to indicate which antenna has scanned tag.

If the Message Type is **2** (Reader information report), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Reader Version	<=7	'0' - '9' 'A' - 'Z'
Reader Model Code	<=2	0 - FF
Maximum Frequency	2	00-FF
Minimum Frequency	2	00-FF
Scan Time	2	00 - FF
Antenna Enable Mask	2	00 - FF
Antenna Check Mode	1	0|1

- *Reader Version*

  UHF Reader firmware version.

- *Reader Model Code*

  A code of reader.

- *Scan Time*

  Reader will respond the inventory command delivered from host within this specific time.

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Unit 100ms.

- *Antenna Enable Mask*
  Bitwise mask to indicate antenna configuration information, set to 1 means this antenna is enabled.
- *Antenna Check Mode*
  A numeral to indicate enable or disable the antenna check during tag reading/writing operation. When the parameter <Accessory Type> of the AT+GTUHF command is 1, this parameter will be reported as empty.
  - **0** - Disable antenna check
  - **1** - Enable antenna check

If the Message Type is **3** (Obtain the reader GPIO state), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Reader GPIO Status	2	00-FF
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	

- *Reader GPIO Status*
  The input and output states of UHF reader GPIO. 1 means high voltage level. Other bits are reserved.
  - **Bit 0** - IN1 pin status
  - **Bit 1** - Reserved
  - **Bit 2** - Reserved
  - **Bit 3** - Reserved
  - **Bit 4** - OUT1 pin status
  - **Bit 5** - OUT2 pin status
  - **Bit 6** - Reserved
  - **Bit 7** - Reserved

If the Message Type is **4** (Obtain the reader unique serial number), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Unique Serial Number	<=8	'0' - '9'
Reserved	0	

Fields	Length	Range/Format
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	

If the Message Type is **5** (Obtain the reader working mode), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Reader Working Mode	1	0-2
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	

If the Message Type is **6** (Antenna disconnected), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Disconnected Antenna ID	1	1-8
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	

- *Disconnected Antenna ID*

  A numeral to indicate which antenna has disconnected.

4.5.49 ATR (Alcohol Tester Report)

If the parameter <Mode> in AT+GTURT is set to 44, the device will send the message **+RESP:GTATR** to the server.

Example:
+RESP:GTATR,740D01,866775050902253,GV350CEU,,1,20,,0,0.0,261,97.3,117.129168,31.839455,20230328053756,0460,0000,691D,6141,01,1,20250701054040,003C$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	ATR
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Detection Status	1	0-5
	Alcohol Concentration	<=8	0.000-4000.000(mg/L)
	Reserved	0	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF

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Parts	Fields	Length	Range/Format
	Tail	1	$

✧ *Detection Status*

Alcohol tester detection status.

- **0** - Ready and waiting.
- **1** - No abnormalities detected.
- **2** - DUI (Driving Under the Influence).
- **3** - DWI (Driving While Intoxicated).
- **4** - Failed.
- **5** - Timeout.

✧ *Alcohol Concentration*

Alcohol concentration detected by ACL-303.

4.5.50 BFE (Expand Bluetooth Fields Setting Report)

Example:

+RESP:GTBFE,740B05,860000000099993,GV350CEU,70,1,1,1,C30000322719,32E15EDA0966421CA7B93B646C028231,0007,20E2,100,,1,0.0,0,65.7,117.129191,31.839292,20250801060135,0460,0011,DF5C,02A90902,11,12,0,,20250801060136,0B71$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BFE
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Detected Count	<=4	0-9999
	Total Frame	1	1-5
	Frame Index	1	1-5
	Beacon Number	<=2	0-20
	MAC	12	(HEX)
	UUID	32	(HEX)

Parts	Fields	Length	Range/Format
	Major	4	(HEX)
	Minor	4	(HEX)
	Battery Level	<=3	0-100
	Reserved	0	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State (Optional)	1	0-3
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Detected Count*

It indicates the sequence number of beacons that have been detected in each index. And it starts at 0 if the value exceeds 9999.

✧ *Total Frame*

A numeral to indicate the total number of frames that the following data takes up.

✧ *Frame Index*

A numeral to indicate the index of the current frame.

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4.6 Data Flow Reports

This section describes the message related to certain data needs to be sent. Please refer to the details below.

4.6.1 BTD (Bluetooth Accessory Data Report)

If **+RESP:GTBTD** is enabled, the device will send the message **+RESP:GTBTD** to the backend server.

Example:
+RESP:GTBTD,740D01,862170010196747,GV350CEU,0,0,0,000001FF,GV350CEU_name,GV350CEUmac,1,0,4,0.00,FFFE0005FF04,5A5A00,0,000A,000B,000A,000A,000B,,,20120725122928,004A$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	BTD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Index	2	00-09
	Accessory Type	<=2	0| 15
	Accessory Model	1	0
	Data Mask	<=8	0 - 7FFFFFFF
	Accessory Name(Optional)	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Accessory MAC(Optional)	12	'0' - '9' 'A' - 'F'
	Accessory Status(Optional)	1	0| 1
	Accessory Battery Level(Optional)	<=4	0-5000(mV)
	Accessory Temperature(Optional)	<=3	-40-80(℃)
	Enhanced Temperature(Optional)	<=5	-40.00-80.00(℃)

Parts	Fields	Length	Range/Format
	Tri-axial Acceleration Data (Optional)	12	HEX
	Angle Values (Optional)	6	HEX
	Event Mask (Optional)	2	HEX
	Tilt Event (Optional)	4	HEX
	Motion Event (Optional)	4	HEX
	Crash Event (Optional)	4	HEX
	Falling Event (Optional)	4	HEX
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *Index*
  The Index of the Bluetooth accessory.
- *Accessory Type*
  The type of the Bluetooth accessory.
- *Accessory Model*
  The model of the Bluetooth accessory.
- *Accessory Name(Optional)*
  The name of the Bluetooth accessory.
- *Accessory MAC(Optional)*
  The MAC address of the Bluetooth accessory.
- *Accessory Status(Optional)*
  It indicates the connection status of Bluetooth accessory.
  - **0** - Disconnected.
  - **1** - Connected.
- *Accessory Battery Level(Optional)*
  It indicates the remaining level of the battery in Bluetooth accessory.
- *Accessory Temperature(Optional)*
  It indicates the temperature measured by Bluetooth accessory. When this parameter is reported in the HEX-formatted message, this parameter is reported as 7F if the accessory temperature is not obtained.
- *Tri-axial Acceleration Data (Optional)*
  Values are coded on 16 bits(signed). The values are expressed in mg (+8g/-8g). For example: 0xFFFE0005FF04

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	X-axis		Y-axis		Z-axis	
HEX	D[0]	D[1]	D[2]	D[3]	D[4]	D[5]
Binary	0xFF	0xFE	0x00	0x05	0xFF	0x04

- X-axis: 0xFFFE => -2mg acceleration on X-axis
- Y-axis: 0x0005 => 5mg acceleration on Y-axis
- Z-axis: 0xFF04 => -252mg acceleration on Z-axis

✧ *Angle Values (Optional)*

Angle values are coded on 8 bits(unsigned). The values are expressed in degree (0-180 degree) based in gravity direction. For example: 0x5A5A00

	X-axis	Y-axis	Z-axis
HEX	D[0]	D[1]	D[2]
Binary	0x5A	0x5A	0x00

- X-axis: 0x5A => 90deg, x-axis state is horizontal
- Y-axis: 0x5A => 90deg, y-axis state is horizontal
- Z-axis: 0x00 => 0deg, z-axis state is vertical up

✧ *Event Mask (Optional)*

This is event alarm mask, please refer to the following mask define:

- **Bit0** - Tilt mask, it controls Angle Tilt zone.
- **Bit1** - Motion mask, it controls motion state zone.
- **Bit2** - Crash mask, it controls Crash value zone.
- **Bit3** - Falling mask, it controls Falling value zone.

If tilt function enables, the tilt mask will be set 1, otherwise it will be set 0. If motion function enables, the motion mask will be set 1, otherwise it will be set 0. If crash function enables, the crash mask will be set 1, otherwise it will be set 0. If falling function enables, the falling mask will be set 1, otherwise it will be set 0.

✧ *Tilt Event (Optional)*

Tilt Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: tilt/0: normal) on LSB.

	Tilt[0]		Tilt[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: 0x000A

- 0: tilt state (state normal)
- 0000 0000 0000 101: event counter value on 15 bits, count 5.

✧ *Motion Event (Optional)*

Motion Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: move/0: still) on LSB.

	Motion[0]		Motion[1]	
HEX	0	0	0	B
Binary	0000	0000	0000	1011

For example: 0x000B

- 1: motion state (state move)
- 0000 0000 0000 101: event counter value on 15 bits, count 5.

✧ *Crash Event (Optional)*

Crash Event (state change) counter on the 16 (unsigned).

	Crash[0]		Crash[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: 0x000A

- 0000 0000 0000 1010: event counter value on 16 bits, count 10.

✧ *Falling Event (Optional)*

Fall Event (state change) counter on the 16 (unsigned).

	Falling[0]		Falling[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: 0x000A

- 0000 0000 0000 1010: event counter value on 16 bits, count 10.

4.6.2 CRG (Crash GNSS Data Packet)

The **+RESP:GTCRG** message contains GNSS information before/after the crash. When crash is detected, GNSS information before the crash will be reported to the backend server. And the device will continue to record GNSS information after the crash and report the packed data to the backend server.

Example:

+RESP:GTCRG,740D01,135790246811220,GV350CEU,1,10,1,1,19.1,165,54.8,121.390739,31.164275,20160202060648,10,1,24.8,176,51.3,121.390733,31.164220,20160202060649,3,1,14.0,173,47.3,121.390729,31.164224,20160202060650,4,1,8.5,173,46.4,121.390737,31.164227,20160202060651,5,1,8.1,194,46.1,121.390725,31.164225,20160202060652,6,1,12.3,229,46.6,121.390690,31.164227,20160202060653,7,1,17.6,258,4

3.9,121.390635,31.164223,20160202060654,8,1,6.8,268,43.8,121.390672,31.164269,20160202060655,9,1,2.2,229,44.8,121.390701,31.164282,20160202060656,10,1,2.8,229,44.3,121.390709,31.164306,20160202060657,20160202060658,01A8$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CRG
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Data Type	1	0| 1
	GNSS Validity Number	<=2	0-10
	GNSS Point Index	<=2	1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	…		
	GNSS Point Index	<=2	10
	GNSS Accuracy	<=2	0| 1-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
Tail	Send Time	14	YYYYMMDDHHMMSS

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Parts	Fields	Length	Range/Format
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Data Type*

The data reported to the backend server is recorded before crash or after crash.

- **0** - Before crash
- **1** - After crash

✧ *GNSS Validity Number*

The number of the successfully fixed GNSS positions included in the report message.

✧ *GNSS Point Index*

The index of total GNSS point before/after the crash.

4.6.3 DUC (Data Usage Statistics)

This message is used to get statistics about data usage.

Example:

+RESP:GTDUC,740D01,862170019025640,GV350CEU,0,0,90,,20201123064427,05D1$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	DUC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Report Type	1	0-4
	Total Data Usage	<=8	0-99999999(M)
	Day Data Usage	<=8	0-99999999(Kbyte)
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Report Type*

The type of this report.

- **0** - Report triggered by <Mode> of AT+GTRTO.
- **1** - Report triggered by <Report Interval> of AT+GTDUC.
- **2** - Report triggered by <Total Percentage> of **AT+GTDUC**.
- **3** - Report triggered by <Day Data Usage> of **AT+GTDUC**.
- **4** - Report triggered by <Data Usage> of **AT+GTDUC**.

✧ *Total Data Usage*

The total data that has been consumed.

✧ *Day Data Usage*

The data that has been consumed today.

4.6.4 FSD (Fuel Sensor Data Packet)

This message is used for reporting fuel sensor data.

Example:

+RESP:GTFSD,740D01,862170016790444,GV350CEU,39,*QL,407D,01,00000,0132,0014,00000,0229#,,,,,20141021021206,0018$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	FSD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Data Length	2	
	Sensor Data	<=128	ASCII String
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF

Parts	Fields	Length	Range/Format
	Tail	1	$

✧ *Data Length*
The length of <Sensor Data>.

✧ *Sensor Data*
The fuel data from fuel sensor. It starts with "*" and ends with "#".

4.6.5 PHD (Photo Data Packet)

This message is used for reporting photo data and only sent via GPRS even if the report mode is forced SMS mode.

Example:
+RESP:GTPHD,740D01,862170019025640,GV350CEU,0,,20131018075847,20,20,8,AP/V/9k=,,,,,2013101807
5950,006C$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	PHD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Camera ID	1	0-3
	Reserved	0	
	Photo Time	14	YYYYMMDDHHMMSS
	Total Frames	<=3	
	Current Frame Index	<=3	
	Photo Data Length	<=3	
	Photo Data	<=684	
	Reserved	0	
	Reserved	0	
	Reserved	0	

Parts	Fields	Length	Range/Format
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *Total Frames*
  The total frames of one picture.
- *Current Frame Index*
  The index of the current frame.
- *Photo Data Length*
  The length of picture data in the current frame.

4.6.6 CRD (Crash Data Packet)

The **+RESP:GTCRD** message contains the tri-axial acceleration data before and after the crash, which is determined by the parameters <Samples Before Crash> and <Samples After Crash>. When crash accident is detected, tri-axial acceleration data before crash will be reported to backend server in several frames. And the device will continue to record tri-axial data after crash and report the data to backend server in several frames.

Example:

+RESP:GTCRD,740D01,359231038715676,GV350CEU,00,00,3,1,0001000100550001000200510000000005
5000000010052000100010056000100010053000000000054000000010051000100000054000000010053
0010001005500010000005300010001005400000003005100000001005300001ffff005300000001005300001
0000005200000000005400030001005300021ffff005300010001005200000002005100010003005300010000
0005300011ffff005400000001005200000003005500020001005300010000005200010001005500010001000
540001ffff005300000002005300000002005 6ffff000000530000000000520001000000520001000200520002
000100540000000010054ffff000200520000000100510001ffff00530002ffff00540001fffe00520001ffff0053
0000000200520000000200520002000100520001000100560001000100520001ffff005300010002005600001
1ffff005100010001005500010000005100020002005300000000005500010000005200010001005500010001
0010053ffffffff00520000ffff005200010002005300020001005400010000005500010002005300010000005300
0000001005300010001005200000ffff005100010000005200020000005200021ffff005200010002005300000
0020054000000000054000 1fffe00530001ffff005200010001005200010001005300010001005200 00,201203
30120443,005C$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CRD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Crash Counter	2	00-FF
	Data Type	2	00-7F
	Total frame	<=2	1-32
	Frame Number	<=2	1-32
	Data	<=1200	'0'-'9' 'A'-'F'
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Crash Counter*

It indicates the sequence number of the crash event. The report of **+RESP:GTCRA** and **+RESP:GTCRD** are combined into one crash event. It rolls from 0x00 to 0xFF.

✧ *Data Type*

A hexadecimal parameter to indicate the time of the data (before crash or after crash) and crash direction (+X, -X, +Y, -Y, +Z, -Z or several of them).

Mask Bit	Description
Bit 0	0: Before crash 1: After crash
Bit 1	0: X-axis crash not detected 1: X-axis crash detected
Bit 2	0: X-axis positive direction 1: X-axis negative direction
Bit 3	0: Y-axis crash not detected 1: Y-axis crash detected
Bit 4	0: Y-axis positive direction 1: Y-axis negative direction
Bit 5	0: Z-axis crash not detected 1: Z-axis crash detected
Bit 6	0: Z-axis positive direction 1: Z-axis negative direction
Bit 7	0: Acceleration data

✧ *Total frame*

Total number of messages that are sent to the backend server for the crash event.

✧ *Frame Number*

A numeral to indicate the sequence of the current message.

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✧ *Data*

There are 1200 ASCII characters in one message at most which includes acceleration samples in 1 second at most. There are 12 characters in a group. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters represent Z axis acceleration data. The ASCII "0001" is equal to 0x0001 in hex format, and the ASCII "afff" is equal to 0xAFFF in hex format. They are two's complement.

- *Example*
  - +RESP:GTCRD,740D01,359231038715676,,0,3,1,000100010055…,20120330120443,005C$
    This is the oldest XYZ-axis acceleration data:
    Conversion to hex format: X (axis acceleration data) = 0x0001; Y = 0x0001; Z = 0x0055;
    Decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;
  - +RESP:GTCRD,740D01,359231038715676,,1,3,3,…ffffff10052,20120330115736,005A$
    This is the last XYZ-axis acceleration data:
    Conversion to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; Z = 0x0052;
    Decimal format: X (axis acceleration data) = -1; Y = -15; Z = 82;

Note

Acceleration of gravity (+g) is the 82 in decimal format and - g is -82. The linearized acceleration data 1394 represents +16g and -1394 represents -16g.

4.6.7 ACC (Acceleration Data Packet)

The device will report 75 sets of tri-axial acceleration data to the backend server in the message **+RESP:GTACC**. The device will report the message every 3 seconds, and record 25 XYZ-axis acceleration data per second.

Example:

+RESP:GTACC,740D01,864292043426376,GV350CEU,FFFE0000007EFFFE0000007EFFFE0000007FFFFF00000
07EFFFF0000007EFFFE0000007FFFFE0000007EFFFE0000007EFFFF0000007FFFFE0000007EFFFF0000007EFF
FE0000007EFFFE0000007FFFFE0000007EFFFE0000007FFFFE0000007FFFFF0000007EFFFFFFFF007EFFFE000
0007EFFFE0000007EFFFE0000007EFFFE0000007EFFFE0000007EFFFE0000007EFFFE0000007EFFFE0000007
EFFFE0000007EFFFE0000007EFFFE0000007EFFFE0000007EFFFF0000007EFFFE0000007EFFFE0000007FFFFE
0000007EFFFE0000007EFFFE0000007EFFFE0000007EFFFF0000007DFFFE0000007EFFFE0000007EFFFFFFFF0
07DFFFE0000007EFFFE0000007FFFFE0000007EFFFE0000007EFFFE0000007FFFFE0000007EFFFE0000007EF
FFF0000007EFFFE0000007EFFFE0000007FFFFE0000007EFFFE0000007EFFFF0000007EFFFF0000007EFFFE00
00007EFFFE0000007EFFFF0000007EFFFE0000007EFFFE0000007FFFFE0000007EFFFEFFFF007EFFFE0000007
EFFFF0000007EFFFF0000007DFFFE0000007EFFFE0000007EFFFE0000007DFFFE0000007FFFFE0000007FFFF
E0000007EFFFF0000007EFFFE0000007EFFFE0000007EFFFFFFFF007E,,,,20200623030020,863C$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	ACC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Data	12*75	'0'-'9' 'A'-'F'
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Data*

There are 12*75 ASCII characters in the message with 12 characters in a group. The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data. The ASCII “0001” represents HEX value 0x0001, so it means the acceleration is 1. The ASCII “fffd” represents HEX value 0xFFFD which is the complement of -3, so it means the acceleration is -3.

- *Example*
  - **+RESP:GTACC**,740D01,864292043426376,,000100010055…,,,,20200623030021,863D$
    This is the earliest XYZ-axis acceleration data:
    Conversion to hex format: X (axis acceleration data) = 0x0001; Y = 0x0001; Z = 0x0055;
    Decimal format: X (axis acceleration data) = 1; Y = 1; Z = 85;
  - **+RESP:GTACC**,740D01,864292043426376,,fffffff10052…,,,,20200623030022,863E$
    This is the latest XYZ-axis acceleration data:
    Conversion to hex format: X (axis acceleration data) = 0xFFFF; Y = 0xFFF1; Z = 0x0052;
    Decimal format: X (axis acceleration data) = -1; Y = -15; Z = 82;

Note

Acceleration of gravity (+g) is 82 in decimal format and - g is -82. The linearized acceleration data 1394 represents +16g and -1394 represents -16g.

4.7 Data Transmission

This section describes the message related to certain data needs to be sent. Please refer to the details below.

4.7.1 DAT (Transparent Data Transmission)

The device supports transparent data transfer between the backend server and the peripheral device connected to its secondary serial port/Bluetooth. The device supports bi-directional data transmission. In both directions, the data is transparent to the device.

1. Transfer data from the peripheral device to the backend server:

According to <Working Mode> of the command AT+GTURT, there are two ways for the peripheral device to communicate with the device.If the peripheral device supports the AT+GTDAT command, it can transfer data via this command. The peripheral device can send the command **AT+GTDAT** with the data to the serial port/Bluetooth. According to <Command Type> of **AT+GTDAT**, the device wraps the corresponding data into the backend server with the **+RESP:GTDAT** message either in short format or in long format.

2. Transfer data from the backend server to the peripheral device:

If the backend server needs to send data to the peripheral device, it can send the command **AT+GTDAT** with the data to the device and the device will pick out the raw data and send it to the secondary serial port/Bluetooth. The peripheral device can thus get the data from the serial port/Bluetooth.

4.7.1.1 Short Format

Example:
+RESP:GTDAT,740D01,135790246811220,GV350CEU,data,20111222122137,0017$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	DAT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF

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Parts	Fields	Length	Range/Format
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Data to the Backend Server	<=1280	ASCII Code
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.7.1.2 Long Format

Example:
+RESP:GTDAT,740D01,135790246811220,GV350CEU,3,,,1645026150,0,0.5,0,29.4,121.390923,31.164295,20111222022935,0460,0000,1806,2142,01,1,,,,,20111222022938,001A$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	DAT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Report Type	1	0-2|4|28
	Reserved	0	
	Reserved	0	
	Data to the Backend Server	<=1280	ASCII String
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS

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Parts	Fields	Length	Range/Format
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX|XXXXXXXX
	Reserved	2	00
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Report Type*

It indicates where the data comes from.

- **0** - Reserved
- **1** - **AT+GTDAT** from serial port
- **2** - **AT+GTDAT** from Bluetooth
- **4** - **AT+GTDAT** triggered by events in AT+GTUDF
- **28** - **AT+GTDAT** from TPT2

Note

Data to the secondary serial port/Bluetooth starts with a new line and is terminated with \r\n.

4.7.2 UDT (UART Data Transfer)

If the parameter <Mode> in AT+GTUDT is enabled, or a GEO-Fence event occurs, the device will send the message **+RESP:GTUDT** at the sending interval to the destination specified by <Mode> in **AT+GTUDT**.

Example:

+RESP:GTUDT,740D01,0122,0105,,866775051508042,GV350CEU,0,,1,1,0.0,357,96.2,117.129344,31.839195,20220630085211,0460,0011,691D,0DE98A34,01,12,0.3,,00012:01:01,,,12,0,4905,9433,3689,00,00,21,12234,0.00,0,00000,0,00000,,20220630085212,0003$

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Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	UDT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Firmware Version	4	0000 - FFFF
	Hardware Version	4	0000 - FFFF
	Reserved	0	
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Report Type	1	0-2
	Report ID	<=2	0-99
	Number	1	1
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
	Reserved	0	
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00

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Parts	Fields	Length	Range/Format
	Reserved	0	
	Reserved	0	
	GSV Number	<=3	0-255
	GEO-Fence State	1	0| 1
	Analog Input1 Voltage	<=5	0 - 16000(mV)| F(0 - 100)
	Analog Input2 Voltage	<=5	0 - 16000(mV)| F(0 - 100)
	Analog Input3 Voltage	<=5	0 - 30000(mV)| F(0 - 100)
	Digital Input	<=4	0000-0F0F
	Digital Output	<=4	0000-0F1F
	Motion Status	2	11| 12| 16| 1A| 21| 22| 41| 42
	External Power VCC	<=5	0-32000(mV)
	Backup Battery Level	<=4	0.00-4.50(V)
	Charging	1	0| 1
	GEO Status Mask	5	00000 - FFFFF
	PEO-Fence State	1	0| 1
	PEO Status Mask	5	00000 - FFFFF
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Report Type*

A numeral to indicate the type of the report.

- **0** - Timer event triggered.
- **1** - GEO-Fence event triggered.
- **2** - PEO-Fence event triggered.

✧ *Report ID*

GEO-Fence/PEO-Fence event triggered report ID. It is in HEX format.

✧ *GSV Number*

The number of satellites GNSS finds.

✧ *GEO-Fence State*

The activated GEO-Fence state.

- **0** - Outside the GEO-Fence
- **1** - Inside the GEO-Fence

✧ *GEO Status Mask*

GEO status mask. Bit 0 to Bit 19 represent the status of GEO 0 to 19 respectively. 0 means “Outside the GEO-Fence” or “The status is unknown”, and 1 means “Inside the GEO-Fence”.

✧ *PEO-Fence State*

The activated PEO-Fence state.

- **0** - Outside the PEO-Fence
- **1** - Inside the PEO-Fence

✧ *PEO Status Mask*

Bit 0 - Bit 19 represent the status of PEO 0 - 19 respectively. 0 means “Outside the PEO-Fence” or “The status is unknown”, and 1 means “Inside the PEO-Fence”.

4.7.3 TKS (Basic Information)

4.7.3.1 Short Information Type

When the parameter <Command Type> equals to **1**: AT+GTTKS=gv350ceu,1,,,0018$

Example:
+RESP:GTTKS(short),740D01,866775051622785,1,1,0D,06,20221201084534,2E70$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TKS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
Body	GNSS Accuracy	1	0-1
	GPRS Signal	1	0-1
	Digital Inputs	2	00-0F
	Digital Outputs	2	00-1F
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

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4.7.3.2 Long Information Type

When the parameter <Command Type> equals to **2**: AT+GTTKS=gv350ceu,2,,,0018$

Example:
+RESP:GTTKS(long),740D01,866314060228424,1,1,01,00,20230724110041,12159,0.0,0,111.4,117.129368,31.839569,20230724110040,0.0,00006:43:33,100,0,0,53,,,,,,,,0A7E$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TKS
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
Body	GNSS Accuracy	1	0-1
	GPRS Signal	1	0-1
	Digital Inputs	2	00-0F
	Digital Outputs	2	00-1F
	Send Time	14	YYYYMMDDHHMMSS
	External Power VCC	<=5	0-32000(mV)
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	Mileage	<=9	0.0-4294967.0(km)
	Hour Meter Count	13	0000000:00:00 - 1193000:00:00
	Backup Battery Percentage	<=3	0-100
	Analog Input1 Voltage	<=5	0 - 16000(mV)|F(0 - 100)
	Analog Input2 Voltage	<=5	0 - 16000(mV)|F(0 - 100)

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Parts	Fields	Length	Range/Format
	Analog Input3 Voltage	<=5	0 - 30000(mV)|F(0 - 100)
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Count Number	4	0000-FFFF
	Tail	1	$

4.7.4 DTT (Data Transmission)

The device supports data transfer from the peripheral device to the backend server. According to <Working Mode> of the command AT+GTURT, there are two ways for the peripheral device to communicate with the terminal device.

4.7.4.1 Short Format

Example:
+RESP:GTDTT(short),740D01,866775051622785,GV350CEU,,,0,7,1134122,20221201085334,2E9C$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	DTT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Reserved	0	

Parts	Fields	Length	Range/Format
	Data Type	1	0|1
	Data Length	<=4	1-1280
	Data to the Backend Server	<=1280	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

4.7.4.2 Long Format

Example:
+RESP:GTDTT(long),740D01,866775051622785,GV350CEU,,,0,9,1134122,0,0.0,173,72.7,117.129363,31.839142,20221201085356,0460,0000,550B,085BE2AA,01,6,,,,,20221201085357,2E9E$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	DTT
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Reserved	0	
	Data Type	1	0|1
	Data Length	<=4	1-1280
	Data to the Backend Server	<=1280	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx

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Parts	Fields	Length	Range/Format
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX|XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
	Mileage	<=9	0.0-4294967.0(km)
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Data Type*

- **0** - Binary data
- **1** - Binary data written in hexadecimal ASCII format

✧ *Data Length*

It represents the length of the original data.

✧ *Data to the Backend Server*

It is hexadecimal data if <Mode> in AT+GTURT is 7, and raw HEX data as is input through UART if <Mode> is 6 or 8.

4.7.5 TTR (Transparent THR100 Transmission)

Data to the backend server is wrapped into the message **+RESP:GTTTR** and sent to the backend server.

Example:

+RESP:GTTTR,740D01,866775051516177,GV350CEU,0004,0B,,00,FIN 1100000012845000*,Musterfrau 8 Krista 8*,,20221103110914,2E53$

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Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TTR
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Request ID	4	0000-FFFF
	Message Type	2	0-6| 8-D| 10
	Reserved(option1)	0	
	Reserved(option2)	0	
	Reserved(option3)	0	
	Reserved(option4)	0	
	Reserved(option5)	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Request ID*

It is the response to the server with the same field <Request ID> in the command AT+GTTTR.

✧ *Message Type*

- **0** - Reply for DDD file request.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	0-3
Device Status	2	0x00 - 0xFF
File State In Memory	2	00-FF
Error Code	2	0x00 - 0xFF
Reserved	0	

– *Reply Result*

If <Message Type> is 0(Reply for DDD file request), it is reply on inquiry read request.

- **0** - Request OK.
- **1** - Request busy: Advanced test.
- **2** - Request busy: THR_100 is executing precious order.
- **3** - Request busy: Configuration of the cancel order.

– *Device Status*
  - Bit 0 = 1 - Authentication in progress
  - Bit 1 = 1 - Authentication OK (bit is cleared at next read request or cancelled)
  - Bit 2 = 1 - Request processing ERROR (bit is cleared when request is cancelled or at next read request)
  - Bit 3 = 1 - THR_100 is downloading files from tachograph
  - Bit 4 = 1 - Data is ready to read from THR_100 by master device. Bit is cleared after all awaiting data is read (If all bytes are sent in one frame, this bit will be cleared after sending this frame. If all bytes are sent in 3 frames, this bit will be cleared after sending 3 frames)
  - Bit 7:Bit 5 = Details of the error - Flags bit 7:bit 5 and flag bit 2 must be treated as combined information. The information is split to maintain protocol's backward compatibility. Flags bit 7:bit 5 are cleared at next read request
  - 000 - No error
  - 001 - 24 hours passed after the ignition was turned off, tachograph is in power down mode (This error code is generated based on THR_100's timer, there is no attempt of connection with tachograph)
  - 010 - It has been 2 hours since last authentication session, tachograph is in power down mode. (This error code is generated based on THR_100's timer, there is no attempt of connection with tachograph)
  - 011 - No answer from tachograph (wrongly connected wires or CAN-C is off in tachograph)
  - 100 - Cannot open communication session with tachograph (remote download function is off in tachograph)
  - 101 - No answer or incorrect answer on company card inquiry (remote download function is off in tachograph)
  - 110 - Error during file transfer
  - 111 - Reserved for future use

– *File State In Memory*
  - **Bit 0** - Set it to 1 means that the tachograph file is in THR_100 memory memory
  - **Bit 1** - Set it to 1 means that the file from card in slot 1 is in THR_100 memory memory
  - **Bit 2** - Set it to 1 means that the file from card in slot 2 is in THR_100 memory memory
  - **Bit 3** - Not used (to be ignored)
  - **Bit 4** - Set it to 1 means that the file from tachograph is already read from THR_100 (it is possible to read once more, bit 0 will be still set), this flag is set after read whole file from THR_100
  - **Bit 5** - Set it to 1 means that the file from card in slot 1 is already read from THR_100 (it is possible to read once more, bit 1 will be still set), this flag is set after reading whole file from THR_100

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- **Bit 6** - Set it to 1 means that the file from card in slot 2 is already read from THR_100 (it is possible to read once more, bit 2 will be still set), this flag is set after reading whole file from THR_100
- **Bit 7** - Not used (to be ignored)

– *Error Code*

Extended error code. A detailed description can be found in section **6.4** (Error Codes Table).

- **1** - Authorization result.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	0-3
Device Status	2	0x00 - 0xFF
Reserved	0	
Error Code	2	0x00 - 0xFF
Reserved	0	

– *Reply Result*

If <Message Type> is 1(Authorization result), it is reply on inquiry the status of the device:

- **0** - Authorization OK.
- **1** - Authorization fails.
- **2** - Authorization timeout.
- **3** - Authorization data error.

- **2** - APDU Data received from THR_100.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
APDU Sequence Number	4	
APDU DATA		
Reserved	0	
Reserved	0	

– *APDU Sequence Number*

It is the serial number of APDU received from THR_100. Numbering starts from 0001 when receiving a new DDD file request. This value is in ASCII hexadecimal format.

– *APDU DATA*

It is the APDU received from THR_100. The value is in ASCII hexadecimal format.

- **3** - The result of the process that THR_100 reads file from tachograph.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	0-6
Device Status	2	0x00 - 0xFF
File State In Memory	2	0x00 - 0xFF
Error Code	2	0x00 - 0xFF
Reserved	0	

– *Reply Result*

If <Message Type> is 3(file reading), it is result of file reading:

- **0** - THR_100 getting file from Tachograph OK.
- **1** - THR_100 getting file from Tachograph fail.
- **2** - File mismatch.
- **3** - THR_100 getting file from Tachograph timeout.
- **4** - Device getting file from THR_100 timeout.
- **5** - Device getting file from THR_100 fail.
- **6** - DDD file size error.

Note

Here are the timeout instructions for file reading.

- <Read file Type> is 0x01
  THR_100 getting file from Tachograph timeout is 15 minutes.
  Device getting file from THR_100 timeout is 5 minutes.
- <Read file Type> is 0x02 or 0x04
  THR_100 getting file from Tachograph timeout is 5 minutes.
  Device getting file from THR_100 timeout is 3 minutes.
- <Read file Type> is 0x03 or 0x05
  THR_100 getting file from Tachograph timeout is 20 minutes.
  Device getting file from THR_100 timeout is 10 minutes.
- <Read file Type> is 0x06
  THR_100 getting file from Tachograph timeout is 10 minutes.
  Device getting file from THR_100 timeout is 5 minutes.
- <Read file Type> is 0x07
  THR_100 getting file from Tachograph timeout is 20 minutes.
  Device getting file from THR_100 timeout is 10 minutes.

- **4** - Communication timeout.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	

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Fields	Length	Range/Format
Reserved	0	

- **5** - Debug mode, the state of THR_100.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
Device Status	2	0x00 - 0xFF
File State In Memory	2	0x00 - 0xFF
Error Code	2	0x00 - 0xFF
Error Code Memory	2	0x00 - 0xFF

– *Error Code Memory*

This is the error code byte <Error Code> stored when the next order of the download is sent.

- **6** - FTP transfer event.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	<=2	0|8|10|12
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	

– *Reply Result*

If <Message Type> is 6, it is the event of FTP transfer.

- **0** - FTP open server OK
- **8** - FTP open server error
- **10** - FTP send data OK
- **12** - FTP send data error

- **8** - Restart TachoReader.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	0|1
Reserved	0	
Reserved	0	
Reserved	0	
Reserved	0	

– *Reply Result*

If <Message Type> is 8(Restart TachoReader), it is result of command execution.

- **0** - Command OK.

  The command is executed successfully by TachoReader.

- **1** - Command Error.

  An unexpected error occurs while executing the command.

- **9** - Tachograph details.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
Tachograph producer	2	
Tachograph model	<=40	
Reserved	0	
Reserved	0	

– *Tachograph producer*

- **0x00** - None
- **0x01** - VDO/Siemens
- **0x02** - Efas
- **0x03** - Stoneridge
- **0x04** - Actia
- **0x80** - Error of connection on D8 wire
- **0x81** - Not supported format „2400" analogue tachographs

– *Tachograph model*

Tachograph name given by the manufacturer.

- **A** - Inquiry status of the device.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
Reserved	0	
Device status/Files in device memory	4	X(0 - FF)Y(0 - FF)
Reserved	0	
Reserved	0	

- **B** - Inquiry Tachograph driver 1 ID, Name and surname.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
Tachograph driver time related states	2	0x00 - 0xFF
Tachograph driver 1 id	<=40	

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Fields	Length	Range/Format
Tachograph driver 1 name and surname	<=40	
Reserved	0	

– *Tachograph driver time related states*
Driver time related state.
- **0** - normal/no limits reached
- **1** - 15 min before 4½ h
- **2** - 4½ h reached
- **3** - 15 min before 9 h
- **4** - 9 h reached
- **5** - 15 minute before 16 h (not having 8h rest during the last 24h)
- **6** - 16 h reached
- **7** - week's driving time limit about to be reached
- **8** - week's driving time limit exceeded
- **9** - fortnight's driving time limit about to be reached
- **A** - fortnight's driving time limit exceeded
- **B** - driver's card validity term about to end
- **C** - driver's card reading time approaching soon
- **D** - other
- **E** - error on CAN-bus
- **F** - parameter currently not available

– *Tachograph driver 1 id*
Card number given in ASCII string terminated with „*". First two or three letters are country code. Following is a SPACE character (0x20) and the 16-character long card number: e.g. PL 1820625133460000*
In addition to standard country codes, the following abbreviations also apply:
- „EC" - European Union,
- „EUR" - Rest of Europe,
- „WLD" - rest of the world.

– *Tachograph driver 1 name and surname*
Surname and name (names) of driver given in an ASCII string terminated with „*". Each word is separated by a SPACE character (0x20).

Note
Number K will be returned if the card is not inserted into tachograph slot (or parameter currently not available; or card inserted, but no information read).
- K = 0x00 - Card not inserted,
- K = 0x01 - Card inserted, but no information read,
- K = 0xFF - Parameter currently not available.

- **C** - Inquiry special status.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
Reserved	0	
Special status	12	0x000000000000 - 0xFFFFFFFFFFFF
Reserved	0	
Reserved	0	

– *Special status*

Byte 1 - 2: Device status

- Bit 0 = 1 - Authorization in progress
- Bit 1 = 1 - Authorization successful (this bit is deleted upon next read request)
- Bit 2 = 1 - Authorization error (this bit is deleted upon next read request)
- Bit 3 = 1 - Device is downloading files from tachograph
- Bit 4 = 1 - Data (not files!) is ready to be downloaded from the device, the counter changes to zero after all waiting data is read (If data is sent in only one frame, the counter changes to zero right after that frame; if data is sent in 3 frames, the counter will change to zero after the third frame is sent).
- Bit 5 - Communication with tachograph not possible, tachograph in sleep mode
- Bit 6 - Free, always zero
- Bit 7 - Free, always zero

Byte 3 - 4: Files in device memory

- Bit 0 = 1 - File read from tachograph is in device's memory
- Bit 1 = 1 - File read from card in slot 1 is in device's memory
- Bit 2 = 1 - File read from card in slot 2 is in device's memory
- Bit 3 = 1 - File read from external reader is in device's memory
- Bit 4 = 1 - File read from tachograph, which has already been read from the device (it can be read again, bit 0 is still set), this flag is set after the whole file has been read.
- Bit 5 = 1 - File read from card in slot 1, which has already been read from the device (it can be read again, bit 1 is still set), this flag is set after the whole file has been read.
- Bit 6 = 1 - File read from card in slot 2, which has already been read from the device (it can be read again, bit 2 is still set), this flag is set after the whole file has been read.
- Bit 7 = 1 - File read from an external reader, which has already been read from device (it can be read again, bit 3 is still set), this flag is set after the whole file has been read.

Byte 5 - 6: File currently being transferred from tachograph to TachoReader.

- Bit 0 = 1 - File from card 1
- Bit 1 = 1 - File from card 2
- Bit 2 = 1 - File from tachograph's memory

Byte 7 - 12: Amount of file data read so far. If Byte 5 - 6=0x00, then Byte 7 - 12 may be random values.

Note

If there is no data returned within 2 seconds after the query command is issued due to

abnormal communication, this filed will be reported as 00 in HEX format message and be empty in the ASCII format message.

- **D** - Check the current TachoReader connection environment and the device whether ready to download DDD.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
Reserved	0	
Reserved	0	
THR100 Check Information	<=2	0-FF
THR100 bus Status	1	0-2

– *THR100 Check Information*

It indicates the set of states associated with the tachographer.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
U3	U2	U1	U0	T1	T0	D1	D0

- **R** - Reserved
- **D1:D0** - D8-bus activity
- b'00' - D8-bus sleep mode (inactive),
- b'01' - D8-bus active,
- b'10' - communication error,
- b'11' - parameter not available.
- **T1:T0** - Tachograph online on CAN-bus
- b'00' - no tachograph,
- b'01' - tachograph online,
- b'10' - error,
- b'11' - parameter not available (CAN-bus in sleep mode or CAN-bus error).
- **U3:U0** - Status of CAN-bus power-up test,
- b'0000' - no test (backward compatibility),
- b'0001' - OK. Messages are received on the CAN-bus,
- b'0010' - OK. Self-test of the CAN-bus finished correctly,
- b'0100' - error, CAN-bus is in „1" state,
- b'0101' - error, CAN-bus is in „0" state,

other values remain unused, left for future development.

– *THR100 bus Status*

It indicates the status of the THR100 bus.

- **0** - bus in sleep mode
- **1** - bus active
- **2** - bus error

- **10** - Inquiry Tachograph driver 2 ID, name and surname, and driver time related states.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	0	
Tachograph driver time related states	2	0x00 - 0xFF
Tachograph driver 2 id	<=40	
Tachograph driver 2 name and surname	<=40	
Reserved	0	

4.8 CAN Bus Information Report

This section describes the message format of CANBUS information. Please refer to the details below.

4.8.1 CAN (CAN Bus Device Information)

If the CAN bus device information report function is enabled by the command AT+GTCAN, the device will send the CAN bus device information via the message **+RESP:GTCAN** to the backend server periodically.

Example:

+RESP:GTCAN,740904,862524060205859,GV350CEU,00,1,F00FFFFF,,,,,,,,,,,,,,,,8080,,,00,801FFFFF,,,,,,,,,,,,,,,,,,,,B,,FF,F,65535,FFFF,255,255,C0,,,,,1,0.0,0,171.7,117.129337,31.839680,20240227130203,0460,0000,550B,B7B1,00,20240227130204,110E$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	CAN
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Distance Type / Report Type	2	X(0 | 1)X(0-5)
	CAN Bus Device State	1	0| 1
	CAN Bus Report Mask	<=8	0-FFFFFFFF
	VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'

Parts	Fields	Length	Range/Format
	Ignition Key	1	0-2
	Total Distance	<=12	H(0 - 99999999)/I(0 - 2147483647)
	Total Fuel Used/Total Fuel Used Expand	<=11	0.00 - 999999.99(L) | L(0.00 - 999999.99) | K(0 - 99999999.9)
	Engine RPM	<=5	0-16383(rpm)
	Vehicle Speed	<=3	0-455(km/h)
	Engine Coolant Temperature	<=4	-40-+215(℃)
	Fuel Consumption	<=6	L/100km(0.0 - 999.9)| L/H(0.0 - 999.9)
	Fuel Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
	Range	<=8	0-99999999(hm)
	Accelerator Pedal Pressure	<=3	0-100(%)
	Total Engine Hours	<=10	0.00-9999999.99(h)
	Total Driving Time	<=10	0.00-9999999.99(h)
	Total Engine Idle Time	<=10	0.00-9999999.99(h)
	Total Idle Fuel Used/Total Idle Fuel Used Expand	<=11	0.00 - 999999.99(L) | L(0.00 - 999999.99) | K(0 - 99999999.9)
	Axle Weight 2nd	<=5	0-65535(kg)
	Tachograph Information	4	00 - FFFF
	Detailed Information / Indicators	4	00-FFFF
	Lights	2	0-FF
	Doors	2	0-FF
	Total Vehicle Overspeed Time	<=10	0.00-9999999.99(h)
	Total Vehicle Engine Overspeed Time	<=10	0.00-9999999.99(h)
	Engine Cold Starts Count	<=8	0-16449535
	Engine All Starts Count	<=8	0-16449535
	Engine Starts by Ignition Count	<=8	0-16449535

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Parts	Fields	Length	Range/Format
	Total Engine Cold Running Time	<=9	0-421108120(s)
	Handbrake Applies During Ride Count	<=5	0-64255
	CAN Report Expansion Mask	<=8	0-FFFFFFFF
	Ad-Blue Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
	Axle Weight 1st	<=5	0-65535(kg)
	Axle Weight 3rd	<=5	0-65535(kg)
	Axle Weight 4th	<=5	0-65535(kg)
	Tachograph Overspeed Signal	1	0| 1
	Tachograph Vehicle Motion Signal	1	0| 1
	Tachograph Driving Direction	1	0| 1
	Analog Input Value	<=5	0-99999(mV)
	Engine Braking Factor	<=10	0-4278190079
	Pedal Braking Factor	<=10	0-4278190079
	Total Accelerator Kick-downs	<=6	0-999999
	Total Effective Engine Speed Time	<=10	0.00-9999999.99(h)
	Total Cruise Control Time	<=10	0.00-9999999.99(h)
	Total Accelerator Kick-down Time	<=10	0.00-9999999.99(h)
	Total Brake Applications	<=6	0-999999
	Tachograph Driver 1 Card Number	<=40	ASCII
	Tachograph Driver 2 Card Number	<=40	ASCII
	Tachograph Driver 1 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Tachograph Driver 2 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Registration Number	<=40	ASCII
	Expansion Information	<=4	00-FFFF

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Parts	Fields	Length	Range/Format
	Rapid Brakings	<=8	0-16711679
	Rapid Accelerations	<=8	0-16711679
	Engine Torque	<=3	0-100(%)
	Service Distance	<=8	-160635-327675(km)
	Ambient Temperature	<=4	-40-+215(℃)
	DTC Number	<=2	0-99
	DTC 1	<=6	'0'-'9' 'a'-'z' 'A'-'Z'
	…		
	DTC N	<=6	'0'-'9' 'a'-'z' 'A'-'Z'
	Gaseous Fuel Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
	Tachograph Information Expand	8	00000000 - FFFFFFFF
	CAN Report Expansion Mask1	<=8	0-FFFFFFFF
	Retarder Usage	<=3	0-125(%)
	Power Mode	<=2	0-FF
	Oil Temperature	<=4	-40-+215(℃)
	Oil Level	<=8	L(0.00 - 9999.99) | P(0.00 - 100.00)
	Axle Weight 5th	<=5	0-65535(kg)
	Axle Weight 6th	<=5	0-65535(kg)
	Axle Weight 7th	<=5	0-65535(kg)
	Current Gear Number	<=2	0-FF
	DPF Soot Level	<=8	L(0.00 - 9999.99) | P(0.00 - 100.00)
	VIN of Trailer	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'
	Expansion2 Information	<=8	0-FFFFFFFF
	Vehicle Gross Weight	<=5	0-65535(x10kg)
	Tyres Number	<=2	0-31
	Position of an axle	<=2	1-15
	Position of a wheel on the axle	<=2	1-15

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Parts	Fields	Length	Range/Format
	Tyre Pressures	<=5	0-65535(kPa)
	Tyre Temperatures	<=4	-60-+215(℃)
	Tyre Status	1	0-2
	Remaining Time to Maintenance Service	<=5	-1000-65535(day)
	Total Fuel Read from Vehicle's Computer	<=10	0.00-9999999.99(L)
	Total Gaseous Fuel Usage	<=13	0.00-9999999999.99(kg)
	DTC Status	2	00-FF
	E-GENSET Report Mask	<=8	0-FFFFFFFF
	Hours Until Service	<=5	0-65535(h)
	System Status Health	<=4	0-FFFF
	Status Inverter Mode	<=3	0 - 255
	Remaining Runtime	<=3	0-255(h)
	Battery Temperature	<=3	0-255
	BMS Board Temperature	<=3	0-255
	Battery Voltage	<=10	0-4294967295
	Minimum Cell Voltage	<=5	0-65535
	Maximum Cell Voltage	<=5	0-65535
	Maximum Cell Temperature	<=3	0-255
	Minimum Cell Temperature	<=3	0-255
	Module / Battery Pre-warning	<=3	0-255
	CECU-Error	<=3	0-255
	Cumulative charging hours	<=10	0-4294967295
	Inverter AC current L1	<=5	0-65535
	Inverter AC current L2	<=5	0-65535
	Inverter AC current L3	<=5	0-65535
	Inverter Ambient Temperature	<=3	0-255
	Inverter / OBC Temperature	<=3	0-255
	Inverter AC Voltage L1	<=5	0-65535

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Parts	Fields	Length	Range/Format
	Inverter AC Voltage L2	<=5	0-65535
	Inverter AC Voltage L3	<=5	0-65535
	Inverter State	<=3	0-255
	Shut Down Reason	<=3	0-255
	Cumulative Usage Time	<=10	0-4294967295
	Cumulative Idle Time	<=10	0-4294967295
	Electric Report Mask	<=8	0-FFFFFFFF
	Battery Instantaneous Voltage	<=5	0-64255(V)
	Battery Charging Cycles Count	<=5	0-64255(Cycle)
	Total Energy Recuperated	<=10	0-4211081215(Wh)
	Vehicles Battery Charge Level	<=8	P(0.00 - 100.00)
	Charge State	<=2	0 - FF
	Battery Temperature	<=4	-40-+215(℃)
	Battery Charging Current	<=3	0-125(A)
	Battery Instantaneous Power	<=7	-327680-325110(W)
	Battery State of Health (SoH)	<=3	0-100(%)
	Total Energy Used	<=10	0-4211081215(Wh)
	Total Energy Used When Idling	<=10	0-4211081215(Wh)
	Total Energy Charged	<=10	0-4211081215(Wh)
	Charge State Optimization	<=2	0 - FF
	Reserved	0	
	Reserved	0	
	GNSS Accuracy	<=2	0-50
	Speed	<=5	0.0-999.9(km/h)
	Azimuth	<=3	0-359
	Altitude	<=8	(-)xxxxx.x (m)
	Longitude	<=11	(-)xxx.xxxxxx
	Latitude	<=10	(-)xx.xxxxxx
	GNSS UTC Time	14	YYYYMMDDHHMMSS
	MCC	4	0XXX

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Parts	Fields	Length	Range/Format
	MNC	4	0XXX
	LAC	4	XXXX
	Cell ID	4|8	XXXX| XXXXXXXX
	Position Append Mask	2	00 - FF
	Satellites in Use (Optional)	<=2	0-72
	GNSS Jamming State(Optional)	1	0-3
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Distance Type / Report Type*

It indicates the type of total distance (unit: hm) and the report type.

Distance Type has the following meanings:

- **0** - Total distance acquired from CAN Chipset.
- **1** - Total distance obtained by calculation with GNSS.

Report Type has the following meanings:

- **0** - Periodic report.
- **1** - RTO CAN report.
- **2** - Ignition event report.
- **3** - Tachograph Driver Card ID changed event report.
- **4** - Tachograph Driver working status or “Out of Scope” condition changed event report.
- **5** - Ignition key changed event report.

✧ *CAN Bus Device State*

A numeral to indicate the communication state with the external CAN bus device.

- **0** - Abnormal.

  It fails to receive data from the external CAN bus device.
- **1** - Normal.

  It is able to receive data from the external CAN bus device.

✧ *CAN Bus Report Mask*

Please refer to <CAN Report Mask> in AT+GTCAN.

✧ *VIN*

Vehicle identification number.

✧ *Ignition Key*

A numeral to indicate the ignition status.

- **0** - Ignition off
- **1** - Ignition on

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- **2** - Engine on

✧ *Total Distance*

Vehicle total distance. The number is always increasing. The unit is hectometer (H) or distance impulse (I) (if distance from dashboard is not available).

✧ *Total Fuel Used/Total Fuel Used Expand*

- Total Fuel Used
  The number of liters of fuel used since vehicle manufacture or device installation. The unit is liter.
- Total Fuel Used Expand
  It is recommended to use this parameter by enabling Bit13 of <CAN Report Extension Mask 1> in the GTCAN command if the vehicle provides petrol/diesel total fuel usage and gas total fuel usage. The unit is liter(L) or kilogram(K).

✧ *Engine RPM*

The revolutions per minute. The unit is rpm.

✧ *Vehicle Speed*

The vehicle speed based on wheel. The unit is km/h.

✧ *Engine Coolant Temperature*

The unit is Celsius. Negative value is preceded by negative sign (-), e.g. “-2”. If the value is positive, no extra character is inserted, e.g. “20”.

✧ *Fuel Consumption*

The fuel consumption is calculated based on values read from vehicle. The unit is L/100Km(M) or L/H(H).

✧ *Fuel Level*

The level of fuel in vehicle tank. The unit is liter (L) or percentage (P).

✧ *Range*

The number of hectometers to drive on remaining fuel. The unit is hectometer.

✧ *Accelerator Pedal Pressure*

The unit is percentage.

✧ *Total Engine Hours*

Time of engine running since vehicle manufacture or device installation. The unit is hour.

✧ *Total Driving Time*

Time of engine running (non-zero speed) since vehicle manufacture or device installation. The unit is hour.

✧ *Total Engine Idle Time*

Time of engine running during idling status (vehicle at rest) since vehicle manufacture or device installation. The unit is hour.

✧ *Total Idle Fuel Used/Total Idle Fuel Used Expand*

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- Total Idle Fuel Used
  The number of liters of fuel used since vehicle manufacture or device installation. The unit is liter.
- Total Idle Fuel Used Expand
  It is recommended to use this parameter by enabling Bit13 of <CAN Report Extension Mask 1> in the GTCAN command if the vehicle provides petrol/diesel total fuel usage and gas total fuel usage. The unit is liter(L) or kilogram(K).

✧ *Axle Weight 2nd*

Weight of vehicle's second axle. The unit is kg.

✧ *Tachograph Information*

Two bytes. The high byte describes driver 2, while the low byte describes driver 1.

Each byte format:

Validity mark	Reserved	Driver working states		Driver card	Driving time related states		
V	R	W1	W0	C	T2	T1	T0

V: Validity mark (0 - valid driver data, 1 - no valid data)

R: Reserved

C: Driver card (1 - card inserted, 0 - no card inserted)

T2-T0: Driving time related states:

- **0** - Normal / no limits reached.
- **1** - 15min before 4½h.
- **2** - 4½h reached.
- **3** - 15min before 9h.
- **4** - 9h reached.
- **5** - 15minute before 16h (without 8h rest during the last 24h).
- **6** - 16h reached.
- **7** - Other limit.

W1-W0: Driver working states:

- **0** - Rest - sleeping.
- **1** - Driver available - short break.
- **2** - Work - loading, unloading, working in an office.
- **3** - Drive - behind the wheel.

✧ *Detailed Information / Indicators*

A hexadecimal number. Each bit contains information of one indicator.

- **Bit0** - FL - fuel low indicator (1 - indicator on, 0 - indicator off)
- **Bit1** - DS - driver seatbelt indicator (1 - indicator on, 0 - indicator off)
- **Bit2** - AC - air conditioning (1 - on, 0 - off)
- **Bit3** - CC - cruise control (1 - active, 0 - disabled)

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- **Bit4** - B - brake pedal (1 - pressed, 0 - released)
- **Bit5** - C - clutch pedal (1 - pressed, 0 - released)
- **Bit6** - H - handbrake (1 - pulled-up, 0 - released)
- **Bit7** - CL - central lock (1 - locked, 0 - unlocked)
- **Bit8** - R - reverse gear (1 - on, 0 - off)
- **Bit9** - RL - running lights (1 - on, 0 - off)
- **Bit10** - LB - low beams (1 - on, 0 - off)
- **Bit11** - HB - high beams (1 - on, 0 - off)
- **Bit12** - RFL - rear fog lights (1 - on, 0 - off)
- **Bit13** - FFL - front fog lights (1 - on, 0 - off)
- **Bit14** - D - doors (1 - any door open, 0 - all doors closed)
- **Bit15** - T - trunk (1 - open, 0 - closed)

✧ *Lights*

A hexadecimal number. Each bit contains information of one type of light.

- **Bit0** - Running Lights (1 - on, 0 - off)
- **Bit1** - Low Beam (1 - on, 0 - off)
- **Bit2** - High Beam (1 - on, 0 - off)
- **Bit3** - Front Fog Light (1 - on, 0 - off)
- **Bit4** - Rear Fog Light (1 - on, 0 - off)
- **Bit5** - Hazard Lights (1 - on, 0 - off)
- **Bit6 - 7** Reserved

✧ *Doors*

A hexadecimal number. Each bit contains information of one door.

- **Bit0** - Driver Door (1 - open, 0 - closed)
- **Bit1** - Passenger Door (1 - open, 0 - closed)
- **Bit2** - Rear Left Door (1 - open, 0 - closed)
- **Bit3** - Rear Right Door (1 - open, 0 - closed)
- **Bit4** - Trunk (1 - open, 0 - closed)
- **Bit5** - Hood (1 - open, 0 - closed)
- **Bit6 - 7** Reserved

✧ *Total Vehicle Overspeed Time*

The total time when the vehicle speed is greater than the limit defined in CAN Module's configuration.

✧ *Total Vehicle Engine Overspeed Time*

The total time when the vehicle engine speed is greater than the limit defined in CAN Module's configuration.

✧ *Ad-Blue Level*

The level of Ad-Blue.

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- *Axle Weight 1st*
  Vehicle first axle weight. The unit is Kg.
- *Axle Weight 3rd*
  Vehicle third axle weight. The unit is Kg.
- *Axle Weight 4th*
  Vehicle fourth axle weight. The unit is Kg.
- *Tachograph Overspeed Signal*
  Vehicle overspeed signal from the tachograph.
  - **0** - Overspeed is not detected.
  - **1** - Overspeed is detected.
- *Tachograph Vehicle Motion Signal*
  The vehicle motion signal in the tachograph.
  - **0** - Motion is not detected.
  - **1** - Motion is detected.
- *Tachograph Driving Direction*
  Vehicle driving direction from the tachograph.
  - **0** - Driving forward.
  - **1** - Driving backward.
- *Analog Input Value*
  The value of analog input. The unit is mV.
- *Engine Braking Factor*
  It measures how often driver brakes with brake pedal or with engine and stores both counts (always increasing). Decreasing speed with no pedal pressed causes an increase in engine braking factor.
- *Pedal Braking Factor*
  It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes an increase in pedal braking factor.
- *Total Accelerator Kick-downs*
  The count of accelerator pedal kick-downs (with the pedal pressed over 90%).
- *Total Effective Engine Speed Time*
  Total time when the vehicle engine speed is effective. The unit is h.
- *Total Cruise Control Time*
  Total time when vehicle speed is controlled by cruise-control module. The unit is h.
- *Total Accelerator Kick-down Time*
  Total time when accelerator pedal is pressed over 90%. The unit is h.
- *Total Brake Applications*
  The total number of braking processes initiated by brake pedal.

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- *Tachograph Driver 1 Card Number*
  The card number of tachograph driver 1.
- *Tachograph Driver 2 Card Number*
  The card number of tachograph driver 2.
- *Tachograph Driver 1 Name*
  The name of tachograph driver 1.
- *Tachograph Driver 2 Name*
  The name of tachograph driver 2.
- *Registration Number*
  The vehicle registration number.
- *Expansion Information*
  A hexadecimal number. Each bit contains information of one indicator.
  - **Bit0** - Reserved
  - **Bit1** - BFL - brake fluid low indicator (1 - on, 0 - off or not available)
  - **Bit2** - CLL - coolant level low indicator (1 - on, 0 - off or not available)
  - **Bit3** - BAT - battery indicator (1 - on, 0 - off or not available)
  - **Bit4** - BF - brake system failure indicator (1 - on, 0 - off or not available)
  - **Bit5** - OP - oil pressure indicator (1 - on, 0 - off or not available)
  - **Bit6** - EH - engine hot indicator (1 - on, 0 - off or not available)
  - **Bit7** - ABS - ABS failure indicator (1 - on, 0 - off or not available)
  - **Bit8** - EPS - EPS failure indicator (1 - on, 0 - off or not available)
  - **Bit9** - CHK - “check engine” indicator (1 - on, 0 - off or not available)
  - **Bit10** - AIR - airbag indicator (1 - on, 0 - off or not available)
  - **Bit11** - SC - service call indicator (1 - on, 0 - off or not available)
  - **Bit12** - OLL - oil level low indicator (1 - on, 0 - off or not available)
  - **Bit13** - CHG - battery charging for electric cars (1 - battery is being charged, 0 - no charging)
  - **Bit14** - FS - fuel source - for vehicles equipped with factory gas installation (1 - engine powered by gas, 0 - engine powered by petrol)
- *Rapid Brakings*
  The number of total rapid brakings since installation (calculation based on CAN Module settings of speed decrease time and value).
- *Rapid Accelerations*
  The number of total rapid accelerations since installation (calculation based on CAN Module settings of speed increase time and value).
- *Engine Torque*
  The engine torque. Unit: percentage.
- *Ambient Temperature*
  A numerical value is used to indicate the ambient temperature.

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✧ *DTC N*

Diagnostic trouble codes read from the vehicle. The protocol is OBD II/SAE J2012.

Each diagnostic trouble code is a 3-byte element in following format:

Byte m								Byte m+1								Byte m+2							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
C1		C2		C3				C4				C5									T	P	C

- C1 - first DTC character
  - **b'00'** - P - powertrain
  - **b'01'** - C - chassis
  - **b'10'** - B - body
  - **b'11'** - U - network
- C2 - second DTC character (digit 0 to 3)
- C3, C4, C5 - consecutive DTC characters (hexadecimal digits 0 to F)
- T - DTC status flag: permanent (stored into non-volatile memory)
- P - DTC status flag: pending (detected during current or last driving cycle)
- C - DTC status flag: confirmed (stored)

  Each code may have one or multiple status flags set. For example:

  0x02 0x2E 0x03 is a code P022E with status pending and confirmed.

  0x61 0x99 0x02 is a code C2199 with status pending.

✧ *Gaseous Fuel Level*

The alternative fuel levels. When gas installation, LPG, is factory equipment and information is provided by vehicle. The unit is liter (L) or percentage (P).

✧ *Tachograph Information Expand*

Four bytes. The high byte describes driver working states, while the low byte describes tachograph other information and the middle two bytes describe driver 1 information and driver 2 information respectively.

Driver working states	Driver 1 information	Driver 2 information	Tachograph other information
High byte(T)	K1	K2	Low Byte(I)

- T: Driver working states:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
OUT1	OUT0	TD2	TD1	TD0	TP2	TP1	TP0

- OUT1: OUT0 - "out of scope" condition (2 bits)
  - b'00' - no out of scope condition opened, normal operation
  - b'01' - out of scope condition opened
  - b'10', b'11' - Invalid data.
- TD2: TD0 - Driver 2 working state (3 bits)

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- TP2: TP0 - Driver 1 working state (3 bits)
  - b'000': Rest - sleeping.
  - b'001': Driver available - short break.
  - b'010': Work - loading, unloading, working in an office.
  - b'011': Drive - behind the wheel.
  - b'100', b'101' - reserved.
  - b'110', b'111' - Invalid data.
- K1 - Driver 1 information (card in slot 1)
- K2 - Driver 2 information (card in slot 2)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	1	KK1	KK0	CZ3	CZ2	CZ1	CZ0

- KK1 : KK0 - driver card
  - b'00' - no card in slot.
  - b'01' - card in slot.
  - b'10', b'11' - Invalid data.
- CZ3 : CZ0 - driver time related states (4 bits)
  - b'0000' - normal/no limits reached
  - b'0001' - 15 min before 4½ h
  - b'0010' - 4½ h reached
  - b'0011' - 15 min before 9 h
  - b'0100' - 9 h reached
  - b'0101' - 15 minute before 16 h (not having 8h rest during the last 24h)
  - b'0110' - 16 h reached
  - b'0111' - weekly driving time pre-warning active
  - b'1000' - weekly driving time warning active
  - b'1001' - 2 weeks driving time pre-warning active
  - b'1010' - 2 weeks driving time warning active
  - b'1011' - driver 1 card expiry warning active
  - b'1100' - next mandatory driver 1 card download warning active
  - b'1101' - other
  - b'1110', b'1111' - Invalid data
- I - tachograph other information

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	1	P1	P0	K1	K0	R1	R0

- R1 : R0 - vehicle motion
  - b'00' - vehicle motion not detected.
  - b'01' - vehicle motion detected.
  - b'10' - Invalid data.
- K1 : K0 - direction indicator

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- b’00’ - forward.
- b’01’ - reverse.
- b’10’, b’11’ - Invalid data.

- P1 : P0 - vehicle overspeed (it indicates whether the vehicle is exceeding the legal speed limit set in the tachograph)
  - b’00’ - no overspeed
  - b’01’ - overspeed
  - b’10’, b’11’ - Invalid data

✧ *Retarder Usage*

The unit is percentage.

✧ *Power Mode*

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
R	R	PTO1	PTO0	R	R	R	R

- R - Reserved for future use (set to 1)
- PTO1:PTO0 - Power Take-Off
  - b’00’ - PTO not engaged.
  - b’01’ - PTO engaged.
  - b’10’ - unknown state of PTO (not complian

✧ *Oil Temperature*

The unit is Celsius. Negative value is preceded by negative sign (-), e.g. “-2”. If the value is positive, no extra character is inserted, e.g. “20”.

✧ *Current Gear Number*

- **0** - Neutral
- **1 ~ 0xF** - Subsequent gears numbers (1 to 15)
- **0x1D** - Reverse gear (-2)
- **0x1E** - Reverse gear (-1)
- **0x1F** - Parameter currently not available
- **others** - Reserved for future use

✧ *Expansion2 Information*

A hexadecimal number. Each bit contains information of one indicator.

- **Bit0** - Brake linings worn off indicator L. 1 - indicator on (brake linings to be replaced), 0 - indicator off (brake linings fine) or not available.
- **Bit1 - 31** Reserved

✧ *Tyres Number*

The number of tyres.

The five parameters <Position of an axle>, <Position of a wheel on the axle>, <Tyre Temperatures>, <Tyre Pressures> and <Tyre Status> following this parameter will repeat <Tyres Number> times.

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- *Position of an axle*
  The axles are indicated from front (0) to back.
- *Position of a wheel on the axle*
  The wheels are indicated from left (0) to right.
- *Tyre Temperatures*
  The unit is Celsius. Negative value is preceded by negative sign (-), e.g. "-2". If the value is positive, no extra character is inserted, e.g. "20".
- *Tyre Status*
  Tyre pressure status.
  - **0** - OK.
  - **1** - Low pressure.
  - **2** - Very low pressure.
- *Total Fuel Read from Vehicle's Computer*
  Total fuel read from vehicle's computer. The unit is liter.
- *Total Gaseous Fuel Usage*
  Total gaseous fuel usage. The unit is kg.
- *DTC Status*
  A number used to indicate the DTC status.
  - **00** - Successful, the array contains all read DTCs.
  - **02** - DTC read is not available for this vehicle.
  - **03** - Invalid format: car provided DTCs codes with unrecognized format.
  - **05** - DTC read failed.
  - **0A** - Overflow, car reported more trouble codes than CAN-Logistic's capacity as the array contains maximum number of DTCs supported by CAN-Logistic, but not all reported by the car.
  - **0B** - DTCs has not been read yet (first DTC read is performed within 1 minute since switching ignition on).
  - **0C** - DTC read is not available for this vehicle.
  - **FD** - Internal error.
  - **Others** - Unavailable.
- *System Status Health*

Bit 15 - Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
spare	F04 Fuses in CC1	F03 Insulation fault (Bender IMD)	F02 Maxtemp Battery Cells (BMS)	F01 Maxtemp Bel DC/DC Converter	F00 Maxtemp Bel Inverter

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- *Status Inverter Mode*
  - **0** - Idle
  - **1** - Charging
  - **2** - Charging
  - **8** - Power export
  - **16** - Power export
- *Battery Instantaneous Voltage*
  For electric cars this parameter stands for instantaneous high voltage of battery cells (read from BMS). The unit is voltage (V).
- *Battery Charging Cycles Count*
  For electric cars this parameter counts cycles of battery charging (increments at every finished cycle of charging). The unit is cycle.
- *Total Energy Recuperated*
  Sum of energy transmitted to battery with no charger connected. The unit is Wh.
- *Vehicles Battery Charge Level*
  The battery charge level for electric vehicles. The unit is percentage (P).
- *Charge State*
  The status of battery charging and Charging cable connected in electric cars.
  - **0x00** - Plug disconnected
  - **0x01** - Plug connected, not charging
  - **0x02** - Connecting (plug connected, but charging not started yet)
  - **0x03** - Charging in progress
  - **0x04** - Charging failure
- *Battery Temperature*
  A numerical value is used to indicate the battery temperature.
- *Battery Charging Current*
  A numerical value is used to indicate the electric car's battery charging current. The unit is ampere.
- *Battery Instantaneous Power*
  For electric cars this parameter stands for instantaneous power used by (positive values) or recuperated from (negative values) the car. The unit is W.
- *Battery State of Health (SoH)*
  For electric cars this parameter stands for battery general condition (100% means brand new, 0% totally damaged).
- *Total Energy Used*
  Sum of energy used by car's engine and equipment; recuperated energy does not affect this parameter. The unit is Wh.
- *Total Energy Used When Idling*
  Sum of energy used by car's engine and equipment with vehicle speed 0 km/h; recuperated energy

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does not affect this parameter. The unit is Wh.

✧ *Total Energy Charged*
Sum of energy transmitted to battery from external charger. The unit is Wh.

✧ *Charge State Optimization*
The status of battery charging and Charging cable connected in electric cars.

- **0x00** - Plug disconnected
- **0x01** - Plug connected, not charging
- **0x02** - Connecting (plug connected, but charging not started yet)
- **0x03** - Charging in progress
- **0x04** - Charging failure

4.9 Update Configuration

This section describes the message related to firmware and configuration upgrade. Please refer to the details below.

4.9.1 UPC (Configuration Update Notification)

The report for over-the-air configuration update.

Example:
+RESP:GTUPC,740D01,135790246811220,GV350CEU,0,100,http://www.GV350CEU.com/configure.ini,20150201000000,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	UPC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Command ID	<=3	
	Result	3	100-103| 200-202| 300-302| 305| 306
	Download URL	<=100	Complete URL

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Parts	Fields	Length	Range/Format
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Command ID*

The command ID in the update configuration file. It is always 0 before the device starts to update the configuration (<Result> <= 300). It indicates the total number of the commands when <Result> is 301. It indicates the ID of the command which has wrong format when <Result> is 302.It is empty when <Result> is greater than 302.

✧ *Result*

A numeral to indicate whether the configuration is updated successfully.

- **100** - The update command is starting.
- **101** - The update command is confirmed by the device.
- **102** - The update command is refused by the device.
- **103** - The update process is refused because the battery is low.
- **200** - The device starts to download the package.
- **201** - The device finishes downloading the package successfully.
- **202** - The device fails to download the package.
- **300** - The device starts to update the device configuration.
- **301** - The device finishes updating the device configuration successfully.
- **302** - The device fails to update the device configuration.
- **305** - The update process is interrupted by abnormal reboot.
- **306** - The update process is interrupted by MD5 verification error.

✧ *Download URL*

The complete URL to download the configuration. It includes the file name.

4.9.2 UPD (Firmware Upgrade Report)

4.9.2.1 Update Confirmation

The device sends update confirmation information to the backend server if:

- The update command is confirmed by the device.
- The update command is refused by the device.
- The update process is cancelled by the backend server or refused because of an incorrect URL.
- The update command is refused because the battery is low.

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Example:
+RESP:GTUPD,740D01,135790246811220,GV350CEU,100,,20090101000000,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	UPD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Code	3	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Code*
It indicates the confirmation information.

- **1x0** - The update command is confirmed by the device.
- **1x1** - The update command is refused by the device.
- **1x2** - The update process is cancelled by the backend server or refused because of an incorrect URL.
- **1x3** - The update process is refused because the external power supply is not inserted.
- **1x4** - Reserved.
- **1x5** - The update process is refused because the upgraded unit is not working.

Note
x here means <Update Type> defined in the command AT+GTUPD.

4.9.2.2 Package Download

The device sends package download information to the backend server if:

- The device starts to download the package.
- The device finishes downloading the package successfully.
- The device fails to download the package.

Example:
+RESP:GTUPD,740D01,135790246811220,GV350CEU,200,1,20090101000000,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	UPD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Code	3	
	Download Times	1	1-4
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Code*
It indicates the download information.

- **2x0** - The device starts to download the package.
- **2x1** - The device finishes downloading the package successfully.
- **2x2** - The device fails to download the package.

Note
x here means <Update Type> defined in the command **AT+GTUPD**.

✧ *Download Times*
The count number of the package download.

4.9.2.3 Firmware Update

The device sends firmware update information to the backend server if:

- The device starts to update the firmware.
- The device finishes updating the firmware successfully.
- The device fails to update the firmware.
- The update process does not start because the battery is low.

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Example:

+RESP:GTUPD,740D01,135790246811220,GV350CEU,300,,20090101000000,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	UPD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Code	3	
	New Version (Optional)	<=10	'0' - '9' 'a' - 'z' 'A' - 'Z'
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Code*

It indicates the update information.

- **3x0** - The device starts to update the firmware.
- **3x1** - The device finishes updating the firmware successfully.
- **3x2** - The device fails to update the firmware.
- **3x3** - The update process does not start because the battery is low.
- **3x4** - Serial Number does not match, firmware upgrade fails.

Note

x here means <Update Type> defined in the command **AT+GTUPD**.

✧ *New Version (Optional)*

The version of the new firmware in the CAN Module , THR100 or UFS xxx fuel sensor.

4.9.3 EUC (Extended Configuration Update Report)

Example:

+RESP:GTEUC,740D01,135790246811220,GV350CEU,1,301,http://www.GV350CEU.com/configure.ini,ABCD ABCD,,,,,20150201000000,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	EUC
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Command ID	<=3	
	Result	3	100-103| 200-202| 300-302| 305| 306
	Download URL	<=100	Complete URL
	Identifier Number	8	00000000 - FFFFFFFF
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Command ID*

The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It indicates the total number of the commands when the response code is 301 or 306. It indicates wrong format of command ID when the response code is 302. It is empty when the response code is 304 or 305.

✧ *Result*

A numeral to indicate whether the configuration is updated successfully.

- **100** - The update command is starting.
- **101** - The update command is confirmed by the device.
- **102** - The update command is refused by the device.
- **103** - The update process is refused because the battery is low.
- **200** - The device starts to download the package.
- **201** - The device finishes downloading the package successfully.
- **202** - The device fails to download the package.
- **300** - The device starts to update the device configuration.

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- **301** - The device finishes updating the device configuration successfully.
- **302** - The device fails to update the device configuration.
- **305** - The update process is interrupted by abnormal reboot.
- **306** - The update process is interrupted by MD5 verification error.

✧ *Download URL*

The complete URL to download the configuration. It includes the file name.

✧ *Identifier Number*

Please refer to the parameter <Identifier Number> in the command AT+GTUPC.

4.9.4 EUD (Extended Firmware Update Report in ASCII Format)

4.9.4.1 Update Confirmation

The device will send update confirmation information to the backend server if:

- The device confirms this update command.
- The device refuses this update command.
- The backend server cancels this update process.
- The device refuses this request because the battery is low.

Example:

+RESP:GTEUD,740D01,135790246811220,GV350CEU,100,,00000000,,,,,20090101000000,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	EUD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Code	3	
	New Version (Optional)	<=20	ASCII
	Identifier Number	8	00000000 - FFFFFFFF
	Reserved	0	
	Reserved	0	

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Parts	Fields	Length	Range/Format
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Code*

It indicates the confirmation information.

- **1x0** - The device confirms this update command.
- **1x1** - The device refuses this update command.
- **1x2** - The backend server cancels this update process.
- **1x3** - The device refuses this request because the battery is low.
- **1x4** - The update process is refused because the upgraded unit is not working.

Note

x here means <Update Type> defined in the command AT+GTUPD.

4.9.4.2 Package Download

The device will send the package download information to the backend server if:

- The device starts to download the package.
- The device downloads the package successfully.
- The device fails to download the package.

Example:

+RESP:GTEUD,740D01,135790246811220,GV350CEU,200,1,00000000,,,,,20090101000000,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	EUD
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Code	3	

Parts	Fields	Length	Range/Format
	Download Times	1	1-4
	Identifier Number	8	00000000 - FFFFFFFF
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Code*

It indicates the download information.

- **2x0** - The device starts to download the package.
- **2x1** - The device downloads the package successfully.
- **2x2** - The device fails to download the package.

Note

x here means <Update Type> defined in the command **AT+GTUPD**.

✧ *Download Times*

The count number of the package download.

4.9.4.3 Firmware Update

The device will send the firmware update information to the backend server if:

- The device starts to update firmware.
- The device updates the firmware successfully.
- The device fails to update the firmware.
- The firmware update is cancelled because the battery is low.

Example:

+RESP:GTEUD,740D01,135790246811220,GV350CEU,300,,00000000,,,,,20090101000000,11F0$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	EUD

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Parts	Fields	Length	Range/Format
	Leading Symbol	1	,
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Code	3	
	New Version (Optional)	<=20	ASCII
	Identifier Number	8	00000000 - FFFFFFFF
	Reserved	0	
	Reserved	0	
	Reserved	0	
	Reserved	0	
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Code*

It indicates the update information.

- **3x0** - The device starts to update the firmware.
- **3x1** - The device updates the firmware successfully.
- **3x2** - The device fails to update the firmware.
- **3x3** - The device cancels the firmware update because the battery is low.
- **3x4** - Serial Number does not match, firmware upgrade fails.

Note

x here means <Update Type> defined in the command **AT+GTUPD**.

4.10 Thin Message

This section describes the message related to thin. Please refer to the details below.

4.10.1 TMR (Thin Message Report)

When <Mode> is set to 46 in the AT+GTURT command, the **+RESP:GTTMR** message is reported according to the parameter <Report Message Mask> and the corresponding message mask in the AT+GTTMC command and <Mode> of AT+GTTMT command.

Example:
+RESP:GTTMR,740D01,866775051509818,GV350CEU,,STT,13FC,22,0,0.0,0,92.7,117.129336,31.839311,1768267784,0460,0000,550B,085BE2AA,11,12,0,1768267785,0012$

Parts	Fields	Length	Range/Format
Head	Header	8	+RESP:GT
	Message Name	3	TMR
	Leading Symbol	1	,
	TMR ASCII Mask	<=4	0 - FFFF
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Body	Reserved	0	
	Message Name	3	SOS| TOW| DIS| IOB| SPD| RTL| DOG| IGL| HBM| IGN| IGF| STT| GIN| GOT| DAT| UDT| DOS| EPS| AIS| BCS| BDS| BAA| BAR| BID| BIE| CAN| CLT| FRI| ERI| JDR| JDS
	Optional Parameter		
Tail	Send Time	<=10	0-4294967295(s)
	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Message Name*

Message Name (ASCII)	Message Name (HEX)
SOS	00
TOW	01
DIS	02
IOB	03
SPD	04
RTL	05
DOG	06
IGL	07

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Message Name (ASCII)	Message Name (HEX)
HBM	08
IGN	09
IGF	10
STT	11
GIN	12
GOT	13
DAT	14
UDT	15
DOS	16
EPS	17
AIS	18
BCS	19
BDS	20
BAA	21
BAR	22
BID	23
BIE	24
Reserved	25
CAN	26
CLT	27
FRI	28
ERI	29
JDR	30
JDS	31

✧ *Optional Parameter*

Optional parameters select information based on the mask of the corresponding message of the parameter <Report Message Mask>. Please refer to the following table.

If the Message Name is **SOS, TOW, DIS, IOB, SPD, RTL, DOG, IGL, HBM**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - 9)
Number	1	1
GNSS Accuracy	<=2	0-50

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Fields	Length	Range/Format
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **TOW**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - A)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF

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Fields	Length	Range/Format
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **DIS**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - A)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **IOB**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - A)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359

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Fields	Length	Range/Format
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **SPD**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - A)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

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Fields	Length	Range/Format
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **RTL**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - A)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **DOG**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - A)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx

Fields	Length	Range/Format
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **IGL**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - A)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **HBM**, <Optional Parameter> will be unfolded as follows.

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Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report ID / Report Type	2	X(0 - F)Y(0 - A)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **IGN**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Duration of Ignition Off	<=6	0-999999(s)
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX

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Fields	Length	Range/Format
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Hour Meter Count	13	0000000:00:00 - 1193000:00:00
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **IGF**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Duration of Ignition On	<=6	0-999999(s)
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Hour Meter Count	13	0000000:00:00 - 1193000:00:00
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **STT**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Motion Status	2	11|12|16|21|22|41|42

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Fields	Length	Range/Format
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

If the Message Name is **GIN**, **GOT**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
ID Report Format	1	0|1
Parameter 1		
Parameter 2		
Parameter 3		
Parameter 4		
Parameter 5		
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)

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Fields	Length	Range/Format
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

- *ID Report Format*

  A numerical value to indicate the format of GEO ID. The following five parameters have different definitions for each format.

  – **0** - Mask Format.

  Each Geo ID will be indicated as a bit of <Area Mask>.

Fields	Length	Range/Format
Area Type	1	1
Area Mask 1	8	00000000 - 000FFFFF
Area Mask 2	8	HEX
Area Mask 3	8	HEX
Area Mask 4	8	HEX

  – **1** - Group Format.

  Using <Group ID>, <Start GEO ID> and <End GEO ID> to indicate reported Geo Fence.

Fields	Length	Range/Format
Area Type	1	0
Area Mask	8	00000000 - 000FFFFF
Group ID	1	0 - 9
Start GEO ID	<=3	0 - 199
End GEO ID	<=3	0 - 199

If the Message Name is **GOT**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
ID Report Format	1	0|1
Parameter 1		
Parameter 2		

Fields	Length	Range/Format
Parameter 3		
Parameter 4		
Parameter 5		
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **DAT**, <Optional Parameter> will be unfolded as follows.

- **Short Format**

Field	Length	Range/Format
Message Mask	<=8	0 - FFFFFFFF
Data to the Backend Server	<=1280	ASCII Code

- **Long Format**

Field	Length	Range/Format
Message Mask	<=8	0 - FFFFFFFF
Report Type	1	0 - 2 | 4
Data to the Backend Server	<=1280	ASCII String
GNSS Accuracy	<=2	0 - 50

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Field	Length	Range/Format
Speed	<=5	0.0 - 999.9 (km/h)
Azimuth	<=3	0 - 359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0 - 4294967295 (s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX

If the Message Name is **UDT**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Report Item Mask	<=8	0-0003FFF3
Firmware Version	4	0000 - FFFF
Hardware Version	4	0000 - FFFF
Report Type	1	0-2
Report ID	<=2	0-99
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72

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Fields	Length	Range/Format
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)
Hour Meter Count	13	0000000:00:00 - 1193000:00:00
Reserved	0	
GSV Number	<=3	0-255
GEO-Fence State	1	0|1
Analog Input1 Voltage	<=5	0 - 16000(mV)|F(0 - 100)
Analog Input2 Voltage	<=5	0 - 16000(mV)|F(0 - 100)
Analog Input3 Voltage	<=5	0 - 30000(mV)|F(0 - 100)
Digital Input	<=4	0000-0F0F
Digital Output	<=4	0000-0F1F
Motion Status	2	11|12|16|1A|21|22|41|42
External Power VCC	<=5	0-32000(mV)
Backup Battery Level	<=4	0.00-4.50(V)
Charging	1	0|1
GEO Status Mask	5	00000 - FFFFF
PEO-Fence State	1	0|1
PEO Status Mask	5	00000 - FFFFF

If the Message Name is **DOS**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Wave1 Output ID	<=2	1-5|7- C
Wave1 Output Active	1	0-2
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295 (s)

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Fields	Length	Range/Format
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

If the Message Name is **EPS**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
External Power Voltage	<=5	0-32000(mV)
Report ID / Report Type	2	X(0-3 | 5)Y(0 | 1)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **AIS**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF

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Fields	Length	Range/Format
Analog Input Voltage	<=5	0-30000(mV)
Report ID / Report Type	2	X(0-3 | 5)Y(0 | 1)
Number	1	1
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)

If the Message Name is **BCS**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX

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Fields	Length	Range/Format
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Bluetooth Report Mask	4	0000-FFFF
Bluetooth Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_' '%'
Bluetooth Mac Address	12	000000000000 - FFFFFFFFFFFF
Peer Role	1	0|1
Peer Address Type	1	0|1
Peer MAC Address	12	000000000000 - FFFFFFFFFFFF
Reserved	0	

If the Message Name is **BDS**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3
Bluetooth Report Mask	4	0000-FFFF
Bluetooth Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_' '%'
Bluetooth Mac Address	12	000000000000 - FFFFFFFFFFFF

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Fields	Length	Range/Format
Peer Role	1	0|1
Peer Address Type	1	0|1
Peer MAC Address	12	000000000000 - FFFFFFFFFFFF
Reason	1	0|4

If the Message Name is **BAA**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Index	<=2	00-09|FF|FE
Accessory Type	<=2	0-3|6|11-13|15|23
Accessory Model | Beacon ID Model	<=2	0-5|7|10
Alarm Type	2	0-4|7-A|C-1E
Append Mask	4|8	0-FFFF7FFF
Accessory Name(Optional)	<=20	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '
Accessory MAC(Optional)	12	'0' - '9' 'A' - 'F'
Accessory Status(Optional)	1	0|1
Accessory Battery Voltage(Optional)	<=4	0-5000(mV)
Accessory Temperature(Optional)	<=3	-40-80(℃)
Accessory Humidity(Optional)	<=3	0-100(%RH)
Accessory Mode(Optional)	<=2	0-12
Accessory Event(Optional)	<=3	0-255
Tire Pressure(Optional)	<=3	0-500(kPa)
Timestamp(Optional)	14	YYYYMMDDHHMMSS
Enhanced Temperature(Optional)	<=5	-40.00-80.00(℃)
Magnet ID(Optional)	2	00-FF
MAG Event Counter(Optional)	<=5	0-32767
Magnet State(Optional)	1	0|1
Accessory Battery Percentage(Optional)	<=3	0-100(%)
Relay Config Result(Optional)	1	0-4
Relay State(Optional)	1	0|1
Tri-axial Acceleration Data (Optional)	12	HEX

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Fields	Length	Range/Format
Angle Values (Optional)	6	HEX
Event Mask (Optional)	2	HEX
Tilt Event (Optional)	4	HEX
Motion Event (Optional)	4	HEX
Crash Event (Optional)	4	HEX
Falling Event (Optional)	4	HEX
Move Event (Optional)	4	HEX
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

If the Message Name is **BAR**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Index	<=2	00-09
Accessory Type	<=2	7
Accessory Model	<=2	0-4
Accessory Append Mask	<=4	0000-FFFF
Accessory Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Accessory MAC	12	(HEX)
Accessory Status	1	0|1

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Fields	Length	Range/Format
Accessory Data	<=1300	
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

- *Accessory Type*

  The type of the Bluetooth accessory which is defined in the <Index>. The following is supported now:

  – **7** - Technoton accessory

- *Accessory Data*

  There are accessory data para according <Accessory Type> and <Accessory Model>:

  If the <Accessory Type> is 7 and <Accessory Model> is 0 (DUT-E S7), <Accessory Model> is 3 (GNOM DDE S7) or <Accessory Model> is 4(GNOM DP S7):

Fields	Length	Range/Format
Version	2	(HEX)
PGN	4	(HEX)
PGN Data	<=42	(HEX)

  If the <Accessory Type> is 7 and <Accessory Model> is 1 (DFM 100 S7):

Fields	Length	Range/Format
Version	2	(HEX)
PGN1	4	(HEX)
PGN Data1	<=42	(HEX)
PGN2	4	(HEX)
PGN Data2	<=42	(HEX)

Fields	Length	Range/Format
PGN3	4	(HEX)
PGN Data3	<=42	(HEX)

If the <Accessory Type> is 7 and <Accessory Model> is 2 (DFM 250D S7):

Fields	Length	Range/Format
Version	2	(HEX)
PGN1	4	(HEX)
PGN Data1	<=42	(HEX)
PGN2	4	(HEX)
PGN Data2	<=42	(HEX)
PGN3	4	(HEX)
PGN Data3	<=42	(HEX)
PGN4	4	(HEX)
PGN Data4	<=42	(HEX)

- *Version*
  It indicates the version of accessory software.
- *PGNx*
  It means parameter group number.
- *PGN Datax*
  Different PGN, PGN Data have different data frame formats. It needs to parse according to the TECHNOTON S7 BUS Protocol.

Note

If the total number of characters in a single message is too long, **+RESP:GTBAR** will be divided into multiple messages.

If the Message Name is **BID**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Number	<=2	0-3|0-15
Beacon ID Model	<=2	0-2|4|7|10
Accessory Append Mask	<=4	0000-FFFF
Accessory Name(Optional)	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Accessory MAC (Optional)	12	'0' - '9' 'A' - 'F'
Accessory Battery Level (Optional)	<=4	0-5000(mV)
Accessory Signal Strength (Optional)	<=4	-120-0

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Fields	Length	Range/Format
Beacon Type (Optional)	1|3	0-2|255
Beacon Data (Optional)	<=100	
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

- *Beacon Data (Optional)*

  Select the data format according to <Beacon Type>:

  If <Beacon Type> is 0, the data format is as follows:

Fields	Length	Range/Format
ID_Mfr_Data	12	(HEX)

  If <Beacon Type> is 1, the data format is as follows:

Fields	Length	Range/Format
UUID	32	(HEX)
Major	4	(HEX)
Minor	4	(HEX)

  If <Beacon Type> is 2, the data format is as follows:

Fields	Length	Range/Format
NID	20	(HEX)
BID	12	(HEX)

If the Message Name is **BIE**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF

Fields	Length	Range/Format
Detected Count	<=4	0-9999
Total Frame	1	1-5
Frame Index	1	1-5
Beacon Number	<=2	0-20
Beacon ID Model	<=2	0-2|4|7|10
Append Mask	4	0000-FFFF
Accessory Name (Optional)	<=16	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '
Accessory MAC (Optional)	12	'0'-'9' 'A'-'F'
Accessory Battery Level (Optional)	<=4	0-5000(mV)
Accessory Signal Strength (Optional)	<=4	-120-0(dBm)
Beacon Type(Optional)	1|3	0-2|255
Beacon Data(Optional)	<=100	
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

If the Message Name is **CAN**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Distance Type / Report Type	2	X(0 | 1)X(0-5)
CAN Bus Device State	1	0|1

Fields	Length	Range/Format
CAN Bus Report Mask	<=8	0-FFFFFFFF
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'
Ignition Key	1	0-2
Total Distance	<=12	H(0 - 99999999)/I(0 - 2147483647)
Total Fuel Used/Total Fuel Used Expand	<=11	0.00 - 999999.99(L) | L(0.00 - 999999.99) | K(0 - 99999999.9)
Engine RPM	<=5	0-16383(rpm)
Vehicle Speed	<=3	0-455(km/h)
Engine Coolant Temperature	<=4	-40-+215(℃)
Fuel Consumption	<=6	L/100km(0.0 - 999.9)|L/H(0.0 - 999.9)
Fuel Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
Range	<=8	0-99999999(hm)
Accelerator Pedal Pressure	<=3	0-100(%)
Total Engine Hours	<=10	0.00-9999999.99(h)
Total Driving Time	<=10	0.00-9999999.99(h)
Total Engine Idle Time	<=10	0.00-9999999.99(h)
Total Idle Fuel Used/Total Idle Fuel Used Expand	<=11	0.00 - 999999.99(L) | L(0.00 - 999999.99) | K(0 - 99999999.9)
Axle Weight 2nd	<=5	0-65535(kg)
Tachograph Information	4	00 - FFFF
Detailed Information / Indicators	4	00 - FFFF
Lights	2	0-FF
Doors	2	0-FF
Total Vehicle Overspeed Time	<=10	0.00-9999999.99(h)
Total Vehicle Engine Overspeed Time	<=10	0.00-9999999.99(h)
Engine Cold Starts Count	<=8	0-16449535
Engine All Starts Count	<=8	0-16449535
Engine Starts by Ignition Count	<=8	0-16449535
Total Engine Cold Running Time	<=9	0-421108120(s)
Handbrake Applies During Ride Count	<=5	0-64255
CAN Report Expansion Mask	<=8	0-FFFFFFFF

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Fields	Length	Range/Format
Ad-Blue Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
Axle Weight 1st	<=5	0-65535(kg)
Axle Weight 3rd	<=5	0-65535(kg)
Axle Weight 4th	<=5	0-65535(kg)
Tachograph Overspeed Signal	1	0|1
Tachograph Vehicle Motion Signal	1	0|1
Tachograph Driving Direction	1	0|1
Analog Input Value	<=5	0-99999(mV)
Engine Braking Factor	<=10	0-4278190079
Pedal Braking Factor	<=10	0-4278190079
Total Accelerator Kick-downs	<=6	0-999999
Total Effective Engine Speed Time	<=10	0.00-9999999.99(h)
Total Cruise Control Time	<=10	0.00-9999999.99(h)
Total Accelerator Kick-down Time	<=10	0.00-9999999.99(h)
Total Brake Applications	<=6	0-999999
Tachograph Driver 1 Card Number	<=40	ASCII
Tachograph Driver 2 Card Number	<=40	ASCII
Tachograph Driver 1 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Tachograph Driver 2 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Registration Number	<=40	ASCII
Expansion Information	<=4	00-FFFF
Rapid Brakings	<=8	0-16711679
Rapid Accelerations	<=8	0-16711679
Engine Torque	<=3	0-100(%)
Service Distance	<=8	-160635-327675(km)
Ambient Temperature	<=4	-40-+215(℃)
DTC Number	<=2	0-99
DTC 1	<=6	'0'-'9' 'a'-'z' 'A'-'Z'
…		
DTC N	<=6	'0'-'9' 'a'-'z' 'A'-'Z'
Gaseous Fuel Level	8	L(0.00 - 9999.99)/P(0.00 - 100.00)

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Fields	Length	Range/Format
Tachograph Information Expand	<=8	00000000 - FFFFFFFF
CAN Report Expansion Mask1	<=8	0-FFFFFFFF
Retarder Usage	<=3	0-125(%)
Power Mode	<=2	0-FF
Oil Temperature	<=4	-40-+215(℃)
Oil Level	<=8	L(0.00 - 9999.99) | P(0.00 - 100.00)
Axle Weight 5th	<=5	0-65535(kg)
Axle Weight 6th	<=5	0-65535(kg)
Axle Weight 7th	<=5	0-65535(kg)
Current Gear Number	<=2	0-FF
DPF Soot Level	<=8	L(0.00 - 9999.99) | P(0.00 - 100.00)
VIN of Trailer	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'
Expansion2 Information	<=8	0-FFFFFFFF
Vehicle Gross Weight	<=5	0-65535(x10kg)
Tyres Number	<=2	0-31
Position of an axle	<=2	1-15
Position of a wheel on the axle	<=2	1-15
Tyre Pressures	<=5	0-65535(kPa)
Tyre Temperatures	<=4	-60-+215(℃)
Tyre Status	1	0-2
Remaining Time to Maintenance Service	<=5	-1000-65535(day)
Total Fuel Read from Vehicle's Computer	<=10	0.00-9999999.99(l)
Total Gaseous Fuel Usage	<=13	0.00-9999999999.99(kg)
DTC Status	2	00-FF
E-GENSET Report Mask	<=8	0-FFFFFFFF
Hours Until Service	<=5	0-65535(h)
System Status Health	<=4	0-FFFF
Status Inverter Mode	<=3	0-255
Remaining Runtime	<=3	0-255(h)

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Fields	Length	Range/Format
Battery Temperature	<=3	0-255
BMS Board Temperature	<=3	0-255
Battery Voltage	<=10	0-4294967295
Minimum Cell Voltage	<=5	0-65535
Maximum Cell Voltage	<=5	0-65535
Maximum Cell Temperature	<=3	0-255
Minimum Cell Temperature	<=3	0-255
Module / Battery Pre-warning	<=3	0-255
CECU-Error	<=3	0-255
Cumulative charging hours	<=10	0-4294967295
Inverter AC current L1	<=5	0-65535
Inverter AC current L2	<=5	0-65535
Inverter AC current L3	<=5	0-65535
Inverter Ambient Temperature	<=3	0-255
Inverter / OBC Temperature	<=3	0-255
Inverter AC Voltage L1	<=5	0-65535
Inverter AC Voltage L2	<=5	0-65535
Inverter AC Voltage L3	<=5	0-65535
Inverter State	<=3	0-255
Shut Down Reason	<=3	0-255
Cumulative Usage Time	<=10	0-4294967295
Cumulative Idle Time	<=10	0-4294967295
Electric Report Mask	<=8	0-FFFFFFFF
Battery Instantaneous Voltage	<=5	0-64255(V)
Battery Charging Cycles Count	<=5	0-64255(Cycle)
Total Energy Recuperated	<=10	0-4211081215(Wh)
Vehicles Battery Charge Level	<=8	P(0.00 - 100.00)
Charge State	<=2	0-FF
Battery Temperature	<=4	-40-+215(℃)
Battery Charging Current	<=3	0-125(A)
Battery Instantaneous Power	<=7	-327680-325110(W)

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Fields	Length	Range/Format
Battery State of Health (SoH)	<=3	0-100(%)
Total Energy Used	<=10	0-4211081215(Wh)
Total Energy Used When Idling	<=10	0-4211081215(Wh)
Total Energy Charged	<=10	0-4211081215(Wh)
Charge State Optimization	<=2	0-FF
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

If the Message Name is **CLT**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Group ID	<=2	0-19
Combined Alarm Mask 1	8|16	00000000 - FFFFFFFF | 0000000000000000 - FFFFFFFFFFFFFFFF
Alarm Mask 2	<=8	0 - FFFFFFFF
Alarm Mask 3	<=8	0 - FFFFFFFF
CAN Bus Data Mask	<=8	0 - FFFFFFFF
VIN	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'
Ignition Key	1	0-2

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Fields	Length	Range/Format
Total Distance	<=12	H(0 - 99999999)/I(0 - 2147483647)
Total Fuel Used	<=9	0.00-999999.99(L)
Engine RPM	<=5	0-16383(rpm)
Vehicle Speed	<=3	0-455(km/h)
Engine Coolant Temperature	<=4	-40-+215(℃)
Fuel Consumption	<=10	L/100km(0.0 - 999.9)|L/H(0.0 - 999.9)
Fuel Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
Range	<=8	0-99999999(hm)
Accelerator Pedal Pressure	<=3	0-100(%)
Total Engine Hours	<=10	0.00-9999999.99(h)
Total Driving Time	<=10	0.00-9999999.99(h)
Total Engine Idle Time	<=10	0.00-9999999.99(h)
Total Idle Fuel Used	<=9	0.00-999999.99(L)
Axle Weight 2nd	<=5	0-65535(kg)
Tachograph Information	<=4	00 - FFFF
Detailed Information|Indicators	<=4	00-FFFF
Lights	<=2	00-FF
Doors	<=2	00-FF
Total Vehicle Overspeed Time	<=10	0.00-9999999.99(h)
Total Vehicle Engine Overspeed Time	<=10	0.00-9999999.99(h)
Engine Cold Starts Count	<=8	0-16449535
Engine All Starts Count	<=8	0-16449535
Engine Starts by Ignition Count	<=8	0-16449535
Total Engine Cold Running Time	<=9	0-421108120(s)
Handbrake Applies During Ride Count	<=5	0-64255
CAN Report Expansion Mask	<=8	0-FFFFFFFF
Ad-Blue Level	<=8	L(0.00 - 9999.99)/P(0.00 - 100.00)
Axle Weight 1st	<=5	0-65535(kg)
Axle Weight 3rd	<=5	0-65535(kg)
Axle Weight 4th	<=5	0-65535(kg)

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Fields	Length	Range/Format
Tachograph Overspeed Signal	1	0|1
Tachograph Vehicle Motion Signal	1	0|1
Tachograph Driving Direction	1	0|1
Analog Input Value	<=5	0-99999(mV)
Engine Braking Factor	<=10	0-4278190079
Pedal Braking Factor	<=10	0-4278190079
Total Accelerator Kick-downs	<=6	0-999999
Total Effective Engine Speed Time	<=10	0.00-9999999.99(h)
Total Cruise Control Time	<=10	0.00-9999999.99(h)
Total Accelerator Kick-down Time	<=10	0.00-9999999.99(h)
Total Brake Applications	<=6	0-999999
Tachograph Driver 1 Card Number	<=40	ASCII
Tachograph Driver 2 Card Number	<=40	ASCII
Tachograph Driver 1 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Tachograph Driver 2 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Registration Number	<=40	ASCII
Expansion Information	<=4	00-FFFF
Rapid Brakings	<=8	0-16711679
Rapid Accelerations	<=8	0-16711679
Engine Torque	<=3	0-100(%)
Service Distance	<=8	-160635-327675(km)
Ambient Temperature	<=4	-40-+215(℃)
DTC Number	<=2	0-99
DTC 1	<=6	'0'-'9' 'a'-'z' 'A'-'Z'
…		
DTC N	<=6	'0'-'9' 'a'-'z' 'A'-'Z'
CAN Report Expansion Mask1	<=8	0-FFFFFFFF
Retarder Usage	<=3	0-125(%)
Electric Report Mask	<=8	0-FFFFFFFF
Charging State	<=2	0 - FF
GNSS Accuracy	<=2	0-50

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Fields	Length	Range/Format
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

If the Message Name is **FRI**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
External Power Voltage	<=5	0-32000(mV)
Report ID / Report Type	2	X(1-5)Y(0-8 | A)
Number	<=2	1-15
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF

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Fields	Length	Range/Format
Satellites in Use (Optional)	<=2	0-72
GNSS Trigger Type(Optional)	1	0-4
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)
Hour Meter Count	13	0000000:00:00 - 1193000:00:00
Analog Input1 Voltage	<=5	0 - 16000(mV)|F(0 - 100)
Analog Input2 Voltage	<=5	0 - 16000(mV)|F(0 - 100)
Analog Input3 Voltage	<=5	0 - 30000(mV)|F(0 - 100)
Backup Battery Percentage	<=3	0-100
Device Status	6 | 10	000000-0F0FFFFFFF

If the Message Name is **ERI**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
ERI Mask	8	00000000-FFFFFFFF
External Power Supply	<=5	0-32000(mV)
Report ID / Report Type	2	X(1-5)Y(0-8 | A)
Number	<=2	1-15
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Trigger Type(Optional)	1	0-4

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Fields	Length	Range/Format
GNSS Jamming State(Optional)	1	0-3
Mileage	<=9	0.0-4294967.0(km)
Hour Meter Count	13	0000000:00:00 - 1193000:00:00
Analog Input1 Voltage	<=5	0 - 16000(mV)|F(0 - 100)
Analog Input2 Voltage	<=5	0 - 16000(mV)|F(0 - 100)
Analog Input3 Voltage	<=5	0 - 30000(mV)|F(0 - 100)
Backup Battery Percentage	<=3	0-100
Device Status	6 | 10	000000-0F0FFFFFFF
UART Device Type	1	0|1
Digital Fuel Sensor Data(Optional)	<=20	
1-wire Data (Optional)		
CAN Data (Optional)	<=1000	
Fuel Sensor Data (Optional)		
Bluetooth Accessory Data (Optional)		
RAT and Band Data (Optional)		

- *Digital Fuel Sensor Data(Optional)*

  The raw data read from the digital fuel sensor. If Bit 0 of <ERI Mask> in AT+GTFRI is enabled, this field will be displayed; otherwise, it will not be displayed.

- *1-wire Data (Optional)*

Fields	Length	Range/Format
1-wire Device Number	<=2	0 - 19
1-wire Device ID	16	
1-wire Device Type	<=2	1
1-wire Device Data	<=40	

  - *1-wire Device Number*

    The number of 1-wire devices.

    If it is 0, the following fields <1-wire Device ID>, <1-wire Device Type> and <1-wire Device Data> will not be displayed.

    If there are more than one 1-wire devices connected, the following fields <1-wire Device ID>, <1-wire Device Type> and <1-wire Device Data> will appear repeatedly showing the information of all connected 1-wire devices.

    If Bit 1 of <ERI Mask> in AT+GTFRI is enabled, the information contained in the <1-wire Data> field will be displayed; otherwise, <1-wire Data> related information will not be displayed.

- *1-wire Device ID*
  It indicates the device ID read from the 1-wire device.
- *1-wire Device Type*
  It indicates the type of the 1-wire device.
  - **1** - Temperature sensor.
- *1-wire Device Data*
  It indicates the data read from the 1-wire devices.
  If <1-wire Device Type> is 1, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix). To get the real temperature in degrees Centigrade, please convert the data to a decimal value according to the calculation in Appendix first and then multiply the decimal value by 0.0625.

- *Fuel Sensor Data (Optional)*

Fields	Length	Range/Format
Sensor Number	<=3	0 - 100
Sensor Type	<=2	0-6 | 20-22
Percentage (Optional)	<=5	0 - 100.0
Volume (Optional)	<=6	0 - 6000.0
Fuel Temperature (Optional)	<=3	-40 - 85(x1 ℃)

- *Bluetooth Accessory Data (Optional)*

Fields	Length	Range/Format
Bluetooth Accessory Number	<=2	0 - 10
Index	2	0 - 9
Accessory Type	<=2	0-2 | 6-8 | 10-15 | 23
Accessory Model	1	0-5
Raw Data	<=18	
Accessory Append Mask	<=4|8	0 - 7FFF | 0 - 7FFFFFFF
Accessory Name(Optional)	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Accessory MAC(Optional)	12	000000000000 - FFFFFFFFFFFF
Accessory Status(Optional)	1	0 - 1
Accessory Battery Voltage(Optional)	<=4	0 - 5000(mV)
Accessory Temperature(Optional)	<=3	-40 - 80(℃)
Accessory Humidity(Optional)	<=3	0 - 100(%RH)
Accessory Output Status(Optional)	2	00 - 03
Accessory Digital Input Status(Optional)	2	00 - 01
Accessory Analog Input Voltage(Optional)	<=5	0 - 32000(mV)
Accessory Mode(Optional)	<=2	0 - 12
Accessory Event(Optional)	<=3	0 - 255

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Fields	Length	Range/Format
Tire pressure(Optional)	<=3	0 - 500(kPa)
Timestamp(Optional)	14	YYYYMMDDHHMMSS
Enhanced Temperature(Optional)	<=5	-40.00 - 80.00 (℃)
Magnet ID(Optional)	2	00 - FF
MAG Event Counter(Optional)	<=5	0 - 32767
Magnet State(Optional)	1	0 - 1
Accessory Battery Percentage(Optional)	<=3	0 - 100(%)
Relay State(Optional)	1	0 - 1
Tri-axial Acceleration Data (Optional)	12	(HEX)
Angle Values (Optional)	6	(HEX)
Event Mask (Optional)	2	(HEX)
Tilt Event (Optional)	4	(HEX)
Motion Event (Optional)	4	(HEX)
Crash Event (Optional)	4	(HEX)
Falling Event (Optional)	4	(HEX)
Move Event (Optional)	4	(HEX)
Accessory RSSI (Optional)	<=4	-128 - 127
Device Serial Number (Optional)	6	HEX
Sensor Identifier (Optional)	4	HEX

- *RAT and Band Data (Optional)*

Fields	Length	Range/Format
RAT	<=2	0 | 1 | 4
Band	<=4	0-5 | 7 | 8 | 20 | 28 | 850 | 900 | 1800 | 1900

  - *RAT*
    Radio Access Technology.
    - **0** - NO SERVICE mode
    - **1** - EGPRS mode
    - **4** - LTE Cat1 mode
  - *Band*
    0 means invalid band, 1-5/7-8/20/28 means band number and others means GSM number.

If the Message Name is **JDR**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF

Fields	Length	Range/Format
Jamming Net	1	1-3
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

If the Message Name is **JDS**, <Optional Parameter> will be unfolded as follows.

Fields	Length	Range/Format
Message Mask	<=8	0-FFFFFFFF
Jamming Status	1	1|2|5|6
Jamming Net	1	1-3
GNSS Accuracy	<=2	0-50
Speed	<=5	0.0-999.9(km/h)
Azimuth	<=3	0-359
Altitude	<=8	(-)xxxxx.x (m)
Longitude	<=11	(-)xxx.xxxxxx
Latitude	<=10	(-)xx.xxxxxx
GNSS UTC Time	<=10	0-4294967295(s)
MCC	4	0XXX
MNC	4	0XXX
LAC	4	XXXX
Cell ID	4|8	XXXX|XXXXXXXX

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Fields	Length	Range/Format
Position Append Mask	2	00 - FF
Satellites in Use (Optional)	<=2	0-72
GNSS Jamming State(Optional)	1	0-3

Note

<GNSS UTC Time> and <Send Time> are Unix timestamps.

4.11 SACK (Server Acknowledgement)

If server acknowledgement is enabled by the AT+GTSRI command, the backend server should reply to the device whenever it receives a message from the device.

Example:

+SACK:11F0$

Parts	Fields	Length	Range/Format
Head	Header	5	+SACK
Tail	Count Number	4	0000-FFFF
	Tail	1	$

✧ *Count Number*

The backend server uses the <Count Number> extracted from the received message as the <Count Number> in the server acknowledgement.

4.12 HBD (Heartbeat Data)

4.12.1 Heartbeat Report

Heartbeat is used to maintain the contact between the device and the backend server while communicating via GPRS. The heartbeat package is sent to the backend server at the interval specified by <Heartbeat Interval> in the AT+GTSRI command.

Example:

+ACK:GTHBD,740D01,135790246811220,GV350CEU,20100214093254,11F0$

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Parts	Fields	Length	Range/Format
Head	Header	4	+ACK
	Leading Symbol	1	:
	Command Word	5	'A'-'Z', '0'-'9'
	Full Protocol Version	6	000000-FFFFFF
	Unique ID	15	IMEI
	Device Name	<=20	'0' - '9' 'a' - 'z' 'A' - 'Z' '-' '_'
Tail	Send Time	14	YYYYMMDDHHMMSS
	Count Number	4	0000-FFFF
	Tail	1	$

- *Command Word*
  Corresponding to the "Command Word" in the configuration command. For example, it is **"GTHBD"**.
- *Full Protocol Version*
  The protocol version that the device conforms to. It is separated into 3 parts. The first two characters represent the device type. As shown in the example above, 74 means GV350CEU. The second part includes two characters which indicate the major version number of the protocol and the last part includes two characters which indicate the minor version number of the protocol. Both version numbers are hex digits. For example, 0A01 means version 10.01.
- *Unique ID*
  The International Mobile Equipment Identity of the terminal device.
- *Device Name*
  The name of terminal device.
- *Send Time*
  The local time when the frame was generated, in "YYYYMMDDHHMMSS" format.
  For example, "20191120135807" indicates 13:58:07 on November 20, 2019.
- *Count Number*
  A self-increasing count number in each acknowledgement message. It begins from "0000" and increases by 1 for each acknowledgement message. And it rolls back after "FFFF".

4.12.2 Heartbeat Acknowledgement

Whenever the backend server receives a heartbeat package, it should reply with an acknowledgement to the device.

Example:
+SACK:GTHBD,740D01,11F0$

Parts	Fields	Length	Range/Format
Head	Header	5	+SACK
	Leading Symbol	1	:
	Command Word	5	'A'-'Z', '0'-'9'
	Full Protocol Version	6	000000-FFFFFF
Tail	Count Number	4	0000-FFFF
	Tail	1	$

- *Command Word*
  Corresponding to the "Command Word" in the configuration command. For example, it is **GTHBD**.
- *Full Protocol Version*
  The protocol version that the device conforms to. It is separated into 3 parts. The first two characters represent the device type. As shown in the example above, 74 means GV350CEU. The second part includes two characters which indicate the major version number of the protocol and the last part includes two characters which indicate the minor version number of the protocol. Both version numbers are hex digits. For example, 0A01 means version 10.01.
- *Count Number*
  The backend server uses the <Count Number> extracted from the heartbeat package from the device as the <Count Number> in the server acknowledgement of the heartbeat.

4.13 Buffer Report

4.13.1 Overview

If the buffer report function is enabled by the command AT+GTSRI or AT+GTMSI, the terminal will save the report messages in a local buffer when the following occurs.

- GSM network is not available.
- PDP activation for the TCP or UDP connection fails.
- Establishment of the TCP connection with the backend server fails.

These messages will be sent to the backend server when connection to the server is recovered again. The buffered reports are saved to the built-in non-volatile memory in case the device is reset. The terminal can buffer up to 10,000 messages (160 bytes per message).

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Example:
+BUFF:GTFRI,740D00,863286020684354,GV350CEU,,10,1,1,0.0,0,0.5,121.392413,31.164143,20160804044602,0460,0000,1877,03A3,00,104.8,,,,100,210100,,,,20140804044611,2E78$

4.13.2 Description Information

Detailed information about buffer report is listed below.

- Only +RESP messages excluding **+RESP:GTPDP** , **+RESP:GTSOT** and **+RESP:GTALM** are buffered.
- In the buffer report, the original header string "**+RESP**" is replaced by "**+BUFF**" while the other content including the original sending time and count number remains unchanged.
- Buffered messages will be sent only via GPRS by TCP or UDP protocol. They cannot be sent via SMS. If the current report is forced SMS mode, the buffered message will not be sent until the report mode is changed to TCP or UDP.
- The buffered messages will be sent after the real-time messages if <Buffer Mode> in AT+GTSRI is set to 1.
- The buffered messages will be sent before the real-time messages if <Buffer Mode> in AT+GTSRI is set to 2. The SOS message has the highest priority and is sent before buffered messages.

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5 Report(Hex)

This section defines the HEX formats of the report messages. Please refer to the details below.

5.1 ACK (Acknowledgement)

The frame format of **+ACK** is as follows:

Example:

2B41434B017F2474090409204756333530434555 00FFFF07E807050E1F05542F43A70D0A

2B41434B047F2474090409204756333530434555 00FFFF07E807050E230E5471DD720D0A

2B41434B0B7F2474090409204756333530434555 0000BA07E8030806051D1531EE0B0D0A

2B41434B107F2474090409204756333530434555 01FFFF07E9030B033A0E007B89780D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+ACK
	Message Type	1	
	Report Mask	1	00-FF
Body	ACK Expand Mask	1	00-FF
	Length	1	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	ID	1	
	Additional Number	2	0-700
	Serial Number	2	0000 - FFFF
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF

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Parts	Fields	Length	Range/Format
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Message Type*

The ID of the command that the device receives.

Command	ID
AT+GTBSI	0
AT+GTSRI	1
AT+GTQSS	2
AT+GTCFG	4
AT+GTTOW	5
AT+GTEPS	6
AT+GTDIS	7
AT+GTIOB	9
AT+GTTMA	10
AT+GTFRI	11
AT+GTGEO	12
AT+GTSPD	13
AT+GTSOS	14
AT+GTRTO	16
AT+GTSIM	19
AT+GTUPD	21
AT+GTPIN	22
AT+GTDAT	23
AT+GTOWH	24
AT+GTDOG	25
AT+GTAIS	26
AT+GTJDC	27
AT+GTIDL	28
AT+GTHBM	29
AT+GTHMC	30
AT+GTURT	32
AT+GTWLT	34
AT+GTHRM	35
AT+GTFFC	36

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Command	ID
AT+GTJBS	37
AT+GTSSR	38
AT+GTEFS	41
AT+GTIDA	43
AT+GTACD	44
AT+GTPDS	45
AT+GTCRA	46
AT+GTBZA	47
AT+GTSPA	48
AT+GTUDT	50
AT+GTTMP	51
AT+GTFSC	52
AT+GTRMD	53
AT+GTPEO	54
AT+GTCMS	55
AT+GTTAP	56
AT+GTCAN	57
AT+GTUFS	59
AT+GTFTP	60
AT+GTCMD	61
AT+GTUDF	62
AT+GTGAM	65
AT+GTOEX	68
AT+GTIEX	69
AT+GTUPC	70
AT+GTCLT	71
AT+GTCFU	74
AT+GTCDA	75
AT+GTASC	79
AT+GTFVR	81
AT+GTSVR	82
AT+GTBTS	89
AT+GTVVS	91
AT+GTAVS	92
AT+GTGDO	93

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Command	ID
AT+GTOWL	97
AT+GTPEG	99
AT+GTVMS	102
AT+GTBAS	103
AT+GTWRT	104
AT+GTTTR	105
AT+GTGNA	108
AT+GTBID	109
AT+GTAEX	116
AT+GTDUC	117
AT+GTDOS	119
AT+GTSMS	128
AT+GTIDS	131
AT+GTROS	134
AT+GTMSI	136
AT+GTMQT	138
AT+GTTLS	139
AT+GTRTP	141
AT+GTIDC	146
AT+GTBTD	153
AT+GTCDS	169
AT+GTTPM	172
AT+GTBFS	176
AT+GTGPJ	177
AT+GTCAS	205
AT+GTUHF	212
AT+GTATS	221
AT+GTTMT	223
AT+GTETI	224
AT+GTTMC	225

✧ *Report Mask*

Please refer to <+ACK Mask> in AT+GTHRM.

✧ *Length*

The whole length of the acknowledgement message from header to the tail characters.

✧ *Unique ID*

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If Bit 4 of <+ACK Mask> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit 4 of <+ACK Mask> is 1, the device name is used as the unique ID of the device. Device name is an 8-byte string, please refer to <Device Name> in AT+GTCFG. If the length of <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the HEX format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	q	u	e	c	l	i	n	k
HEX	71	75	65	63	6C	69	6E	6B

✧ *ID*

- **AT+GTGEO** - This field represents the GEO command ID.
- **AT+GTPEO** - This field represents the PEO command ID.
- **AT+GTIOB** - This field represents the IOB command ID.
- **AT+GTTMP** - This field represents the TMP alarm ID.
- **AT+GTCLT** - This field represents the CLT group ID.
- **AT+GTCMD** - This field represents the stored command ID.
- **AT+GTUDF** - This field represents the UDF group ID.
- **AT+GTFSC** - This field represents the FSC table ID.
- **AT+GTBAS** - This field represents the BAS index.
- **AT+GTAIS** - This field represents the AIS index.
- **AT+GTIDS** - This field represents the IDS result of issuing **AT+GTIDS**.
- **AT+GTRTO** - This field represents the RTO sub-command ID.
- **AT+GTROS** - This field represents the ROS Output ID.
- **AT+GTXXX** - For other commands, it is 0.

✧ *Additional Number*

✧ *Serial Number*

The serial number in the configuration command.

✧ *Send Time*

The local time to send the acknowledgement message. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

Time	2011	01	31	06	29	11
HEX	07DB	01	1F	06	1D	0B

✧ *Count Number*

A self-increasing count number in each acknowledgement message. It begins from “0000” and increases by 1 for each acknowledgement message. And it rolls back after “FFFF”.

✧ *Checksum*

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2 bytes. This is an 16-bit CRC checksum, and it is generated by a CRC algorithm with the properties displayed in CRC-16 Calculation. The CRC16 checksum of data between the fields of <Message Header> and <Checksum> (exclude <Message Header> and <Checksum>).

Note

The +ACK frame only indicates that the terminal device has received the command, but does not mean that the command has been successfully executed; the terminal device will send a report to inform the backend server of the execution result of the command when necessary.

5.2 Position Related Report

This section describes the format of positioning related messages. Please refer to the details below.

5.2.1 Generic Location Report

- **TOW** (Tow Alarm Information)
  If the tow alarm is enabled by the command AT+GTTOW, the device will send the message **+RESP:GTTOW** to the backend server when the motion sensor detects tow.
- **AIS** (Analog Input Alarm)
  If the analog input alarm is enabled by the command AT+GTAIS, the device will send the message **+RESP:GTAIS** to the backend server when analog input voltage enters the alarm range.
- **DIS** (Digital Input Alarm)
  If the status change of digital inputs is detected, the device will send the message **+RESP:GTDIS** to the backend server.
- **IOB** (IO Ports Bind Alarm)
  If the IO combination is set and the corresponding condition is met, the device will report the message **+RESP:GTIOB** to the backend server.
- **SPD** (Speed Alarm Information)
  If the speed alarm is enabled, the device will send the message **+RESP:GTSPD** to the backend server when the speed of the device within the alarm range is detected.
- **RTL** (Realtime Location Information)
  After the device receives the command AT+GTRTO, it will start GNSS to get the current position and then send the message **+RESP:GTRTL** to the backend server.
- **DOG** (Watchdog Reboot Alarm)
  The protocol watchdog reboot message **+RESP:GTDOG**.
- **IGL** (Ignition Location Information)
  The location message **+RESP:GTIGL** for ignition on and ignition off.

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- **VGL** (Ignition Location Information)

  The location message **+RESP:GTVGL** for virtual ignition on and ignition off.

- **HBM** (Harsh Behavior Alarm)

  If harsh behavior is detected, the message **+RESP:GTHBM** will be sent to the backend server.

- **EPS** (External Power Alarm)

  If the external power supply monitoring is enabled by the command AT+GTEPS, the device will send the message **+RESP:GTEPS** to the backend server when the voltage of the external power supply enters the alarm range.

Example:

2B525350014FFEFFFF01D0740904092047563335304345550002FEC0000000000000000000000016080001
01000000015D001F06FB40C301E5D35607E9030B05340304600011DF5C0DD0833A0000000000000000000
0000000000000000000003FFFFFFF314731424C353250375452313135353230020 5F5E1000000000500038
4000000D2FF270F0000006400000000000005F5E0F6001E0000270F630000270F630000270F63000F42400
011923B3EFFFF3F3F0001869F630001869F6300000000002710004E2000753000000E109C40F3FFFFFF0063
7D7D7D7D7D7D01000100002DF00098967F000F423F000F423F0001869F630001869F630001869F63000F4
23F4445203138323036323531333334363030303100444520313832303632353133333436303030310043 4
152314E414D4500434152324E414D4500303536363300 1FFE000F423F000F423F640000000000D202022E0
3619902FF0000002800DBD6D3D600003FFB7DDFFFFFFF0000002800003200320096 0FFE000000FA0031473
1424C353250375452313135353231000000000000000FFFFFFFFF10FF00017FC7006400C80000012C500003
000132000003E864000003E8000007D000000BB80307E9030B0534030030526A0D0A

2B5253500E09FEDFFF00667409040920475633353043455500 2F43000000000100210911010400000000000
00F906FB431401E5D4B607E90314032F3B04600000550B085BE2AE0000000000000000000000000000000000
000000007E9031403300005C4BF740D0A

2B5253500509FEDFFF00667409040920475633353043455500 2F70000000000300220C1101020000000000
010206FB42D501E5D4DA07E90314033119046000005 50B085BE2AE0000000000000000000000000000000000
000000007E9031403311A05D82F430D0A

2B5253500609FEDFFF00667409040920475633353043455500 2F72000000000100210B0101010000000000
00FB06FB42D401E5D51907E9031403322D04600000550B085BE2AE0000000000000000000000000000000000
000000007E9031403322E05ECE4390D0A

2B5253500909FEDFFF00667409040920475633353043455500 2F55000000000100210C0101010000000000

00FB06FB42D401E5D51907E9031403341D04600000550B085BE2AE000000000000000000000000000000000000000007E9031403341E0603D96B0D0A

2B5253500B09FEDFFF006674090409204756333530434555002F6D00000000100210C0001030000000000010A06FB423301E5D5A307E90314033506046000000550B085BE2AE000000000000000000000000000000000000000007E90314033507060F486A0D0A

2B5253500C09FEDFFF006674090409204756333530434555002F46000000000300220C1301010000000000010A06FB423301E5D5A307E90314033529046000000550B085BE2AE000000000000000000000000000000000000000007E9031403352A061B46FA0D0A

2B525350104FFEFFFF007174090409204756333530434555003128000000000000000000D0000220C0001010000000000003F06FB3FFF01E5D4F107E8030507230C04600001DF5C027A4F1F000000000000000010100000000000000000000000000000007E80305102C0C3FD421110D0A

2B5253501A4FFEFFFF009B74090409204756333530434555002EBC000000000000000000000002210A2001010000000000001BA06FB428101E5D36B07E8071F061300046000000550B085BE2AE000001020000000102000000000000000000067805411D2891011000000000017FC7000000000000000000000FF000000000000000000000000000000000000FF07E8071F101700DD0EA7B30D0A

2B5253500F4FFEFFFF007174090409204756333530434555003106000000000000000000D0000220C0201010000000099003F06FB3FFF01E5D4F107E8030507231A04600001DF5C027A4F1F000000000000000010100000000000000000000000000000007E80305102C1B3FD785930D0A

2B5253500409FEDFFF006674090409204756333530434555002F7E00000000100210C0101010000000014005006FB40A901E5D2F407E90314050634046000000550B085BE2AE000000000000000000000000000000000000000007E903140506350A32C0D70D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	

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Parts	Fields	Length	Range/Format
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Report ID | Report Type	1	
	Number	1	1-15
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF

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Parts	Fields	Length	Range/Format
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Message Type*

The ID of a specific location report message.

Message	ID
+RESP:GTTOW	1
+RESP:GTLBC	3
+RESP:GTEPS	4
+RESP:GTDIS	5
+RESP:GTIOB	6
+RESP:GTFRI	7
+RESP:GTSPD	9
+RESP:GTSOS	10
+RESP:GTRTL	11
+RESP:GTDOG	12
+RESP:GTAIS	14
+RESP:GTHBM	15
+RESP:GTIGL	16
+RESP:GTIDA	17
+RESP:GTERI	18
+RESP:GTGIN	20
+RESP:GTGOT	21
+RESP:GTVGL	26

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Message	ID
+RESP:GTSPE	101
+RESP:GTIDC	102

✧ *Report Mask*

Please refer to <+RSP Mask> in AT+GTHRM.

✧ *Unique ID*

If Bit 6 of <+RSP Mask> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit 6 of <+RSP Mask> is 1, the device name is used as the unique ID of the device. Please refer to <Device Name> in AT+GTCFG for the device name. Device name is an 8-byte string.

If the length of <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	q	u	e	c	l	i	n	k
HEX	71	75	65	63	6C	69	6E	6B

✧ *External Power Voltage*

The value of external power supply, the unit is mV. The highest bit is used to indicate the length of this value field, 0 means 2 bytes and 1 means 4 bytes. If the highest bit is 1, please use the formula **<External Power Voltage> & 0x7FFFFFFF** to obtain a HEX value. For example, 0x0011 is 17 mV, and 0x80010011 is 65553 mV.

✧ *Analog Input Mode*

The mode of analog input ports. The low 4 bits of the high byte are for analog input 3. The low 4 bits of the low byte are for analog input 1. The high 4 bits of the low byte are for analog input 2.

✧ *EIO100 Input Status*

The status of EIO100 inputs. For each bit, 0 means “Inactive status”, and 1 means “Active status”.

- **Bit0** - For EIO100 input 9
- **Bit1** - For EIO100 input A
- **Bit2** - For EIO100 input B
- **Bit3** - For EIO100 input C
- **Bit4 - 7** Reserved

✧ *Digital Input Status*

Input Status Mask	ID
Ignition Detection	0x01
Digital Input1	0x02
Digital Input2	0x04
Digital Input3	0x08

✧ *EIO100 Output Status*

The status of EIO100 outputs. For each bit, 0 means “Inactive status”, and 1 means “Active status”.

- **Bit0** - For EIO100 output 9
- **Bit1** - For EIO100 output A
- **Bit2** - For EIO100 output B
- **Bit3** - For EIO100 output C
- **Bit4 - 7** Reserved

✧ *Digital Output Status*

Output Status Mask	ID
Digital Output1	0x01
Digital Output2	0x02
Digital Output3	0x04
Digital Output4	0x08
Digital Output5	0x10

✧ *Motion Status*

The current motion status of the device.

✧ *Satellites in Use*

Number of satellites being used for tracking. The high nibble is reserved and the low nibble is valid. But if Bit 1 of <RSP Expansion Mask> is set to 1, this parameter would be expanded to two bytes, the high byte is reserved and the low byte is valid.

✧ *Report ID | Report Type*

The high nibble is for <Report ID> and the low nibble is for <Report Type>.

✧ *Speed*

3 bytes in total. The first 2 bytes are for the integer part of the speed and the last byte is for the fractional part. The fractional part has 1 digit.

✧ *Altitude*

The altitude from GNSS. If the altitude is negative, it is represented in Two’s Complement format. Unit: meter.

✧ *Longitude*

The longitude of the current position. 4 bytes in total. The device converts the longitude to an integer with 6 implicit decimals and reports this integer in HEX format. If the value of the longitude is negative, it is represented in Two’s Complement format.

Longitude (121.390847)	121390847			
HEX	07	3C	46	FF

✧ *Latitude*

The latitude of the current position. 4 bytes in total. The device converts the latitude to an integer with 6 implicit decimals and reports this integer in HEX format. If the value of the latitude is negative, it is represented in Two’s Complement format.

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Latitude (31.164503)	31164503			
HEX	01	DB	88	57

✧ *GNSS UTC Time*

UTC time obtained from the GNSS chip. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

GNSS UTC Time	2011		07	14	08	24	13
HEX	07	DB	07	0E	08	18	0D

✧ *Current Mileage*

3 bytes in total. The first 2 bytes are for the integer part of the current mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Current Mileage	0		0
HEX	00	00	00

✧ *Total Mileage*

5 bytes in total. The first 4 bytes are for the integer part of the total mileage and the last byte is for the fractional part. The fractional part has 1 digit.

Total Mileage	0				0
HEX	00	00	00	00	00

✧ *Total Hour Meter Count*

6 bytes in total. The first 4 bytes represent the hour part, the fifth byte represents the minute part, and the sixth byte represents the second part.

Total Hour Meter Count	0				0	0
HEX	00	00	00	00	00	00

✧ *RFID Length*

This is the length of the <RFID>. It is controlled by Bit 27 (for <RFID Length>) in <+RSP Mask>, and the default value of Bit 27 in <+RSP Mask> is 0.

✧ *RFID*

It is the card ID of RFID that is supported by the device. If Bit 27 (for <RFID Length>) in <+RSP Mask> is set to 1, the length of this field is defined by <RFID Length>.

Note

If the device does not get the card ID and Bit 27 (for <RFID Length>) in <+RSP Mask> is 1, the <RFID Length> will be 0 and the <RFID> will be empty.

✧ *CAN Data*

Please refer to the **+RESP:GTCAN** report in hex format. The <CAN Data> contains the following fields:

From <CAN Bus Device State> up to <GNSS Accuracy>, but excluding <GNSS Accuracy>. This field can be analyzed as per the **+RESP:GTCAN** report.

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5.2.2 FRI (Fixed Report Information)

5.2.2.1 FRI (Fixed Report Information)

The location report message **+RESP:GTFRI** in HEX format is as follow.

Example:
2B525350074FFEBFFF007374090409204756333530434555003074033100 4A003B00010000220C10010100000000003005306FB400001E5D3BA07E80308090A2F04600001DF5C05FE661F00000000000000000000000000000000000004553FC875000000000007E80308090A300095205A0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F

Parts	Fields	Length	Range/Format
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11|0x12|0x16|0x1A|0x21|0x22|0x41|0x42
	Satellites in Use	1|2	0 - 72
	Report ID | Report Type	1	
	Number	1	1-15
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	2|4	0000 - FFFF|00000000 - FFFFFFFF
	Reserved|GNSS Trigger Type(Optional)	1	00|00-04
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX

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Parts	Fields	Length	Range/Format
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *GNSS Trigger Type*

The trigger type of GNSS point has the following meanings.

- **00** - Time point
- **01** - Corner point
- **02** - Distance point
- **03** - Mileage point
- **04** - Optimum point (time & mileage)

5.2.3 LBC (Location By Call Alarm)

If the parameter <Location Request Mask> is enabled by the command AT+GTCFG, the device will get and send the current position to the backend server via the message **+RESP:GTLBC** when there is an SMS. The message **+RESP:GTLBC** in HEX format is as below.

Example:

2B525350034FFEFFFF007C74090409204756333530434555003101033 12ED7004A003B00010000210C0070

18895322920F01030000000000000A906FB422D01E5D46407E80308090F1B04600000550B085BE2AA00000

00000000000000000000000000000000004553FC875000000000007E80308090F1C00B0F3880D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF

Parts	Fields	Length	Range/Format
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Report ID | Report Type	1	
	Number Length | Number Type	1	
	Phone Number	<=10	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00

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Parts	Fields	Length	Range/Format
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Number Length | Number Type*

The high nibble is for <Number Length> and the low nibble is for <Number Type>.

<Number Length> is the total number of bytes which is equal to the length of <Phone Number> in bytes plus the length of the parameter <Number Length / Number Type>.

<Number Type> indicates if there is a "+" sign before the phone number. 1 means "with the sign", and 0 means "without the sign".

Message	Number Length	Number Type
HEX	7	0

✧ *Phone Number*

No more than 10 bytes. In each byte, use the high nibble and low nibble to represent one digit of the phone number respectively.

If there is no digit for the last low nibble to represent, fill it with 0xF.

Phone Number (02154450293)	02	15	44	50	29	3
HEX	02	15	44	50	29	3F

5.2.4 SOS (SOS Alarm Notification)

If the SOS function is enabled, the device will send the message **+RESP:GTSOS** to the backend server when the corresponding digital input port triggers SOS. The location report message **+RESP:GTSOS** in HEX format is as below.

Example:

2B5253500A4FFEFFFF00767409040920475633353043455500311603312EDB004A003B00030000210C1000

```
0103000000000000A906FB422D01E5D46407E8030809102504600000550B085BE2AA00000000000000000000000000000000000000004553FC875000000000007E8030809102600B7E6650D0A
```

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Report ID | Report Type	1	
	Reserved	1	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)

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Parts	Fields	Length	Range/Format
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.2.5 IDA (ID Authentication Alarm)

According to <Mode> of the command AT+GTIDA, the reporting mode of **+RESP:GTIDA** varies.

If <Mode> is set to 1 , 2 or 5, **+RESP:GTIDA** will be reported according to the <Report Mode> setting.

If <Mode> is set to 0, **+RESP:GTIDA** will always be reported without checking the status of ID authorization.

The location report message **+RESP:GTIDA** in HEX format is as below.

Example:

2B525350114FFEFFFF007B7409040920475633353043455500311F03312EDB004A003B00030000210A0004553FC875000103000000000000A906FB422D01E5D46407E80308091117046000005 50B085BE2AA0000000000000000000000000000000000000000004553FC875000000000007E8030809111900B95E3B0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Report ID | Report Type	1	00
	ID Length	1	00-0E
	ID	<=0E	ASCII (not including '=' and ',')

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Parts	Fields	Length	Range/Format
	ID Report Type	1	0-3
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *ID*

The ID that is currently read.

✧ *ID Report Type*

The type of reported ID.

- **0** - IDA function is disabled.
- **1** - The ID is authorized.

- **2** - The ID has logged out.
- **3** - The ID is unauthorized.

5.2.6 ERI (Expand Fixed Report Information)

If **+RESP:GTERI** is enabled, the device will send the message **+RESP:GTERI** to the backend server instead of **+RESP:GTFRI**.

The message **+RESP:GTERI** in HEX format is as below.

Example:

2B525350120DFE2FFF0000010001A87409040920475633353043455500000000010F00210C10010A000100
00040000030C001F54445F31303031313400D971858039B3010DAC1401020000040BB41680001F5754533
330300078054101E641010BB41602060500040D690921283F57544833303100780541206F36A010D691722
092164030700000400000193000744555 42D45205337000018E9C336E0010408000000008757424333303 0
00780541046E3E0103010018050B000004000000011007 4D41472043303037393300D325C2B2A2F801000
00001060D000004000000004007575 24C33303000D7300738AFF80100070C000004001E43A2061754504D
532D310008351B00038E011B004B07E8030B0E3122080F000000881F000757494433323047 00D45508383
1FA010B3317095E007CFF8403A152620B0F00640BBE00640001090F010000800F00094D4F5620454C4100C
69E19F49FB2010BC100000019FC2300000101000000000000004706FB402A01E5D45307E8030B0631270460
0001DF5C027A4F1F0000000000000000000000000000000000000007E8030B0E312880AF66030D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	ERI Mask	4	00000000 - FFFFFFFF
	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)

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Parts	Fields	Length	Range/Format
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Report ID | Report Type	1	
	UART Device Type	1	0| 1| 7
	Digital Fuel Sensor Data (Optional)	2	0000 - FFFF
	Expand Digital Fuel Sensor Data (Optional)		
	1-Wire Data (Optional)		
	Fuel Sensor Data (Optional)		
	RF433 Accessory Data (Optional)		
	Bluetooth Accessory Data(Optional)		
	RAT and Band data (Optional)		
	Number	1	1-15
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	

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Parts	Fields	Length	Range/Format
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved|GNSS Trigger Type(Optional)	1	00| 00-04
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *UART Device Type*

The type of the device connected to the secondary serial port.

- **0** - No device connected
- **1** - Digital fuel sensor
- **7** - WRT100 accessory

✧ *Digital Fuel Sensor Data (Optional)*

The raw data read from the digital fuel sensor. If Bit 0 of <ERI Mask> in AT+GTFRI is enabled, this field will be displayed. Otherwise, this field will not be displayed.

✧ *Expand Digital Fuel Sensor Data (Optional)*

Fields	Length	Range/Format
Reserved	1	
Reserved	1	
Data Mask	2	0000 - FFFF
Digital Fuel Sensor Data (Optional)	2	0000 - FFFF

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Fields	Length	Range/Format
Real-time Fuel Level (Optional)	2	0000 - FFFF (x0.1mm)

✧ *1-Wire Data (Optional)*

Fields	Length	Range/Format
1-wire Device Number	1	0-19
1-wire Device ID	8	
1-wire Device Type	1	00-FF
Device Data Length	1	00-FF
1-wire Device Data	<=20	

- *1-wire Device Number*
  The number of 1-wire devices determines whether fields <1-wire Device ID>, <1-wire Device Type>, <Device Data Length>, and <1-wire Device Data> display. If zero 1-wire devices are connected, these fields will not display. If multiple 1-wire devices are connected, the fields repeat for each 1-wire device to show all connected device information. The <1-wire Data> field displays only if Bit 1 of <ERI Mask> in AT+GTFRI is enabled.
- *1-wire Device ID*
  It indicates the device ID read from the 1-wire device.
- *1-wire Device Type*
  It indicates the type of the 1-wire device.
  - **1** - Temperature sensor
- *Device Data Length*
  It indicates the length of <1-wire Device Data>.
- *1-wire Device Data*
  It indicates the data read from the 1-wire devices.
  If <1-wire Device Type> is 1, this parameter indicates the temperature value and it is in two's complement format (refer to Appendix). To get the real temperature in degrees Centigrade, please convert the data to a decimal value according to the calculation in Appendix first and then multiply the decimal value by 0.0625.

Fields		Length	Range/Format
1-wire Device Data	Temperature	2	0000 - FFFF

✧ *Fuel Sensor Data (Optional)*

Fields	Length	Range/Format
Sensor Number	1	0-99
Sensor Type	1	0-6|20-22
Reserved	1	00
Percentage (Optional)	2	0-100.0(%)
Volume (Optional)	2	0-6000.0

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Fields	Length	Range/Format
Fuel Temperature (Optional)	1	-40-85(x1 ℃)

- *Percentage (Optional)*
  The corresponding percentage value of fuel. This value needs to be divided by 10 to get the actual percentage value.
- *Volume (Optional)*
  To get the actual volume value, this parameter value needs to be divided by 10.

✧ *RF433 Accessory Data (Optional)*

Fields	Length	Range/Format
Accessory Number	1	0-10
Accessory Serial Number	5	00001-FFFFE
Accessory Type	1	1|2
Temperature	1	-20-60(x1 ℃)
Humidity (Optional)	1	0-100(x1%)

✧ *Bluetooth Accessory Data(Optional)*

Fields	Length	Range/Format
Bluetooth Accessory Number	1	0-10
Index	1	0-9
Accessory Type	1	0-2|6-8|10-15|23
Accessory Model	1	0-5
Raw Data Length	2	0000-FFFF
Raw Data	<=FFFF	
Accessory Append Mask	2|4	0000-7FFFFFFF
Accessory Name(Optional)	<=21	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Accessory MAC(Optional)	6	000000000000 - FFFFFFFFFFFF
Accessory Status(Optional)	1	0|1
Accessory Battery Voltage(Optional)	2	0-5000(mV)
Accessory Temperature(Optional)	1	-40-80(℃)|0x7F
Accessory Humidity(Optional)	1	0-100(%RH)
Accessory Output Status(Optional)	1	00 - 03
Accessory Digital Input Status(Optional)	1	00 - 01
Accessory Analog Input Voltage(Optional)	2	0-32000(mV)

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Fields	Length	Range/Format
Accessory Mode(Optional)	1	0-12
Accessory Event(Optional)	1	0-255
Tire Pressure(Optional)	2	0-500(kPa)
Timestamp(Optional)	7	YYYYMMDDHHMMSS
Enhanced Temperature(Optional)	2	-40.00-80.00(℃)|0x7FFF
Magnet ID(Optional)	1	00 - FF
MAG Event Counter(Optional)	2	0-32767
Magnet State(Optional)	1	0|1
Accessory Battery Percentage(Optional)	1	0-100(%)
Relay State(Optional)	1	0|1
Tri-axial Acceleration Data (Optional)	6	HEX
Angle Values (Optional)	3	HEX
Event Mask (Optional)	1	HEX
Tilt Event (Optional)	2	HEX
Motion Event (Optional)	2	HEX
Crash Event (Optional)	2	HEX
Falling Event (Optional)	2	HEX
Move Event (Optional)	2	HEX
Accessory RSSI (Optional)	1	-128-127
Device Serial Number (Optional)	3	HEX
Sensor Identifier (Optional)	2	HEX

- *Bluetooth Accessory Number*
  It indicates the number of accessories connected with the device.
- *Index*
  The index of Bluetooth accessory defined in AT+GTBAS which triggers the **+RESP:GTBAA** message.
- *Accessory Type*
  The type of the Bluetooth accessory which is defined in the <Index>. The following is supported now:
  - **0** - No Bluetooth accessory
  - **1** - Escort sensor
  - **2** - Beacon temperature sensor

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- **6** - Beacon multi-functional sensor
- **7** - Techonoton accessory
- **8** - External Input Output Bluetooth accessory
- **10** - Mechatronics Bluetooth accessory
- **11** - Magnet sensor
- **12** - BLE TPMS sensor
- **13** - Relay sensor
- **14** - Smart Cap sensor
- **15** - Movement-angle BLE sensor
- **23** - Epsilon sensor

- *Accessory Model*
  The model of the Bluetooth accessory which is defined in AT+GTBAS.
- *Raw Data Length*
  It indicates the length of <Raw Data>.
- *Raw Data*
  The raw data is read from Bluetooth accessory. It varies depending on <Accessory Type> and <Accessory Model>.
- *Accessory Name(Optional)*
  The name of the Bluetooth accessory. It ends with 0x00.
- *Accessory MAC(Optional)*
  The MAC address of the Bluetooth accessory.
- *Accessory Status(Optional)*
  A numeral to indicate whether the accessory is available.
  - **0** - The accessory is not available.
  - **1** - The accessory is available.
- *Accessory Battery Voltage(Optional)*
  It indicates the voltage of the battery in Bluetooth accessory.
- *Accessory Temperature(Optional)*
  Temperature data of Bluetooth accessory. If the temperature is not obtained, the parameter is reported as 0x7F.
- *Accessory Humidity(Optional)*
  Humidity data for the Bluetooth accessory.
- *Enhanced Temperature(Optional)*
  It instructs Bluetooth accessories to measure temperature with high precision. If the temperature is not obtained, the parameter is reported as 0x7FFF.

Temperature (16.66)	**1666**	
HEX	06	82

Note

The current temperature value. A total of 2 bytes. The temperature value is converted to an integer with 2 implicit decimals, and the integer is reported in HEX format. If the temperature value is negative, it is expressed in 2's complement format.

- *Magnet ID(Optional)*
  ID corresponding to different magnet sensors.
- *MAG Event Counter(Optional)*
  The total number of times detected by the magnet sensor.
- *Magnet State(Optional)*
  The state of the two parts of the magnet sensor.
  - **0** - Separate
  - **1** - Closed
- *Accessory Battery Percentage(Optional)*
  Percentage of Bluetooth accessory's battery power.
- *Relay State(Optional)*
  The current state of the relay sensor.
- *Accessory RSSI (Optional)*
  Signal strength RSSI value for the Bluetooth accessory.
- *Device Serial Number (Optional)*
  A hexadecimal value representing the device serial number of ER2-BLE sensor.
- *Sensor Identifier (Optional)*
  A hexadecimal value representing the sensor identifier (sensor number in the group) of ER2-BLE sensor.

✧ *RAT and Band data (Optional)*

Fields	Length	Range/Format
RAT	1	0|1|4
Band	2	0-5|7|8|20|28|850|900|1800|1900

- *RAT*
  Radio Access Technology.
  - **0** - NO SERVICE mode
  - **1** - EGPRS mode
  - **4** - LTE Cat 1 mode
- *Band*
  0 means invalid band, 1-5/7-8, 20, 28 means band number and others mean GSM number.

✧ *GNSS Trigger Type*

The trigger type of GNSS point has the following meanings.

- **00** - Time point
- **01** - Corner point
- **02** - Distance point

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- **03** - Mileage point
- **04** - Optimum point (time & mileage)

Note

The word “Optional” means the item is controlled by the parameter <ERI Mask>.

5.2.7 GIN | GOT (Geo-Fence Information)

The messages **+RESP:GTGIN** and **+RESP:GTGOT** in HEX format are as below.

Example:

2B525350144DFEFFFF007974090409204756333530434555003095033 12EE7004B003C00010000220C0101

000000000008000001010000000E0002606FB3FA301E5D5EB07E8030B071B1704600000550B085BE2AA0

00000000000000000000000000000000000004553FC87507E8030B071B173632EB6E0D0A

2B525350154DFEFFFF007974090409204756333530434555003 0BF03312EF0004B003C00010000220C0101

000000000002000001030000000D0002606FB3FA301E5D5EB07E8030B071C0D04600000550B085BE2AA0

00000000000000000000000000000000000004553FC87507E8030B071C0D3636EDB60D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	

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Parts	Fields	Length	Range/Format
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Area Type	1	0| 1
	Mask Group	1	00-0F
	Area Mask Group 1	8	0000000000000001 - FFFFFFFFFFFFFFFF
	Area Mask Group 2	8	0000000000000001 - FFFFFFFFFFFFFFFF
	Area Mask Group 3	8	0000000000000001 - FFFFFFFFFFFFFFFF
	Area Mask Group 4	8	0000000000000001 - FFFFFFFFFFFFFFFF
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00

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Parts	Fields	Length	Range/Format
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Mask Group*

Bitwise mask to determine whether to report <Area Mask>. Bit 0 is for Area Mask Group 1 and Bit 1 is for Area Mask Group 2. 1 means “Report the information”, and 0 means “Do not report the information”.

✧ *Area Mask Group 1*

Bitwise mask for trigger condition composition of the corresponding PEO or GEO ID. Each bit, from the lowest bit to the highest bit, represents the logic status of the corresponding ID to trigger the entering or exiting event. 1 means that the event of the ID set is triggered, and 0 means the event of the ID set is not triggered. In a group, if no event of ID is triggered, the bitwise mask will be null.

- *Area Mask Group 1*
  From bit 0 to bit 63 represents ID 0 to 63.
- *Area Mask Group 2*
  From bit 0 to bit 63 represents ID 64 to 127
- *Area Mask Group 3*
  From bit 0 to bit 63 represents ID 128 to 191.
- *Area Mask Group 4*
  From bit 0 to bit 63 represents ID 192 to 199.

5.2.8 IDC (ID Check Report)

The location report message **+RESP:GTIDC** in HEX format is as follow.

Example:

2B525350664DFEFFFF007474090409204756333530434555002DF900000000000000000E0F0F00210C0455

3FC875010000000000155005A06FB404901E5D43707E8030B0A373204600000550B085BE2AE00000000000000000000000000000000000000000004553FC87507E8030B142333859CFFD60D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	ID Length	1	00-0E
	ID Number	<=0E	ASCII (not including '=' and ',')
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)

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Parts	Fields	Length	Range/Format
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *ID Number*

Target ID number.

5.2.9 SPE (Speed Alarm inside the Geo-Fence)

Example:

2B525350654DFEFFFF00737409040920475633353043455550030AE03312EF0004B003C00010000220B0100

0000010000020200910021 06FB3FE001E5D53A07E8030B07252804600000550B085BE2AA0000000000000

00000000000000000000000004553FC87507E8030B07252E366141990D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+RSP
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	RSP Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Report ID | Report Type	1	
	Group ID	1	00-09
	Reserved	2	0000
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	

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Parts	Fields	Length	Range/Format
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Group ID*

A numeral to indicate in which group the speed alarm is triggered.

5.3 Device Information Reports

This section describes the message related to device generic information. Please refer to the details below.

5.3.1 INF (Device Information)

Information report messages include the messages shown in the default value of the following table. However, only **+RESP:GTINF** includes all the items while other messages only include information of items related to themselves.

Example:

2B494E4601FFFFF147001C00A74756333530434555740904092001050000000000000000000000000000000000000000010000210000C0007E8070508281F0000007F00001E000258000000D02FC300000089860015126625106274140004000018010460000055OB000023600013070A1C0D280F2B121E1728181E1D190007081F0B0F0D24130A15231628221E000000000000000000200010000000107E807050828200192B9470D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+INF
	Message Type	1	
	Report Mask	2	0000 - FFFF
Body	INF Expansion Mask	2	0000 - FFFF
	INF Expansion2 Mask	2	0000 - FFFF
	Length	2	
	Unique ID	8	IMEI/Device Name
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	+RESP:GTVER		
	+RESP:GTIOS		
	+RESP:GTGPS		
	+RESP:GTBAT		
	+RESP:GTCID		
	+RESP:GTCSQ		
	+RESP:GTTMZ		
	+RESP:GTGSM		
	+RESP:GTGSV/+RESP:GTRSV/+RESP:GTBSV/+RESP:GTASV		
	+RESP:GTUVN		
	+RESP:GTCVN		
	+RESP:GTCML		
	+RESP:GTWRT		
	+RESP:GTSCS		

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Parts	Fields	Length	Range/Format
	+RESP:GTTVN		
	+RESP:GTBTI		
	+RESP:GTCIF		
	+RESP:GTCBS		
	Network Type	1	00-03
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Message Type*

The ID of a specific information report message.

Message	ID
+RESP:GTINF	1
+RESP:GTGPS	2
+RESP:GTCID	4
+RESP:GTCSQ	5
+RESP:GTVER	6
+RESP:GTBAT	7
+RESP:GTIOS	8
+RESP:GTTMZ	9
+RESP:GTGSM	10
+RESP:GTGSV	11
+RESP:GTUVN	12
+RESP:GTCVN	13
Reserved	…
+RESP:GTRSV	21
+RESP:GTBSV	22
+RESP:GTBTI	24
+RESP:GTCML	26
Reserved	…
+RESP:GTSCS	28
Reserved	…

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Message	ID
+RESP:GTWRT	30
+RESP:GTTVN	32
Reserved	…
+RESP:GTCIF	35
+RESP:GTASV	37
+RESP:GTCBS	42

✧ *Report Mask*

Please refer to <+INF Mask> in AT+GTHRM.

✧ *Unique ID*

If Bit 1 of <+INF Mask> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit 1 of <+INF Mask> is 1, the device name is used as the unique ID of the device.

Device name is an 8-byte string, please refer to <Device Name> in AT+GTCFG.

If the length of <Device Name> is more than 8 bytes, the device will only acquire the first 8 bytes. In the HEX format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	q	u	e	c	l	i	n	k
HEX	71	75	65	63	6C	69	6E	6B

✧ *Device Type, Protocol Version, Firmware Version*

If <Message Type> is 6 (**+RESP:GTVER**) in the message, Bit 2 (<Device Type>)/Bit 3 (<Protocol Version>)/Bit 4 (<Firmware Version>) in <+INF Mask> will be forced to 1, and these fields will be always present in the HEX report of **+RESP:GTVER**.

✧ *+RESP:GTVER*

Fields	Length	Range/Format
Hardware Version	2	0000 - FFFF
Reserved	2	0000
Reserved	2	0000

✧ *+RESP:GTIOS*

Fields	Length	Range/Format
Reserved	1	00
Analog Input1 Voltage	2	
Analog Input2 Voltage	2	
Analog Input3 Voltage	2	

Fields	Length	Range/Format
Reserved	1	00
Reserved	2	0000
Reserved	2	0000
EIO100 IO Status	2	0000-0F0F
Digital Input Status	1	00-0F
Digital Output Status	1	00-1F
Reserved	1	00

- *EIO100 IO Status*

  The status of EIO100 inputs and outputs. For each bit, 0 means “Disable status”, and 1 means “Enable status”.

  - **Bit 0** - For EIO100 output 9
  - **Bit 1** - For EIO100 output A
  - **Bit 2** - For EIO100 output B
  - **Bit 3** - For EIO100 output C
  - **Bit 4** - Reserved
  - **Bit 5** - Reserved
  - **Bit 6** - Reserved
  - **Bit 7** - Reserved
  - **Bit 8** - For EIO100 input 9
  - **Bit 9** - For EIO100 input A
  - **Bit 10** - For EIO100 input B
  - **Bit 11** - For EIO100 input C
  - **Bit 12** - Reserved
  - **Bit 13** - Reserved
  - **Bit 14** - Reserved
  - **Bit 15** - Reserved

✧ *+RESP:GTGPS*

Fields	Length	Range/Format
Motion Status	1	0x11|0x12|0x16|0x1A|0x21|0x22|0x41|0x42
Reserved	1	00
Satellites in Use	1|2	0 - 72
Power Saving Mode | OWH Mode | Outside Working Hours | AGPS	1	00-FF
Last Fix UTC Time	7	YYYYMMDDHHMMSS

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Fields	Length	Range/Format
Reserved	1	00
FRI Discard No Fix	1	0|1
Report Item Mask	2	
IGN Interval	3	
IGF Interval	3	
Reserved	2	0000
Reserved	1	00

- *Power Saving Mode | OWH Mode | Outside Working Hours | AGPS*
  The highest bit, or Bit 7, is reserved; Bit 5 and Bit 6 are for <Power Saving Mode>; Bit 4 and Bit 3 are for <OWH Mode>; Bit 2 is for <Outside Working Hours>, and Bit 0 and Bit 1 are for <AGPS>. <Outside Working Hours> is used to indicate whether the device is currently outside working hours. 1 means “Outside working hours”.
  - **Bit 0** - AGPS
  - **Bit 1** - AGPS
  - **Bit 2** - Outside Working Hours
  - **Bit 3** - OWH Mode
  - **Bit 4** - OWH Mode
  - **Bit 5** - Power Saving Mode
  - **Bit 6** - Power Saving Mode

✧ *+RESP:GTBAT*

Fields	Length	Range/Format
Power Supply | Backup Battery On | Charging | LED State | Power Mode	1	00-FF
External Power Voltage	2|4	0-32000(mV)
Backup Battery Voltage	2	0-4500(mV)
Backup Battery Percentage	1	0-100

- *Power Supply | Backup Battery On | Charging | LED State | Power Mode*
  The highest bit, or Bit 7, is for <Power Supply> which indicates whether the external power supply is connected to the device. Bit 6 is for <Backup Battery On> which indicates whether the backup battery is working. Bit 5 is for <Charging> which indicates whether the backup battery is currently charging. Bit 4 is for <LED State>, indicating at least one LED indicator is blinking or steady on when it is 1, and all LEDs are off when it is 0. Bit 0 is for <Power Mode>.
  - **Bit 0** - Power Mode
  - **Bit 1** - Reserved
  - **Bit 2** - Reserved
  - **Bit 3** - Reserved

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- **Bit 4** - LED State
- **Bit 5** - Charging
- **Bit 6** - Backup Battery On
- **Bit 7** - Power Supply

✧ *+RESP:GTCID*

Fields	Length	Range/Format
ICCID	10	ICCID

- *ICCID*

  ICCID is a 20-digit string. In the HEX format message, every 4 bits are used to represent one digit of the 20 digits of the ICCID.

ICCID	89	86	00	00	09	09	17	21	49	53
HEX	89	86	00	00	09	09	17	21	49	53

✧ *+RESP:GTCSQ*

Fields	Length	Range/Format
CSQ RSSI|RSRP	1	0-31|99|0-97|255
CSQ BER	1	0-7|99

✧ *+RESP:GTTMZ*

Fields	Length	Range/Format
Time Zone Offset Sign | Enable Daylight Saving | Network Time Checking	1	00-FF
Time Zone Offset	2	HHMM

- *Time Zone Offset Sign | Enable Daylight Saving | Network Time Checking*
  - **Bit 0** - for <Time Zone Offset Sign> which indicates the positive or negative offset of the local time from UTC time. 1 means “negative offset”.
  - **Bit 1** - for <Enable Daylight Saving> which indicates whether the daylight saving function is currently enabled.
  - **Bit 2** - for <Network Time Checking> which indicates whether to check GNSS UTC time with network time.

✧ *+RESP:GTGSM*

Fields	Length	Range/Format
GIR Trigger Type	1	
Cell Number	1	
MCC	2	
MNC	2	
LAC	2	

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Fields	Length	Range/Format
Cell ID	4	00000000 - FFFFFFFF
Reserved	1	00
RX Level	1	
…		
MCC	2	
MNC	2	
LAC	2	
Cell ID	4	00000000 - FFFFFFFF
Reserved	1	
RX Level	1	

- *GIR Trigger Type*

  The ID of fix type. It indicates what kind of GNSS fix this cell information is for.
  - **INF** - This cell information is for INF request.
  - **SOS** - This cell information is for SOS request.
  - **RTL** - This cell information is for RTL request.
  - **LBC** - This cell information is for LBC request.
  - **TOW** - This cell information is for TOW request.
  - **FRI** - This cell information is for FRI request.
  - **GIR** - This cell information is for sub command **C** in the **AT+GTRTO** command.
  - **ERI** - This cell information is for ERI request.

Fix Type	ID
INF	0
SOS	1
RTL	2
LBC	3
TOW	4
FRI	5
GIR	6
ERI	7

- *Cell Number*

  The number of cells. It also indicates the number of cell information groups. One cell information group consists of MCC, MNC, LAC, and Cell ID.

✧ *+RESP:GTGSV/+RESP:GTRSV/+RESP:GTBSV/+RESP:GTASV*

Fields	Length	Range/Format
SV Count	1	

Fields	Length	Range/Format
SV ID	1	
SV Power	1	
…		
SV ID	1	
SV Power	1	

✧ *+RESP:GTUVN*

Fields	Length	Range/Format
Sensor Protocol Version	1	
Sensor SW Version	2	
Sensor HW Version	1	

✧ *+RESP:GTCVN*

Fields	Length	Range/Format
CAN Module SW Version Length	1	0-10
CAN Module SW Version	<=10	

✧ *+RESP:GTCML*

Fields	Length	Range/Format
CAN Module Car Model ID	2	0x0000 - 0xFFFF
CAN Module Car Name Length	1	0-50
CAN Module Car Name	<=50	
CAN Module Sync Status	1	1-4

✧ *+RESP:GTWRT*

Fields	Length	Range/Format
Accessory Number	1	0-10
Accessory Type	1	1|2
Accessory Serial Number	5	00001-FFFFE
…		
Accessory Type	1	1|2
Accessory Serial Number	5	00001-FFFFE

✧ *+RESP:GTSCS*

Fields	Length	Range/Format
Self Calibration Status	1	0-2

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Fields	Length	Range/Format
X_Forward	1	-100-100
Y_Forward	1	-100-100
Z_Forward	1	-100-100
X_Side	1	-100-100
Y_Side	1	-100-100
Z_Side	1	-100-100
X_Vertical	1	-100-100
Y_Vertical	1	-100-100
Z_Vertical	1	-100-100

✧ *+RESP:GTTVN*

Fields	Length	Range/Format
THR_100 SW Version	<=8	'0' - '9' 'a' - 'z'
THR_100 HW Version	<=8	'0' - '9' 'a' - 'z'

Note

<THR_100 SW Version> and <THR_100 HW Version> end with 0x00.

✧ *+RESP:GTBTI*

Fields	Length	Range/Format
Bluetooth Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_' '%'
Bluetooth MAC Address	6	000000000000 - FFFFFFFFFFFF
Bluetooth State	1	0|1
Connected Device Number	1	0-11
Connected Device Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Connected Device MAC	6	000000000000 - FFFFFFFFFFFF
Role	1	0
Real-Time State	1	0|1
Ghost Battery Percentage	1	0-100
Ghost Status	2	0000 - FFFF

Note

<Connected Device Name> ends with 0x00.

✧ *+RESP:GTCIF*

Fields	Length	Range/Format
CAN Module Information Mask	1	00 - FF

Fields	Length	Range/Format
CAN Module Version Length(optional)	1	0-10
CAN Module Version Number(optional)	<=10	
CAN Module Serial Length(optional)	1	0-10
CAN Module Serial Number(optional)	<=10	
CAN Module Car Model ID(optional)	2	0x0000 - 0xFFFF
CAN Module Car Name Length(optional)	1	0-50
CAN Module Car Name(optional)	<=50	
Extended Debug Information Length	1	00-FF
Extended Debug Information	<=250	
Standard Debug Information Length	1	00-FF
Standard Debug Information	<=250	
Hardware Information Length	1	00-FF
Hardware Information	<=250	
CAN Module Info Mask Extend	1	00 - FF
CAN Configure Deep Sleep Mode Switch	1	0|1
CAN Module Configure Version Length	1	0-10
CAN Module Configure Version	<=10	
Machine Model Debug Information Length(optional)	1	00-FF
Machine Model Debug Information(optional)	<=64	

- *CAN Module Information Mask*
  Configuration information for a specific CAN Module information mask that can be obtained and represent the low byte portion of the <CAN Module Information Mask> in AT+GTRTO.
- *CAN Module Car Model ID(optional)*
  The car model ID of the CAN Module device. If the value is 0, it means that no model has been obtained.
- *CAN Module Car Name(optional)*

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Car Name is human-readable make and model of the car. If this string value is equal to "sync", then the <CAN Module Car Model ID> of the query is a class ID that has been synchronized.

- *CAN Module Info Mask Extend*
  When bit7 of <CAN Module Info Mask> is 1, this mask will be obtained and represent the high byte portion of the <CAN Module Information Mask> in AT+GTRTO.
- *CAN Configure Deep Sleep Mode Switch*
  It is used to control whether CAN configuration has enabled deep-sleep mode.
  - **0** - CAN Module will enter deep sleep (very low power consumption mode) when vehicle's CAN bus (and entire car) goes sleep.
    CAN-Logistic uses very little energy in deep-sleep mode, but it takes more time to wake it up and some information may be lost in some cases.
  - **1** - CAN Module will not enter deep-sleep mode.
- *CAN Module Configure Version*
  The configure version of the CAN device.

Note

As <Hardware Information>, <Standard Debug Information> and <Extended Debug Information> contain many bytes, it is recommended to query only one set of debug message at a time.

✧ *+RESP:GTCBS*

Fields	Length	Range/Format
CAN Report Mask	1	00-FF
CAN2-bus or J1708-bus Status	1	0-3
CAN1-bus Status	1	0-3

5.3.2 ATI (Version Information)

After the device receives the command AT+GTRTO to get the basic device information, it will send the information to the backend server via the message **+RESP:GTATI**.

Example:
2B4154493474090409205654570028B5A1A0600181031092001050500020467000000000000000007E9030B0B221C0126736D0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+ATI
Body	Length	1	
	Device Type	1	74

Parts	Fields	Length	Range/Format
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI
	ATI Mask	4	00000000 - FFFFFFFF
	Firmware Version	2	'0' - '9' 'A' - 'F'
	Hardware Version	2	'0' - '9' 'A' - 'F'
	BT Firmware Version	2	0000 - FFFF
	BT Boot Firmware Version	2	0000 - FFFF
	Sensor ID	1	00 - FF
	Modem IMEI	8	IMEI
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *ATI Mask*

This mask is set by the AT+GTRTO command and used to control parameter fields in **+ATI** message.

5.4 Event Reports

This section describes the message related to certain events. Please refer to the details below.

5.4.1 Generic Event Report

- **PNA** (Power-on Report)
- **PFA** (Power-off Report)
- **MPN** (Main Power Connection)
- **MPF** (Main Power Disconnection)
- **BTC** (Battery Starts Charging)
- **STC** (Stop Charging Notification)
- **STT** (Device Status Notification)
- **PDP** (GPRS Connection Establishment Report)
- **IDN** (Enter Idle State)
- **STR** (Enter Start State)

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- **STP** (Enter Stop State)
- **LSP** (Enter Long Stop State)

Example:

2B45565401CFF6FFFF00000002007D74090409204756333530434555640000000200000000000000010000
4100000100000000000000000000000000000000000000000000000000000000000000000000000000000000
00000000000000000000000000801A66C810100001E000000000007E9030C060F1B0AF1B7EE0D0A

2B4556540209FEDFFF00657409040920475633353043455500 2F3A000000000100210C01010000000000FF
FA06FB401101E5D44807E90314060628046000005 50B085BE2AA00000000000000000000000000000000
0000007E9031406062A0D931CB10D0A

2B4556540309FEDFFF00657409040920475633353043455500 2F55000000000100220C01020000000000FF
E506FB3FFE01E5D45307E90314060724046000005 50B085BE2AA00000000000000000000000000000000
0000007E903140607250DA65CF10D0A

2B4556540409FEDFFF00657409040920475633353043455500000000000000000100220C01020000000000FF
E506FB3FFE01E5D45307E9031406071C04600000550B085BE2AA00000000000000000000000000000000
0000007E9031406071D0DA4A6140D0A

2B4556540709FEDFFF00657409040920475633353043455500 2F4000000000100220C0103000000000D6FF
D706FB407801E5D3F907E9031406081E04600000550B085BE2AA00000000000000000000000000000000
0000007E9031406081F0DB4BC710D0A

2B4556540809FEDFFF00657409040920475633353043455500 2EA7000000000100220C0101000000000D6FF
D706FB407801E5D3F907E90314060822046000005 50B085BE2AA00000000000000000000000000000000
0000007E903140608230DB6FBEA0D0A

2B4556540909FEDFFF00657409040920475633353043455500 2F4000000000100220C0101000000000D6FF
CA06FB407B01E5D3EF07E90314060B0B04600000550B085BE2AA00000000000000000000000000000000
0000007E90314060B0C0DDE1A940D0A

2B4556540C09FEDFFF00657409040920475633353043455564 2E3F000000000100210301000002060 0B200
5306FB404C01E5D14D07E607060B1C160000000000000000000000000000000000000000000000000000000
0000007E607060B1D1E033B50480D0A

2B4556540D09FEDFFF006974090409204756333530434555002F42000000000100210C0000000101000000
0000D6FFCA06FB407B01E5D3EF07E90314060C3004600000550B085BE2AA0000000000000000000000000000
000000000000007E90314060C310DFCFE6E0D0A

2B4556541709FEDFFF006574090409204756333530434555002F7E0000000001002208010400010200B900
4306FB406301E5D00D07E607060B052904600001DE1105FE6667000000000000000000000000000000000000
0000007E607060B052B02C5DD7C0D0A

2B4556541809FEDFFF006574090409204756333530434555002F7E0000000001002208010400000000B900
4306FB407801E5D02007E607060B052B04600001DE1105FE6667000000000000000000000000000000000000
0000007E607060B052D02C6C99A0D0A

2B4556541D09FEDFFF006574090409204756333530434555002F950000000001002108010500000000B900
4306FB407801E5D02007E607060B062B04600001DE1105FE6667000000000000000000000000000000000000
0000007E607060B062D02CA91690D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	

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Parts	Fields	Length	Range/Format
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF

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Parts	Fields	Length	Range/Format
	Tail	2	0x0D 0x0A

✧ *Message Type*

The ID of a specific event report message.

Message	ID
+RESP:GTPNA	1
+RESP:GTPFA	2
+RESP:GTMPN	3
+RESP:GTMPF	4
+RESP:GTBPL	6
+RESP:GTBTC	7
+RESP:GTSTC	8
+RESP:GTSTT	9
+RESP:GTPDP	12
+RESP:GTIGN	13
+RESP:GTIGF	14
+RESP:GTUPD	15
+RESP:GTIDN	16
+RESP:GTIDF	17
+RESP:GTDAT	18
+RESP:GTJDR	20
+RESP:GTGSS	21
+RESP:GTFLA	22
+RESP:GTSTR	23
+RESP:GTSTP	24
+RESP:GTCRA	25
+RESP:GTDOS	27
+RESP:GTGES	28
+RESP:GTLSP	29
+RESP:GTTMP	30
+RESP:GTDTT	31
+RESP:GTJDS	32
+RESP:GTRMD	33
+RESP:GTPHL	34
+RESP:GTEXP	35

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Message	ID
+RESP:GTUFS	37
+RESP:GTFTP	38
+RESP:GTUPC	40
+RESP:GTCLT	41
+RESP:GTCFU	42
+RESP:GTVGN	45
+RESP:GTVGF	46
+RESP:GTASC	47
+RESP:GTPNR	48
+RESP:GTPFR	49
+RESP:GTHBE	51
+RESP:GTBCS	52
+RESP:GTBDS	53
+RESP:GTLBA	60
+RESP:GTWPB	61
+RESP:GTTTR	62
+RESP:GTTRL	63
+RESP:GTBAA	65
+RESP:GTBID	67
+RESP:GTBAR	70
+RESP:GTSVR	73
+RESP:GTBIE	77
+RESP:GTEUC	84
+RESP:GTRTP	86
+RESP:GTFRT	90
+RESP:GTTPM	106
+RESP:GTGPJ	108
+RESP:GTBFS	110
+RESP:GTSOT	111
+RESP:GTUHF	112
+RESP:GTATR	123
+RESP:GTBFE	124

✧ *Report Mask*

Please refer to <+EVT Mask> in AT+GTHRM.

✧ *Unique ID*

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If Bit 6 of <+EVT Mask> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit 6 of <+EVT Mask> is 1, the device name is used as the unique ID of the device. Device name is an 8-byte string, please refer to <Device Name> in AT+GTCFG. If the length of <Device Name> is more than 8 bytes, the device will only acquire the first 8 bytes. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	q	u	e	c	l	i	n	k
HEX	71	75	65	63	6C	69	6E	6B

✧ *Satellites in Use*

Number of satellites being used for tracking. The high nibble is reserved and the low nibble is valid. But if Bit 1 of <EVT Expansion Mask> is set to 1, this parameter would be expanded to two bytes, the high byte is reserved and the low byte is valid.

✧ *RFID Length*

It indicates the length of <RFID>. It is controlled by Bit 27 in <+EVT Mask>, and the default value is 0.

✧ *RFID*

It is the card ID of RFID that is supported by the device. If Bit 27 (for <RFID Length>) in <+EVT Mask> is set to 1, the length of this field is defined by <RFID Length>.

Note

If the device does not get the card ID and Bit 27 in <+EVT Mask> is 1, <RFID Length> will be 0 and <RFID> will be empty.

5.4.2 BPL (Backup Battery Low Alarm)

The event report message **+RESP:GTBPL** in HEX format is as below.

Example:

2B4556540609FEDFFF0067740705071A4756333530434555160000000000000000410C0E71010100000001
53005806FB401301E5D3BE07E6070703373B04600000550B085BE2AA00000000000000000000000000000000
00000000007E607070338010F0A7B560D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	

Parts	Fields	Length	Range/Format
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Backup Battery Voltage	2	0-4500(mV)
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF

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Parts	Fields	Length	Range/Format
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.3 JDR (Jamming Indication Notification)

Jamming indication. The event report message **+RESP:GTJDR** in HEX format is as below.

Example:

2B4256541409FEDFFF006674090409204756333530434555390000000000000000001A050201000000000023005706FB401E01E5D50207E607070A2510000000000000000000000000000000000000000000000000000000000000000000000000000000000000000007E607070A251D1D9AD5890D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	

Parts	Fields	Length	Range/Format
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Jamming Net	1	1-3
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF

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Parts	Fields	Length	Range/Format
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.4 JDS (Jamming Indication Notification)

Jamming indication. The event report message **+RESP:GTJDS** in HEX format is as below.

Example:

2B4256542009FEDFFF006774090409204756333530434555580000000000000000120702020100000706015600 5A06FB3FB601E5D52207E607070703230000000000000000000000000000000000000000000000000000000000 0000000007E607070703291526009 90D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF

Parts	Fields	Length	Range/Format
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Jamming Status	1	1| 2| 5| 6
	Jamming Net	1	1-3
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)

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Parts	Fields	Length	Range/Format
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Jamming Status*

The current jamming status of the device.

- **1** - Quit the jamming state.
- **2** - Enter the jamming state.
- **5** - Quit the jamming warning state.
- **6** - Enter the jamming warning state.

5.4.5 GPJ (GNSS Jamming Indication Notification)

The event report message **+RESP:GTGPJ** in HEX format is as below.

Example:

2B4556546C09FEDFFF006774090409204756333530434555002F41000000000100210C0900010100000000AF004B06FB3FC801E5D43D07E90314061F3504600000550B085BE2AA00000000000000000000000000000000000000000007E90314061F370F2753510D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	

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Parts	Fields	Length	Range/Format
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	CW Jamming Value	1	0-255
	GNSS Jamming State	1	0| 1| 3
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF

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Parts	Fields	Length	Range/Format
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *CW Jamming Value*
The current continuous wave jamming value.

✧ *GNSS Jamming State*
The current jamming state.

- **0** - Unknown.
- **1** - (OK) No significant jamming.
- **3** - (Critical) Interference visible and no fix.

5.4.6 IGN | IGF

- IGN - Ignition-on Report
- IGF - Ignition-off Report

The HEX format of the event report messages **+RESP:GTIGN** and **+RESP:GTIGF** is as follows. For these two types of messages, the <Current Mileage> and <Total Mileage> fields will always be present regardless of the <+EVT Mask> setting.

Example:
2B4556540D09FEDFFF006974090409204756333530434555002F44000000000100210C0000000101010000
0000D4004B06FB3FC801E5D43D07E90314062028046000005 50B085BE2AA00000000000000000000000000

000000000000007E9031406202A0F37D7670D0A

2B4556540E09FEDFFF006974090409204756333530434555002F44000000000000110C000004A8010100000000D4004B06FB3FC801E5D43D07E90314062027046000005 50B085BE2AA00000000000000000000000000000000000000000000007E903140620290F35F9530D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Duration of Ignition On or Ignition Off	4	0-999999(s)
	Number	1	1

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Parts	Fields	Length	Range/Format
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.7 VGN | VGF

- VGN - Virtual Ignition-on Report
- VGF - Virtual Ignition-off Report

The HEX format of the event report messages **+RESP:GTVGN** and **+RESP:GTVGF** is as follows. For these two messages, the <Current Mileage> and <Total Mileage> fields will always be present regardless of the <+EVT Mask> setting.

Example:

2B4556542D09FEDFFF006B74090409204756333530434555003020000000000022050004000001110100000000000005206FB419C01E5D40107E607070327070460000055OB0000B7A900000000000000000000000000000000000000000007E6070703291E055CF0B40D0A

2B4556542E09FEDFFF006B74090409204756333530434555002FF900000000000011060004000000 8D01020000000000FFF506FB44A801E5D67207E60707032A2404600000550B0000B1E2000000000000000000000000000000000000000007E60707032A26056123750D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F

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Parts	Fields	Length	Range/Format
	Digital Output Status	1	00-1F
	Virtual Output ID Status	2	0000 - FFFF
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Reserved	1	00
	Report Type	1	0| 2| 4| 7
	Duration of Ignition On or Ignition Off	4	0-999999(s)
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS

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Parts	Fields	Length	Range/Format
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.8 IDF (Exit Idle State)

The HEX format of the event report message **+RESP:GTIDF** is as follows.

Example:

2B4556541109FEDFFF006974090409204756333530434555002F7E0000000000001107000001610100000000000004306FB403E01E5D1CF07E607060A350504600001DE1105FE6667000000000000000000000000000000000000007E607060A383002A8F20B0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F

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Parts	Fields	Length	Range/Format
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	11| 12| 16| 1A| 22
	Satellites in Use	1|2	0 - 72
	Duration of Idling	4	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

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5.4.9 GSS (GNSS Signal Status)

The HEX format of the event report message **+RESP:GTGSS** is as follows.

Example:
2B4556541509FEDFFF006A7409040920475633353043455564000000000000000011060100000000010000
00000135004D06FB400E01E5D3F407E60707011C0904600001DE1105FE6667000000000000000000000000
00000000000000007E60707011C080B25F2330D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72

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Parts	Fields	Length	Range/Format
	GNSS Signal Status	1	0| 1
	Reserved	4	00000000
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Satellites in Use*

Number of satellites being used for tracking. The high nibble is reserved and the low nibble is valid. But If Bit 1 of <EVT Expansion Mask> is 1 this parameter would be expanded to two bytes, the high byte is reserved and the low byte is valid.

✧ *GNSS Signal Status*

- **0** - GNSS signal lost or no successful GNSS fix
- **1** - GNSS signal recovered and successful GNSS fix

5.4.10 FLA (Unusual Fuel Consumption Alarm)

The HEX format of the event report message **+RESP:GTFLA** is as follows.

Example:

2B4556541609FEDFFF006874090409204756333530434555002FCF00410000000004107014C410102000000000000009806FB42CB01E5D30207E6061E06230204600011691D06919805000000000000000002000000000000000000007E6061E0623033140C3F60D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F

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Parts	Fields	Length	Range/Format
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Input ID	1	0-3
	Last Fuel Level	1	0-100
	Current Fuel Level	1	0-100
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

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- *Input ID*
  The ID of the input to which the fuel sensor is connected. 0 means “Connected with serial port”.
- *Last Fuel Level*
  The fuel level saved before the fuel loss alarm event occurs.
- *Current Fuel Level*
  The current fuel level when the fuel loss alarm event occurs.

5.4.11 DOS (Wave Shape 1 Output Status)

The HEX format of the event report message **+RESP:GTDOS** is as follows.

Example:
2B4556541B09FEDFFF006774090409204756333530434555002F4C0000000000100210C0100010100000000D4004B06FB3FC801E5D43D07E90314062917046000005 50B085BE2AA00000000000000000000000000000000000000000007E903140629180FC480D70D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F

Parts	Fields	Length	Range/Format
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Wave1 Output ID	1	1-5| 7-C
	Wave1 Output Active	1	0-2
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF

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Parts	Fields	Length	Range/Format
	Tail	2	0x0D 0x0A

5.4.12 GES (Parking-Fence Information)

The HEX format of the event report message **+RESP:GTGES** is as follows.

Example:

2B4556541C09FEDFFF007574090409204756333530434555002E0C000000000000110C0012011500000032
0000000501010000000000005906FB405801E5D51707E8030B08180B04600000550B085BE2AA000000000
00000000000000000000000000004553FC87507E8030B10180D82B913C60D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F

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Parts	Fields	Length	Range/Format
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Trigger GEO ID	2	0-19
	Enable Trigger GEO	1	0| 1
	Trigger Mode	1	0| 21| 22
	Radius	4	50-6000000(m)
	Check Interval	4	0| 5-86400(s)
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF

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Parts	Fields	Length	Range/Format
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Trigger GEO ID*
The ID of Geo-Fence.

✧ *Enable Trigger GEO*
The current Parking-Fence is active or inactive.

- **0** - The current Parking-Fence is inactive.
- **1** - The current Parking-Fence is active.

5.4.13 TMP (Temperature Alarm)

The HEX format of the event report message **+RESP:GTTMP** is as follows.

Example:
2B4556541E09FEDFFF00727409040920475633353043455500 2FC500000000100210C000128D1A6F60A0
0005000001B0101000000000000005906FB3FA801E5D45507E6061D0A340E04600011691D0DE98A34000000
00000000000100000000000000000000007E6061D0A340F16EEED9E0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	

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Parts	Fields	Length	Range/Format
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Temperature Alarm ID	1	0-3
	Temperature Status	1	0-1
	Temperature Sensor Device ID	8	'0'-'9' 'a'-'f' 'A'-'F'
	Reserved	1	00
	Temperature Sensor Device Data	2	-55-125(℃)
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS

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Parts	Fields	Length	Range/Format
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Temperature Alarm ID*
The ID of temperature alarm.

✧ *Temperature Status*
The status of current temperature.

- **Bit0** - 0 means “Outside the predefined temperature range”. 1 means “Within the predefined temperature range”.

✧ *Temperature Sensor Device ID*
The ID of the temperature sensor.

✧ *Temperature Sensor Device Data*
The current temperature the sensor detects.

5.4.14 RMD (Roaming State Report)

The HEX format of the event report message **+RESP:GTRMD** is as follows.

Example:
2B4556542109FEDFFF006674090409204756333530434555003017000000000001110B000101000000000B0007606FB40AA01E5D35207E607070605030460000055 0B0000B1E2000000000000000000000000000000000000000007E60707060505066C1FBA0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF

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Parts	Fields	Length	Range/Format
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Roaming State	1	0-3
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0 - 359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF

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Parts	Fields	Length	Range/Format
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.15 PHL (Location Information for CMS)

The HEX format of the event report message **+RESP:GTPHL** is as follows, and it is only sent via GPRS even if the report mode is forced SMS mode.

Example:
2B4556542209FEDFFF007174090409204756333530434555002FCD000000000000410C000300080007E6061E06321701010000000000006E06FB409601E5D25407E6061E06321804600011691D069198050000000000000000200000000000000000000007E6061E0632193194A06E0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74

Parts	Fields	Length	Range/Format
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Attribute Mask	2	0000 - FFFF
	Attribute Length	2	
	Camera ID	1	0-3
	Photo Time	7	YYYYMMDDHHMMSS
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF

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Parts	Fields	Length	Range/Format
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Attribute Length*

The total length of attribute parameters which include <Camera ID> and <Photo Time>.

5.4.16 EXP (Information of Digital Fuel Sensor)

The HEX format of the event report message **+RESP:GTEXP** is as follows.

Example:

2B4556542309FEDFFF006974090409204756333530434555002FB8000000000001110A0400000101010000

0000B1005906FB40A701E5D43307E607070B021104600000550B0000B7B1000000000000000000000000000

000000000000007E607070B02130F889D780D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	

Parts	Fields	Length	Range/Format
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Digital Fuel Sensor Type	1	2| 4
	Reserved	1	00
	Reserved	1	00
	HW Fault Code	1	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF

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Parts	Fields	Length	Range/Format
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.17 FTP (Transfer File Alarm)

The event report message **+RESP:GTFTP** is for reporting location information after transferring a file to FTP server and the HEX format is as follows.

Example:

2B4556542609FEDFFF007D7409040920475633353043455500 2FCD000000000000410C526565736532303232303633303036353032332E6A706700010100000000000006E06FB409601E5D25407E6061E06321F04600011691D0691980500000000000000000020000000000000000000000007E6061E063220319525E00D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF

Parts	Fields	Length	Range/Format
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	File Name	<=100	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF

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Parts	Fields	Length	Range/Format
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *File Name*

The name of the file transferred to FTP server.

5.4.18 CLT (CAN Bus Information Alarm)

The HEX format of the event report message **+RESP:GTCLT** is as follows.

Example:

2B455654294FFEFFFF019974090409204756333530434555003130033100000000000000010000220C139F
FEFEBD20000142003F003F00000005010000000900E0002E06FB3FCF01E5D4C507E8030B07130D04600000
550B085BE2AA00000000000000000000000000000000000004553FC875013FFFFFFF314731424C35325037
5452313135353230000000001F4000B29AC3802BC005000D2FF270F000000640000000000000005F5E0F6001E
0000270F630000270F630000270F63000B29AC3811923B3EFEBD3F3F0001869F630001869F630000000000
2710004E2000753000000E109C40F3FFFFFF00637D7D7D7D7D01010100002DF00098967F000F423F000
F423F0001869F630001869F630001869F63000F423F717565636C696E6B303300717565636C696E6B30330
0434152314E414D4500434152324E414D45003035363633001FFE000F423F000F423F64FFFD8F0000D2020
22E03619902FF0000002800DBD6D3D5000000037DDF00003FC7006400C80000012C500003000132000003
E864000003E8000007D007E8030B07130E360638180D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Group ID	1	00-19
	Combined Alarm Mask 1	4|8	00000000 - FFFFFFFF | 0000000000000000 - FFFFFFFFFFFFFFFF
	Alarm Mask 2	4	00000000 - FFFFFFFF
	Alarm Mask 3	4	00000000 - FFFFFFFF
	Number	1	1
	GNSS Accuracy	1	0-50

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Parts	Fields	Length	Range/Format
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Group ID*

The ID of CAN bus alarm group. The CAN bus alarm function supports settings of a total of 20 groups.

✧ *Combined Alarm Mask 1*

The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Detailed Information/Indicators> of the **CAN** (ASCII)/(HEX) message. If an alarm event satisfies the triggering condition and the <Inverse Alarm Mask 1> is checked in the bitwise, the parameter <Combined Alarm Mask 1> in the message **+RESP:GTCLT** will be composed of <Alarm Mask 1> and <Inverse Alarm Mask 1>. Besides, Bit31 of parameter <Alarm Mask 1> is automatically set to 1 to prompt the information of <Inverse Alarm Mask 1>. If the trigger conditions for the **+RESP:GTCLT**

alarm event report are met and all bits of the <Inverse Alarm Mask 1> are set to 0, the parameter <Combined Alarm Mask 1> will only include <Alarm Mask 1> and Bit 31 of the parameter <Alarm Mask 1> is automatically set to 0.
For example:

- <Alarm Mask 1> = 0x00000000, <Inverse Alarm Mask 1> = 0x00000020
  1. Not trigger seatbelt on alarm
  2. If the trigger seatbelt off alarm: <Combined Alarm Mask 1> = 0x8000000000000020
- <Alarm Mask 1> = 0x00000020, <Inverse Alarm Mask 1> = 0x00000000
  1. If the trigger seatbelt on alarm: <Combined Alarm Mask 1> = 0x00000020
  2. Not trigger seatbelt off alarm

✧ *Alarm Mask 2*

The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Lights> and <Doors> of the **CAN** (ASCII)/(HEX) message.

✧ *Alarm Mask 3*

The alarm mask is configured in a bitwise manner. The alarm mask information is based on <Engine RPM> of the **CAN** (ASCII)/(HEX) message.

5.4.19 PNR (Power-on Reason)

Example:

2B4556543009FEDFFF006674090409204756333530434555000000000000000000041000101000000000000
000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
00000007E60707033033056F19910D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name

Parts	Fields	Length	Range/Format
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Power On Reason	1	0-3| 5| 6
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS

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Parts	Fields	Length	Range/Format
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.20 PFR (Power-off Reason)

Example:

2B4556543109FEDFFF006674090409204756333530434555003017000000000001110C020101000000015F005806FB407F01E5D35F07E607070618220460000055 0B0000B1E2000000000000000000000000000000000000000000007E60707061823069A97970D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	

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Parts	Fields	Length	Range/Format
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Power Off Reason	1	0-3
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	

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Parts	Fields	Length	Range/Format
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.21 LBA (Low Power Alarm for RF433)

The low power alarm (less than 2.4V) event message for the RF433 accessories.

Example:

2B4556543C09FEDFFF006B74090409204756333530434555002FC900000000100210C0130303042380101000000009E006406FB403601E5D42507E6061D0B0B1104600011691D0DE98A340000000000000000001000000000000000000007E6061D0B0B12178611150D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F

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Parts	Fields	Length	Range/Format
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Accessory Type	1	01-03
	Accessory Serial Number	5	00001-FFFFE
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF

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Parts	Fields	Length	Range/Format
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.22 WPB (Button Alarm for WPB100)

The button alarm event message for WPB100 accessory.

Example:

2B4556543D09FEDFFF006A7409040920475633353043455500 2F4D000000000100210C303030353101010000000000004906FB407901E5D39F07E60B1E06183204600000550B0000B7B10000000000000000000000000000000000000000007E60B1E06183208E7CF210D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F

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Parts	Fields	Length	Range/Format
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Accessory Serial Number	5	00001-FFFFE
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

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5.4.23 ASC (Acceleration Calibration Alarm)

The HEX format of the event report message **+RESP:GTASC** is as follows.

Example:

2B4556542F4FFEFFFF00C974090409204756333530 5F42000A0000042100000000000000000010220C3256
01AB3200FF0063010000190100000035 06FB209C01E5F01807E607050521110460000 1DE1005A90B0E000
00003000004FE0300001200000118 1F1B0000000FFFFF0000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000007E607050521116516 0F120D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F

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Parts	Fields	Length	Range/Format
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	X_Forward	1	-100-100
	Y_Forward	1	-100-100
	Z_Forward	1	-100-100
	X_Side	1	-100-100
	Y_Side	1	-100-100
	Z_Side	1	-100-100
	X_Vertical	1	-100-100
	Y_Vertical	1	-100-100
	Z_Vertical	1	-100-100
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E

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Parts	Fields	Length	Range/Format
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

- *X_Forward, Y_Forward, Z_Forward*
  The factors to calculate the new acceleration in forward direction. The formula to calculate the acceleration in Forward direction Xnew is Xnew = <X_Forward> * X + <Y_Forward> * Y + <Z_Forward> * Z.
- *X_Side, Y_Side, Z_Side*
  The factors to calculate the new acceleration in side direction. The formula to calculate the acceleration in Side direction Ynew is Ynew = <X_Side> * X + <Y_Side> * Y + <Z_Side> * Z.
- *X_Vertical, Y_Vertical, Z_Vertical*
  The factors to calculate the new acceleration in vertical direction. The formula to calculate the acceleration in Vertical direction Znew is Znew = <X_Vertical> * X + <Y_Vertical> * Y + <Z_Vertical> * Z.

5.4.24 HBE (Acceleration Information for HBM)

XYZ-axis acceleration data in one harsh behavior. The HEX format of the event report message **+RESP:GTHBE** is as follows.

Example:

2B455654334FFEFFFF00D27409040920475633353O5F42000C0000042100000000000000000010220C0002
00000D000B0056FFF5000000530000090100002207000300350 6FB209601E5EF4307E6070505210E046000
01DE1005A90B0E00000002000004FE0300000F000001181F180000000FFFFF0000000000000000000000000
0000000000000000000000000000000000000000000000000000000000000000000000000000000000000000
0000000000000000000000000000000000000000000000000007E6070505210E65151C9D0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF

Parts	Fields	Length	Range/Format
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x21| 0x22| 0x41| 0x42| x1A
	Satellites in Use	1|2	0 - 72
	Reserved	1	00
	Self Calibration Status	1	0-2
	Harsh Behavior Type	1	0-4
	Max Acceleration Data	6	'0'-'9' 'A'-'F'
	Average Acceleration Data	6	'0'-'9' 'A'-'F'
	Harsh Behavior Duration	3	0-999999(x10ms)
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	

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Parts	Fields	Length	Range/Format
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Self Calibration Status*

The status of the self-calibration for Acceleration Data.

- **0** - Self-calibration is disabled.
- **1** - Self-calibration is not done.
- **2** - Self-calibration is successful.

✧ *Harsh Behavior Type*

The type of the harsh behavior.

- **0** - Harsh braking behavior.
- **1** - Harsh acceleration behavior.
- **2** - Harsh cornering behavior.
- **3** - Harsh braking and cornering behavior.
- **4** - Harsh acceleration and cornering behavior.

✧ *Max Acceleration Data*

There are 12 characters in a group of acceleration data. It is the maximal value of acceleration data which triggers this harsh behavior report. The XYZ-axis of the <Max Acceleration Data> in the **+RESP:GTHBE** report correspond to those of the device's coordinate system.
The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data.
The ASCII "0001" indicates HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" indicates HEX value 0xFFFD which is the compliment of -3, so it means the acceleration is -3. This value is only valid in Mode 5 of the AT+GTHBM command.

✧ *Average Acceleration Data*
There are 12 characters in a group of acceleration data. It is the average value of acceleration data which triggers this harsh behavior report.
The first 4 characters of these 12 characters represent X axis acceleration data, the middle 4 characters represent Y axis acceleration data and the last 4 characters are for Z axis acceleration data.
The ASCII "0001" indicates HEX value 0x0001, so it means the acceleration is 1. The ASCII "fffd" means HEX value 0xFFFD which is the compliment of -3, so it means the acceleration is -3. This value is only valid in Mode 5 of the **AT+GTHBM** command.

✧ *Harsh Behavior Duration*
The duration of the harsh behavior event. This value is only valid in Mode 5 of the AT+GTHBM command.

5.4.25 CRA (Crash Alarm)

The HEX format of the event report message **+RESP:GTCRA** is as follows.

Example:
2B4556541909FEDFFF006674090409204756333530434555003015000000000101220C0001000000000027004C06FB402601E5D13E07E6070706361D04600000550B0000B1E200000000000000000000000000000000000000000007E6070706361E06F5F2580D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74

Parts	Fields	Length	Range/Format
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Crash Counter	1	00-FF
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00

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Parts	Fields	Length	Range/Format
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Crash Counter*

A parameter to indicate the crash sequence. It combines the report **+RESP:GTCRA** and **+RESP:GTCRD** into one crash event. It rolls from 0x00 to 0xFF.

5.4.26 BCS (Bluetooth Connection Alarm)

The report for Bluetooth connection.

Example:

2B4556543409FEDFFF00877409040920475633353043455525494D4549008B0874FF3C840000047F0E3C57EE01010000000000005D06FB403F01E5D45C07E8030B09163104600000550B085BE2AA00000000000000000000000000000000000004553FC87507E8030B13023183E737B20D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74

Parts	Fields	Length	Range/Format
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Bluetooth Report Mask	2	0000 - FFFF
	Bluetooth Name	<=21	ASCII
	Bluetooth MAC Address	6	000000000000 - FFFFFFFFFFFF
	Peer Role	1	0| 1
	Peer Address Type	1	0| 1
	Peer MAC Address	6	000000000000 - FFFFFFFFFFFF
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS

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Parts	Fields	Length	Range/Format
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Bluetooth Name*

The name of the device for Bluetooth identification. It ends with 0x00.

5.4.27 BDS (Bluetooth Disconnection Alarm)

The report for Bluetooth disconnection.

Example:

2B4556543509FEDFFF00887409040920475633353043455525494D4549008B0874FF3C840000047F0E3C57EE000101000000000005D06FB403F01E5D45C07E8030B09172304600000550B085BE2AA00000000000000000000000000000000000000004553FC87507E8030B13032383EDDC490D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	

Parts	Fields	Length	Range/Format
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Bluetooth Report Mask	2	0000 - FFFF
	Bluetooth Name	<=21	ASCII
	Bluetooth MAC Address	6	000000000000 - FFFFFFFFFFFF
	Peer Role	1	0| 1
	Peer Address Type	1	0| 1
	Peer MAC Address	6	000000000000 - FFFFFFFFFFFF
	Reason	1	0| 4
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)

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Parts	Fields	Length	Range/Format
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Bluetooth Name*

The name of the device for Bluetooth identification. It ends with 0x00.

5.4.28 BAA (Bluetooth Accessory Alarm)

The HEX format of the event report message **+RESP:GTBAA** is as follows.

Example:

2B4556544109FEDFFF007F74090409204756333530434555002E1B000000000100210C00010000001F5444

5F31303031313400D971858039B3010DAC13010000000000000008906FB407E01E5D57007E8030B051C090

4600001DF5C027A4F1F0000000000000000000000000000000000000007E8030B0D1C097E9EDBE00D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-0F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Index	1	00-09| FE-FF
	Accessory Type	1	0-3| 6| 11-15| 23
	Accessory Model / Beacon ID Model	1	0-5| 7| 10
	Alarm Type	1	0-4| 7-0A| 0C-1E
	Append Mask	2|4	0000 - FFFF7FFF
	Accessory Name(Optional)	<=21	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Accessory MAC(Optional)	6	'0' - '9' 'A' - 'F'

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Parts	Fields	Length	Range/Format
	Accessory Status(Optional)	1	0| 1
	Accessory Battery Voltage(Optional)	2	0-5000(mV)
	Accessory Temperature(Optional)	1	-40-80(°C)| 0x7F
	Accessory Humidity(Optional)	1	0-100(%RH)
	Accessory Mode(Optional)	1	0-12
	Accessory Event(Optional)	1	0-255
	Tire Pressure(Optional)	2	0-500(kPa)
	Timestamp(Optional)	7	YYYYMMDDHHMMSS
	Enhanced Temperature(Optional)	2	-40.00-80.00(°C)| 0x7FFF
	Magnet ID(Optional)	1	00 - FF
	MAG Event Counter(Optional)	2	0-32767
	Magnet State(Optional)	1	0| 1
	Accessory Battery Percentage(Optional)	1	0-100(%)
	Relay Config Result(Optional)	1	0-4
	Relay State(Optional)	1	0| 1
	Tri-axial Acceleration Data (Optional)	6	(HEX)
	Angle Values (Optional)	3	(HEX)
	Event Mask (Optional)	1	(HEX)
	Tilt Event (Optional)	2	(HEX)
	Motion Event (Optional)	2	(HEX)
	Crash Event (Optional)	2	(HEX)
	Falling Event (Optional)	2	(HEX)
	Move Event (Optional)	2	(HEX)
	Accessory RSSI (Optional)	1	-128-127
	Device Serial Number (Optional)	3	HEX

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Parts	Fields	Length	Range/Format
	Sensor Identifier (Optional)	2	HEX
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	2|4	0000 - FFFF| 00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Index*

The index of Bluetooth accessory defined in AT+GTBAS which triggers the message **+RESP:GTBAA**. For WKF300 and WKF310, it is 0xFF. For other Beacon, it is 0xFE.

✧ *Accessory Type*

The type of the Bluetooth accessory which is defined in the <Index>.

- **0** - No Bluetooth accessory.
- **1** - Escort sensor.
- **2** - Beacon temperature sensor.
- **3** - Bluetooth beacon accessory.
- **6** - Beacon Multi-functional sensor.
- **11** - Magnet sensor.
- **12** - BLE TPMS sensor.
- **13** - Relay sensor.
- **14** - Smart Cap Bluetooth accessory
- **15** - Movement-angle BLE sensor.
- **23** - Epsilon sensor

✧ *Accessory Model / Beacon ID Model*

The model of the Bluetooth accessory which is defined in AT+GTBAS or the model of the Bluetooth beacon accessory which is defined in AT+GTBID.

✧ *Alarm Type*

The type of the alarm which is generated by the Bluetooth accessory specified by <Accessory Type> and <Accessory Model> in the command AT+GTBAS.

- **0** - The voltage of the Bluetooth accessory is low.
- **1** - Temperature alarm: The current temperature value is below <Low Temperature> set in the command AT+GTBAS.
- **2** - Temperature alarm: The current temperature value is above <High Temperature> set in the command AT+GTBAS.
- **3** - Temperature alarm: The current temperature value is within the range defined by <Low Temperature> and <High Temperature> set in the command AT+GTBAS.
- **4** - Push button event for WKF300 or WKF310 is detected.
- **7** - Humidity alarm: The current humidity value is below <Low Humidity> set in the command AT+GTBAS.
- **8** - Humidity alarm: The current humidity value is above <High Humidity> set in the command AT+GTBAS.
- **9** - Humidity alarm: The current temperature value is within the range defined by <Low Humidity> and <High Humidity>, which are set in the command AT+GTBAS.
- **0A** - Angle event notification.
- **0C** - Magnet event notification.
- **0D** - Beacon event notification.
- **0E** - Tire pressure alarm: The current Tire pressure value is lower than <Low Tire pressure> set in the AT+GTBAS command.
- **0F** - Tire pressure alarm: The current Tire pressure value is higher than <High Tire pressure> set in the AT+GTBAS command.
- **10** - Tire pressure alarm: The current Tire pressure value is within the range defined by

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<Low Tire pressure> and <High Tire pressure> set in the command AT+GTBAS.

- **11** - No available Bluetooth accessory is detected.
- **12** - An available Bluetooth accessory is detected.
- **13** - Door open.
- **14** - Door closed.
- **15** - Relay event notification.
- **16** - Cap is on neck and locked.
- **17** - Cap is removed from neck.
- **18** - Cap is rotated.
- **19** - Tilt event.
- **1A** - Motion event(Both MOV BLE and WID320G will report event).
- **1B** - Crash event.
- **1C** - Falling event.
- **1D** - Tilt normal event.
- **1E** - Still event.

✧ *Append Mask*

Bitwise mask defined in the command AT+GTBAS or AT+GTBID to indicate the reported Bluetooth accessory data fields.

- **Bit0** - <Accessory Name>
- **Bit1** - <Accessory MAC>
- **Bit2** - <Accessory Status>
- **Bit3** - <Accessory Battery Voltage>
- **Bit4** - <Accessory Temperature>
- **Bit5** - <Accessory Humidity>
- **Bit7** - <Accessory Input Output Data>, including <Accessory Output Status>, <Accessory Digital Input Status>, <Accessory Analog Input Voltage>
- **Bit8** - <Accessory Event Notification Data>, including <Accessory Mode>, <Accessory Event>
- **Bit9** - <Tire Pressure>
- **Bit10** - <Time Stamp>
- **Bit11** - <Enhanced Temperature>
- **Bit12** - <MAG Notification Data>, including <Magnet ID>, <MAG Event Counter>, <Magnet State>
- **Bit13** - <Accessory Battery Percentage>
- **Bit14** - <Relay Data>, including <Relay Config Result>, <Relay State>
- **Bit15** - <Expansion Mask>, if Bit 15 is set to 1, Bit 16 - Bit 31 will be valid.
- **Bit16** - <Tri-axial Acceleration Data>
- **Bit17** - <Angle Values>
- **Bit18** - <Sensor Event Mask>, including <Event Mask>, <Tilt Event>, <Motion Event>, <Crash Event>, <Falling Event>

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- **Bit19** - <MOV ELA Data>
- **Bit20** - Reserved
- **Bit21** - <Accessory RSSI>
- **Bit23** - <ER2 Info Mask>, including <Device Serial Number>, <Sensor Identifier>

Note

In the message bit 0 - bit 15 precedes bit 16 - bit 31. Here is an example: <Accessory Append Mask> = 0x081F0007, 0x081F indicates bit 15 - bit 0, 0x0007 indicates bit 31 - bit 16.

✧ *Accessory Name(Optional)*

The name of the Bluetooth accessory which ends with '0'(0x00). If the accessory name is not found, this filed will be filled with 0x00.

✧ *Accessory MAC(Optional)*

The MAC address of the Bluetooth accessory.

✧ *Accessory Status(Optional)*

A numeral to indicate whether the accessory is available.

- **0** - The accessory is not available.
- **1** - The accessory is available.

✧ *Accessory Battery Voltage(Optional)*

The battery voltage of the Bluetooth accessory.

✧ *Accessory Temperature(Optional)*

Temperature data of Bluetooth accessory. If the temperature is not obtained, the parameter is reported as 0x7F.

✧ *Accessory Humidity(Optional)*

Humidity data of the Bluetooth accessory.

✧ *Accessory Mode(Optional)*

The operating mode of angle sensor.

✧ *Accessory Event(Optional)*

The event is generated by the angle sensor.

✧ *Timestamp(Optional)*

Timestamp of the tire pressure value collection.

✧ *Enhanced Temperature(Optional)*

It instructs Bluetooth accessories to measure temperature with high precision. If the temperature is not obtained, the parameter is reported as 0x7FFF.

Temperature (16.66)	**1666**	
HEX	06	82

Note

The current temperature value. A total of 2 bytes. The temperature value is converted to an integer with 2 implicit decimals, and the integer is reported in HEX format. If the temperature value is negative, it is expressed in 2's complement format.

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✧ *Magnet ID(Optional)*
ID corresponding to different magnet sensors.

✧ *MAG Event Counter(Optional)*
The total number of times detected by the magnet sensor.

✧ *Magnet State(Optional)*
The state of the magnet sensor's two parts.

- **0** - Separate
- **1** - Closed

✧ *Accessory Battery Percentage(Optional)*
Percentage of Bluetooth accessory's battery power.

✧ *Relay Config Result(Optional)*
The number representing the response result of the relay, which is controlled and reported by Bit14 of the parameter <Accessory Append Mask> in AT+GTBAS.

- **0** - Configuration updated successfully.
- **1** - Error in connecting.
- **2** - The current password is incorrect.
- **3** - Password update error.
- **4** - Relay open or close error.

✧ *Relay State(Optional)*
The current state of the relay sensor.

✧ *Tri-axial Acceleration Data (Optional)*
The values are coded on 16 bits (signed) in mg (+8g/-8g).
For example, **0xFFFE0005FF04**:

	X-axis		Y-axis		Z-axis	
HEX	D[0]	D[1]	D[2]	D[3]	D[4]	D[5]
Binary	0xFF	0xFE	0x00	0x05	0xFF	0x04

- **X-axis** - 0xFFFE => -2mg acceleration on X-axis
- **Y-axis** - 0x0005 => 5mg acceleration on Y-axis
- **Z-axis** - 0xFF04 => -252mg acceleration on Z-axis

✧ *Angle Values (Optional)*
Angle values are coded on 8 bits(unsigned). The values are expressed in degree (0-180 degree) based on the direction of gravity.
For example, **0x5A5A00**:

	X-axis	Y-axis	Z-axis
HEX	D[0]	D[1]	D[2]
Binary	0x5A	0x5A	0x00

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- **X-axis** - 0x5A => 90deg, X-axis state is horizontal
- **Y-axis** - 0x5A => 90deg, Y-axis state is horizontal
- **Z-axis** - 0x00 => 0deg, Z-axis state is vertical up

Note

If the angle value cannot be obtained, then use 0xFF to represent an invalid angle value.

✧ *Event Mask (Optional)*

This is event alarm mask.

- **Bit0** - Tilt mask, it controls Angle Tilt zone.
- **Bit1** - Motion mask, it controls motion state zone.
- **Bit2** - Crash mask, it controls Crash value zone.
- **Bit3** - Falling mask, it controls Falling value zone.

If tilt function is enabled, the tilt mask will be set to 1, otherwise it will be set to 0.
If motion function is enabled, the motion mask will be set to 1, otherwise it will be set to 0.
If crash function is enabled, the crash mask will be set to 1, otherwise it will be set to 0.
If falling function is enabled, the falling mask will be set to 1, otherwise it will be set to 0.

✧ *Tilt Event (Optional)*

Tilt Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: tilt/0: normal) on LSB.

	Tilt[0]		Tilt[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: **0x000A**

- **0** - Tilt state (normal)
- **0000 0000 0000 101** - Event counter value on 15 bits, count 5

✧ *Motion Event (Optional)*

Motion Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: move/0: still) on LSB.

	Motion[0]		Motion[1]	
HEX	0	0	0	B
Binary	0000	0000	0000	1011

For example: **0x000B**

- **1** - Motion state (move)
- **0000 0000 0000 101** - Event counter value on 15 bits, count 5

✧ *Crash Event (Optional)*

Crash Event (state change) counter on the 16 (unsigned) bits.

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	Crash[0]		Crash[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: **0x000A**

- **0000 0000 0000 1010** - Event counter value on 16 bits, count 10.

✧ *Falling Event (Optional)*

Fall Event (state change) counter on the 16 (unsigned) bits.

	Falling[0]		Falling[1]	
HEX	0	0	0	A
Binary	0000	0000	0000	1010

For example: **0x000A**

- **0000 0000 0000 1010** - Event counter value on 16 bits, count 10

✧ *Move Event (Optional)*

Move Event (state change) counter on the 15 (unsigned) MSB, Instantaneous state (1: move/0: still) on LSB.

	Motion[0]		Motion[1]	
HEX	0	0	0	B
Binary	0000	0000	0000	1011

For example: **0x000B**

- **1** - Move state (move)
- **0000 0000 0000 101** - Event counter value on 15 bits, count 5.

✧ *Accessory RSSI (Optional)*

Signal strength RSSI value for the Bluetooth accessory.

✧ *Device Serial Number (Optional)*

A hexadecimal value representing the device serial number of ER2-BLE sensor.

✧ *Sensor Identifier (Optional)*

A hexadecimal value representing the sensor identifier (sensor number in the group) of ER2-BLE sensor.

5.4.29 BID (Bluetooth Beacon ID Report)

The HEX format of the event report message **+RESP:GTBID** is as follows.

Example:

2B4556544309FEDFFF008E74090409204756333530434555002E0C000000000F00220C0300004A78054101

F46D0B9FC700004A78054101F4790A96D400004A780541056FB40B15BE01010000000000005D06FB403F01E5D45C07E8030B0A233404600000550B085BE2AA00000000000000000000000000000000000004553FC87507E8030B140F35851B98F00D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Number	1	0-3| 0-15
	Beacon ID Model	1	0-2| 4| 7| 10
	Accessory Append Mask	2	0000-FFFF
	Accessory Name (Optional)	<=17	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '

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Parts	Fields	Length	Range/Format
	Accessory MAC (Optional)	6	'0' - '9' 'A' - 'F'
	Accessory Battery Level (Optional)	2	0-5000(mV)
	Accessory Signal Strength (Optional)	1	-120-0
	Beacon Type (Optional)	1	0-2| 255
	Beacon Data (Optional)	<=100	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF

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Parts	Fields	Length	Range/Format
	Tail	2	0x0D 0x0A

✧ *Number*

The number of Bluetooth beacon accessories.

From <Number> to <GNSS Accuracy>, excluding the series of parameters including <GNSS Accuracy>, the subsequent content will be repeated <Number> times.

- **WKF300 and WKF310**. The maximum value is 3.
- **iBeacon E6**. The maximum value is 15.
- **ID ELA**. The maximum value is 15.
- **WID310**. The maximum value is 15.
- **WID330** - The maximum value is 15.

✧ *Beacon ID Model*

The model of the Bluetooth beacon accessory which is defined in AT+GTBID.

✧ *Accessory Append Mask*

Bitwise mask defined in the AT+GTBID command to indicate the reported Bluetooth beacon accessory data fields.

- **Bit0** - <Accessory Name>
- **Bit1** - <Accessory Mac>
- **Bit2** - Reserved
- **Bit3** - <Accessory Battery Level>
- **Bit4 - 5** Reserved
- **Bit6** - <Accessory Signal Strength>
- **Bit7** - <Beacon Type> and <Beacon Data>

✧ *Accessory Name (Optional)*

The name of the Bluetooth accessory which ends with '0'(0x00).

✧ *Accessory MAC (Optional)*

Bluetooth accessory MAC address.

✧ *Accessory Battery Level (Optional)*

The voltage of Bluetooth accessory.

✧ *Accessory Signal Strength (Optional)*

The signal strength of Bluetooth accessory.

✧ *Beacon Type (Optional)*

Types of beacons.

- **0** - "ID" Format
- **1** - "iBeacon" Format
- **2** - "Eddy stone" Format
- **255** - "Unknown" Format, no beacon data reporting

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✧ *Beacon Data (Optional)*

Select the data format according to <Beacon Type>:

If <Beacon Type> is 0, the data format is as follows:

Fields	Length	Range/Format
ID_Mfr_Data	6	(HEX)

If <Beacon Type> is 1, the data format is as follows:

Fields	Length	Range/Format
UUID	16	(HEX)
Major	2	(HEX)
Minor	2	(HEX)

If <Beacon Type> is 2, the data format is as follows:

Fields	Length	Range/Format
NID	10	(HEX)
BID	6	(HEX)

5.4.30 BIE (Expand BID Report)

The HEX format of the event report message **+RESP:GTBIE** is as follows.

Example:

2B4556544D09FEDFFF00D774090409204756333530434555002F4B00000000100210C00C60101050200CA4FF3638F0DB10000B400000000000000200CAC6ED3B503C840000A70000000000000000200CABBFD13900DB10000AC000000000000000200CAEC619EA10C0A0BA8B60102020204050607080090A0B0C0D0E0E0F020B010A0200CA78054129620100000A60000000000000000105000000079002D06FB3FAE01E5D4F407E90315060D0404600000550B085BE2AA00000000000000000000000000000000000000000007E90315060D055D29308A0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	

Parts	Fields	Length	Range/Format
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Detected Count	2	0-9999
	Total Frame	1	1-5
	Frame Index	1	1-5
	Beacon Number	1	0-20
	Beacon ID Model	1	0-2| 4| 7| 10
	Accessory Append Mask	2	0000-FFFF
	Accessory Name (Optional)	<=17	'0' - '9', 'a' - 'z', 'A' - 'Z', '-', '_', ' '
	Accessory MAC (Optional)	6	'0'-'9' 'A'-'F'
	Accessory Battery Level (Optional)	2	0-5000(mV)
	Accessory Signal Strength (Optional)	1	-120-0(dBm)
	Beacon Type(Optional)	1	0-2| 255

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Parts	Fields	Length	Range/Format
	Beacon Data(Optional)	<=100	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Detected Count*

It indicates the sequence number of beacons that have been detected in each index. And it starts at 0 if the value exceeds 9999.

✧ *Total Frame*

A numeral to indicate the total number of frames that the following data takes up.

✧ *Frame Index*

A numeral to indicate the index of the current frame.

✧ *Beacon Number*

The number of the Bluetooth beacon accessories.

From <Number> to <GNSS Accuracy>, excluding the series of parameters including <GNSS Accuracy>, the subsequent content will be repeated <Number> times.

✧ *Beacon ID Model*

The model of the Bluetooth beacon accessory which is defined in AT+GTBID.

✧ *Accessory Append Mask*

Bitwise mask defined in the AT+GTBID command to configure which data item is reported.

- **Bit0** - <Accessory Name>
- **Bit1** - <Accessory MAC>
- **Bit2** - Reserved
- **Bit3** - <Accessory Battery Level>
- **Bit4 - 5** Reserved
- **Bit6** - <Accessory Signal Strength>
- **Bit7** - <Beacon Type> and <Beacon Data>

✧ *Accessory Name (Optional)*

The name of the Bluetooth accessory which ends with '0'(0x00).

✧ *Accessory MAC (Optional)*

The MAC address of the Bluetooth accessory.

✧ *Accessory Battery Level (Optional)*

The voltage of Bluetooth accessory.

✧ *Accessory Signal Strength (Optional)*

The signal strength of Bluetooth accessory.

✧ *Beacon Type(Optional)*

Types of beacons.

- **0** - "ID" Format
- **1** - "iBeacon" Format
- **2** - "Eddystone" Format
- **255** - "Unknown" Format, no beacon data reporting.

✧ *Beacon Data(Optional)*

It is used to select the data format according to <Beacon Type>.

If <Beacon Type> is 0, the data format is as follows:

Fields	Length	Range/Format
ID_Mfr_Data	6	HEX

If <Beacon Type> is 1, the data format is as follows:

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Fields	Length	Range/Format
UUID	16	HEX
Major	2	HEX
Minor	2	HEX

If <Beacon Type> is 2, the data format is as follows:

Fields	Length	Range/Format
NID	10	HEX
BID	6	HEX

5.4.31 BAR (Bluetooth Accessory Report)

The HEX format of the event report message **+RESP:GTBAR** is as follows.

Example:
2B4556544609FEDFFF009474090409204756333530434555002E75000000000100210C0307040007474E4F4D204450205337000101820CD7CE0010148F76D014600000000FFFFFFFFFFFFFFFFFFFFFFFFFFFF0101000000000000008906FB407E01E5D57007E8030B06010704600001DF5C027A4F1F00000000000000000000000000000000000000000000007E8030B0E01087F64563B0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	

Parts	Fields	Length	Range/Format
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Index	1	0-9
	Accessory Type	1	7
	Accessory Model	1	0-4
	Append Mask	2	0000 - FFFF
	Accessory Name	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Accessory MAC	6	'0' - '9' 'A' - 'F'
	Accessory Status	1	0 - 1
	Accessory Data	<=650	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	2|4	0000 - FFFF| 00000000 - FFFFFFFF

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Parts	Fields	Length	Range/Format
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Accessory Data*

There are accessory data para according <Accessory Type> and <Accessory Model>.

- If the <Accessory Type> is 7 and <Accessory Model> is 0 (DUT-E S7) or <Accessory Model> is 4 (GNOM DP S7):

Fields	Length	Range/Format
Version	1	00 - FF
PGN	2	0000 - FFFF
PGN Data	21	000000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

- If the <Accessory Type> is 7 and <Accessory Model> is 3(GNOM DDE S7):

Fields	Length	Range/Format
Version	1	00 - FF
PGN	2	0000 - FFFF
PGN Data	20	0000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

- If the <Accessory Type> is 7 and <Accessory Model> is 1 (DFM 100 S7):

Fields	Length	Range/Format
Version	1	00 - FF
PGN1	2	0000 - FFFF
PGN Data1	20	00000000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PGN2	2	0000 - FFFF
PGN Data2	20	00000000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PGN3	2	0000 - FFFF
PGN Data3	20	00000000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

- If the <Accessory Type> is 7 and <Accessory Model> is 2 (DFM 250DS7):

Fields	Length	Range/Format
Version	1	00 - FF
PGN1	2	0000 - FFFF
PGN Data1	20	00000000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PGN2	2	0000 - FFFF
PGN Data2	20	00000000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PGN3	2	0000 - FFFF
PGN Data3	20	00000000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF
PGN4	2	0000 - FFFF
PGN Data4	20	00000000000000000000000000000000000000000000 – FFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF

5.4.32 TRL (Tachographer Real Location)

The HEX format of the event report message **+RESP:GTTRL** is as follows.

Example:
2B4556543F0000000056434B0509022C040002435F32303232303332345F313133345F4D75737465726672
61755F385F4B72697374615F385F313130303030303031323834353030302E44444400010106FB401801E5
D2FA07E603180B222C07700D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	File Download Count	2	0001-FFFF
	DDD File Name	<=129	
	Number	1	1

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Parts	Fields	Length	Range/Format
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *File Download Count*

It is a number that indicates current download DDD file number of times.

✧ *DDD File Name*

The file name of DDD which ends by "\0", the value is in ASCII format string.

5.4.33 RTP (Remote File Transfer)

The HEX format of the event report message **+RESP:GTRTP** is as follows.

Example:

2B4556545609FEDFFF007174090409204756333530434555002E10000000000F00210C0000000065515100

0101000000155005A06FB404901E5D43707E8030B0A350704600000550B085BE2AE00000000000000000000

00000000000000000000004553FC87507E8030B142108858DE0050D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Mode	1	0
	Protocol Type	1	0
	File Type	1	0-2

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Parts	Fields	Length	Range/Format
	Code	2	100| 101| 200-202| 301| 302
	Download URL	<=101	Complete URL
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Mode*

The working mode of file transfer.

- **0** - Download file

✧ *Protocol Type*

The type of communication protocol used to obtain data from the background server.

- **0** - HTTP

✧ *File Type*

It defines the type of file to download from the server.

- **0** - CA certificate
- **1** - Client certificate
- **2** - Client key

✧ *Code*

It indicates the download information.

- **100** - The update command is starting.
- **101** - The update command is refused by the device.
- **200** - The device starts to download the file.
- **201** - The device finishes downloading the file successfully.
- **202** - The device fails to download the file.
- **301** - The device finishes updating the file successfully.
- **302** - The device fails to update the file.

✧ *Download URL*

The complete URL to download the configuration. It includes the file name and ends by 0x00.

5.4.34 SVR (Stolen Vehicle Recovery)

Stolen vehicle recovery message reported by the Primary device.

Example:

2B45565449CFF6FFFF0000000201E87409040920475633353043455500 2F2400010000000000000000100002100C021111111111110B3000000000000000000000000010100000001 5800B206FB40D401E5D4E607E903140C382A04600000550B085BE2AE0000000000000000000000000000000000000000003FFFFFFF314731424C353250375452313135353230020000001 4000F4240000384000000D2FF270F00000064000000000000005F5E0F6001E0000270F630000270F630000270F639DCD65000011923B3EFFFF3F3F0001869F630001869F630000000000271000 4E2000753000000E109C40F3FFFFFF00637D7D7D7D7D7D01000100002DF00098967F000F423F000F423F0001869F630001869F630001869F63000F423F4445203138323036323531333334363030303100443452031383230363235313333343630303031004445203138323036323531333334363030303100434152314E414D4500434152324E414D45003035363633001FFE000F423F000F423F640000000000D202022E03619902FF0000002800DBD6D3D600003FFB7DDFFFFFFF0000002800003200320096 0FFE000000FA00314731424C353250375452313135353231000000000000000FFFFFFFFF10FF00017FC7006400C80000012C500004000132000003E864000003E8000007D000000BB80407E903140C382B25C103CA0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	SVR Working State	1	0-2
	Ghost Device MAC Broadcast	6	000000000000 - FFFFFFFFFFFF
	SVR Appending Length	1	
	SVR Appending Information	<=15	
	Reserved	1	00
	Number	1	1
	GNSS Accuracy	1	0-50

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Parts	Fields	Length	Range/Format
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.35 CFU (CAN Module FOTA Upgrade Report)

The HEX format of the event report message **+RESP:GTCFU** is as follows.

Example:

2B4556542A09FEDFFF006C74090409204756333530434555002E34000000000F00210C0066000101000000
0155005A06FB404901E5D43707E8030B0A3A0504600000550B085BE2AA000000000000000000000000000000
00000000004553FC87507E8030B14260685AD997F0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Code	2	
	Reserved	1	00
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	

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Parts	Fields	Length	Range/Format
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.36 FRT (1-Wire Temperature Sensor)

The HEX format of the event report message **+RESP:GTFRT** is as follows.

Example:

2B4556545A09FEDFFF007874090409204756333530434555002FFD000000000100210C0128FF6402F00E999D0018010100000000AB003D06FB3F9201E5D41907E9030B08321004600011DF5C0DD0833A0000000000000000000000000000000000000801A66C810100001E07E9030B08321103DCB4C10D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	

Parts	Fields	Length	Range/Format
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Num of Temperature	1	0-4
	Temperature Sensor ID	8	'0'-'9' 'a'-'f' 'A'-'F'
	Temperature Sensor Data	2	-55-125(℃)
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	

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Parts	Fields	Length	Range/Format
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

- *Num of Temperature*
  The number of temperature.
- *Temperature Sensor ID*
  The ID of the temperature sensor.
- *Temperature Sensor Data*
  The current temperature detected by the sensor.

5.4.37 UFS (UFSxxx FOTA Upgrade Report)

The device will send the message **+RESP:GTUFS** to the backend server during the upgrade process.

The message in HEX format is as follows.

Example:

2B4556542509FEDFFF006C7409040920475633353043455500 2E0A000000000F00210C0065000101000000

0155005A06FB404901E5D43707E8030B0B002804600000550B085BE2AA00000000000000000000000000000000000000004553FC87507E8030B14282885BC6ACA0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Code	2	
	Reserved	1	00
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)

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Parts	Fields	Length	Range/Format
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.38 TPM (Tire Pressure Monitoring)

The HEX format of the event report message **+RESP:GTTPM** is as follows.

Example:

2B4556546A4FFEFFFF013A74090409204756333530434555642FD2000000000000000000010000220A0100
3F120252D87B03000000FFFF2A01CBF5EB03000000FFFF2806F07EAE0300000000232805FF90F503000000
00182804118AA40300000000182A03319FAD0300000000242A0A60B82A0300000000002809FC631803000
0000000280895C5BA03000000001A280796D33403000000001A2B24FD96490300000000002823AE421403

00001900192B22BDC4040300001900192B21D15BD20300000000182B28ADD8D603000019001A2B27CA0
19A0300001900192B263F298C03000000001928252049810300002000192801010000000007007006FB40C
901E5D4B007E8061C06273904600001DF5C027A4F1F000E510300000E510300221E000000153818000000
00000007E8061C0E27394530FD3E0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Accessory Type/Report Type	1	
	Append Mask	2	0000 - FFFF
	Tire Number	1	0-24
	Tire Position (Optional)	1	00 - FF

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Parts	Fields	Length	Range/Format
	Sensor ID (Optional)	3	000000 - FFFFFF
	Sensor Bat Vol (Optional)	2	1.9-3.4(V)
	Tire Pressure (Optional)	2	0.00 - 25.57 (Bar) | 0 - 255 (PSI)
	Tire Temperature (Optional)	2	-50-205(℃)
	Tire status (Optional)	1	00 - FF
	Time Out(Optional)	1	0-255(min)
	RF Quality(Optional)	1	0-100
	Reference Pressure(Optional)	1	0-255(PSI)
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF

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Parts	Fields	Length	Range/Format
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Accessory Type/Report Type*

It is a one-byte hexadecimal value. 4 higher bits of the indicates Accessory type and 4 lower bits of the hexadecimal value indicates Report Type.

Accessory type has several meanings as follows.

- **0 -** Saftire D21.
- **1 -** PressurePRO TPMS.

Report Type has the following meanings.

- **0 -** Tire data changes.
- **1 -** Fixed time report.
- **2 -** Trigger by **AT+GTRTO** command.

✧ *Sensor Bat Vol (Optional)*

Tire pressure sensor battery voltage.

Sensor Bat Vol (1.9)	0109	
HEX	01	09

✧ *Tire Pressure (Optional)*

Tire pressure value.

Tire Pressure (8.50)	0832	
HEX	08	32

✧ *Tire Temperature (Optional)*

The temperature value of the current position. 2 bytes in total. If the value of the tire temperature is negative, it is represented in Two's complement format.

Temperature (128)	128	
HEX	00	80

5.4.39 BFS (Bluetooth Fields Setting Report)

The HEX format of the event report message **+RESP:GTBFS** is as follows.

Example:

2B4556546ECFF6FFFF000000020093740B050B1B4756333530434555002EA70000000000000000000010000

21000C0001C3000032271932E15EDA0966421CA7B93B646C028231000720E20064010100000000000420

6FB3FE701E5D43C07E9080108311804600011DF5C0DD0833A0000000000000000000000000000000000000

00000000000007E908010831190CAF42C20D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Reserevd	1	00
	Accessory Number	1	0-10
	MAC	6	HEX
	UUID	16	HEX
	Major	2	HEX
	Minor	2	HEX
	Beacon Battery Level	2	HEX
	Number	1	1

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Parts	Fields	Length	Range/Format
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.40 SOT (Server LOGOUT)

The HEX format of the event report message **+RESP:GTSOT** is as follows.

Example:

2B4556546F4FFEFFFF0071740A010A044756333530434555642E8201110000000000680001000021OC0001

```
010000000000004D06FB3EAF01E5D4BE07E902130824120460000055 0B085BE2AA0000000000000000000
0000000000000000000000000000000007E902130824130156176 60D0A
```

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Reserevd	1	00
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359

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Parts	Fields	Length	Range/Format
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.41 UHF (UHF RFID Reader Report)

If the RFID tag information of UHF RFID reader received or inventory command is sent, the device will send the message **+RESP:GTUHF** to the server.

Example:

2B4556547009FEDFFF0080740A020A0F4756333530434555002FB50000000000100210C0101040C20160612
08725A011A6014B5450000010100000014B006C06FB402701E5D44907E904020B182C04600000550B085
BE2AA00000000000000000000000000000000000000008019C75F71E00000707E904020B182D2F3029DB0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Message Type	1	1-7
	Parameter(Optional)		
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	

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Parts	Fields	Length	Range/Format
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Message Type*

- **1** - Scanned tag data report.
- **2** - Reader information report.
- **3** - Obtain the reader GPIO state.
- **4** - Obtain the reader unique serial number.
- **5** - Obtain the reader working mode.
- **6** - Antenna disconnected.
- **7** - UHF Reader disconnected.

✧ *Parameter(Optional)*

If the Message Type is **1** (Scanned tag data report), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Tag Number	1	1-8
Read Tag Antenna ID	1	1-8

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Fields	Length	Range/Format
Tag Data Length	1	00-3F
Tag Data	<=128	HEX
RSSI	1	00-FF
Reserved	1	00
Reserved	1	00

- *Read Tag Antenna ID*

  A numeral to indicate which antenna has scanned tag.

If the Message Type is **2** (Reader information report), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Reader Version	2	0000 - FFFF
Reader Model Code	1	00 - FF
Maximum Frequency	1	00-FF
Minimum Frequency	1	00-FF
Scan Time	1	00 - FF
Antenna Enable Mask	1	00 - FF
Antenna Check Mode	1	0|1

- *Reader Version*

  UHF Reader firmware version.

- *Reader Model Code*

  A code of reader.

- *Scan Time*

  Reader will respond the inventory command delivered from host within this specific time. Unit 100ms.

- *Antenna Enable Mask*

  Bitwise mask to indicate antenna configuration information, set to 1 means this antenna is enabled.

- *Antenna Check Mode*

  A numeral to indicate enable or disable the antenna check during tag reading/writing operation. When the parameter <Accessory Type> of the AT+GTUHF command is 1, this parameter will be reported as empty.

  – **0** - Disable antenna check

  – **1** - Disable antenna check

If the Message Type is **3** (Obtain the reader GPIO state), In this mode, Parameter(Optional)

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represent the following meanings:

Fields	Length	Range/Format
Reader GPIO Status	1	00-FF
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00

- *Reader GPIO Status*

  The input and output states of UHF reader GPIO. 1 means high voltage level. Other bits are reserved.

  - **Bit 0** - IN1 pin status
  - **Bit 1** - Reserved
  - **Bit 2** - Reserved
  - **Bit 3** - Reserved
  - **Bit 4** - OUT1 pin status
  - **Bit 5** - OUT2 pin status
  - **Bit 6** - Reserved
  - **Bit 7** - Reserved

If the Message Type is **4** (Obtain the reader unique serial number), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Unique Serial Number	4	HEX
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00

If the Message Type is **5** (Obtain the reader working mode), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Reader Working Mode	1	0-2

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Fields	Length	Range/Format
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00

If the Message Type is **6** (Antenna disconnected), In this mode, Parameter(Optional) represent the following meanings:

Fields	Length	Range/Format
Disconnected Antenna ID	1	1-8
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00

- *Disconnected Antenna ID*
  A numeral to indicate which antenna has disconnected.

5.4.42 ATR (Alcohol Tester Report)

The event report message **+RESP:GTATR** in HEX format is as below.

Example:
2B4556547B09FEDFFF006A740B020B1147563335304345556 42F55000000000104220C00031F4000010100
00000094001D06FB3F9B01E5D48E07E90709080B0904600000550B085BE2AE00000000000000000000000000
0000000000000007E90709080B0A01B28D480D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF

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Parts	Fields	Length	Range/Format
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Reserved	1	00
	Detection Status	1	0-5
	Alcohol Concentration	3	0-4000000(x0.001mg/L)
	Reserved	1	00
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS

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Parts	Fields	Length	Range/Format
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.4.43 BFE (Expand Bluetooth Fields Setting Report)

The HEX format of the event report message **+RESP:GTBFE** is as follows.

Example:

2B4556547CCFF6FFFF000000020097740B050B1B4756333530434555002EC3000000000000000000000100002100C0001010101C30000321D04842A076CF4C34F5798755DA246302FAC00191E9D00160001010000000000004206FB3FE701E5D43C07E908010832370460001 1DF5C0DD0833A00000000000000000000000000000000000000000000000000000007E908010832380CB472C50D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF

Parts	Fields	Length	Range/Format
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Detected Count	2	0-9999
	Total Frame	1	1-5
	Frame Index	1	1-5
	Beacon Number	1	0-20
	MAC	6	(HEX)
	UUID	16	(HEX)
	Major	2	(HEX)
	Minor	2	(HEX)
	Battery Level	2	(HEX)
	Reserved	1	00
	Number	1	1

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Parts	Fields	Length	Range/Format
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

5.5 Data Flow Reports

This section describes the message related to certain data needs to be sent. Please refer to the details below.

5.5.1 Generic Data Flow Report

PHD(Photo Data Packet)

EHD(Extend Photo Data Packet)

FSD(Fuel Sensor Data Packet)

CRG(Crash GNSS Data Packet)

DUC(Data Usage Statistics)

TRD(DDD Data Report)

BTD(Bluetooth Accessory Data Report)

Example:

2B444154010000007F012574090409204756333530434555000300080007E9030C091139050500F04086B4
9513494011BBF1D6A169062802267A899BBD302177A88B5203FFD3E3E6965BD97BE2B534EB1118048A42
362240B5383C53002F8A6973EB4806F99CD34BF3401197E69864E6801A5F229864A008DA4A63494011BC8
0540EF9A008D9EA32D4011B1A8CB5007FFFD4C5B5B158C722B463403B524227040A0BD301BBE99E66280
19BF9A469290119939A6B35004665C77A6349CD0046D2530BD0046CF9A8D9A981196A613400C2D4C268
03FFD5802E0D2F4A0434B63A5216A00697E6A36702801BE660530CBCD20185F9A63499E280232F8EF4C67
E68018CF4C2F400C66A616A6034B530B50030B546ED81401FFFD907E9030C0912010E46E48B0D0A

2B444154030000007F009274090409204756333530434555000300080007E6061E0636230010001005BC9
00649E0726A9DAE595E53F7A4627FCFE26802CBE0281DBFC2A2E9D7B75FC39A04325198CA93D700FF3A7
018C0F4C0FC850020E833EDFE3483B7E1FE3400E8BAE7DBF9D4CA28113A8C0AA121CCA69822BCC71137D
2AB5219FFFD907E6061E06362E31C9014B0D0A

2B444154020000007F004E74090409204756333530434555002 72A514C2C3533344A2C30372C303130313
62C303530302C303130302C30313031362C303330342307E60707091B280BDF4F1A0D0A

2B444154040000007F011774090409204756333530434555010A0101000000002D006306FB405801E5D2F
507E607070717200201000000002D006306FB405801E5D2F507E607070717210301000000002D006306FB
405801E5D2F507E607070717220401000000002D006306FB405801E5D2F507E607070717230501000000002D006306FB405801E5D2F507E607070717240601000000002D006306FB405801E5D2F507E607070717250701000000002D006306FB405801E5D2F507E607070717260801000000002D006306FB405801E5D2F507E607070717270901000000002D006306FB405801E5D2F507E607070717280A01000000002D006306FB405801E5D2F507E6070707172907E6070707172A07E952400D0A

2B444154090000007F002E74090409204756333530434555000000000000000000007E8030B142A3085C876850D0A

2B4441540500000000056434B0509022C04000200000001E8303030323030303031393030303030324539343531313138313141443635333132303332333233373330333041443330333733363335303037363043303030353030303030383030344130303331303532303739353130353031303030303041303130303030304331383335443030304338373030353031303130303830324130344443433843374331334146353442353643353833743433735383137463441434141423042383734343639423746364330333145313834434532364545443743424635354137394545414631453036463244324532424533373636454241443746394643313041454539344435304132323544413438323432423636303843323334343637433846433736443531363535304337424145374236353533363438373136374241414643424534344236394539414344373045343331453544393734642323946314434314244453742444633464332393043333945313333374146363139463532313742363442382333344424138454641454434433130303030303043323036344336384646323638353936413831314430464432353645314135454544444235373946324338444541433139413036453935393339393932303046374443423442374393141393444364243344139433541424638463244423037423100789 50D0A

2B4441540A0000007F00447409040920475633530434555000F0004000001FF00FFFFFFFFFFF000000000000000000000000000007E8070801140C75E09DFA0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+DAT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	+RESP:GTPHD		
	+RESP:GTEHD		
	+RESP:GTFSD		
	+RESP:GTCRG		
	+RESP:GTDUC		
	+RESP:GTTRD		
	+RESP:GTBTD		

Parts	Fields	Length	Range/Format
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Message Type*

The ID of a specific data report message.

Message	ID
+RESP:GTPHD	1
+RESP:GTFSD	2
+RESP:GTEHD	3
+RESP:GTCRG	4
+RESP:GTTRD	5
+RESP:GTDUC	9
+RESP:GTBTD	10

✧ *Report Mask*

Please refer to <+DAT Mask> in AT+GTHRM.

✧ *+RESP:GTPHD*

Fields	Length	Range/Format
Attribute Mask	2	0000 - FFFF
Attribute Length	2	
Camera ID	1	0-3
Photo Time	7	YYYYMMDDHHMMSS
Total Frames	1	
Current Frame Index	1	
Photo Data Length	2	
Photo Data	<=512	

- *Attribute Length*

  The total length of attribute parameters which include <Camera ID> and <Photo Time>.
- *Total Frames*

  If the message is **+RESP:GTPHD** and the actual size of the picture is larger than 0xFF frames (255*512Bytes), its value will be 0 which indicates more frames wait to be received until the remaining frames is less or equal to 0xFF when its value equals to the remaining frames.

✧ *+RESP:GTEHD*

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Fields	Length	Range/Format
Attribute Mask	2	0000 - FFFF
Attribute Length	2	
Camera ID	1	0-3
Photo Time	7	YYYYMMDDHHMMSS
Total Frames	2	
Current Frame Index	2	
Photo Data Length	2	
Photo Data	<=512	

✧ *+RESP:GTFSD*

Fields	Length	Range/Format
Data Length	2	
Sensor Data	<=128	

✧ *+RESP:GTCRG*

Fields	Length	Range/Format
Data Type	1	0|1
GNSS Validity Number	1	0-10
GNSS Point Index	1	1
GNSS Accuracy	1	0|1-50
Speed	3	0.0- 999.9(km/h)(km/h)
Azimuth	2	0-359
Altitude	2	(-)xxxxx.x (m)
Longitude	4	(-)xxx.xxxxxx
Latitude	4	(-)xx.xxxxxx
GNSS UTC Time	7	YYYYMMDDHHMMSS
…		
GNSS Point Index	1	10
GNSS Accuracy	1	0|1-50
Speed	3	0.0-999.9 (km/h)(km/h)
Azimuth	2	0-359
Altitude	2	(-)xxxxx.x (m)
Longitude	4	(-)xxx.xxxxxx

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Fields	Length	Range/Format
Latitude	4	(-)xx.xxxxxx
GNSS UTC Time	7	YYYYMMDDHHMMSS

- *Data Type*

  The data reported to the backend server is recorded before crash or after crash.

  - **0** - Before crash.
  - **1** - After crash.

- *GNSS Validity Number*

  The number of the successfully fixed GNSS positions included in the report message.

- *GNSS Point Index*

  The index of GNSS point.

✧ *+RESP:GTDUC*

Fields	Length	Range/Format
Report Type	1	0-4
Total Data Usage	4	M
Day Data Usage	4	Kbyte

- *Report Type*

  The type of this report.

  - **0** - Report triggered by <Mode> of AT+GTRTO.
  - **1** - Report triggered by <Report Interval> of AT+GTDUC.
  - **2** - Report triggered by <Total Percentage> of AT+GTDUC.
  - **3** - Report triggered by <Day Data Usage> of AT+GTDUC.
  - **4** - Report triggered by <Data Usage> of AT+GTDUC.

- *Total Data Usage*

  The total data that has been consumed.

- *Day Data Usage*

  The data that has been consumed today.

✧ *+RESP:GTTRD*

Fields	Length	Range/Format
File Download Count	2	0001 - FFFF
File Frame End flag	1	0|1
Current Frame Index	2	
DDD Data Length	2	
DDD Data	<=684	
Reserved	1	00

✧ *+RESP:GTBTD*

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Fields	Length	Range/Format
Index	1	00-09
Accessory Type	1	0|15
Accessory Model	1	0-5
Data Mask Length	1	0-255
Data Mask	<=4	0 - 7FFFFFFF
Accessory Name(Optional)	<=20	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
Accessory MAC(Optional)	6	'0' - '9' 'A' - 'F'
Accessory Status(Optional)	1	0|1
Accessory Battery Level(Optional)	2	0-5000(mV)
Accessory Temperature(Optional)	1	-40-80 (℃)|0x7F
Enhanced Temperature(Optional)	2	-40.00-80.00(℃)|0x7FFF
Tri-axial Acceleration Data (Optional)	6	HEX
Angle Values (Optional)	3	HEX
Event Mask (Optional)	1	HEX
Tilt Event (Optional)	2	HEX
Motion Event (Optional)	2	HEX
Crash Event (Optional)	2	HEX
Falling Event (Optional)	2	HEX

- *Accessory Temperature(Optional)*
  Temperature data of Bluetooth accessory. If the temperature is not obtained, the parameter is reported as 0x7F.
  Note
  If the accessory temperature is not obtained, the parameter <Accessory Temperature> is reported as 7F, and the parameter <Enhanced Temperature> is reported as 7FFF.
- *Enhanced Temperature(Optional)*
  It instructs Bluetooth accessories to measure temperature with high precision. If the temperature is not obtained, the parameter is reported as 0x7FFF.

5.5.2 CRD (Crash Data Packet)

The HEX format of the report message **+RESP:GTCRD** is as follows.

Example:

2B435244007D028074090409205619180602093009000705010258FFB80028FFB8FFBE0028FF92FFDD0013

FF66FFEBFFFCFEF500150022FED300860036FEDB00100021FF27FFEB000DFF70FFEB0007FFD8FF8C000D002AFF2100100081FEF8FF9A020DFFB1FF68041FFFE8FFDD0183FFF8FFE9008A000AFFE1005C0006FFEC004B0006FFEE00480003FFF000460005FFF1004400080000003F000D0012003A001200230030001A00210028001A001E001D001F001B0016002A001300130033FFF7000D0039FFE4FFFA0034FFE6FFF7002AFFF1FFFC0025FFFC0004002600040000B00250004000E001F00010011001C00030014001BFFF90020000FFFF4002DFFF1FFED008AFFD4FFDF0121FFDFFFF701270002000F00D3000900040073001400 0C003F001D000300300025FFFE002A0023FFFA0023001C000200310013000 6004C000A0001005B000CFFEF00640013FFF3006A0013FFFB00580013FFFF00480014FFFF00430015FFFE00450016FFFA004F0016FFFA00560013FFFD00510013FFFB004F0013FFFD004E0013FFFC004E0011FFFD004E0012FFFE004F0013FFFC00500013FFFC004F0013FFFC004E0013FFFC004F0013FFFD00500012FFFD00500012FFFD004E0014FFFD004F0016FFFC004F0016FFFC004E0014FFFC004E0013FFFC004F0013FFFC004F0014FFFC004F0014FFFD004F0014FFFC004E0013FFFC004F0013FFFC004F0013FFFD00510012FFFB004D0014FFFF004C0016FFFC00510015FFFC004D0013FFFD004F0013FFFC004F0015FFFC004F0013FFFD004E0014FFFC004F0014FFFC004F0014FFFC004F0014FFFC004E0013FFFC004F0014FFFC004F0014FFFC004F0014FFFC004F0014FFFC004F07E8030B143400862583030D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+CRD
	Report Mask	2	0000 - FFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Crash Counter	1	00 - FF
	Data Type	1	00-7F
	Total Frame	1	01-20
	Frame Number	1	01-20
	Data Length	2	0-1200
	Data	<=1200	HEX
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

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✧ *Report Mask*

Please refer to <+CRD Mask> in AT+GTHRM.

✧ *Unique ID*

If Bit 1 of <+CRD Mask> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit 4 of <+CRD Mask> is 1, the device name is used as the unique ID of the device. Device name is an 8-byte string, please refer to <Device Name> in AT+GTCFG. If the length of <Device Name> is more than 8 bytes, only the first 8 bytes will be acquired. In the HEX format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	q	u	e	c	l	i	n	k
HEX	71	75	65	63	6C	69	6E	6B

✧ *Crash Counter*

It indicates the sequence number of the crash event. The reports of **+RESP:GTCRA** and **+RESP:GTCRD** are combined into one crash event. It rolls from 0x00 to 0xFF.

✧ *Data Type*

A hexadecimal parameter to indicate the time of the data (before crash or after crash) and crash direction (+X, -X, +Y, -Y, +Z, -Z or several of them). Please refer to the following table for the detailed syntax.

Mask Bit	Description
Bit 0	0: Before crash 1: After crash
Bit 1	0: X-axis crash not detected 1: X-axis crash detected
Bit 2	0: X-axis positive direction 1: X-axis negative direction
Bit 3	0: Y-axis crash not detected 1: Y-axis crash detected
Bit 4	0: Y-axis positive direction 1: Y-axis negative direction
Bit 5	0: Z-axis crash not detected 1: Z-axis crash detected
Bit 6	0: Z-axis positive direction 1: Z-axis negative direction
Bit 7	0: Acceleration data

✧ *Total Frame*

Total number of the messages that are sent to the backend server for the crash event.

✧ *Frame Number*

A numeral to indicate the sequence of the current message.

✧ *Data*

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There is a maximum of 1200 bytes in one frame which contains acceleration samples in 2 seconds at most. There are 6 bytes in a group: the first 2 bytes represent X axis acceleration data, the middle 2 bytes represent Y axis acceleration data and the last 2 bytes are Z axis acceleration data. And they are two's complement. Regarding how to convert the two's complement to the original value, please refer to the Appendix.

5.5.3 ACC (Acceleration Data Packet)

The HEX format of the report message **+RESP:GTACC** is as follows.

Example:

2B414343740904092018060209300900l4FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC0
04E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0
014FFFC004E0015FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014F
FFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC0
04E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0
014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014F
FFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC0
04E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0
014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014F
FFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC004E0014FFFC0
04E0014FFFC004F0014FFFC004F0014FFFC004E0014FFFC004E07E8030B1434358637195F0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+ACC
Body	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Unique ID	8	IMEI
	Data	6*75	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Unique ID*

The IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	86	80	34	00	10	00	39	7
HEX	56	50	22	00	0A	00	27	07

✧ *Data*

There are 6*75 bytes in one message with 6 bytes in a group. The first 2 bytes of these 6 numbers represent X axis acceleration data, the middle 2 bytes represent Y axis acceleration data and the last 2 bytes are for Z axis acceleration data.

5.6 Data Transmission

This section describes the message related to certain data needs to be sent. Please refer to the details below.

5.6.1 DAT (Transparent Data Transmission)

The HEX format of the event report message **+RESP:GTDAT** is as follows.

Example:

2B4556541209FEDFFF006A74090409204756333530434555003002000000000000220800033132330102000106000000310 6FB40A301E5D29707E607070333310460000055 0B000011190000000000000000000000000000000000000000000000007E60707033332057C10B80D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	

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Parts	Fields	Length	Range/Format
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Data Length	2	
	Data		
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX

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Parts	Fields	Length	Range/Format
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Data Length*

It indicates the length of the parameter <Data>.

5.6.2 DTT (Data Transmission)

The HEX format of the event report message **+RESP:GTDTT** is as follows.

Example:

2B4556541F09FEDFFF006A74090409204756333530434555003016000000000001110A0000020D0A01010

0000000B0007606FB40AA01E5D35207E6070706030F04600000550B0000B1E2000000000000000000000000

00000000000000007E6070706031006681C780D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	

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Parts	Fields	Length	Range/Format
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Reserved	1	00
	Data Length	2	
	Data		
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX

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Parts	Fields	Length	Range/Format
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Data Length*

It indicates the length of the parameter <Data>.

5.6.3 TTR (Transparent THR100 Transmission)

The HEX format of the event report message **+RESP:GTTTR** is as follows.

Example:

2B4556543E09FEDFFF007274090409204756333530434555003082000000000100210C00010C0000FFFFFF

FFFFFF000001010000000000007106FB409E01E5D41A07E6030705320E04600000550B085BE2AA00000000

00000000000000000000000000000007E603070532160E9B132E0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	

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Parts	Fields	Length	Range/Format
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Request ID	2	0000 - FFFF
	Message Type	1	0-6| 8-0D| 10
	Reserved(option1)		
	Reserved(option2)		
	Reserved(option3)		
	Reserved(option4)		
	Reserved(option5)		
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)

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Parts	Fields	Length	Range/Format
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Request ID*

It is the response to the server with the same field <Request ID> in the command **AT+GTTTR**.

✧ *Message Type*

- **0** - Reply for DDD file request.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	0-3
Device Status	1	0x00 - 0xFF
File State In Memory	1	00-FF
Error Code	1	0x00 - 0xFF
Reserved	1	00

– *Reply Result*

If <Message Type> is 0 (Reply for DDD file request), it is reply on inquiry read request.

- **0** - Request OK.
- **1** - Request busy: Advanced test.
- **2** - Request busy: THR_100 is executing precious order.
- **3** - Request busy: Configuration of the cancel order.

– *Device Status*

- Bit 0 = 1 - Authentication in progress,
- Bit 1 = 1 - Authentication OK (bit is cleared at next read request or cancelled),
- Bit 2 = 1 - Request processing ERROR (bit is cleared when request is cancelled or at next read request),
- Bit 3 = 1 - THR_100 is downloading files from tachograph,
- Bit 4 = 1 - Data is ready to read from THR_100 by master device. Bit is cleared after all awaiting data is read (If all bytes are sent in one frame, this bit will be cleared after sending this frame. If all bytes are sent in 3 frames, this bit will be cleared after sending

3 frames).

- Bit 7:Bit 5 = Details of the error. Flags bit 7:bit 5 and flag bit 2 must be treated as combined information. The information is split to maintain protocol's backward compatibility. Flags bit 7:bit 5 are cleared at next read request.
- 000 - No error
- 001 - 24 hours have passed after turning off the ignition, tachograph is in power down mode (This error code is generated based on THR_100's timer, there is no attempt of connection with tachograph)
- 010 - 2hours have passed after last authentication session, tachograph is in power down mode.(This error code is generated based on THR_100's timer, there is no attempt of connection with tachograph)
- 011 - No answer from tachograph (wrongly connected wires or CAN-C is off in tachograph)
- 100 - Cannot open communication session with tachograph (remote download function is off in tachograph)
- 101 - No answer or incorrect answer on company card inquiry (remote download function is off in tachograph).
- 110 - Error during file transfer.
- 111 - Reserved for future use.

– *File State In Memory*

- **Bit 0** - Set it to 1 means that the tachograph file is in THR_100 memory
- **Bit 1** - Set it to 1 means that the file from card in slot 1 is in THR_100 memory
- **Bit 2** - Set it to 1 means that the file from card in slot 2 is in THR_100 memory
- **Bit 3** - Not used (to be ignored),
- **Bit 4** - Set it to 1 means that the file from tachograph is already read from THR_100 (it is possible to read once more, bit 0 will be still set), this flag is set after read whole file from THR_100
- **Bit 5** - Set it to 1 means that the file from card in slot 1 is already read from THR_100 (it is possible to read once more, bit 1 will be still set), this flag is set after reading whole file from THR_100
- **Bit 6** - Set it to 1 means that the file from card in slot 2 is already read from THR_100 (it is possible to read once more, bit 2 will be still set), this flag is set after reading whole file from THR_100
- **Bit 7** - Not used (to be ignored)

– *Error Code*

Extended error code. A detailed description can be found in section **6.4** (Error Codes Table).

- **1** - Authorization result.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	0-3
Device Status	1	0x00 - 0xFF
Reserved	1	00
Error Code	1	0x00 - 0xFF
Reserved	1	00

– *Reply Result*

If <Message Type> is 1 (Authorization result), it is reply on inquiry the status of the device:

- **0** - Authorization OK.
- **1** - Authorization fail.
- **2** - Authorization timeout.
- **3** - Authorization data error.

- **2** - APDU Data received from THR_100.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	1	00
APDU Sequence Number	2	
APDU DATA Length	2	
APDU DATA		
Reserved	1	00

– *APDU Sequence Number*

It is the serial number of APDU received from THR_100. Numbering starts from 0001 when receiving a new DDD file request.

– *APDU DATA*

It is the APDU received from THR_100.

- **3** - The result of the process that THR_100 reads file from tachograph.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	0-6
Device Status	1	0x00 - 0xFF
File State In Memory	1	0x00 - 0xFF
Error Code	1	0x00 - 0xFF
Reserved	1	00

– *Reply Result*

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If <Message Type> is 3 (file reading), it is result of file reading:

- **0** - THR_100 getting file from Tachograph OK.
- **1** - THR_100 getting file from Tachograph fail.
- **2** - File mismatch.
- **3** - THR_100 getting file from Tachograph timeout.
- **4** - Device getting file from THR_100 timeout.
- **5** - Device getting file from THR_100 fail.
- **6** - DDD file size error.

Note

Here are the timeout instructions for file reading.

- <Read file Type> is 0x01
  THR_100 getting file from Tachograph timeout is 15 minutes.
  Device getting file from THR_100 timeout is 5 minutes.
- <Read file Type> is 0x02 or 0x04
  THR_100 getting file from Tachograph timeout is 5 minutes.
  Device getting file from THR_100 timeout is 3 minutes.
- <Read file Type> is 0x03 or 0x05
  THR_100 getting file from Tachograph timeout is 20 minutes.
  Device getting file from THR_100 timeout is 10 minutes.
- <Read file Type> is 0x06
  THR_100 getting file from Tachograph timeout is 10 minutes.
  Device getting file from THR_100 timeout is 5 minutes.
- <Read file Type> is 0x07
  THR_100 getting file from Tachograph timeout is 20 minutes.
  Device getting file from THR_100 timeout is 10 minutes.

- **4** - Communication timeout.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00

- **5** - Debug mode, the state of THR_100.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	1	00
Device Status	1	0x00 - 0xFF

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Fields	Length	Range/Format
File State In Memory	1	0x00 - 0xFF
Error Code	1	0x00 - 0xFF
Error Code Memory	1	0x00 - 0xFF

– *Error Code Memory*

This is the error code byte <Error Code> stored when the next order of the download is sent.

- **6** - FTP transfer event.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	00 - 0E
Reserved	1	00
Reserved	1	00
Reserved	1	00
Reserved	1	00

– *Reply Result*

If <Message Type> is 6, it is the event of FTP transfer.

- **0** - FTP open server OK.
- **1** - FTP open server no service.
- **2** - FTP open server roaming.
- **3** - FTP open server in FOTA process.
- **4** - FTP open server login error.
- **5** - FTP open server host error.
- **6** - FTP open server bearer fail.
- **7** - FTP open server over max.
- **8** - FTP open server error.
- **9** - FTP server lost connection.
- **10** - FTP send data OK.
- **11** - FTP send data timeout.
- **12** - FTP send data error.
- **13** - FTP send data server id error.
- **14** - FTP send data request close.

- **8** - Restart TachoReader.

In this mode, <Reserved(option1)> … <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reply Result	1	0|1
Reserved	1	00

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Fields	Length	Range/Format
Reserved	1	00
Reserved	1	00
Reserved	1	00

– *Reply Result*

If <Message Type> is 8 (Restart TachoReader), it is result of command execution.

- **0** - Command OK. The command is executed successfully by TachoReader.
- **1** - Command Error. An unexpected error occurs while executing the command.

- **9** - Tachograph details.

Fields	Length	Range/Format
Reserved	1	00
Tachograph producer	1	HEX
Tachograph model	<=40	
Reserved	1	00
Reserved	1	00

– *Tachograph producer*

- **0x00** - None
- **0x01** - VDO/Siemens
- **0x02** - Efas
- **0x03** - Stoneridge
- **0x04** - Actia
- **0x80** - Error of connection on D8 wire
- **0x81** - Not supported format „2400" analogue tachographs

– *Tachograph model*

Tachograph name given by the manufacturer.

- **0A** - Inquiry status of the device.

Fields	Length	Range/Format
Reserved	1	00
Reserved	1	00
Device status / Files in device memory	2	X(0 - FF)Y(0 - FF)
Reserved	1	00
Reserved	1	00

- **0B** - Inquiry Tachograph driver 1 ID, name and surname.

Fields	Length	Range/Format
Reserved	1	00
Tachograph driver time related states	1	0x00 - 0xFF

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Fields	Length	Range/Format
Tachograph driver 1 id	<=40	
Tachograph driver 1 name and surname	<=40	
Reserved	1	00

– *Tachograph driver 1 id*

Card number given in ASCII string terminated with „*”. First two or three letters are country code. Following is a SPACE character (0x20) and the 16-character long card number e.g. PL 1820625133460000*

In addition to standard country codes, the following abbreviations also apply:

- „EC” - European Union,
- „EUR” - Rest of Europe,
- „WLD” - rest of the world.

– *Tachograph driver 1 name and surname*

Surname and name (names) of driver given in an ASCII string terminated with „*”. Each word is separated by a SPACE character (0x20).

Note

Number K will be returned if the card is not inserted into tachograph slot (or parameter currently not available; or card inserted, but no information read).

- K = 0x00 card not inserted,
- K = 0x01 card inserted, but no information read,
- K = 0xFF parameter currently not available.

- **0C** - Inquiry special status.

Fields	Length	Range/Format
Reserved	1	00
Reserved	1	00
Special status	6	0x000000000000 - 0xFFFFFFFFFFFF
Reserved	1	00
Reserved	1	00

– *Special status*

- **Byte 1 - 2** - Device status

  Bit 0 = 1 - authorization in progress,

  Bit 1 = 1 - authorization successful (this bit is deleted upon next read request),

  Bit 2 = 1 - uthorization error (this bit is deleted upon next read request),

  Bit 3 = 1 - device is downloading files from tachograph,

  Bit 4= 1 - data (not files!) is ready to be downloaded from the device, the counter changes to zero after all waiting data is read (If data is sent in only one frame, the counter changes to zero right after that frame; if data is sent in 3 frames, the counter will change to zero after the third frame is sent),

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Bit 5 = communication with tachograph not possible, tachograph in sleep mode,
Bit 6 - free, always zero,
Bit 7 - free, always zero.

- **Byte 3 - 4** - Files in device memory
  Bit 0 = 1 file read from tachograph is in device's memory,
  Bit 1 = 1 file read from card in slot 1 is in device's memory,
  Bit 2 = 1 file read from card in slot 2 is in device's memory,
  Bit 3 = 1 file read from external reader is in device's memory,
  Bit 4 = 1 file read from tachograph, which has already been read from the device (it can be read again, bit 0 is still set), this flag is set after the whole file has been read.
  Bit 5 = 1 file read from card in slot 1, which has already been read from the device (it can be read again, bit 1 is still set), this flag is set after the whole file has been read.
  Bit 6 = 1 file read from card in slot 2, which has already been read from the device (it can be read again, bit 2 is still set), this flag is set after the whole file has been read.
  Bit 7 = 1 file read from an external reader, which has already been read from device (it can be read again, bit 3 is still set), this flag is set after the whole file has been read.
- **Byte 5 - 6** - File currently being transferred from tachograph to TachoReader.
  Bit 0 = 1 file from card 1,
  Bit 1 = 1 file from card 2,
  Bit 2 = 1 file from tachograph's memory.
- **Byte 7 - 12** - Amount of file data read so far. If Byte 5 - 6=0x00, then Byte 7 - 12 may be random values.

- **0D** - Check the current TachoReader connection environment and the device whether ready to download DDD.

Fields	Length	Range/Format
Reserved	1	00
Reserved	1	00
Reserved	1	00
THR100 Check Information	1	00-FF
THR100 bus Status	1	0-2

– *THR100 Check Information*
It indicates the set of states associated with the tachographer.

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
U3	U2	U1	U0	T1	T0	D1	D0

- **D1:D0** - D8-bus activity
- b'00' - D8-bus sleep mode (inactive),
- b'01' - D8-bus active,
- b'10' - communication error,
- b'11' - parameter not available.

- **T1:T0** - Tachograph online on CAN-bus
- b'00' - no tachograph,
- b'01' - tachograph online,
- b'10' - error,
- b'11' - parameter not available (CAN-bus in sleep mode or CAN-bus error).
- **U3:U0** - Status of CAN-bus power-up test,
- b'0000' - no test (backward compatibility),
- b'0001' - OK. Messages are received on the CAN-bus,
- b'0010' - OK. Self-test of the CAN-bus finished correctly,
- b'0100' - error, CAN-bus is in „1" state,
- b'0101' - error, CAN-bus is in „0" state,

other values remain unused, left for future development.

– *THR100 bus Status*

It indicates the status of the THR100 bus.

- **0** - bus in sleep mode
- **1** - bus active
- **2** - bus error

- **10** - Inquiry Tachograph driver 2 ID, name and surname, and driver time related states.

In this mode, <Reserved(option1)> - <Reserved(option5)> represent the following meanings:

Fields	Length	Range/Format
Reserved	1	00
Tachograph driver time related states	1	0x00 - 0xFF
Tachograph driver 2 id	<=40	
Tachograph driver 2 name and surname	<=40	
Reserved	1	00

Note

If there is no data returned within 2s after the query command is issued due to abnormal communication, 00 or Reserved will be reported (Hex will report 00, string will report Reserved).

5.7 CAN Bus Information Report

This section describes the message format of CANBUS information. Please refer to the details below.

5.7.1 CAN (CAN Bus Device Information)

The CAN bus device information report message **+RESP:GTCAN** uses the format below.

Example:

2B43414E01000007FF01AC74090409204756333530434555000003FFFFFFF314731424C3532503754523131
3535323002000000140000F4240000384000000D2FF270F0000006400000000000005F5E0F6001E0000270F
630000270F630000270F639DCD65000011923B3EFFFF3F3F0001869F630001869F6300000000002710004E
2000753000000E109C40F3FFFFFF00637D7D7D7D7D7D01000100002DF00098967F000F423F000F423F000
1869F630001869F630001869F63000F423F4445203138323036323531333334363030303100444520313 83
230363235313333343630303031004341523 14E414D4500434152324E414D4500303536363300 1FFE000F4
23F000F423F640000000000D202022E03619902FF0000002800DBD6D3D600003FFB7DDFFFFFFF00000028
000032003200960FFE000000FA00314731424C353250375452313135353231000000000000000FFFFFFFF1
0FF00017FC7006400C80000012C500004000132000003E864000003E8000007D000000BB80401000000015
800B206FB40D401E5D4E607E903140C391604600000550B085BE2AE0007E903140C391725CA66920D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+CAN
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Distance Type|Report Type	1	X(0 | 1)X(0-5)
	CAN Bus Device State	1	0| 1
	CAN Bus Report Mask	4	00000000-FFFFFFFF
	VIN	17	
	Ignition Key	1	0-2
	Total Distance	4	H(0 - 99999999)
	Total Fuel Used/Total Fuel Used Expand	5	0.00 - 999999.99(L) | L(0.00 - 999999.99) | K(0 - 99999999.9)
	Engine RPM	2	0-16383(rpm)
	Vehicle Speed	2	0-455(km/h)
	Engine Coolant Temperature	2	-40-+215(℃)

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Parts	Fields	Length	Range/Format
	Fuel Consumption	3	L/100km(0.0 - 999.9)| L/H(0.0 - 999.9)
	Fuel Level (Liter)	5	L(0.00 - 9999.99)
	Fuel Level (Percentage)	5	P(0.00 - 100.00)
	Range	4	0-99999999(hm)
	Accelerator Pedal Pressure	2	0-100(%)
	Total Engine Hours	5	0.00-9999999.99(h)
	Total Driving Time	5	0.00-9999999.99(h)
	Total Engine Idle Time	5	0.00-9999999.99(h)
	Total Idle Fuel Used/Total Idle Fuel Used Expand	5	0.00 - 999999.99(L) | L(0.00 - 999999.99) | K(0 - 99999999.9)
	Axle Weight 2nd	2	0-65535(kg)
	Tachograph Information	2	00 - FFFF
	Detailed Information/Indicators	2	00-FFFF
	Lights	1	00-FF
	Doors	1	00-FF
	Total Vehicle Overspeed Time	5	0.00-9999999.99(h)
	Total Vehicle Engine Overspeed Time	5	0.00-9999999.99(h)
	Total Distance Impulses	4	0-2147483648
	Engine Cold Starts Count	3	0-16449535
	Engine All Starts Count	3	0-16449535
	Engine Starts by Ignition Count	3	0-16449535
	Total Engine Cold Running Time	4	0-421108120(s)
	Handbrake Applies During Ride Count	2	0-64255
	CAN Bus Report Expansion Mask	4	00000000-FFFFFFFF
	Ad-Blue Level	2	0-100(%)
	Axle Weight 1st	2	0-65535(kg)
	Axle Weight 3rd	2	0-65535(kg)

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Parts	Fields	Length	Range/Format
	Axle Weight 4th	2	0-65535(kg)
	Tachograph Overspeed Signal	1	0| 1
	Tachograph Vehicle Motion Signal	1	0| 1
	Tachograph Driving Direction	1	0| 1
	Analog Input Value	4	0-99999(mV)
	Engine Braking Factor	4	0-4278190079
	Pedal Braking Factor	4	0-4278190079
	Total Accelerator Kick-downs	4	0-999999
	Total Effective Engine Speed Time	5	0.00-9999999.99(h)
	Total Cruise Control Time	5	0.00-9999999.99(h)
	Total Accelerator Kick-down Time	5	0.00-9999999.99(h)
	Total Brake Applications	4	0-999999
	Tachograph Driver 1 Card Number	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Tachograph Driver 2 Card Number	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Tachograph Driver 1 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Tachograph Driver 2 Name	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Registration Number	<=40	'0'-'9' 'a'-'z' 'A'-'Z' '-' '_'
	Expansion Information	2	0000-FFFF
	Rapid Brakings	4	0-16711679
	Rapid Accelerations	4	0-16711679
	Engine Torque	1	0-100(%)
	Service Distance	4	-160635-327675(km)
	Ambient Temperature	2	-40-+215(℃)
	DTC Number	1	00-99
	DTC 1	3	'0' - '9' 'a' - 'z' 'A' - 'Z'

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Parts	Fields	Length	Range/Format
	…		
	DTC N	3	'0' - '9' 'a' - 'z' 'A' - 'Z'
	Gaseous Fuel Level	6	L(0.00 - 9999.99)/P(0.00 - 100.00)
	Tachograph Information Expand	4	00000000 - FFFFFFFF
	CAN Report Expansion Mask1	4	00000000-FFFFFFFF
	Retarder Usage	1	0-125(%)
	Power Mode	1	0 - FF
	Oil Temperature	2	-40-+215(℃)
	Oil Level	6	L(0.00 - 9999.99) | P(0.00 - 100.00)
	Axle Weight 5th	2	0-65535(kg)
	Axle Weight 6th	2	0-65535(kg)
	Axle Weight 7th	2	0-65535(kg)
	Current Gear Number	1	0 - FF
	DPF Soot Level	6	L(0.00 - 9999.99) | P(0.00 - 100.00)
	VIN of Trailer	17	'0' - '9' 'A' - 'Z' except 'I', 'O', 'Q'
	Expansion2 Information	4	00000000-FFFFFFFF
	Vehicle Gross Weight	2	0-65535(x10kg)
	Tyres Number	1	0-31
	Position of an axle	1	1-15| FF
	Position of a wheel on the axle	1	1-15| FF
	Tyre Pressures	2	0-65535(kPa)
	Tyre Temperatures	2	-60-+215(℃)
	Tyre Status	1	0-2| FF
	Remaining Time to Maintenance Service	2	-1000-65535(day)
	Total Fuel Read from Vehicle's Computer	5	0.00-9999999.99(L)

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Parts	Fields	Length	Range/Format
	Total Gaseous Fuel Usage	5	0.00-9999999999.99(kg)
	DTC Status	1	00 - FF
	E-GENSET Report Mask	4	00000000-FFFFFFFF
	Hours Until Service	2	00-65535(h)
	System Status Health	2	00-FFFF
	Status Inverter Mode	1	00-255
	Remaining Runtime	1	00-255(h)
	Battery Temperature	1	0-255
	BMS Board Temperature	1	0-255
	Battery Voltage	4	0-4294967295
	Minimum Cell Voltage	2	0-65535
	Maximum Cell Voltage	2	0-65535
	Maximum Cell Temperature	1	0-255
	Minimum Cell Temperature	1	0-255
	Module / Battery Pre-warning	1	0-255
	CECU-Error	1	0-255
	Cumulative charging hours	4	0-4294967295
	Inverter AC current L1	2	0-65535
	Inverter AC current L2	2	0-65535
	Inverter AC current L3	2	0-65535
	Inverter Ambient Temperature	1	0-255
	Inverter / OBC Temperature	1	0-255
	Inverter AC Voltage L1	2	0-65535
	Inverter AC Voltage L2	2	0-65535
	Inverter AC Voltage L3	2	0-65535
	Inverter State	1	0-255
	Shut Down Reason	1	0-255
	Cumulative Usage Time	4	0-4294967295
	Cumulative Idle Time	4	0-4294967295
	Electric Report Mask	4	00000000-FFFFFFFF

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Parts	Fields	Length	Range/Format
	Battery Instantaneous Voltage	2	0000-64255(V)
	Battery Charging Cycles Count	2	0000-64255(Cycle)
	Total Energy Recuperated	4	00000000-4211081215(Wh)
	Vehicles Battery Charge Level	2	0-FFFF
	Charge State	1	0 - FF
	Battery Temperature	2	-40-+215(℃)
	Battery Charging Current	1	00-125(A)
	Battery Instantaneous Power	4	-327680-325110(W)
	Battery State of Health (SoH)	1	0-100(%)
	Total Energy Used	4	00000000-4211081215(Wh)
	Total Energy Used When Idling	4	00000000-4211081215(Wh)
	Total Energy Charged	4	00000000-4211081215(Wh)
	Charge State Optimization	1	0 - FF
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Message Type*

The ID of the CAN report message.

Message	ID
+RESP:GTCAN	1

✧ *Report Mask*

Please refer to <+CAN Mask> in AT+GTHRM.

✧ *Length*

The length of the whole message from header to the tail characters.

✧ *Unique ID*

If Bit 6 of <+CAN Mask> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit 6 of <+CAN Mask> is 1, the device name is used as the unique ID of the device. Device name is an 8-byte string, please refer to <Device Name> in AT+GTCFG for the device name. If the length of <Device Name> is more than 8 bytes, the device will only acquire the first 8 bytes. In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	q	u	e	c	l	i	n	k
HEX	71	75	65	63	6C	69	6E	6B

✧ *Distance Type|Report Type*

The high nibble is for <Distance type> and the low nibble is for <Report Type>.

Distance type has the following meanings.

- **0** - Total distance acquired from CAN Chipset.
- **1** - Total distance obtained by calculation with GNSS.

Report type has the following meanings.

- **0** - Periodic report.
- **1** - RTO CAN report.
- **2** - Ignition event report.
- **3** - Tachograph Driver Card ID changed event report.
- **4** - Tachograph Driver working status or “Out of Scope” condition changed event report.
- **5** - Ignition key changed event report.

✧ *CAN Bus Device State*

A numeral to indicate the state of communication with the external CAN bus device.

- **0** - Abnormal.

  It fails to receive data from the external CAN bus device.
- **1** - Normal.

  It is able to receive data from the external CAN bus device.

✧ *CAN Bus Report Mask*

Please refer to <CAN Report Mask> in AT+GTCAN.

✧ *VIN*

Vehicle identification number.

✧ *Total Distance*

Vehicle distance. The number is always increasing. The unit is hectometer. If it is set to 0, the distance is not available.

✧ *Total Fuel Used/Total Fuel Used Expand*

- Total Fuel Used
  A total of 5 bytes. The first 4 bytes are for the integer part of the total fuel used and the last byte is for the decimal part. The decimal part has 2 digits.
- Total Fuel Used Expand
  A total of 5 bytes. The highest bit of the first 4 bytes (Bit31) representing the unit, Bit31 is 0, indicating the unit is liter(L), Blt31 is 1, indicating the unit is kilogram(K). (Bit 0~Bit30) bits are for the integer part of total fuel used, and the last byte is for the decimal part. The decimal part has 2 digits.

✧ *Engine Coolant Temperature*

The engine coolant temperature of the vehicle. 2 bytes in total. If this value is negative, it is represented in Two's complement format.

✧ *Fuel Consumption*

3 bytes in total. The first byte indicates the unit. The unit L/100km is represented as FE, and the unit L/H is represented as FF. The other two bytes indicate the value. The fuel consumption value is converted to an integer with 1 implicit decimal digit by multiplying it by 10 and the integer is reported in HEX format.

Fuel Consumption Value 12.1	**121**	
HEX	00	79

✧ *Fuel Level (Liter)*

5 bytes in total. The first 4 bytes are for the integer part of the fuel level (liters) and the last byte is for the fractional part. The fractional part has 2 digits. This field is controlled by Bit 8 in <CAN Bus Report Mask>.

✧ *Fuel Level (Percentage)*

5 bytes in total. The first 4 bytes are for the integer part of the fuel level (percentage) and the last byte is for the fractional part. The fractional part has 2 digits. This field is controlled by Bit 8 in <CAN Bus Report Mask>.

✧ *Total Engine Hours*

5 bytes in total. The first 4 bytes are for the integer part of the total engine hours and the last byte is for the fractional part. The fractional part has 2 digits.

✧ *Total Driving Time*

5 bytes in total. The first 4 bytes are for the integer part of the total driving time and the last byte is for the fractional part. The fractional part has 2 digits.

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✧ *Total Engine Idle Time*

5 bytes in total. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.

✧ *Total Idle Fuel Used/Total Idle Fuel Used Expand*

- Total Idle Fuel Used
  5 bytes in total. The first 4 bytes are for the integer part of the total idle fuel used and the last byte is for the decimal part. The decimal part has 2 digits.
- Total Idle Fuel Used Expand
  A total of 5 bytes. The highest bit of the first 4 bytes (Bit31) represents the unit, Bit31 is 0, indicating the unit is liter(L), Bit31 is 1, indicating the unit is kilogram(kg). From Bit 0 to Bit30 are for the integer part of total fuel used, and the last byte is for the decimal part. The decimal part has 2 digits.

✧ *Tachograph Information*

Two bytes. The high byte describes driver 2, and the low byte describes driver 1.
Each byte format:

Validity mark	Reserved	Driver working states		Driver card	Driving time related states		
V	R	W1	W0	C	T2	T1	T0

- **V** - Validity mark (0 - valid driver data, 1 - no valid data)
- **R** - Reserved
- **C** - Driver card (1 - card inserted, 0 - no card inserted)
- **T2-T0** - Driving time related states:
  - **0** - Normal / no limits reached
  - **1** - 15min before 4½h
  - **2** - 4½h reached
  - **3** - 15min before 9h
  - **4** - 9h reached
  - **5** - 15 minutes before 16h (without 8h rest during the last 24h)
  - **6** - 16h reached
  - **7** - Other limit
- **W1-W0** - Driver working states:
  - **0** - Rest - sleeping
  - **1** - Driver available - short break
  - **2** - Work - loading, unloading, working in an office
  - **3** - Driver - behind the wheel

✧ *Detailed Information/Indicators*

2 bytes in total. Each bit contains information of one indicator.

- **Bit0** - FL - fuel low indicator (1 - indicator on, 0 - off)
- **Bit1** - DS - driver seatbelt indicator (1 - indicator on, 0 - indicator off)

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- **Bit2** - AC - air conditioning (1 - on, 0 - off)
- **Bit3** - CC - cruise control (1 - active, 0 - inactive)
- **Bit4** - B - brake pedal (1 - pressed, 0 - released)
- **Bit5** - C - clutch pedal (1 - pressed, 0 - released)
- **Bit6** - H - handbrake (1 - pulled-up, 0 - released)
- **Bit7** - CL - central lock (1 - locked, 0 - unlocked)
- **Bit8** - R - reverse gear (1 - on, 0 - off)
- **Bit9** - RL - running lights (1 - on, 0 - off)
- **Bit10** - LB - low beams (1 - on, 0 - off)
- **Bit11** - HB - high beams (1 - on, 0 - off)
- **Bit12** - RFL - rear fog lights (1 - on, 0 - off)
- **Bit13** - FFL - front fog lights (1 - on, 0 - off)
- **Bit14** - D - doors (1 - any door open, 0 - all doors closed)
- **Bit15** - T - trunk (1 - open, 0 - closed)

✧ *Lights*

A hexadecimal number. Each bit contains information of one light.

- **Bit0** - Running Lights (1 - on, 0 - off)
- **Bit1** - Low Beam (1 - on, 0 - off)
- **Bit2** - High Beam (1 - on, 0 - off)
- **Bit3** - Front Fog Light (1 - on, 0 - off)
- **Bit4** - Rear Fog Light (1 - on, 0 - off)
- **Bit5** - Hazard Lights (1 - on, 0 - off)
- **Bit6 - 7** Reserved

✧ *Doors*

A hexadecimal number. Each bit contains information of one door.

- **Bit0** - Driver Door (1 - open, 0 - closed)
- **Bit1** - Passenger Door (1 - open, 0 - closed)
- **Bit2** - Rear Left Door (1 - open, 0 - closed)
- **Bit3** - Rear Right Door (1 - open, 0 - closed)
- **Bit4** - Trunk (1 - open, 0 - closed)
- **Bit5** - Hood (1 - open, 0 - closed)
- **Bit6 - 7** Reserved

✧ *Total Vehicle Overspeed Time*

5 bytes in total. The first 4 bytes are for the integer part of the total vehicle overspeed time and the last byte is for the fractional part. The fractional part has 2 digits.

✧ *Total Vehicle Engine Overspeed Time*

5 bytes in total. The first 4 bytes are for the integer part of the total vehicle engine overspeed time and the last byte is for the fractional part. The fractional part has 2 digits.

✧ *Total Distance Impulses*

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Vehicle distance in impulses. The number is always increasing. The unit is imp. If it is set to 0, the distance in imp is not available.

- *Ad-Blue Level*
  The level of Ad-Blue. 2 bytes in total.
- *Axle Weight 1st*
  Vehicle first axle weight. The unit is kg.
- *Axle Weight 3rd*
  Vehicle third axle weight. The unit is kg.
- *Axle Weight 4th*
  Vehicle fourth axle weight. The unit is kg.
- *Tachograph Overspeed Signal*
  Vehicle overspeed signal from the tachograph.
  - **0** - Overspeed is not detected.
  - **1** - Overspeed is detected.
- *Tachograph Vehicle Motion Signal*
  The vehicle motion signal in the tachograph.
  - **0** - Motion is not detected.
  - **1** - Motion is detected.
- *Tachograph Driving Direction*
  Vehicle driving direction from the tachograph.
  - **0** - Driving forward.
  - **1** - Driving backward.
- *Analog Input Value*
  The value of analog input. The unit is mV.
- *Engine Braking Factor*
  It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with no pedal pressed causes an increase of the engine braking factor.
- *Pedal Braking Factor*
  It measures how often driver brakes with brake pedal or with engine and stores both counts (which are always increasing). Decreasing speed with brake pedal pressed causes an increase of pedal braking factor.
- *Total Accelerator Kick-downs*
  The count of accelerator pedal kick-downs (with the pedal pressed over 90%).
- *Total Effective Engine Speed Time*
  Total time when the vehicle engine speed is effective. The unit is hour. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.

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- *Total Cruise Control Time*
  Total time when vehicle speed is controlled by cruise-control module. The unit is hour. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- *Total Accelerator Kick-down Time*
  Total time when accelerator pedal is pressed over 90%. The unit is hour. The first 4 bytes are for the integer part of the total engine idle time and the last byte is for the fractional part. The fractional part has 2 digits.
- *Total Brake Applications*
  The count of braking processes initiated by brake pedal.
- *Tachograph Driver 1 Card Number*
  The card number of tachograph driver 1. The value is a numeric string and ends by 0x00.
- *Tachograph Driver 2 Card Number*
  The card number of tachograph driver 2. The value is a numeric string and ends by 0x00.
- *Tachograph Driver 1 Name*
  The name of tachograph driver 1. The value is a name string and ends by 0x00.
- *Tachograph Driver 2 Name*
  The name of tachograph driver 2. The value is a name string and ends by 0x00.
- *Registration Number*
  The vehicle registration number. The value is a numeric string and ends by 0x00.
- *Expansion Information*
  A hexadecimal number. Each bit contains information of one indicator.
  - **Bit0** - W - webasto (1 - on, 0 - off or not available)
  - **Bit1** - BFL - brake fluid low indicator (1 - on, 0 - off or not available)
  - **Bit2** - CLL - coolant level low indicator (1 - on, 0 - off or not available)
  - **Bit3** - BAT - battery indicator (1 - on, 0 - off or not available)
  - **Bit4** - BF - brake system failure indicator (1 - on, 0 - off or not available)
  - **Bit5** - OP - oil pressure indicator (1 - on, 0 - off or not available)
  - **Bit6** - EH - engine hot indicator (1 - on, 0 - off or not available)
  - **Bit7** - ABS - ABS failure indicator (1 - on, 0 - off or not available)
  - **Bit8** - Reserved
  - **Bit9** - CHK - “check engine” indicator (1 - on, 0 - off or not available)
  - **Bit10** - AIR - airbags indicator (1 - on, 0 - off or not available)
  - **Bit11** - SC - service call indicator (1 - on, 0 - off or not available)
  - **Bit12** - OLL - oil level low indicator (1 - on, 0 - off or not available)
  - **Bit13** - CHG - battery charging for electric cars (1 - battery is being charged, 0 - no charging)
  - **Bit14** - FS - fuel source - for vehicles equipped with factory gas installation (1 - engine powered by gas, 0 - engine powered by petrol)

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✧ *Rapid Brakings*

The number of total rapid brakings since installation (calculation based on CAN Module settings of speed decrease time and value).

✧ *Rapid Accelerations*

The number of total rapid accelerations since installation (calculation based on CAN Module settings of speed increase time and value).

✧ *Service Distance*

The parameter describes distance left to diagnostic car review.

Examples:

- (0xFFFD8F00): -160 000 km (diagnostic review should be done long distance ago)
- (0XFFFFFE0C): -500 km (diagnostic review should be done 500 km before)
- (0x000124F8): 75 000 km (diagnostic review to be done in 75000 km)

✧ *DTC N*

Diagnostic trouble codes read from the vehicle. The protocol is OBD II/SAE J2012.

Each diagnostic trouble code is a 3-byte element in following format:

Byte m								**Byte m+1**								**Byte m+2**							
7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0
C1		C2		C3				C4				C5									T	P	C

- C1 - first DTC character
  - **b'00'** - P - powertrain
  - **b'01'** - C - chassis
  - **b'10'** - B - body
  - **b'11'** - U - network
- C2 - second DTC character (digit 0 to 3)
- C3, C4, C5 - consecutive DTC characters (hexadecimal digits 0 to F)
- T - DTC status flag: permanent (stored into non-volatile memory)
- P - DTC status flag: pending (detected during current or last driving cycle)
- C - DTC status flag: confirmed (stored)

  Each code may have one or multiple status flags set. For example:

  0x02 0x2E 0x03 is a code P022E with status pending and confirmed.

  0x61 0x99 0x02 is a code C2199 with status pending.

✧ *Gaseous Fuel Level*

6 bytes in total. The first byte indicates the unit. The unit L is represented as FE, and the unit P is represented as FF. The next 4 bytes are for the integer part of the fuel level (percentage) and the last byte is for the fractional part. The fractional part has 2 digits.

✧ *Tachograph Information Expand*

Four bytes. The high byte describes driver working states, while the low byte describes tachograph other information and the middle two bytes describe driver 1 information and driver 2

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information respectively.

Driver working states	Driver 1 information	Driver 2 information	Tachograph other information
High byte(T)	K1	K1	Low Byte(I)

- T - Driver working states:

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
OUT1	OUT0	TD2	TD1	TD0	TP2	TP1	TP0

- OUT1:OUT0 - “out of scope” condition (2 bits)
  - b’00’ - no out of scope condition opened, normal operation
  - b’01’ - out of scope condition opened
  - b’10’, b’11’ - Invalid data.
- TD2:TD0 - Driver 2 working state (3 bits)
- TP2:TP0 - Driver 1 working state (3 bits)
  - b’000’ - Rest - sleeping.
  - b’001’ - Driver available - short break.
  - b’010’ - Work - loading, unloading, working in an office.
  - b’011’ - Drive - behind the wheel.
  - b’100’, b’101’ - Reserved.
  - b’110’, b’111’ - Invalid data.
- K1 - Driver 1 information (card in slot 1)
- K2 - Driver 2 information (card in slot 2)

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	1	KK1	KK0	CZ3	CZ2	CZ1	CZ0

- KK1:KK0 - driver card
  - b’00’ - no card in slot.
  - b’01’ - card in slot.
  - b’10’, b’11’ - Invalid data.
- CZ3:CZ0 - driver time related states (4 bits)
  - b’0000’ - normal/no limits reached
  - b’0001’ - 15 min before 4½ h
  - b’0010’ - 4½ h reached
  - b’0011’ - 15 min before 9 h
  - b’0100’ - 9 h reached
  - b’0101’ - 15 minute before 16 h (not having 8h rest during the last 24h)
  - b’0110’ - 16 h reached
  - b’0111’ - weekly driving time pre-warning active
  - b’1000’ - weekly driving time warning active
  - b’1001’ - 2 weeks driving time pre-warning active

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- b’1010’ - 2 weeks driving time warning active
- b’1011’ - driver 1 card expiry warning active
- b’1100’ - next mandatory driver 1 card download warning active
- b’1101’ - other
- b’1110’, b’1111’ - Invalid data

- I - tachograph other information

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
1	1	P1	P0	K1	K0	R1	R0

- R1:R0 - vehicle motion
  - b’00’ - vehicle motion not detected.
  - b’01’ - vehicle motion detected.
  - b’10’ - Invalid data.
- K1:K0 - direction indicator
  - b’00’ - forward.
  - b’01’ - reverse.
  - b’10’, b’11’ - Invalid data.
- P1:P0 - vehicle overspeed (it indicates whether the vehicle is exceeding the legal speed limit set in the tachograph)
  - b’00’ - no overspeed
  - b’01’ - overspeed
  - b’10’, b’11’ - Invalid data

✧ *Retarder Usage*

The unit is percentage.

✧ *Power Mode*

Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
R	R	PTO1	PTO0	R	R	R	R

- R - Reserved for future use (set to 1)
- PTO1:PTO0 - Power Take-Off
  - b’00’ - PTO not engaged.
  - b’01’ - PTO engaged.
  - b’10’ - unknown state of PTO (not compliant with FMS 3.0 standard).
  - b’11’ - parameter currently not available.

✧ *Oil Temperature*

The Oil Temperature of the vehicle. 2 bytes in total. If this value is negative, it is represented in Two’s complement format.

✧ *Oil Level*

DPF Soot Level

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6 bytes in total. The first byte indicates the unit. The unit L is represented as FE, and the unit P is represented as FF. The next 4 bytes are for the integer part of the fuel level (percentage) and the last byte is for the fractional part. The fractional part has 2 digits.

✧ *Current Gear Number*

- **0** - Neutral
- **1 ~ 0xF** - Subsequent gears numbers (1 to 15)
- **0x1D** - Reverse gear (-2)
- **0x1E** - Reverse gear (-1)
- **0x1F** - Parameter currently not available
- **others** - Reserved for future use

✧ *Expansion2 Information*

A hexadecimal number. Each bit contains information of one indicator.

- **Bit0** - Brake linings worn off indicator L. 1 - indicator on (brake linings to be replaced), 0 - indicator off (brake linings fine) or not available.
- **Bit1 - 31** Reserved

✧ *Position of an axle*

- **FF** - Parameter currently not available

✧ *Position of a wheel on the axle*

- **FF** - Parameter currently not available

✧ *Tyre Temperatures*

The Temperature of tyres. 2 bytes in total. If this value is negative, it is represented in Two's complement format.

✧ *Tyre Status*

Tyre pressure status.

- **0** - OK.
- **1** - Low pressure.
- **2** - Very low pressure.
- **FF** - Status unavailable.

✧ *Total Fuel Read from Vehicle's Computer*

A total of 5 bytes. The first 4 bytes are for the integer part of the total fuel used and the last byte is for the decimal part. The decimal part has 2 digits. The unit is liter.

✧ *Total Gaseous Fuel Usage*

A total of 5 bytes. The first 4 bytes are for the integer part of the total fuel used and the last byte is for the decimal part. The decimal part has 2 digits. The unit is kg.

✧ *Battery Instantaneous Voltage*

For electric cars this parameter stands for instantaneous high voltage of battery cells (read from

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BMS). The unit is voltage (V).

✧ *Battery Charging Cycles Count*
For electric cars this parameter counts cycles of battery charging (increments at every finished cycle of charging). The unit is cycle.

✧ *Total Energy Recuperated*
Sum of energy transmitted to battery with no charger connected. The unit is Wh.

✧ *Vehicles Battery Charge Level*
2 bytes in total. The first byte is for the integer part of the battery level (percentage) and the last byte is for the fractional part. The fractional part has 2 digits. This field is controlled by Bit 6 in <Electric Report Mask>.

✧ *Charge State*
1 byte in total. The status of battery charging and Charging cable connected in electric cars. This field is controlled by Bit 7 in <Electric Report Mask>.

- **0x00** - Plug disconnected
- **0x01** - Plug connected, not charging
- **0x02** - Connecting (plug connected, but charging not started yet)
- **0x03** - Charging in progress
- **0x04** - Charging failure

✧ *Battery Temperature*
A numerical value is used to indicate the battery temperature.

✧ *Battery Charging Current*
A numerical value is used to indicate the electric car's battery charging current. The unit is ampere.

✧ *Battery Instantaneous Power*
For electric cars this parameter stands for instantaneous power used by (positive values) or recuperated from (negative values) the car. The unit is W. offset -327680 W.
Examples:

- (0x8000): 32768 decimal 0 W (neither power usage nor recuperation).
- (0x8010): 32784 decimal 60 W (power taken from the battery).
- (0x7F11): 32529 decimal -2.39 kW (the battery is being charged, includes recuperation).
- (0xFF00 to 0xFFFF): 65280 to 65535 decimal (parameter unavailable).

✧ *Battery State of Health (SoH)*
For electric cars this parameter stands for battery general condition (100% means brand new, 0% totally damaged).

✧ *Total Energy Used*
Sum of energy used by car's engine and equipment; recuperated energy does not affect this parameter. The unit is Wh.

✧ *Total Energy Used When Idling*
Sum of energy used by car's engine and equipment with vehicle speed 0 km/h; recuperated energy

does not affect this parameter. The unit is Wh.

✧ *Total Energy Charged*
Sum of energy transmitted to battery from external charger. The unit is Wh.

✧ *Charge State Optimization*
The status of battery charging and Charging cable connected in electric cars.

- **0x00** - Plug disconnected
- **0x01** - Plug connected, not charging
- **0x02** - Connecting (plug connected, but charging not started yet)
- **0x03** - Charging in progress
- **0x04** - Charging failure

✧ *Send Time*
The local time to send the acknowledgement message. 7 bytes in total. The first 2 bytes are for year, and the other 5 bytes are for month, day, hour, minute and second respectively.

Send Time	2011		01	31	06	29	11
HEX	07	DB	01	1F	06	1D	0B

5.8 Update Configuration

This section describes the message related to firmware and configuration upgrade. Please refer to the details below.

5.8.1 UPC (Configuration Update Notification)

The HEX format of the event report message **+RESP:GTUPC** is as follows.

Example:
2B4556542809FEDFFF0070740904092047563335304345550 02E11000000000F00210C0000663232320001
00000000005D005C06FB404401E5D41E07E8030B0B123804600000550B085BE2AA0000000000000000000000
0000000000000000004553FC87507E8030B143A39866CC25B0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	

Parts	Fields	Length	Range/Format
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Command ID	1	
	Result	2	100-103| 200-202| 300-302| 305| 306
	Download URL	<=101	Complete URL
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF

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Parts	Fields	Length	Range/Format
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Command ID*

The command ID in the update configuration file. It is always 0 before the device starts to update the configuration (<Result><=300). It indicates the total number of the commands when <Result> is 301. It indicates the ID of the command which has wrong format when <Result> is 302.It is empty when <Result> is greater than 302.

✧ *Result*

A numeral to indicate whether the configuration is updated successfully.

- **100** - The update command is starting.
- **101** - The update command is confirmed by the device.
- **102** - The update command is refused by the device.
- **103** - The update process is refused because the battery is low.
- **200** - The device starts to download the package.
- **201** - The device finishes downloading the package successfully.
- **202** - The device fails to download the package.
- **300** - The device starts to update the device configuration.
- **301** - The device finishes updating the device configuration successfully.
- **302** - The device fails to update the device configuration.
- **305** - The update process is interrupted by abnormal reboot.
- **306** - The update process is interrupted by MD5 verification error.

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✧ *Download URL*

The complete URL to download the configuration. It includes the file name and ends by 0x00.

5.8.2 UPD (Firmware Upgrade Report)

The HEX format of the event report message **+RESP:GTUPD** is as follows. For this message, <Protocol Version> and <Firmware Version> will always be present regardless of the <+EVT Mask> setting.

Example:

2B4556540F09FEDFFF006C74090409204756333530434555002E0D000000000F00210C0187010102000000005D005C06FB404401E5D41E07E8030B0B193204600000550B085BE2AA00000000000000000000000000000000000000004553FC87507E8030B15053486A1E0B30D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F

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Parts	Fields	Length	Range/Format
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42
	Satellites in Use	1|2	0 - 72
	Code	2	
	Retry	1	
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

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5.8.3 EUC (Extended Configuration Update Report)

The HEX format of the event report message **+RESP:GTEUC** is as follows, which is similar to **+RESP:GTUPC**.

Example:

2B4556540F09FEDFFF006874090409204756333530434555003 02E000000000000110900640101000000000000FFF506FB44A801E5D67207E60707032F2404600000550B0000B1E2000000000000000000000000000000000000000000007E60707033018056BABAF0D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+EVT
	Message Type	1	
	Report Mask	4	00000000-FFFFFFFF
	EVT Expansion Mask	4	00000000-FFFFFFFF
Body	Length	2	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
	Battery Level	1	0-100
	External Power Voltage	2	0-32000(mV)
	Analog Input Mode	2	
	Analog Input1 Voltage	2	
	Analog Input2 Voltage	2	
	Analog Input3 Voltage	2	
	EIO100 Input Status	1	00-0F
	Digital Input Status	1	00-0F
	EIO100 Output Status	1	00-0F
	Digital Output Status	1	00-1F
	Motion Status	1	0x11| 0x12| 0x16| 0x1A| 0x21| 0x22| 0x41| 0x42

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Parts	Fields	Length	Range/Format
	Satellites in Use	1|2	0 - 72
	Command ID	2	
	Result	2	100-103| 200-202| 300-302| 304-306
	Download URL	<=101	Complete URL
	Identifier Number	4	
	Reserved	1	00
	Number	1	1
	GNSS Accuracy	1	0-50
	Speed	3	0.0-999.9(km/h)
	Azimuth	2	0-359
	Altitude	2	
	Longitude	4	
	Latitude	4	
	GNSS UTC Time	7	YYYYMMDDHHMMSS
	MCC	2	0000 - FFFF
	MNC	2	0000 - FFFF
	LAC	2	0000 - FFFF
	Cell ID	4	00000000 - FFFFFFFF
	Reserved	1	00
	Current Mileage	3	0.0-65535.0(km)
	Total Mileage	5	0.0-4294967.0(km)
	Current Hour Meter Count	3	HHMMSS
	Total Hour Meter Count	6	HHHHHHHHMMSS
	RFID Length	1	00-0E
	RFID	<=0E	HEX
	CAN Data	<=400	
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF

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Parts	Fields	Length	Range/Format
	Tail	2	0x0D 0x0A

5.9 HBD (Heartbeat Data)

5.9.1 Heartbeat Report

Heartbeat is used to maintain the contact between the device and the backend server while communicating via GPRS. The heartbeat package is sent to the backend server at the interval specified by <Heartbeat Interval> in the AT+GTSRI command.

Example:
2B484244FF207409040920475633353043455507E903140A2F121DD17B440D0A

Parts	Fields	Length	Range/Format
Head	Header	4	+HBD
	Report Mask	1	00-FF
Body	Length	1	
	Device Type	1	74
	Protocol Version	2	0000 - FFFF
	Firmware Version	2	0000 - FFFF
	Unique ID	8	IMEI/Device Name
Tail	Send Time	7	YYYYMMDDHHMMSS
	Count Number	2	0000-FFFF
	Checksum	2	0000-FFFF
	Tail	2	0x0D 0x0A

✧ *Report Mask*
Please refer to <+HBD Mask> in AT+GTHRM.

✧ *Unique ID*
If Bit 4 of <+HBD Mask> is 0, the IMEI of the device is used as the unique ID of the device. IMEI is a 15-digit string. In the HEX format message, each 2 digits are encoded into one byte as an integer.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

If Bit 4 of <+HBD Mask> is 1, the device name is used as the unique ID of the device.

Device name is an 8-byte string, please refer to <Device Name> in AT+GTCFG. If the length of <Device Name> is more than 8 bytes, the device will only acquire the first 8 bytes.
In the Hex format message, each byte is encoded into one byte as an integer. If the device name is less than 8 bytes, the remaining bytes are set to 0.

Device Name	q	u	e	c	l	i	n	k
HEX	71	75	65	63	6C	69	6E	6B

If the mask of <UID> in <+HBD Mask> of AT+GTHRM is set to 0, the heartbeat message will not report device name or IMEI information. If the mask of <UID> is set to 1, then the heartbeat message will report device name or IMEI information according to the mask of <Device Name>.

5.10 Buffer Report in Hex Format

When HEX format messages go into the local buffer, the device will replace the second byte of the report messages with “B”. Thus, **+BSP** is buffered report for **+RSP**, **+BNF** is buffered report for **+INF**, **+BRD** is buffered report for **+CRD** and **+BVT** is buffered report for **+EVT**. The remaining part of the report messages is kept unchanged.

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6 Appendices

Here are the appendices of the @Track protocol, including the modification history of this protocol, copyright notice, etc., Please refer to the details below.

6.1 Two's Complement

For a positive value, the two's complement is itself. Take 17 as an example. Its hex format is 0x11 and the two's complement for it is 0x11. For a negative value, the following gives detailed calculations.

-X is a negative value.

Firstly, get to know the number of bits for the negative value N, then the two's complement for it is:

2^N - X

For example, to use 16 bits to represent -100, the two's complements for it should be:

2^16 - 100 = 65436 = 0xFF9C

Above is two's complement for -100 in hex format.

On the contrary, the two's complement can also be converted to the hex value that it represents in a similar way.

1. Get to know the number of bits for the two's complement.
2. Get the sign of the value, positive or negative. If the highest bit is 1, it is a negative value. If the highest bit is 0, it is a positive value.
3. If it is a positive value, there is no need for conversion. It is the value.
4. If it is a negative value, get the real value through the following calculation:

-(2^N - X)

Where:

N is the number of bits for the two's complement.

X is the value that is converted from the two's complement directly.

For example, if the number of bits for the two's complement is 16 and the two's complement is 0xFF9C, then it is a negative value as the highest bit is 1, and the detailed calculation for it is:

-(2^16 - 0XFF9C) = -100

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6.2 Accessory Index

Accessory Model Name	Accessory Type	Accessory Model	Alarm Type	Append Mask
Escort_Fuel_BLE	1	0	0	001F
Escort_Angle_BLE		3	0 | A	011F
WTS300	2	0	0 - 3	001F
Temperature ELA		1	0 - 3	081F
WTH300	6	2	0-3 | 7-9	083F
ELA sensor		3	0-3 | 7-9	083F
DTH100(WMS301)		4	0-3 | 7-9 | 13-14	283F
WTH301		5	0-3 | 7-9	283F
DUT-E S7	7	0		0007
DFM 100S7		1		0007
DFM 25ODS7		2		0007
GN0M DDE S7		3		0007
GNOM DP S7		4		0007
WBC300	8	0		0087
Fuel Sensor	10	0		2017
Angle Sensor		1		0017
DDS Sensor		2		2017
DPS Sensor		3		2017
MAG ELA	11	0	C	100F
ATP100/ATP102	12	0	0 | E-10	0617
WRL300	13	0	15	4007
TR21	14	0	1-3 | 16-18	2017
WID320G	15	0	0 | 19-1E	7881F
MOV ELA		1	0 | 1A | 1E	9800F
Epsilon Fuel_BLE	23	0	0	A0801F

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6.3 CRC-16 Calculation

The 16-bit CRC checksum in the report should be calculated according to the properties in the table below:

Example:
CRC (00 7F 24 1E 01 00 01 11 47 56 37 36 4D 47 2D 34 00 FF FF 07 E4 06 1C 09 1B 24 01 58) = 60D9H (0x60D9)

Property	Value
Name	CRC-16
Width	16 bits
Polynomial	0x1021 ($X^{16} + X^{12} + X^5 + 1$)
Initialization	FFFFH (0xFFFF)
Reflect input	False
Reflect output	False
Final XOR	0000H (0x0000)

Here is a corresponding CRC-16 algorithm routine written in C language:

```
static const uint16_t crc16_table[256] =
{
  0x0000,0x1021,0x2042,0x3063,0x4084,0x50A5,0x60C6,0x70E7,
  0x8108,0x9129,0xA14A,0xB16B,0xC18C,0xD1AD,0xE1CE,0xF1EF,
  0x1231,0x0210,0x3273,0x2252,0x52B5,0x4294,0x72F7,0x62D6,
  0x9339,0x8318,0xB37B,0xA35A,0xD3BD,0xC39C,0xF3FF,0xE3DE,
  0x2462,0x3443,0x0420,0x1401,0x64E6,0x74C7,0x44A4,0x5485,
  0xA56A,0xB54B,0x8528,0x9509,0xE5EE,0xF5CF,0xC5AC,0xD58D,
  0x3653,0x2672,0x1611,0x0630,0x76D7,0x66F6,0x5695,0x46B4,
  0xB75B,0xA77A,0x9719,0x8738,0xF7DF,0xE7FE,0xD79D,0xC7BC,
  0x48C4,0x58E5,0x6886,0x78A7,0x0840,0x1861,0x2802,0x3823,
  0xC9CC,0xD9ED,0xE98E,0xF9AF,0x8948,0x9969,0xA90A,0xB92B,
  0x5AF5,0x4AD4,0x7AB7,0x6A96,0x1A71,0x0A50,0x3A33,0x2A12,
  0xDBFD,0xCBDC,0xFBBF,0xEB9E,0x9B79,0x8B58,0xBB3B,0xAB1A,
  0x6CA6,0x7C87,0x4CE4,0x5CC5,0x2C22,0x3C03,0x0C60,0x1C41,
```

```
    0xEDAE,0xFD8F,0xCDEC,0xDDCD,0xAD2A,0xBD0B,0x8D68,0x9D49,
    0x7E97,0x6EB6,0x5ED5,0x4EF4,0x3E13,0x2E32,0x1E51,0x0E70,
    0xFF9F,0xEFBE,0xDFDD,0xCFFC,0xBF1B,0xAF3A,0x9F59,0x8F78,
    0x9188,0x81A9,0xB1CA,0xA1EB,0xD10C,0xC12D,0xF14E,0xE16F,
    0x1080,0x00A1,0x30C2,0x20E3,0x5004,0x4025,0x7046,0x6067,
    0x83B9,0x9398,0xA3FB,0xB3DA,0xC33D,0xD31C,0xE37F,0xF35E,
    0x02B1,0x1290,0x22F3,0x32D2,0x4235,0x5214,0x6277,0x7256,
    0xB5EA,0xA5CB,0x95A8,0x8589,0xF56E,0xE54F,0xD52C,0xC50D,
    0x34E2,0x24C3,0x14A0,0x0481,0x7466,0x6447,0x5424,0x4405,
    0xA7DB,0xB7FA,0x8799,0x97B8,0xE75F,0xF77E,0xC71D,0xD73C,
    0x26D3,0x36F2,0x0691,0x16B0,0x6657,0x7676,0x4615,0x5634,
    0xD94C,0xC96D,0xF90E,0xE92F,0x99C8,0x89E9,0xB98A,0xA9AB,
    0x5844,0x4865,0x7806,0x6827,0x18C0,0x08E1,0x3882,0x28A3,
    0xCB7D,0xDB5C,0xEB3F,0xFB1E,0x8BF9,0x9BD8,0xABBB,0xBB9A,
    0x4A75,0x5A54,0x6A37,0x7A16,0x0AF1,0x1AD0,0x2AB3,0x3A92,
    0xFD2E,0xED0F,0xDD6C,0xCD4D,0xBDAA,0xAD8B,0x9DE8,0x8DC9,
    0x7C26,0x6C07,0x5C64,0x4C45,0x3CA2,0x2C83,0x1CE0,0x0CC1,
    0xEF1F,0xFF3E,0xCF5D,0xDF7C,0xAF9B,0xBFBA,0x8FD9,0x9FF8,
    0x6E17,0x7E36,0x4E55,0x5E74,0x2E93,0x3EB2,0x0ED1,0x1EF0,
};

uint16_t getCrc16(uint8_t* pdata, uint16_t len)
{
    uint16_t crc16 = 0xffff;

    while(len > 0) {
        crc16 = crc16_table[*pdata ^ (uint8_t)(crc16 >> 8)] ^ (crc16 << 8);
        pdata++;
        len--;
    }

    return crc16;
}
```

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