Device Management Protocol

GSM/GPRS/GPS Tracker

Revision: 4.01

International Telematics Solutions Innovator

www. queclink .com

Document Title	Device Management Protocol
Revision	4.01
Date	2019-01-15
Status	Released

General Notes

Queclink offers this information as a service to its customers, to support application and engineering efforts that use the products designed by Queclink. The information provided is based upon requirements specifically provided to Queclink by the customers. Queclink has not undertaken any independent search for additional relevant information, including any information that may be in the customer's possession. Furthermore, system validation of this product designed by Queclink within a larger electronic system remains the responsibility of the customer or the customer's system integrator. All specifications supplied herein are subject to change.

Copyright

Contents

0. Revision History

Revision	Date	Author	Description of change
1.00	2017-6-9	Forrest Cao	Initial
1.01	2017-6-15	Forrest Cao	1. Add the parameter <*New Password*> and set the password.
1.02	2017-6-21	Forrest Cao	1. Add OBD firmware update and OBD configuration update.
1.03	2017-8-4	Forrest Cao	1. Add Hex Message for **+RESP:GTDMR** and **+RESP:GTUPC**, **+RESP:GTUPD**. 2. Add the parameter <*UPC Fields Mask*>, <*HEX Report Mask*> in the command **AT+GTUPC**. 3. Add the parameter <*UPD Fields Mask*>, <*HEX Report Mask*> in the command **AT+GTUPD**. 4. Add **AT+GTRTO.**
1.03	2017-8-8	Colin Hu	1. Modify the mask for OBD information and BT information.
1.03	2017-8-11	Forrest Cao	1. Add command mask <*VMS*>, <*VVS*>, <*GVS*>, <*AVS*>, <*BTE*>, <*ASC*> in the command **AT+GTFVR**.
1.04	2017-9-5	Abert Xu	1. Add <*Code*> 114 in **+RESP:GTUPD**
2.01	2017-11-6	Eric Xu	1. Extend <*Firmware Version*> parameter in **+RESP:GTDMR** message to support customization version.
2.02	2017-11-8	Bennett Cui	1. Add command mask <AIS>,<MON>,<RTO>, <URT>,<IDA>,<ACD>,<EFS>,<TMP>,<UDT>,<FSC>, <CMS>,<TAP>,<MUT>,<CAN>,<FTP>, <UFS>,<OEX>,<IEX>,<BSE>,<SIM>,<UPC>,<CLT>, <CFU>in the command **AT+GTFVR**.
2.03	2017-12-4	Bennett Cui	1. Add command mask <TKS>, <CDA>, <GDO>, <QRK> in the command **AT+GTFVR**.
2.04	2018-1-29	Bennett Cui	1. Add command mask <ASC>, <AFC>, <MPT>, <SPT> in the command **AT+GTFVR**.
2.05	2018-2-24	Forrest Cao	1. Add new device type from <0xEC> to <0xFF> for **+ACK:GTDMS** field <*Protocol Version*>. 2. Add new bit Bit87-Bit98 for **AT+GTFVR** command field <*Command Mask*>. 3. Add new update type 5/6/7 for **AT+GTUPD** command field <*Update Type*>.
	2018-3-14	Navy Zhang	1. Add new bit Bit99-Bit101 for **AT+GTFVR** command field <*Command Mask*>.
3.00	2018-4-20	Arthur Lee	1. Add <*PEO ID Mask*> in the command **GTFVR**. 2. Add <*Checksum*> and < *Tail Characters*> for

			hex format in **+RESP: GTDMS**.
3.01	2018-5-4	Forrest Cao	1. Added <Update Status Mask> in the command **AT+GTUPC**. 2. Added *<Message Digest>* in the command **AT+GTFVR**.
	2018-5-15	Aleo Liu	1. Added new bit Bit102-Bit103 for **AT+GTFVR** command field *<Command Mask>*. 2. Added 306 message type in the filed *<result>* for message report **+RESP:GTUPC**, **+RESP:GTEUC**.
3.02	2018-9-11	Forrest Cao	1. Added the message **+RESP:GTALS** for the command AT+GTDMS to query the configurations.
3.03	2018-9-20	Berry Xu	1. Added new bit Bit104 - Bit106 in *<Command Mask>* of command **AT+GTFVR** for CL10 project.
		Bennett Cui	1. Added new bit Bit108 in *<Command Mask>* of command **AT+GTFVR** for GV55S_TZA project.
3.04	2018-10-11	Reid Chen	1. Added new bit Bit109 in *<Command Mask>* of command **AT+GTFVR** for Gl530 project.
3.05	2018-10-17	Forrest Cao	1.Modified the meaning of some device type expressions in the command **AT+GTDMS**, including EC,ED,F0,F1,F3,F4,F5,FC,FD,FE,FF.
3.06	2018-10-23	Forrest Cao	1. Added Bit 110, Bit 111, and Bit 112 for the parameter *<Command Mask>* in the command **AT+GTFVR**.
3.07	2018-11-07	Bennett Cui	1. Added new bit Bit113 in *<Command Mask>* of command **AT+GTFVR** for GV300N project.
3.08	2018-11-16	Lemon Xue	1. Added new bit Bit114 in *<Command Mask>* of command **AT+GTFVR** for CL10P project. 2. Modified the meaning of some device type expressions in the command **AT+GTDMS**, including 57.
3.09	2018-12-19	Forrest Cao	1. Modified the device type F5 of **AT+GTDMS**.
3.10	2019-01-17	Bennett Cui	1. Added new bit Bit116 in *<Command Mask>* of command **AT+GTFVR** for GV55S project.
4.00	2018-12-14	Hendry Pan	1. Added new types of *<Download URL>* definition in **AT+GTUPC** and **AT+GTUPD** commands. 2. Added Queclink User-Agent Format Section.
4.01	2019-01-15	Flame Zheng	1. Added new bit Bit115 in *<Command Mask>* of command **AT+GTFVR** for GL500M project. 2. Added the GL500M device of *<Protocol Version>* in the command **AT+GTDMS**.

1. Command and Acknowledgement

1.1. Device Management Service

The command **AT+GTDMS** is used to configure reporting device management information to the device management server. In rest part of this document, 'the server' means the device management server.

➢ **AT+GTDMS=**

Example:
AT+GTDMS=queclinkDM,0,,1,220.178.67.210,8191,,,0,7F9F,,0,,0,30,,0003$

SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9', 'a' – 'z', 'A' – 'Z'	queclinkDM
2	Report Mode	1	0|1|2|3	0
3	New Password	4-20	'0' – '9', 'a' – 'z', 'A' – 'Z'	
4	Buffer Enable	1	0|1	1
5	Server IP/Domain Name	<=60		
6	Server Port	<=5	0 – 65535	0
7	Reserved	0		
8	Reserved	0		
9	Report Interval	<=5	0|1 – 43200 min	0
10	Report Mask	<=8	0 – FFFFFFFF	7F9F
11	Reserved	0		
12	SACK Enable	1	0|1	0
13	Reserved	0		
14	Report Format	0	0|1	0
15	Connection Life	<=3	0|10 – 600s	30
16	Reserved	0		
17	Serial Number	4	0000 – FFFF	
18	Tail Character	1	$	$

✧ <Report Mode>: Supports report modes as following:
- 0: Stop reporting.
- 1: TCP short-connect forced mode. The connection is based on TCP protocol. The terminal connects to the server every time it needs to send data.
- 2: UDP mode. The terminal will send data to the server by UDP protocol. It supports to receive protocol command via UDP. But it is recommended to make sure the IP address and UDP port of the device can be visited in the internet.
- 3: UDP with fixed local port. Like the UDP mode, the terminal will send data using

UDP protocol. The difference is the terminal will use fixed local port rather than random port to communicate with the server in this mode. Thus the server could use identical port to communicate with all terminals if the server and the terminals are all in the same VPN network. The port number the device used is the same as the port number of the server. RACQXL device type NOT supports this mode.

✧ *<Buffer Enable>*: Enable or disable BUFFER function.
- ● 0: Disable the BUFFER function.
- ● 1: Enable the BUFFER function.

✧ *<Server IP/Domain Name>*: The IP address or the domain name of the server.

✧ *<Server Port>*: The port of the server.

✧ *<Report Interval>*: The interval to report the **+RESP:GTDMR** message to the server. The value range is 0|1 – 43200and the unit is minute. 0 means never report **+RESP:GTDMR** message.

✧ *<Report Mask>*: A bitwise mask to indicate the fields to be included in the message **+RESP:GTDMR**. Each bit represents a field. If a bit is set as 1, the corresponding field will be filled. Otherwise, the field will not exist.

Bit	Item to Mask
Bit 0	Device Name
Bit 1	Hardware Version
Bit 2	Firmware Version
Bit 3	Last Firmware Version
Bit 4	Firmware Update Time
Bit 5	Reserved
Bit 6	Reserved
Bit 7	Configuration Version
Bit 8	Last Configuration Version
Bit 9	Configuration Change Time
Bit 10	Main Power Information
Bit 11	Backup Battery Information
Bit 12	Modem Status
Bit 13	GNSS Status
Bit 14	SIM Information
Bit 15	Reserved
Bit 16	OBD Information
Bit 17	BT Information

Bit 18	Reserved
Bit 19	Reserved
Bit 20	Reserved
⦙	Reserved
Bit30	Reserved
Bit31	Reserved

✧ *<SACK Enable>*: A numeric to indicate whether the server should reply SACK message to the device.
  ● 0: The server does not reply SACK message after receiving a message from the device.
  ● 1: The server should reply SACK message after receiving a message from the device.
✧ *<Report Format>*: A numeral to indicate the format of the status report to the server.
  ● 0: ASCII format.
  ● 1: HEX format.
✧ *<Connection Life>*: A numeral to indicate the time to maintain TCP connection for receiving commands from the server. If there is no data transmission within the time of *<Connection Life>*. The TCP connection will be closed. The unit is second.

The acknowledgment message of **AT+GTDMS** command:
➢ **+ACK:GTDMS,**

Example:			
+ACK:GTDMS,2F0401,135790246811220,GL300VC,0003,20160714151425,0A0B$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X ∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9''a' – 'z' 'A' – 'Z''-''_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Protocol Version>*: The protocol version that the terminal conforms to. The first two characters point out the device type. The middle two characters point out the major version number of protocol and the last two characters point out the minor version number of protocol. And both version numbers are hex digital. For example, "**0401**" means the protocol version 4.01.
  Here is detailed definition of device type.

Device Type	**Device**
25	GV300N

27	GV300W
28	GL300VC
29	GV300VC
2B	GV55VC
2C	GL300W
2D	GV500VC
2F	GV55N
30	GL300N
31	GV65N
35	GV200N
36	GV500N
37	GS100N
38	GV65NP
39	GV55NLite
3C	GV75
3D	GT301N
3F	GMT100N
40	GL500N
41	GV75W
42	GMT200N
44	GL520
45	GB100
57	CL10P
EC	Reserved
ED	GV600M
EE	GL500M
EF	Reserved
F0	Reserved
F1	GV350 Series
F3	Reserved

F4	Reserved
F5	GL300M
F7	RACQXL
F8	GV800 Series
FA	Reserved
FC	GV600 Series
FD	GL300/GL300L
FE	GV50 Serials
FF	Reserved

✧ *<Unique ID>*: The IMEI of the terminal.

1.2. Configuration File Version

The command **AT+GTFVR** is used to record information of the configuration file generated by manager tool for **AT+GTUPC**.

➢ **AT+GTFVR=**

Example: AT+GTFVR=gv55,1,0000,,,,,,,,,,,0010$				
SN	Parameter	Length (byte)	Range/Format	Default
1	Password	4 – 20	'0' – '9''a' – 'z' 'A' – 'Z'	gv55
2	Configuration Name	<=40	'0' – '9', 'a' – 'z', 'A' – 'Z', '-', '_'	
3	Configuration Version	4	0000 – 9999	
4	Command Mask	<=32	00000000000000000000 000000000000– FFFFFFFFFFFFFFFFFFFF FFFFFFFFFF	
5	GEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
6	Stocmd ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
7	Group ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
8	Digital Signature	32	'0'-9'a'-'z''A'-'Z'	
9	PEO ID Mask	<=16	0000000000000000 – FFFFFFFFFFFFFFFF	
10	Reserved	0		
11	Reserved	0		
12	Reserved	0		
13	Generate Time	14	YYYYMMDDHHMMSS	
	Serial Number	4	0000 – FFFF	
	Tail Character	1	$	$

✧ *<Configuration Name>*: The name of configuration file.
✧ *<Configuration Version>*: The version number of the configuration. The first two characters means the major version number, the last two characters means the minor version number.
✧ *<Command Mask>*: A hex value to indicate which AT command is included in this configuration file. Each bit corresponds to an AT command.

Bit	Item to Mask
Bit 0	BSI

Bit 1	SRI
Bit 2	QSS
Bit 3	CFG
Bit 4	DIS
Bit 5	TMA
Bit 6	FRI
Bit 7	GEO
Bit 8	SPD
Bit 9	Reserved
Bit 10	OWH
Bit 11	DOG
Bit 12	WLT
Bit 13	PDS
Bit 14	CMD
Bit 15	UDF
Bit 16	Reserved
Bit 17	Reserved
Bit 18	Reserved
Bit 19	Reserved
Bit 20	FVR
Bit 21	TOW
Bit 22	EPS
Bit 23	IDL
Bit 24	HMC
Bit 25	HBM
Bit 26	HRM
Bit 27	CRA
Bit 28	SSR
Bit 29	OBD
Bit 30	OSM

Bit 31	EMG
Bit32	OUT
Bit33	SOS
Bit34	IOB
Bit35	GPJ
Bit36	EMR
Bit37	FFC
Bit38	RMD
Bit39	PEO
Bit40	JDC
Bit41	BZA
Bit42	SPA
Bit43	JBS
Bit 44	BTS
Bit 45	BMS
Bit 46	Reserved
Bit 47	Reserved
Bit48	VMS
Bit49	GVS
Bit50	VVS
Bit51	AVS
Bit52	BTE
Bit53	ASC
Bit 54	PIN
Bit 55	GAM
Bit 56	AIS
Bit 57	MON
Bit 58	Reserved
Bit 59	URT
Bit 60	IDA

Bit 61	ACD
Bit 62	EFS
Bit 63	TMP
Bit 64	UDT
Bit 65	FSC
Bit 66	CMS
Bit 67	Reserved
Bit 68	MUT
Bit 69	CAN
Bit 70	FTP
Bit 71	Reserved
Bit 72	OEX
Bit 73	IEX
Bit 74	BSE
Bit 75	SIM
Bit 76	Reserved
Bit 77	CLT
Bit 78	Reserved
Bit 79	TKS
Bit 80	CDA
Bit 81	GDO
Bit 82	QRK
Bit 83	Reserved
Bit 84	AFC
Bit 85	MPT
Bit 86	SPT
Bit 87	NTS
Bit 88	GLM
Bit 89	NMD
Bit 90	FKS

Bit 91	TEM
Bit 92	WTA
Bit 93	HUA
Bit 94	RFS
Bit 95	RFL
Bit 96	ORR
Bit 97	OID
Bit 98	FIM
Bit 99	BTM
Bit 100	BTD
Bit 101	BTB
Bit 102	CFU
Bit 103	OWL
Bit 104	PFC
Bit 105	GBC
Bit 106	ONE
Bit 107	Reserved
Bit 108	SVR
Bit 109	LSA
Bit 110	SDS
Bit 111	PCS
Bit 112	FMI
Bit 113	DAS
Bit 114	DRS
Bit 115	LTA
Bit 116	BPM
⋮	Reserved

✧ *<GEO ID mask>*: Bitwise to indicate GEO fence.

ID	Bit	Item to Mask
1	Bit 0	Indicate the Geo 0
2	Bit 1	Indicate the Geo 1

3	Bit 2	Indicate the Geo 2
4	Bit 3	Indicate the Geo 3
5	Bit 4	Indicate the Geo 4
6	Bit 5	Indicate the Geo 5
7	Bit 6	Indicate the Geo 6
8	Bit 7	Indicate the Geo 7
9	Bit 8	Indicate the Geo 8
10	Bit 9	Indicate the Geo 9
11	Bit 10	Indicate the Geo 10
12	Bit 11	Indicate the Geo 11
13	Bit 12	Indicate the Geo 12
14	Bit 13	Indicate the Geo 13
15	Bit 14	Indicate the Geo 14
16	Bit 15	Indicate the Geo 15
17	Bit 16	Indicate the Geo 16
18	Bit 17	Indicate the Geo 17
19	Bit 18	Indicate the Geo 18
20	Bit 19	Indicate the Geo 19
⋮	⋮	Reserved
Reserved	Bit 63	Reserved

✧ *<Stocmd ID Mask>*: Please refer to the *<Store CMD ID>* in command **AT+GTCMD**.

Bit	Store CMDID
Bit 0	1
Bit 1	2
Bit 2	3
Bit 3	4
Bit 4	5
Bit 5	6
Bit 6	7
Bit 7	8
Bit 8	9
Bit 9	10
Bit 10	11
Bit 11	12
Bit 12	13
Bit 13	14
Bit 14	15
Bit 15	16
Bit 16	17

Bit 17	18
Bit 18	19
Bit 19	20
┇	┇
Bit 31	31

✧ *<Group ID Mask>*: Please refer to the <*Group ID*> in command **AT+GTUDF**.

Bit	Group id
Bit 0	1
Bit 1	2
Bit 2	3
Bit 3	4
Bit 4	5
Bit 5	6
Bit 6	7
Bit 7	8
Bit 8	9
Bit 9	10
Bit 10	11
Bit 11	12
Bit 12	13
Bit 13	14
Bit 14	15
Bit 15	16
Bit 16	17
Bit 17	18
Bit 18	19
Bit 19	20
┇	┇
Bit 31	31

✧ *<Digital Signature>: The parameter is used to confirm the validity of subsequent commands.*
✧ *<PEO ID mask>*: Bitwise to indicate PEO fence.

ID	Bit	Item to Mask
1	Bit 0	Indicate the PEO 0
2	Bit 1	Indicate the PEO 1
3	Bit 2	Indicate the PEO 2
4	Bit 3	Indicate the PEO 3
5	Bit 4	Indicate the PEO 4
6	Bit 5	Indicate the PEO 5

7	**Bit 6**	Indicate the PEO 6
8	**Bit 7**	Indicate the PEO 7
9	**Bit 8**	Indicate the PEO 8
10	**Bit 9**	Indicate the PEO 9
11	**Bit 10**	Indicate the PEO 10
12	**Bit 11**	Indicate the PEO 11
13	**Bit 12**	Indicate the PEO 12
14	**Bit 13**	Indicate the PEO 13
15	**Bit 14**	Indicate the PEO 14
16	**Bit 15**	Indicate the PEO 15
17	**Bit 16**	Indicate the PEO 16
18	**Bit 17**	Indicate the PEO 17
19	**Bit 18**	Indicate the PEO 18
20	**Bit 19**	Indicate the PEO 19
⋮	⋮	Reserved
Reserved	**Bit 63**	Reserved

✧   *<Generate Time>*: The generate time of the configuration file.

NOTE:

   AT+GTFVR command mask be the first command in configuration file.

The acknowledgment message of **AT+GTFVR** command:

➢   **+ACK:GTFVR,**

Example:			
+ACK:GTFVR,280001,135790246811220,,0012,20090214093254,11F0$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X ∈{'A' – 'Z','0' – '9'}	
Unique ID	14	MEID	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

1.3. Configuration Update Over The Air

The AT+GTUPC command is used to download configuration file over the air for the update of the local configuration.

✧ **AT+GTUPC=**

Example:
AT+GTUPC=queclinkDM,0,10,0,0,168,http://www.queclink.com/configure.ini,0,01,0,0,380,0001$
AT+GTUPC=queclinkDM,0,10,0,0,168,http://www.queclink.com/45BF921F0C85C974B0FDAB3E1E6206BA,0,01,0,0,380,0001$

Parameter	Length (Byte)	Range / Format	Default value
Password	4-20	'0'-'9', 'a' - 'z', 'A'-'Z'	queclinkDM
Max. Download Retry	1	0 – 3	0
Download Timeout	<=2	5 – 30 min	10
Download Protocol	1	0	0
Enable Report	1	0|1	0
Update Interval	<=4	0 – 8760 hour	0
Download URL	<=100	URL	
Mode	1	0|1	0
UPC Fields Mask	<=2	0 - FF	0
Extend Status Report	1	0|1	0
Identifier Number	8	00000000-FFFFFFFF	0
HEX Report Mask	<=8	0 – FFFFFFFF	380
Update Status Mask	1	0 - F	3
Serial Number	4	0000-FFFF	
Tail Character	1	$	$

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

✧ <*Max. Download Retry*>: It specifies the maximum time of retrying to download the configuration file upon download failure.

✧ <*Download Timeout*>: It specifies the expiration timeout of a single download. If the download expires, it is considered to be failure.

✧ <*Download Protocol*>: The protocol used to download the file. Only HTTP is supported now. It is set to 0.

✧ <*Enable Report*>: A numeral which indicates whether to report the message **+RESP:GTUPC** or **+RESP:GTEUC** 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 time interval measured in hours for updating the configuration over the air.

✧ *<Download URL>*: It specifies the URL to download the configuration file. If the *<Download URL>* ends with "/" which means the URL is just a path without file name, the unit will add <imei>.ini as the file name to complete the URL. If it is greater than 100 bytes in length, error will be returned. If the *<Download URL>* ends with 32 hexadecimal bytes (45BF921F0C85C974B0FDAB3E1E6206BA) generated by the server, the server will pick up the specified configuration file from the file server accordingly after receiving HTTP Get request.

✧ *<Mode>*: A numeral which indicates the working mode of downloading configuration over the air.
- 0: Disable this function.
- 1: Enable this function.

✧ *<UPC Fields Mask>*: A hexadecimal value as bitwise to control fields to be included in the HEX format report of **+RESP:GTUPC**. The Highest bit is reserved to extend more masks later. Here is detailed definition of each bit.

Bit	Field to Mask
Bit 0	Identifier Number
Bit 1	Reserved
Bit 2	Reserved
Bit 3	Reserved
Bit 4	Reserved
Bit 5	Reserved
Bit 6	Reserved
Bit 7	Reserved for more field mask

✧ *<Extended Status Report>*: A numeral to indicate the message to report for the configuration update status when *<Enable Report>* is 1.
- 0: Report the message **+RESP:GTUPC**.
- 1: Report the message **+RESP:GTEUC** to include more information.

✧ *<Identifier Number>*: A numeral to identify the update configuration request command. This will be included in the message **+RESP:GTEUC** to inform the request it is related to.

✧ *<Hex Report Mask>*: A hexadecimal value as bitwise to control common fields to be included in the HEX format report of **+RESP:GTUPC**. About the detailed definition of each bit, please refer to the definition of the parameter *<Report Mask>* in the command **AT+GTDMS**.

✧ *<Update Status Mask>*: Bitwise mask to configure the Status which the device could update the Configuration.
- Bit 0 for *<ignition off>*
- Bit 1 for *<ignition on>*

Note:

1. The maximum number of commands in configuration file is 255. If there are more than 255 commands in the configuration file, the device will fail to download the configuration file.

2. Make sure there is only one command per line in the configuration file and there should be a "\r\n" between each command.

3. There should be no space before each command.

4. The configurations containing file should be a plain text file.

The acknowledgement message of **AT+GTUPC** command:

✧ **+ACK:GTUPC**

Example:
+ACK:GTUPC, 2F0605,135790246811220,,0005,20100310172830,11F0$

Parameter	Length (Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF,X∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Device Name	20		
Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

Note: If the <*Download URL*> ends with "/" which means the URL is just a path without file name, the unit will add <imei>.ini as the file name to complete the URL. If the URL is greater than 100 bytes in length, error will be returned.

1.4. Firmware Update Over The Air

AT+GTUPD is used to update or cancel the firmware over the air. To start the firmware update, the server sends the **AT+GTUPD (sub-command:0)** command to the device. Upon receiving this command, the device is informed to where to download the update file and how to download it.

➢ **AT+GTUPD=**

Example:			
AT+GTUPD=queclinkDM,0,0,20,0,,,http://fota.queclink.com/gv55_0201_0205.bin,01,0,0,0,380,0001$ AT+GTUPD=queclinkDM,0,0,20,0,,,http://fota.queclink.com/45BF921F0C85C974B0FDAB3E1E6206BA,01,0,0,0,380,0001$			
Parameter	Length (Byte)	Range / Format	Default
Password	4~6	'0'-'9','a'-'z','A'-'Z'	queclinkDM
Sub-command	1	0	
Max Download Retry	1	0 – 3	0
Download Timeout	2	10 – 30 min	20
Download Protocol	1	0|1	0
Download User Name	<=6	'0'-'9','a'-'z','A'-'Z'	
Download Password	<=6	'0'-'9','a'-'z','A'-'Z'	
Download URL	100	legal URL	
UPD Fields Mask	<=2	0 - FF	0
Update Type	1	0 – 7	0
Extend Status Report	1	0|1	0
Identifier Number	8	00000000-FFFFFFFF	
HEX Report Mask	<=8	0 – FFFFFFFF	380
Serial Number	4	0000-FFFF	
Tail Character	1	$	$

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

✧ *<Sub-command>*: **AT+GTUPD** sub command. 0 means "Starting the firmware update".

✧ *<Max Download Retry>*: It specifies the maximum number of retries to download the update file upon download failure.

✧ *<Download Timeout>*: It specifies the expiration timeout of a single download. If the download expires, it is considered to be failure.

✧ *<Download Protocol>*: The protocol used to download the file.
   ● 0: HTTP.
   ● 1: HTTPS (Only the RACQXL's OBD firmware and configuration files support this way).

✧ *<Download User Name>*: The user name for the file server which stores all kinds of update files. Only valid when *<Update Type>* is 0.

✧ *<Download Password>*: The password for file server. Only valid when the parameter *<Update*

Type> is 0.

✧ *<Download URL>*: It specifies the URL to download the update file. For OBD firmware update, it can be empty or specifies the firmware version, e.g.0007. To OBD configuration file update; it can be empty or specifies the VIN code, e.g. WF06XXGCC6FS51921. If the *<Download URL>* ends with 32 hexadecimal bytes (45BF921F0C85C974B0FDAB3E1E6206BA) generated by the server, the server will pick up the specified firmware/configuration file from the file server accordingly after receiving HTTP GET request.

✧ *<UPD Fields Mask>*:   A hexadecimal value as bitwise to control fields to be included in the HEX format report of **+RESP:GTUPD**. The Highest bit is reserved to extend more masks later. Here is detailed definition of each bit.

Bit	Field to Mask
Bit 0	Identifier Number
Bit 1	Reserved
Bit 2	Reserved
Bit 3	Reserved
Bit 4	Reserved
Bit 5	Reserved
Bit 6	Reserved
Bit 7	Reserved for more field mask

✧ *<Update Type>*: The update type.
   ● 0: The firmware which runs @Track Protocol.
   ● 1: MCU firmware.
   ● 2: OBD firmware.
   ● 3: OBD configuration file
   ● 4: BT firmware.
   ● 5: CAN bus firmware.
   ● 6: Fuel Sensor firmware.
   ● 7: Modem firmware.
✧ *<Extend Status Report>*: The type to express messages report.
   ● 0: Report the message **+RESP:GTUPD** to inform the updating status.
   ● 1: Report the message **+RESP:GTEUD** to inform the updating status.
✧ *<Identifier Number>*: A numeral to identify the updating request command. This will be included in the message **+RESP:GTEUD** to inform the request it is related to.
✧ *<Hex Report Mask>*:   A hexadecimal value as bitwise to control common fields to be included in the HEX format report of **+RESP:GTUPD**. About the detailed definition of each bit, please refer to the definition of the parameter *<Report Mask>* in the command **AT+GTDMS**.

Before the device finishes downloading the update file, the server could use the **AT+GTUPD**

(sub:1) command to cancel the current update process. If the update file is downloaded successfully, this command is ignored.

➢ **AT+GTUPD=**

Example:			
AT+GTUPD=gv55,1,,,,,0001$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
Password	4~6	'0'-'9','a'-'z','A'-'Z'	gv55
Sub-command	1	1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000-FFFF	
Tail Character	1	$	$

✧ <*Sub-command*>: **AT+GTUPD** sub command, 1 means "Cancel the current update process".

The acknowledgement message of **AT+GTUPD** command:

➢ **+ACK:GTUPD,**

Example:			
+ACK:GTUPD,2F0403,135790246811220,,0001,20090101000002,11F0$			
Parameter	**Length (Byte)**	**Range / Format**	**Default**
protocol version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9','a'-'z','A'-'Z'	
Serial Number	4	0000-FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

1.5. Real Time Operation

The command **AT+GTRTO** is used to retrieve information from the terminal or control the terminal when it executes certain actions.

➢ **AT+GTRTO=**

Example:			
AT+GTRTO=queclinkDM,2,,,,,,0015$			
Parameter	**Length (byte)**	**Range / Format**	**Default**
Password	4 – 6	'0' – '9' 'a' – 'z' 'A' – 'Z'	queclinkDM
Sub Command	2	2|F1	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Serial Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <*Sub Command*>: The valid value range is2|F1 (in ASCII format).
- ● 2: *READ*. Get the current configuration of the terminal via the message **+RESP:GTALM**.
- ● F1: **DMS**. Get the **AT+GTDMS** command parameter information.

The acknowledgment message of the **AT+GTRTO** command:

➢ **+ACK:GTRTO,**

Example:			
+ACK:GTRTO,2F0605,135790246811220,,IOS,0015,20090214093254,11F1$			
Parameter	**Length (byte)**	**Range / Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub Command	<=6	Sub Command String	

Serial Number	4	0000 – FFFF	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Sub Command>*: A string which indicates the sub command of **AT+GTRTO**.

2. Messages to the Device Management Server in ASCII Format

2.1. Device Management Report

➢ **+RESP:GTDMR:**

Example:
+RESP:GTDMR,2F0100,135790246811220,1FFF,GV55N,0105,000205,000108,20170515165500,0202,0100,20170515142500,1,12.56,1,4.01,88,0,1,1,16,0,1,3,11,20,13,18,9,16,0,20170515164504,20160907120816,160F$

Parameter	Length (byte)	Range/Format	Default
Protocol Version	6	XX0000 – XXFFFF, X ∈{'A'-'Z','0'-'9'}	
Unique ID	15	IMEI	
Report Mask	<=8	0 – FFFFFFFF	
Device Name	<=20	'0' – '9', 'a' – 'z', 'A' – 'Z'	
Hardware Version	4	'0' – '9', 'A' – 'F'	
Firmware Version	6|8	'0' – '9', 'A' – 'F'	
Last Firmware Version	6|8	'0' – '9', 'A' – 'F'	
Firmware Update Time	14	YYYYMMDDHHMMSS	
Configuration Version	4	'0' – '9', 'A' – 'F'	
Last Configuration Version	4	'0' – '9', 'A' – 'F'	
Configuration Change Time	14	YYYYMMDDHHMMSS	
Main Power Connected	1	0|1	
Main Power Voltage	<=5		
Backup Battery Connected	1	0|1	
Battery Voltage	<=4	0.0 – 4.50V	
Battery Percentage	3	0-100	
GSM State	1	0 – 5	
GPRS State	1	0 – 5	
CSQ RSSI	<=2	0 – 31|99	
CSQ BER	<=2	0 – 7|99	
GNSS On	1	0|1	
Satellites Number	1	0 – 5	
Satellite(i) ID	<=2		
Satellite(i) Power	<=2		
GNSS Fix	<=2	0	
GNSS UTC Time	14	YYYYMMDDHHMMSS	

SIM Status	1	0 – 4	
IMSI	15		
ICCID	20		
OBD Firmware Version	6	'0' – '9', 'A' – 'F'	
OBD Last Firmware Version	6	'0' – '9', 'A' – 'F'	
OBD Firmware Change Time	14	YYYYMMDDHHMMSS	
OBD Configuration Version	4	'0' – '9', 'A' – 'F'	
OBD Last Configuration Version	4	'0' – '9', 'A' – 'F'	
OBD Configuration Change Time	14	YYYYMMDDHHMMSS	
BT Firmware Version	4	'0' – '9', 'A' – 'F'	
BT Last Firmware Version	4	'0' – '9', 'A' – 'F'	
BT Firmware Change Time	14	YYYYMMDDHHMMSS	
Message Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ <Protocol Version>: The protocol version that the terminal conforms to. The first two characters point out the device type. The following four characters is the version of the device management protocol which is different from the definition of <Protocol Version> in other messages. It is composed of major version and minor version. For example, 0100 means the device management protocol version is 1.00 and 010A means the device management protocol version is 1.10.

✧ <Report Mask>: Bitwise report mask to indicate the fields included in the message of **+RESP:GTDMR**. Please refer to the parameter <Report Mask> in the command **AT+GTDMS**.

✧ <Device Name>: The name of the device. It is configured in the command **AT+GTCFG**. If Bit0 of the parameter <Report Mask> is 1, the field exists; otherwise, the field doesn't exist.

✧ <Hardware Version>: Hardware version of the device. It has two parts. The first two bytes are the major hardware version in hexadecimal format. The last two bytes are the minor hardware version in hexadecimal format. It is controlled by the Bit1 of the parameter <Report Mask>.

✧ <Firmware Version>: Current firmware version in the device. It has three parts or four parts. If the first two bytes < 0x80, it has three parts, the first two bytes are the version after "R" in the full firmware version. The middle two bytes are the version number after "A" in the full firmware version. The last two bytes are the version number after "V" in the full firmware version. If the first two bytes >= 0x80, it has four parts, the first two bytes are the customized protocol version, the second two bytes are the version after "R" in the full firmware version. The third two bytes are the version number after "A" in the full firmware version. The last two bytes are the version number after "V" in the full firmware version. It is controlled by the Bit2 of the parameter <Report Mask>.

✧ <Last Firmware Version>: The last firmware version in the device before firmware upgrading. The definition is the same as <Firmware Version>. It is controlled by the Bit3 of the parameter <Report Mask>.

✧ <Firmware Update Time>: The latest time to update firmware in the format YYYYMMDDHHMMSS. It is controlled by the Bit4 of the parameter <Report Mask>.

✧ *<Configuration Version>*: Current configuration version in the device. The first two bytes are the major configuration version in hexadecimal format. The last two bytes are the minor configuration version in hexadecimal format. It is controlled by the Bit7 of the parameter *<Report Mask>*.

✧ *<Last Configuration Version>*: The last configuration version in the device before configuration updating remotely. The definition is the same as *<Configuration Version>*. It is controlled by the Bit8 of the parameter *<Report Mask>*.

✧ *<Configuration Update Time>*: The latest time to update configuration in the format YYYYMMDDHHMMSS. It is controlled by the Bit9 of the parameter *<Report Mask>*.

✧ *<Main Power Connected>*: A numeral to indicate whether the external power is connected. It is controlled by the Bit10 of the parameter *<Report Mask>*.

✧ *<Main Power Voltage>*: The voltage of the external power. The unit is V and its accuracy is 0.01V. It is controlled by the Bit10 of the parameter *<Report Mask>*.

✧ *<Backup Battery Connected>*: A numeral to indicate whether the backup battery is connected. It is controlled by the Bit11 of the parameter *<Report Mask>*.

✧ *<Backup Battery Voltage>*: The voltage of the backup battery. The unit is V and its accuracy is 0.01V. It is controlled by the Bit11 of the parameter *<Report Mask>*.

✧ *<Backup Battery Percentage>*: The percentage level of the backup battery. It is controlled by the Bit11 of the parameter *<Report Mask>*.

✧ *<GSM State>*: The current state of GSM network. It is controlled by the Bit12 of the parameter *<Report Mask>*.
  - 0: Not registered
  - 1: Registered
  - 2: Searching network
  - 3: Registration denied
  - 4: Unknown
  - 5: Registered, roaming

✧ *<GPRS State>*: The current state of GPRS network. It is controlled by the Bit12 of the parameter *<Report Mask>*.
  - 0: Not Registered
  - 1: Registered
  - 2: Searching network
  - 3: Registration denied
  - 4: Unknown
  - 5: Registered, roaming

✧ <CSQ RSSI>: The signal strength level. It is controlled by the Bit12 of the parameter *<Report Mask>*.

CSQ RSSI	Signal Strength (dBm)
0	<-133
1	-111
2 – 30	-109 – -53
31	>-51
99	Unknown

✧ <CSQ BER>: The quality of the GSM signal. The range is 0-7, and 99is for unknown quality. It

is controlled by the Bit12 of the parameter <*Report Mask*>.

✧ <*GNSS On*>: A numeral to indicate whether the GNSS is working now. It is controlled by the Bit13 of the parameter<*Report Mask*>.
- 0: GNSS is not working now.
- 1: GNSS is working now.

✧ <*Satellites Number*>: The number of visible satellites. There are only 5 satellites at most. The TOP 5 satellites will be chosen according to the power of the satellites if the visible satellites are more than 5. It is controlled by Bit13 of the parameter <*Report Mask*>.

✧ <*Satellites (i) ID*>: The ID of the chosen visible satellites.

✧ <*Satellites (i) Power*>: The Power of the satellite whose ID is <*Satellites (i) ID*>. <*Satellites (i) ID*> and <*Satellites (i) Power*> are looped according to the value of <*Satellites Number*>. If <*Satellites Number*> is 0, both <*Satellites (i) ID*> and <*Satellites (i) Power*> don't exist.

✧ <*GNSS Fix*>: A numeral to indicate whether GNSS gets position now and the HDOP of the current GNSS position. It is always 0 because this is an event message. It is controlled by Bit13 of the parameter <*Report Mask*>.

✧ <*GNSS UTC time*>: The UTC time of the latest successful GNSS position in the format YYYYMMDDHHMMSS. It is controlled by the Bit13 of the parameter <*Report Mask*>.

✧ <*Message Time*>: The time when the message is generated in the format YYYYMMDDHHMMSS.

✧ <*Count Number*>: The sequence number of the messages rolling from 0000 to FFFF.

✧ <*SIM Status*>: A numeral to indicate the status of the SIM card. It is controlled by the Bit14 of the parameter <*Report Mask*>.
- 0: SIM card is ready.
- 1: SIM card not inserted.
- 2: SIM-PIN locked.
- 3: SIM-PUK locked.

✧ <*IMSI*>: IMSI of the SIM card in the device. It is controlled by the Bit14 of the parameter <*Report Mask*>.

✧ <*ICCID*>: ICCID of the SIM card in the device. It is controlled by the Bit14 of the parameter <*Report Mask*>.

✧ <*OBD Firmware Version*>: Current OBD firmware version in the device. It has three parts. The first two bytes are the base version in hexadecimal format. The middle two bytes are the major version in hexadecimal. The last two bytes are the minor configuration version in hexadecimal format. It is controlled by the Bit16 of the parameter <*Report Mask*>.

✧ <*OBD Firmware Change Time*>: The latest time to update OBD firmware in the format YYYYMMDDHHMMSS. It is controlled by the Bit16 of the parameter <*Report Mask*>.

✧ <*OBD Configuration Version*>: Current OBD configuration file version in the device. The first two bytes are the major configuration version in hexadecimal format. The last two bytes are the minor configuration version in hexadecimal format. It is controlled by the Bit16 of the parameter <*Report Mask*>.

✧ <*OBD Configuration Change Time*>: The latest time to update OBD configuration file in the format YYYYMMDDHHMMSS. It is controlled by the Bit16 of the parameter <*Report Mask*>.

✧ <*BT Firmware Version*>: Current Bluetooth firmware version in the device. It has two parts. The first two bytes are the major version in hexadecimal format. The last two bytes are the

minor version in hexadecimal format. It is controlled by the Bit17 of the parameter *<Report Mask>*.

✦ *<BT Last Firmware Version>*: Last Bluetooth firmware version in the device. The definition is the same as <BT *Firmware Version>*. It is controlled by the Bit17 of the parameter *<Report Mask>*.

✦ *<BT Firmware Change Time>:* The latest time to update Bluetooth firmware in the format YYYYMMDDHHMMSS. It is controlled by the Bit17 of the parameter *<Report Mask>*.

2.2. Configuration Update report

➢ **+RESP:GTUPC**

Example:
+RESP:GTUPC,2F0601,135790246811220,,10,301,http://www.queclink.com/configure.ini,20150201000000,11F0$
+RESP:GTUPC,2F0601,135790246811220,,10,301,http://www.queclink.com/45BF921F0C85C974B0FDAB3E1E6206BA,20150201000000,11F0$

Parameter	Length(Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9', 'a' - 'z', 'A'-'Z'	
Command ID	<=3		
Result	3	100|101|102|103|200|201|202|300|301|302|304|305|306|500|501|502|503|504|505|506	
Download URL	<=100	Complete URL	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	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. 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 configuration file.
- 201: The device finishes downloading the configuration file successfully.
- 202: The device fails to download the configuration file.
- 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.
- 303: Reserved.
- 304: <Command Mask> <GEO ID mask> <Stocmd ID Mask> or <Group ID Mask> check failed.
- 305: the update process is interrupted by reboot.

- 306: The update process is interrupted by md5 verification error.
- 500: The *<MD5 Encryption Data>* within the Queclink User-Agent of HTTP Get request is invalid.
- 501: The *<Unique ID>* within the Queclink User-Agent of HTTP Get request is not registered on the server. Please refer to Section 4.
- 502: The *<Unique ID>* and the *<Device Type Name>* within the Queclink User-Agent of HTTP Get request are not matched.
- 503: The *<UTC Time>* within the Queclink User-Agent of HTTP Get request is not matched with the UTC time on the server.
- 504: The *<Device Type Name>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 505: The *<Hardware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 506: The *<Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

✧ *<Download URL>*: The complete URL to download the configuration file. It includes the file name.

2.3. Configuration Update Extended Status Report

➤ **+RESP:GTEUC**

Example:
+RESP:GTEUC,2F0601,135790246811220,,0,100,http://www.queclink.com/configure.ini,2,,,,,201502010000000,11F0$
+RESP:GTEUC,2F0601,135790246811220,,0,100,http://www.queclink.com/45BF921F0C85C974B0FDAB3E1E6206BA,2,,,,,20150201000000,11F0$

Parameter	Length(Byte)	Range / Format	Default
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z', '0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9', 'a' - 'z', 'A'-'Z'	
Command ID	<=3		
Result	3	100|101|102|103|200|201|202|300|301|302|304|305|306|500|501|502|503|504|505|506	
Download URL	<=100	Complete URL	
Identifier Number	8	000000000-FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	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. 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 configuration file.
- 201: The device finishes downloading the configuration file successfully.
- 202: The device fails to download the configuration file.
- 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.
- 303: Reserved.
- 304: *<Command Mask>*, *<GEO ID Mask>*, *<Stocmd ID Mask>* or *<Group ID Mask>*check failed.
- 305: The update process is interrupted by reboot.
- 306: The update process is interrupted by md5 verification error.
- 500: The *<MD5 Encryption Data>* within the Queclink User-Agent of HTTP Get request is invalid. Please refer to Section 4.
- 501: The *<Unique ID>* within the Queclink User-Agent of HTTP Get request is not registered on the server.
- 502: The *<Unique ID>* and the *<Device Type Name>* within the Queclink User-Agent of HTTP Get request are not matched.
- 503: The *<UTC Time>* within the Queclink User-Agent of HTTP Get request is not matched with the UTC time on the server.
- 504: The *<Device Type Name>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 505: The *<Hardware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 506: The *<Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

✧ *<Download URL>*: The complete URL to download the configuration file. It includes the file name.

✧ *<Identifier Number>*: Please refer to the command **AT+GTUPC** parameter *<Identifier Number>*.

2.4. Firmware Update Report

2.4.1. Update Acknowledge

At the follow conditions, the terminal device will send the Acknowledge to the server.
- The terminal confirms the update command.
- The terminal refuses the update command.
- The server cancels the update process.
- The terminal refuses the update command as the low battery.

➢ **+RESP:GTUPD,**

EXAMPLE:			
+RESP:GTUPD,2F0403,135790246811220,,100,,20090101000000,11F0$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
protocol version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9','a'-'z','A'-'Z'	
Code	3	1<Update Type>0|1<Update Type>1|1<Update Type>2|1<Update Type>3	
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

✧ *<Code>*: Confirmed information code.
- 1*<Update Type>*0: Such as 100 or 110. The terminal confirms the update command.
- 1*<Update Type>*1: Such as 101 or 111. The terminal refuses the update command.
- 1*<Update Type>*2: Such as 102 or 112. The server cancels the update process.
- 1*<Update Type>*3: Such as 103 or 113. The terminal refuses the update command as the low battery.
- 114: The MCU model does not support upgrades.

2.4.2. Download Update File

At the follow conditions, the terminal device will send the Acknowledge to the server：
- The terminal device starts to download the update file.
- The terminal device downloads the update file successful.
- The terminal device downloads the update file fail.

➢ **+RESP:GTUPD,**

Example:

+RESP:GTUPD,2F0403,135790246811220,,200,1,20090101000000,11F0$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9','a'-'z','A'-'Z'	
Code	3	2<*Update Type*>0|2<*Update Type*>1|2<*Update Type*>2|500|501|502|503|504|505|506|507|508|509|510|511|512|513	
Download Times	1	1|2|3|4	
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

✧ <C*ode*>: Update information code.
- 2<*Update Type*>0: Such as 200 or 210. The terminal starts to download the update file.
- 2<*Update Type*>1: Such as 201 or 211. The terminal finishes downloading the update file successful.
- 2<*Update Type*>2: Such as 202 or 212. The terminal fails to download the update file.
- 500: The <*MD5 Encryption Data*> within the Queclink User-Agent of HTTP Get request is invalid. Please refer to Section 4.
- 501: The <*Unique ID*> within the Queclink User-Agent of HTTP Get request is not registered on the server.
- 502: The <*Unique ID*> and the <*Device Type Name*> within the Queclink User-Agent of HTTP Get request are not matched.
- 503: The <*UTC Time*> within the Queclink User-Agent of HTTP Get request is not matched with the UTC time on the server.
- 504: The <*Device Type Name*> within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in <*Download URL*>.
- 505: The <*Hardware Version*> within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in <*Download URL*>.
- 506: The <*Firmware Version*> within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in <*Download URL*>.
- 507: The <*MCU Version*> within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in <*Download URL*>.
- 508: The <*OBD Firmware Version*> within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in <*Download URL*>.

● 509: The *<OBD Configuration Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

● 510: The *<BT Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

● 511: The *<CAN Bus Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

● 512: The *<Fuel Sensor Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

● 513: The *<Modem Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

✧ *<Download Times>*: The number of times to upgrade differential packet successful.

2.4.3. Update Firmware

At the follow conditions, the terminal device will send the Acknowledge to the server

● The terminal device starts to update.
● The terminal device updates successfully.
● The terminal device failed to update.
● The update process cancels as the low battery.

➢ **+RESP:GTUPD,**

Example:			
+RESP:GTUPD,2F0403,135790246811220,,300,,20090101000000,11F0$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
protocol version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
unique ID	15	IMEI	
device name	<=10	'0'-'9','a'-'z','A'-'Z'	
code	3	3*<Update Type>*0|3*<Update Type>*1|3*<Update Type>*2||3*<Update Type>*3	
reserved	0		
send time	14	YYYYMMDDHHMMSS	
count number	4	0000-FFFF	
tail character	1	$	$

✧ *<Code>*: Update information code.

● 3*<Update Type>*0: Such as 300 or 310. The terminal device starts to update.

● 3*<Update Type>*1: Such as 301 or 311. The terminal device updates successful.

● 3*<Update Type>*2: Such as 302 or 312. The terminal device failed to update.

● 3<Update Type>3: Such as 303 or 313. The update process cancels as the low battery.

2.5. Firmware Update Extended Status Report

2.5.1. Update Acknowledge

At the follow conditions, the terminal device will send the Acknowledge to the server.
- The terminal confirms the update command.
- The terminal refuses the update command.
- The server cancels the update process.
- The terminal refuses the update command as the low battery.

➢ **+RESP:GTEUD,**

EXAMPLE:			
+RESP:GTEUD,2F0403,135790246811220,,100,,2,,,,,20090101000000,11F0$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
protocol version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9','a'-'z','A'-'Z'	
Code	3	1<*Update Type*>0|1<*Update Type*>1|1<*Update Type*>2|1<*Update Type*>3	
Reserved	0		
Identifier Number	8	00000000-FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

2.5.2. Download Update File

At the follow conditions, the terminal device will send the Acknowledge to the server：
- The terminal device starts to download the update file.
- The terminal device downloads the update file successful.
- The terminal device downloads the update file fail.

➢ **+RESP:GTEUD,**

Example:			
+RESP:GTEUD,2F0403,135790246811220,,200,1,2,,,,,20090101000000,11F0$			
Parameter	**Length (byte)**	**Range/Format**	**Default**

Protocol Version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
Unique ID	15	IMEI	
Device Name	<=10	'0'-'9','a'-'z','A'-'Z'	
Code	3	2<*Update Type*>0|2<*Update Type*>1|2<*Update Type*>2|500|501|502|503|504|505|506|507|508|509|510|511|512|513	
Download Times	1	1|2|3|4	
Identifier Number	8	00000000-FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000-FFFF	
Tail Character	1	$	$

2.5.3. Update Firmware

At the follow conditions, the terminal device will send the Acknowledge to the server

- The terminal device starts to update.
- The terminal device updates successfully.
- The terminal device failed to update.
- The update process cancels as the low battery.

➢ **+RESP:GTEUD,**

Example: +RESP:GTUPD,2F0403,135790246811220,,300,,2,,,,,20090101000000,11F0$			
Parameter	**Length(byte)**	**Range/Format**	**Default**
protocol version	6	XX0000–XXFFFF, X∈{'A'–'Z','0'–'9'}	
unique ID	15	IMEI	
device name	<=10	'0'-'9','a'-'z','A'-'Z'	
code	3	3<*Update Type*>0|3<*Update Type*>1|3<*Update Type*>2||3<*Update Type*>3	
Reserved	0		
Identifier Number	8	000000000-FFFFFFFF	
Reserved	0		
Reserved	0		
Reserved	0		
Reserved	0		
send time	14	YYYYMMDDHHMMSS	
count number	4	0000-FFFF	

tail character	1	$	$

2.6. Report for Real Time Querying: RESP:GTALS

After the device receives the command **AT+GTRTO** to get sub AT command configuration information, it will send the configuration information to the server via the message **+RESP:GTALS**. Configuration information varies with different AT Commands. For example, to get DMS configuration, set **AT+GTRTO=gv55,F1,,,,,,0015**$**.**

➢ **+RESP:GTALS,**

Example: +RESP:GTALS,2F0802,863830030749655,,DMS,3,queclinkDM,1,60.174.225.171,10011,,,1,0000 7F9F,,0,,0,30,,20180911070050,001E$			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Protocol Version	6	XX0000 – XXFFFF, X∈{'A' – 'Z','0' – '9'}	
Unique ID	15	IMEI	
Device Name	<=20	'0' – '9' 'a' – 'z' 'A' – 'Z' '-' '_'	
Sub AT Command	3	'a' – 'z' 'A' – 'Z' ' '	DMS
Report Mode	1	0|1|2|3	
New Password	4-20	'0' – '9', 'a' – 'z', 'A' – 'Z'	
Buffer Enable	1	0|1	
Server IP/Domain Name	<=60		
Server Port	<=5	0 – 65535	
Reserved	0		
Reserved	0		
Report Interval	<=5	0|1 – 43200 min	
Report Mask	<=8	0 – FFFFFFFF	
Reserved	0		
SACK Enable	1	0|1	
Reserved	0		
Report Format	0	0|1	
Connection Life	<=3	0|10 – 600s	
Reserved	0		

Send Time	14	YYYYMMDDHHMMSS	
Count Number	4	0000 – FFFF	
Tail Character	1	$	$

✧ *<Sub AT Command >*: This field is fixed to DMS characters due to the query sub instruction fixed to F1.

3. Reports to the Device Management Server in HEX format

3.1. General definition of HEX format report

Example:			
Parameter	**Length (byte)**	**Range/Format**	**Default**
Message Header	4	+HEX	
Message Type	1		
Message Length	2		
Protocol Version	3	XX0000 – XXFFFF, X∈{'A'-'Z','0'-'9'}	
Unique ID	8	IMEI	
Report Mask	4	0x0000–0xFFFF	
Device Name	<=20	'0' – '9', 'a' – 'z', 'A' – 'Z'	
Hardware Version	2		
Firmware Version	3|4		
Last Firmware Version	3|4		
Firmware Update Time	5		
Configuration Version	2	'0' – '9', 'A' – 'F'	
Last Configuration Version	2	'0' – '9', 'A' – 'F'	
Configuration Change Time	5		
Main Power Voltage	2		
Battery Voltage	2		
Battery Percentage	1	0-100	
Network Info	2		
GNSS State/Satellites Number	1		
Satellite(i) ID	1		
Satellite(i) Power	1		
GNSS Fix	1	0|1 – 50	
GNSS UTC Time	5		
SIM Status	1	0 – 4	
IMSI	8		
ICCID	10		
OBD Firmware Version	3	'0' – '9', 'A' – 'F'	
OBD Last Firmware Version	3	'0' – '9', 'A' – 'F'	
OBD Firmware Change Time	5		
OBD Configuration Version	2	'0' – '9', 'A' – 'F'	
OBD Last Configuration	2	'0' – '9', 'A' – 'F'	

Version			
OBD Configuration Change Time	5		
BT Firmware Version	2	'0' – '9', 'A' – 'F'	
BT Last Firmware Version	2	'0' – '9', 'A' – 'F'	
BT Firmware Change Time	5		
Message Body	>=0		
Message Time	5	YYYYMMDDHHMMSS	
Count Number	2	0000 – FFFF	
Checksum	2	0000 – FFFF	
Tail Characters	2	0x0D 0x0A	0x0D 0x0A

✧ *<Message Header>*: +HEX means the message is a message in HEX format.

✧ *<Message Type>*: A numeral to indicate the type of the message to report. Please refer to the following table for the detailed definition of each message type.

Value	Message
0	+RESP:GTDMR
1	+RESP:GTUPC
2	+RESP:GTUPD

✧ *<Message Length>*: The length of the message from the header to the end.

✧ *<Protocol Version>*: The protocol version that the terminal conforms to. The first byte points out the device type. The second byte points out the major version number of the device management protocol and the last byte points out the minor version number of the device management protocol.

✧ *<Unique ID>*: IMEI of the device 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 in decimal. And the last digits are converted to an integer in decimal only.

IMEI	13	57	90	24	68	11	22	0
HEX	0D	39	5A	18	44	0B	16	00

✧ *<Device Name>*: The name of the device. It is configured in the command **AT+GTCFG**. It is a printable string end with '\0'. If Bit0 of the parameter *<Report Mask>* is 1, the field exists; otherwise, the field doesn't exist.

✧ *<Hardware Version>*: Hardware version of the device. It has two parts. The first byte is the major hardware version in hexadecimal format. The last byte is the minor hardware version in hexadecimal format. It is controlled by the Bit1 of the parameter *<Report Mask>*.

✧ *<Firmware Version>*: Current firmware version in the device. It has three parts or four parts. If the first byte< 0x80, it has three parts, the first byte is the version after "R" in the full firmware version. The middle byte is the version number after "A" in the full firmware version. The last byte is the version number after "V" in the full firmware version. If the first byte>= 0x80, it has four parts, the first byte is the customized protocol version, the second byte is the version after "R" in the full firmware version. The third byte is the version

number after "A" in the full firmware version. The last byte is the version number after "V" in the full firmware version. It is controlled by the Bit2 of the parameter <*Report Mask*>.

✧ <*Last Firmware Version*>: The last firmware version in the device before firmware upgrading. The definition is the same as <*Firmware Version*>. It is controlled by the Bit3 of the parameter <*Report Mask*>.

✧ <*Firmware Update Time*>: The latest time to update firmware. It is controlled by the Bit4 of the parameter <*Report Mask*>.The MSB is at the beginning of the parameter. Here are detailed definitions of the parameter by bit.

Bit26 ~ Bit39	Bit22 ~ Bit25	Bit17 ~ Bit21	Bit12 ~ Bit16	Bit6 ~ Bit11	Bit0 ~ Bit5
Year	Month	Day	Hour	Minute	Second

✧ <*Configuration Version*>: Current configuration version in the device. The first byte is the major configuration version. The last byte is the minor configuration version. It is controlled by the Bit7 of the parameter <*Report Mask*>.

✧ <*Last Configuration Version*>: The last configuration version in the device before configuration updating remotely. The definition is the same as <*Configuration Version*>. It is controlled by the Bit8 of the parameter <*Report Mask*>.

✧ <*Configuration Update Time*>: The latest time to update configuration. It is controlled by the Bit9 of the parameter <*Report Mask*>. The detailed definition of the parameter is the same as the parameter <*Firmware Update Time*>.

✧ <*Main Power Voltage*>: The voltage of the external power. The unit is 0.01V. And 0xFFFF means the external power is not connected. It is controlled by the Bit10 of the parameter <*Report Mask*>.

✧ <*Backup Battery Voltage*>: The voltage of the backup battery. The unit is 0.01V. And 0xFFFF means no backup battery. It is controlled by the Bit11 of the parameter <*Report Mask*>.

✧ <*Backup Battery Percentage*>: The percentage level of the backup battery. It is controlled by the Bit11 of the parameter <*Report Mask*>.

✧ <*Network Info*>: The parameter defines the network state and signal quality. It is controlled by the Bit12 of the parameter <*Report Mask*>. Here are the detailed definitions of the parameter.

Bit15 ~ Bit13	Bit12 ~ Bit10	Bit9 ~ Bit4	Bit3~ Bit0
Network State	PS State	CSQ RSSI	CSQ BER

Here are the definitions of Network State:
- 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

Here are the definitions off PS state which indicates the state for data service network:
- 0: No registered, not searching for a new operator
- 1: Registered
- 2: Not registered, searching for a new operator

- 3: Registering
- 4: Unknown
- 5: Registered, roaming

Here are the definitions of **CSQ RSSI**:

RSSI	Signal Strength (dBm)
0	<-133
1	-111
2 – 30	-109 – -53
31	>-51
63	Unknown value

About the part of **CSQ BER**, its range is 0 – 7 | 15. 15 means BER is unknown

✧ <*GNSS State/Satellites Number*>: It includes the current state of GNSS and the number of visible satellites. It is controlled by the Bit13 of the parameter<*Report Mask*>. Here are the detailed definitions of the parameter.

Bit7 ~ Bit6	Bit5 ~ Bit0
GNSS State	Satellites Number

Here is the detailed definition of GNSS State.
- 0: GNSS is not working now.
- 1: GNSS is working now.

"Satellites number" gives the number of the visible satellites. It defines the number of following <*Satellite (i) ID*> and <*Satellite (i) Power*>.The maximum number of visible satellites to be included is 5. The TOP 5 satellites will be chosen according to the power of the satellites if the visible satellites are more than 5.

✧ <*Satellite (i) ID*>: The ID of the chosen visible satellites.

✧ <*Satellite (i) Power*>: The Power of the satellite whose ID is <*Satellites (i) ID*>. <*Satellites (i) ID*> and <*Satellites (i) Power*> are looped according to the value of "Satellites number". If "Satellites number" is 0, both <*Satellites (i) ID*> and <*Satellites (i) Power*> don't exist.

✧ <*GNSS Fix*>: A numeral to indicate whether GNSS gets position now and the HDOP of the current GNSS position. It is always 0 because this is an event message. It is controlled by Bit13 of the parameter<*Report Mask*>.

✧ <*GNSS UTC time*>: The UTC time of the latest successful GNSS position. It is controlled by the Bit13 of the parameter <*Report Mask*>. The detailed definition of the parameter is the same as parameter <*Firmware Update Time*>.

✧ <*SIM Status*>: A numeral to indicate the status of the SIM card. It is controlled by the Bit12 of the parameter <*Report Mask*>.
- 0: SIM card is ready.
- 1: SIM-PIN locked.
- 2: SIM-PUK locked.
- 3: SIM card not inserted.
- 4: SIM card wrong.

✧ <*IMSI*>: IMSI of the SIM card in the device. It is controlled by the Bit14 of the parameter <*Report Mask*>. Every two bytes of IMSI will be converted to an integer in hexadecimal. And

the byte will be converted to an integer in hexadecimal only. Here is an example.

IMSI	46	00	10	24	68	11	22	3
HEX	46	00	10	24	68	11	22	03

✧ <*ICCID*>: ICCID of the SIM card in the device. It is controlled by the Bit14 of the parameter <*Report Mask*>. Every two bytes of IMSI will be converted to an integer in hexadecimal.. Here is an example.

ICCID	89	86	00	00	09	09	17	21	49	53
HEX	89	86	00	00	09	09	17	21	49	53

✧ <OBD Firmware Version>: Current OBD firmware version in the device. The first byte is the base version. The middle byte is the major version. The last byte is the minor version. It is controlled by the Bit16 of the parameter <*Report Mask*>.

✧ <*OBD Firmware Change Time*> The latest time to update OBD firmware. It is controlled by the Bit16 of the parameter <*Report Mask*>. The detailed definition of the parameter is the same as the parameter <*Firmware Update Time*>.

✧ <*OBD Configuration Version*> Current OBD configuration file version in the device. The first byte is the major configuration version. The last byte is the minor configuration version. It is controlled by the Bit16 of the parameter <*Report Mask*>.

✧ <*OBD Configuration Change Time*> The latest time to update OBD configuration file. It is controlled by the Bit16 of the parameter <*Report Mask*>. The detailed definition of the parameter is the same as the parameter <*Firmware Update Time*>.

✧ <*BT Firmware Version*>: Current Bluetooth firmware version in the device. The first byte is the major version. The last byte is the minor version. It is controlled by the Bit17 of the parameter <*Report Mask*>.

✧ <*BT Last Firmware Version*>: Last Bluetooth firmware version in the device. The definition is the same as <BT *Firmware Version*>. It is controlled by the Bit17 of the parameter <*Report Mask*>.

✧ <*BT Firmware Change Time*>: The latest time to update Bluetooth firmware. It is controlled by the Bit17 of the parameter <*Report Mask*>.

✧ <*Message Body*>: The body part of different message type. If the message type is **+RESP:GTDMR**, this field is empty. Please refer to the following chapters for the detailed message body for other reports.

✧ <*Message Time*>: The time when the message is generated. The detailed definition of the parameter is the same as the parameter <*Firmware Update Time*>.

✧ <*Count Number*>: The sequence number of the messages rolling from 0x0000 to 0xFFFF.

✧ <*Checksum*>: The CRC16 checksum for data from <*Message Header*> to <*Count Number*>.

3.2. Message Body of +RESP:GTUPC

Parameter	Length (byte)	Range / Format	Default
UPC Fields Mask	1		
Command ID	2		
Code	2		
Identifier Number (Optional)	4	00000000 - FFFFFFFF	

✧ *<UPC Fields Mask>*: A bitwise mask to inform the included optional fields. Please refer to the definition of the parameter *<UPC Fields Mask>* in the command **AT+GTUPC**.

✧ *<Command ID>*: The command ID in the update configuration file. It is always 0 before the device starts to update the configuration. It is the total number of commands when the response code is 301. It is the command ID with wrong format when the response code is 302.It is 0 when the response code is 304 or 305.

✧ *<Code>*: 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 as the low battery.
  - 200: The device starts to download the configuration file.
  - 201: The device finishes downloading the configuration file successfully.
  - 202: The device fails to download the configuration file.
  - 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.
  - 303: Reserved.
  - 304: *<Command Mask>*, *<GEO ID Mask>*, *<Stocmd ID Mask>* or *<Group ID Mask>* check failed.
  - 305: The update process is interrupted by reboot.
  - 500: The *<MD5 Encryption Data>* within the Queclink User-Agent of HTTP Get request is invalid.
  - 501: The *<Unique ID>* within the Queclink User-Agent of HTTP Get request is not registered on the server. Please refer to Section 4.
  - 502: The *<Unique ID>* and the *<Device Type Name>* within the Queclink User-Agent of HTTP Get request are not matched.
  - 503: The *<UTC Time>* within the Queclink User-Agent of HTTP Get request is not matched with the UTC time on the server.
  - 504: The *<Device Type Name>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
  - 505: The *<Hardware Version>* within the Queclink User-Agent of HTTP Get request

is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

● 506: The *<Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

✧ *<Identifier Number>*: Please refer to the parameter *<Identifier Number>* in command **AT+GTUPC**. It is used to bind the report and the corresponding command which generated the configuration updated.

3.3. Message Body of +RESP:GTUPD

Parameter	Length (byte)	Range / Format	Default
UPD Fields Mask	1		
Code	2		
Identifier Number (Optional)	4	00000000 - FFFFFFFF	

✧ *<UPD Fields Mask>*: A bitwise mask to inform the included optional fields. Please refer to the definition of the parameter *<UPD Fields Mask>* in the command **AT+GTUPD**.

✧ *<Code>*: A numeral to indicate whether the configuration is updated successfully.
- 1*<Update Type>*0: Such as 100 or 110. The terminal confirms the update command.
- 1*<Update Type>*1: Such as 101 or 111. The terminal refuses the update command.
- 1*<Update Type>*2: Such as 102 or 112. The server cancels the update process.
- 1*<Update Type>*3: Such as 103 or 113. The terminal refuses the update command as the low battery.
- 114: The MCU model does not support upgrades.
- 2*<Update Type>*0: Such as 200 or 210. The terminal starts to download the update file.
- 2*<Update Type>*1: Such as 201 or 211. The terminal finishes downloading the update file successful.
- 2*<Update Type>*2: Such as 202 or 212. The terminal fails to download the update file.
- 500: The *<MD5 Encryption Data>* within the Queclink User-Agent of HTTP Get request is invalid. Please refer to Section 4.
- 501: The *<Unique ID>* within the Queclink User-Agent of HTTP Get request is not registered on the server.
- 502: The *<Unique ID>* and the *<Device Type Name>* within the Queclink User-Agent of HTTP Get request are not matched.
- 503: The *<UTC Time>* within the Queclink User-Agent of HTTP Get request is not matched with the UTC time on the server.
- 504: The *<Device Type Name>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 505: The *<Hardware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 506: The *<Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 507: The *<MCU Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 508: The *<OBD Firmware Version>* within the Queclink User-Agent of HTTP Get request is

not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.

- 509: The *<OBD Configuration Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 510: The *<BT Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 511: The *<CAN Bus Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 512: The *<Fuel Sensor Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 513: The *<Modem Firmware Version>* within the Queclink User-Agent of HTTP Get request is not matched with the specified file picked up by the server according to 32 hexadecimal bytes in *<Download URL>*.
- 3*<Update Type>*0: Such as 300 or 310. The terminal device starts to update.
- 3*<Update Type>*1: Such as 301 or 311. The terminal device updates successful.
- 3*<Update Type>*2: Such as 302 or 312. The terminal device failed to update.
- 3<Update Type>3: Such as 303 or 313. The update process cancels as the low battery.

✧ *<Identifier Number>*: Please refer to the parameter *<Identifier Number>* command **AT+GTUPD**. It is used to bind the report and the corresponding command which generated the configuration updated.

4. Queclink User-Agent Format

The Queclink User-Agent is used to validate the HTTP Get request initiated from Queclink device to the server. Only when the Queclink User-Agent within the HTTP Get request is valid, then the server will allow the device to download the specified file. The separator among all fields in Queclink User-Agent is the hyphen '-'.

➢ **Queclink User-Agent Format**

Example:
0400-862369030427856-20181213164600-03-GV300N-0102-FF-(80)001501-0103-0921-04010A-0102-0201-2.2.2a_ SN108744-411D-000208-2c79932edcc6f49407c728cffda41ca5

SN	Parameter	Length (byte)	Range/Format	Default
1	DM Protocol Version	4	'0' – '9'	
2	Unique ID	15	IMEI	
3	UTC Time	14	YYYYMMDDHHMMSS	
4	UA Flag	2	00 – FF	
5	Device Type Name	<=20	'0'-'9','a'-'z','A'-'Z'	
6	Hardware Version	4	'0' – '9', 'A' – 'F'	
7	Version Mask	<=4	0 – FFFF	
8	Firmware Version	6|8	'0' – '9', 'A' – 'F'	
9	MCU Firmware Version	4	'0' – '9', 'A' – 'F'	
10	OBD Firmware Version	6	'0' – '9', 'A' – 'F'	
11	OBD Configuration Version	4	'0' – '9', 'A' – 'F'	
12	BT Firmware Version	4	'0' – '9', 'A' – 'F'	
13	CAN Bus Firmware Version	<=20	ASCII	
14	Fuel Sensor Version	4	'0' – '9', 'A' – 'F'	
15	Modem Firmware Version	6	'0' – '9', 'A' – 'F'	
16	MD5 Encryption Data	32	'0' – '9', 'a' – 'f'	

✧ *<DM Protocol Version>*: The version of the device management protocol. It is composed of major version and minor version. For example, 0100 means the device management protocol version is 1.00 and 010A means the device management protocol version is 1.10.

✧ *<UTC Time>*: The UTC time when HTTP Get request from the device is generated.

✧ *<UA Flag>*: A bitwise mask to indicate some information within the Queclink User-Agent.
   ● Bit 0 for *<UTC Time>*: 0 means the *<UTC Time>* of the device is not adjusted by network, NTP or GNSS. 1 means it is adjusted.
   ● Bit 1 for the update type of the HTTP Get request. 0 means **AT+GTUPD** firmware update. 1 means **AT+GTUPC** configuration update.

✧ *<Device Type Name>*: The name of the device type. Such as 'GV300N'.

✧ *<Hardware Version>*: Hardware version of the device. It has two parts. The first two bytes

are the major hardware version in hexadecimal format. The last two bytes are the minor hardware version in hexadecimal format.

✧ <*Version Mask*>: A bitwise mask to indicate the fields to be included in the Queclink User-Agent. Each bit represents a field. If a bit is set as 1, the corresponding field will be filled. Otherwise, the field will not exist.

Bit	Item to Mask
Bit 0	Firmware Version
Bit 1	MCU Firmware Version
Bit 2	OBD Firmware Version
Bit 3	OBD Configuration Version
Bit 4	BT Firmware Version
Bit 5	CAN Bus Firmware Version
Bit 6	Fuel Sensor Version
Bit 7	Modem Firmware Version

✧ <*Firmware Version*>: Current firmware version in the device. It has three parts or four parts. If the first two bytes < 0x80, it has three parts, the first two bytes are the version after "R" in the full firmware version. The middle two bytes are the version number after "A" in the full firmware version. The last two bytes are the version number after "V" in the full firmware version. If the first two bytes >= 0x80, it has four parts, the first two bytes are the customized protocol version, the second two bytes are the version after "R" in the full firmware version. The third two bytes are the version number after "A" in the full firmware version. The last two bytes are the version number after "V" in the full firmware version.

✧ <*MCU Firmware Version*>: The MCU 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**.

✧ <*OBD Firmware Version*>: The OBD firmware version. The first two characters represent the first part of the version number, the middle characters represent the second part of the version number and the last two characters represent the last part of the version number. For example, 04010A means the version 4.1.10.

✧ <*OBD Configuration Version*>: Current OBD configuration file version in the device. The first two bytes are the major configuration version in hexadecimal format. The last two bytes are the minor configuration version in hexadecimal format.

✧ <*BT Firmware Version*>: Current Blue tooth firmware version in the device. It has two parts. The first two bytes are the major version in hexadecimal format. The last two bytes are the minor version in hexadecimal format.

✧ <*CAN Bus Firmware Version*>: Current CAN Bus firmware version in the device. It has two stings connected with underline '_', i.e. 2.2.2a_ SN108744. The first string '2.2.2a' means firmware version number and the second string 'SN108744' means the serial number of the CAN Bus device.

✧ <*Fuel Sensor Version*>: Current fuel sensor version in the device. It has three parts. The first

byte is the fuel sensor protocol version. The second two bytes are fuel sensor firmware version. The last byte is the fuel sensor hardware version.

✧ <*Modem Firmware Version*>: Current modem firmware version in the device. It has three parts. The first two bytes are the version after "R" in the full firmware version. The middle two bytes are the version number after "A" in the full firmware version. The last two bytes are the version number after "V" in the full firmware version.

✧ <*MD5 Encryption Data*>: The 32 hexadecimal bytes data encrypted by using MD5 based on all previous fields within Queclink User-Agent.