

Protocol Document

TS101-Advanced



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REVISION HISTORY

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1	1.0	27/02/17	Initial Release	Initial Release
2	1.1	12/03/17	Add commands related to HA, HB, UART and Maintenance server	First revision
3	1.2	23/03/17	Add Batch mode description & disable 1 st packet command	Second revision
4	1.3	03/04/17	Add server command response and Password change command	Third revision
5	1.4	14/04/17	Added 2 digital Input and a digital Output	Fourth Version

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Introduction

This document is a reference for implementation of communication protocol between TS101 Advanced device and the tracking Server. This document defines specifics for communication such as packets formats, periodicity, and data type of the information. It also gives you a brief understanding of all the information which is sent by the device to the server. Also listed are the Configuration commands required to configure the different settings in the device.

Intended audience

Architecture design team, hardware design team, testing team, system integrators and clients who are interested in some sort of enhancement or device protocol integration.

Communication Protocol

The communication between the TS101 Advanced and Track server is socket based single threaded client server communication on TCP/IP. TS101 Advanced is considered as client and initiates the communication request on a regular basis called transmission periodicity. On every transmission, TS101 Advanced requests for a connection on a port using the server IP address. If the server is listening on that port, the server establishes the socket connection and creates a separate thread for further communication with that TS101 Advanced device (client). After establishing communication with the server, the client sends information packets to the server through the established socket. No acknowledgement from the server side to the device is required, once the connection is established the device keeps sending data while the server keeps receiving the data through the listener port. The server after receiving each packet, should parse the packets according to the below mentioned protocol. The parser will also be responsible to insert the data into corresponding tables in the database. The different Packet Formats are as explained in the following sections.

Packet Formats

The device sends data to the server in the following formats:

- a. First Packet Format (Reboot Packet)
- b. Tracking Packet (Expanded Format)
- c. Tracking Packet (Compressed Format)
- d. Serial data Packet Format

First Packet Format (Connection packet)

This packet is the first packet which is sent to the server after connection with the server. Subsequently, the connection packet is sent every time the device reconnects to the server in event of socket disconnection.

\$\$CLIENT_1ZF,101010107,15,1_35TS2B0164M,45.118.182.112,17499,internet,T1:10 S,T2:1 M,Ad1:9164061023,Ad2:9164061023,TOF:0 S,,OSC:75 KM,OST:0 S,GPS:NO,Ignition:ON,*33

SL NO	String	Parameter	Description	Data Type
1	\$\$	Packet Header	\$\$ indicates beginning of the packet	String
2	CLIENT_1ZF	Client ID		String
3	140214426	Serial Number/IMEI number of the Device	Unique Serial Number or IMEI of the device	Unsigned Integer
4	15	Event/ Message code	Refer event/ Message code Table:2	Unsigned Integer
5	1_35TS2B0164M	Firmware Version	Firmware version number currently installed in the device	String
6	45.118.182.112	IP Address/DNS	IP address/DNS where the device is reporting to.	String
7	17499	Port Number	Port number where data is being sent	Unsigned Integer
8	internet	APN	APN provided by the service provider	String
9	T1:10 S	Ignition ON reporting interval	Duration in which data is being sent during IGN ON	String
10	T2:1 M	Ignition OFF reporting interval	Duration in which data is being sent during IGN OFF	String
11	Ad1:9164061023	Admin number 1	Currently configured Admin 1 number	String
12	Ad2:9164061023	Admin number 2	Currently configured Admin 2 number	String

		Device	of the device	
4	1	Message/Event code	Refer Message/Event Code Table:2	Unsigned Integer
5	12.962985	Latitude		Float
6	77.576484	Longitude		Float
7	140127165433	Date and time	In yymmddHHMMSS format.	Unsigned Integer
8	A	GPS Status	A= valid. V = invalid.	Character
9	22	GSM Signal	0 to 31.	Unsigned Integer
10	0	Speed	Vehicle Speed in KM/H.	Unsigned Integer
11	0	Accumulated Distance	This field denotes the accumulated distance value in metres. Hence 2.2kms will be denoted here as 2200. (Odometer based on GPS).	Unsigned Integer
12	140	Course in degree	This value represents the heading direction in degree value. (0-360 degrees)	Unsigned Integer
13	6	Satellites in View	Shows the total number of satellites being used for Location points (0-12)	Unsigned Integer
14	0.8	HDOP	Horizontal Dilution of Precision	Float
15	0	Reserved for expansion	Reserved	Boolean
16	0	Reserved for expansion	Reserved	Boolean
17	6000	Voltage equivalent of Analog I/P	Analog input value measured in millivolts. Here it displays	Integer

		reading	6V.	
18	0	Digital Input 1 Status	1= high 0=low	Boolean
19	0	Case open switch status (Tamper switch)	1= Case is open. 0=Case is closed (when record was generated)	Boolean
20	0	Over speed started	1 if the over speed condition has started in this record	Boolean
21	0	Over speed End	1 if the over speed condition has ended in this record	Boolean
22	0	Reserved	Reserved	Boolean
23	0	Reserved	Reserved	Boolean
24	0	Immobilizer Violation Alert	This bit will set if Ignition ON(Ign-1) or speed value is detected when the Digital Output bit is High (Dout-1), else will remain 0.	Boolean
25	0	Power Status	0= Running on vehicle battery 1= Running on internal battery (main power disconnect)	Boolean
26	0	Digital Input 2 Status	1= high 0=low	Boolean
27	0	Reserved	Reserved	Boolean
28	0	Reserved	Reserved	Boolean
29	0	Ignition Status	Status of Ignition Input 1=Ignition ON & 0= Ignition OFF	Boolean
30-35	0, 0, 0, 0.....	Reserved for	Number of fields reserved	Boolean

		expansion	for future enhancement	
36	0	Internal Battery Low Alert	<p>1- Internal Battery below 35%. 0- Sufficient Internal battery</p> <p>*The device will not generate packets nor execute commands if the battery voltage goes below 30%.</p>	Boolean
37	1	Angle Polling bit	<p>It sets every time the packet generated is due to the Angle polling. The min angle can be set using the command given in the command list below.</p> <p>0- Normal interval packet 1- Angle polling packet</p>	Boolean
38-41	0,0,0,0	Reserved for expansion	Reserved	Boolean
42	0	Digital Output 1 Status	1= Enabled 0=Disabled	Boolean
43	0	Reserved for expansion	Reserved	Boolean
44	0	Harsh Acceleration (HA)	<p>Bit gets set when Harsh acceleration event is detected.</p> <p>0- No HA event 1- HA event detected</p>	Boolean
45	0	Harsh Braking (HB)	Bit gets set when Harsh braking	Boolean

			event is detected. 0- No HB event 1- HB event detected	
46		Reserved	Reserved	Boolean
47		Digital Input 3 Status	1= high 0=low	Boolean
48	0	Digital Input 4 Status	1= high 0=low	Boolean
49	0	Digital Output 2 Status	1= Enabled 0=Disabled	Boolean
50	12530	External Battery Voltage	This value indicates the external battery voltage in milli-volts. Here it is 12.53V	Unsigned Integer
51	4200	Internal Battery Voltage	This value represents the internal battery voltage. Here it is 4.20V	Unsigned Integer
52	*	Separator b/w data & checksum		Character
53	26	Checksum	XOR of all data excluding data separator (*), checksum itself and ending characters. Value displayed in HEX	Integer
54	\r\n	Ending characters	2 Bytes. ASCII (0x0D, 0x0A).	

Tracking Packet Format (Compressed bit Format)

This format reverses the data bytes from the 18th to 49th position and then converts it into an event flag (decimal number) positioned on the 18th position of the protocol. The event flag can be converted into binary to get the actual data of individual bits. You can enable this packet format by using the **Compress Bitfield** command as given below:

set\$<SerialNumber/IMEI>@<Password>#CFG_COMPBF:<1=Enable/0=Disable>*

Example Compressed Tracking Packet (comma separated ASCII format)

\$\$CLIENT_1ZF,130329214,1,12.962985,77.576484,140127165433,A,22,0,0,140,6,0.8,0,0,0,00400008,1253,420,*26

SL NO	String	Parameter	Description	Data Type
1	\$\$	Package Header.	\$\$ indicates beginning of the packet	String
2	CLIENT_1DU	Client ID		String
3	140214426	Serial Number/IMEI number of the Device	Unique Serial Number or IMEI of the device	Unsigned Integer
4	1	Message/Event code (reason for packets)	Refer Message/Event Code Table:2	Unsigned Integer
5	12.962985	Latitude		Float
6	77.576484	Longitude		Float
7	140127165433	Date and time	In yymmddHHMMSS format.	Unsigned Integer
8	A	GPS Status	A= valid. V = invalid.	Character
9	22	GSM Signal	0 to 31.	Unsigned Integer
10	0	Speed	With Decimal digit. In KM/H.	Unsigned Integer
11	0	Accumulated Distance	Accumulated Distance (Odometer based on GPS).	Unsigned Integer
12	140	Course in degree	This value represents the heading direction in degree value.(0-360degrees)	Unsigned Integer
13	6	Satellites in View	Shows the total number of satellites being used for Location points (0-12)	Unsigned Integer

14	0.8	HDOP	Horizontal Dilution of Precision	Float
15	0	Reserved for expansion	Reserved	NA
16	0	Reserved for expansion	Reserved	NA
17	0	Voltage equivalent of fuel level (Analog I/P reading)	Analog input 1 measured in millivolts	Integer
18	4194312	Event Flag	Displayed in decimal, this field can be converted to binary to get the positional data for the 32 information fields as explained in the table below. (Please refer table:1)	Unsigned Integer
19	12530	External Battery Voltage	This value indicates the external battery voltage in millivolt. Here it is 12.53V	Unsigned Integer
20	4200	Internal Battery Voltage	This value represents the internal battery voltage in millivolt. Here it is 4.20V	Unsigned Integer
21	*	Separator b/w data & checksum		Character
22	26	Checksum	XOR of all data excluding data separator(*), checksum itself and ending characters. Value displayed in HEX	Integer
23	\r\n	Ending characters	2 Bytes. ASCII (0x0D, 0x0A).	

Event Flag Explanation

As shown below, the data for the 32 bit fields can be got by converting the unsigned decimal integer in place of the Event Flag, to binary.

Eg. Event Flag- 5244968

32 bit Binary representation of 5244968 = (MSB) 00000000101000000010000101000

0	Digital Output 2	31 (MSB)
0	Digital Input 4 Status	30
0	Digital Input 3 Status	29
0	Reserved	28
0	Harsh Braking	27
0	Harsh Acceleration	26
0	Reserved	25
0	Digital output 1 Status	24
0	Reserved	23
1	Reserved	22
0	Reserved	21
1	Reserved	20
0	Angle Polling	19
0	Internal Battery Low	18
0	Reserved	17
0	Reserved	16
0	Reserved	15
0	Reserved	14
0	Reserved	13
0	Reserved	12
1	Ignition Status	11
0	Reserved	10
0	Reserved	9
0	Digital Input 2 Status	8
0	Power Status	7
0	Immobilizer Violation alert	6
1	Reserved	5
0	Reserved	4
1	Overspeed ended	3
0	Overspeed started	2
0	Case Open Status	1
0	Digital Input 1 Status	0

Table 1: Event Flag Explanation table

Event Code /Message Code Table (Field 4 of Protocol)

Event Code	Description
1	Default Packet due to tracking interval
2	Reserved
3	Power Fail Event
4	Digital Input 1 change Event, when DI1 pin Changes from Low to High
5	Digital Input 1 change Event, when DI1 pin Changes from High to Low
6	Digital Input 2 change Event, when DI2 pin Changes from Low to High
7	Digital Input 2 change Event, when DI2 pin Changes from High to Low

8	Over Speed Started Event.
9	Over Speed ended Event.
10	Ignition ON Event
11	Ignition OFF Event
12	Harsh Braking
13	Internal Battery Low Alert.
15	First packet after connection (info packet)
17	Harsh Acceleration
19	Angle Polling Packet
20	Serial Data Packet
Event Code+100	Any Event which comes as a stored packet will be added with 100 in the event code

Table 2:Event Code Table

Backup Packet Format (Stored Packets)

In event of connection loss i.e if there is no GPRS connectivity, the device stores all the generated data during that interval in the internal device memory. After the device reconnects to network, a fresh location packet with event code 1 is sent to the server. Following this, the stored data packets are sent to the server in batch mode in FIFO format. A batch of backup data can contain up to 6 backup packets maximum. Also, the event codes of the backup packets are offset by 100 (i.e Event code+100).

Example:

```

$$CLIENT_1ZF,2345678,101,12.976572,77.549683,170302192827,A,13,0,191781,327,8,0.980
000,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,105,319,*
36
$$CLIENT_1ZF,2345678,101,12.976572,77.549683,170302192927,A,13,0,191781,327,7,1.190
000,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,105,319,*
30
$$CLIENT_1ZF,2345678,101,12.976572,77.549683,170302193027,A,10,0,191781,327,7,1.190
000,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,105,319,*
3B
$$CLIENT_1ZF,2345678,101,12.976572,77.549683,170302193126,A,10,0,191781,327,7,1.160
000,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,105,315,*
38
$$CLIENT_1ZF,2345678,101,12.976503,77.549469,170302193226,A,10,0,191781,324,7,1.150
000,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,105,310,*
3E
$$CLIENT_1ZF,2345678,101,12.976502,77.549606,170302193325,A,10,0,191781,180,8,0.980
000,0,0,0,0,1,0,0,0,0,0,1,0,0,0,0,1,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0,1,0,1,0,105,310,*
30
  
```

Serial Data Packet Format

The data which comes from the peripherals connected to the serial port i.e RS232 connection will be sent from the device to the server in the following format.

SLNO	String	Parameter	Description	Data Type
1	\$\$	Package Header.	\$\$ indicates beginning of packet	String
2	CLIENT_1ZF	Client_ID		String
3	140214426	Serial Number/IMEI number of the Device	Unique Serial Number or IMEI of the device	Unsigned Integer
4	20	Message/Event code (reason for packets)	Serial Data Event	Unsigned Integer
5	12.962985	Latitude		Float
6	77.576484	Longitude		Float
7	140127165433	Date and time	In yymmddHHMMSS format.	Unsigned Integer
8	A	GPS Status	A- Valid fix/ V-Invalid fix	Character
9	00	Serial Device Type/ID	Identifier for type of serial devices connected. Typically 0-127.	Unsigned Integer
10	123456	Serial Data	Data from the Serially connected device. (max 64bytes)	String
11	*	Separator between data		Character
12	26	Checksum	XOR of all data excluding data separator (*), checksum itself and ending characters. Value displayed in HEX	Integer
13	\r\n	Ending Characters	2 Bytes ASCII (0X0D, 0X0A)	

*All parameters are comma separated from each other in the data string except for the Header bit and client ID.

Server Command Response Format

The commands pushed to the device via GPRS/Server send status response back to the server in packet format. The response format is as explained below.

Response Format:

##<Client ID>,<SerialNumber>,<CommandName>,<Success/Failure>,*<Checksum>

*CommandName- Please refer the commands table for the different command names.

Example:

##CLIENT_1ZF,123456789,CFG_TL,Success,*1C

##CLIENT_1ZF,123456789,SET_ODOM,Success,*0D

Configuration Commands

USB and SMS Command list

The commands mentioned below can be used to configure the devices via SMS or connecting the device via USB.

SL NO.	Function	Command Format / Example
1.	APN Settings, IP/DNS, Port To configure the IP/Port and APN settings	Format: set\$<SerialNumber/IMEI>@<Password>#CFG_GPRS:<APN>, ,<IP Address/DNS>,<Port Number>* Example: set\$141214426@aquila123#CFG_GPRS:airtelgprs.com, ,60.243.245.181,3555* set\$141214426@aquila123#CFG_GPRS:airtelgprs.com, ,itriangle.com,3555*
2.	Polling Interval To set data polling intervals for IGN On/Off	Format: set\$<Serial Number/IMEI>@<Password>#CFG_TL:GPRS,<IGN On interval in seconds>S,<IGN Off interval in Minutes>M* Example: set\$141214426@aquila123#CFG_TL:GPRS,10S,1M*
3.	Client ID To configure the client ID parameter	Format: set\$<SerialNumber/IMEI>@<Password>#IRU_REG:<Client ID>* Example: set\$141214426@aquila123#IRU_REG:CLIENT_1DU*
4.	Admin 1 & Admin 2 To configure Admin 1&2 phone numbers for device status replies	Format: set\$<SerialNumber/IMEI>@<Password>#CFG_GSM:<Admin 1>,<Admin 2>,TEXT* Example: set\$141214426@aquila123#CFG_GSM:8884007979,9901935194,TEXT*
5.	TOF [GMT Offset] Country specific offset setting	Format: set\$<SerialNumber/IMEI>@<Password>#CHG_TOF:<Time Zone Offset in seconds>* Example: set\$141214426@aquila123#CHG_TOF:19800*

6.	<p>Check the internal configuration of a device. [Identity Read Back]</p>	<p>Format: %CHKCFG%<Password></p> <p>Example: %CHKCFG%aquila123</p>
7.	<p>Check the Configuration of Admin number and other details.[Identity Read Back]</p>	<p>Format: %CHKCFG2%<Password></p> <p>Example: %CHKCFG2%aquila123</p>
8.	<p>Over Speed Limit To configure the overspeed limit & interval</p>	<p>Format: set\$<SerialNumber/IMEI>@<Password>#CFG_OS:<Over Speed Limit>,<Duration in seconds>S*</p> <p>Example: set\$141214807@aquila123#CFG_OS:60,30S*</p>
9.	<p>Google Map To get the current location by SMS</p>	<p>Format: GLOCATE:<Password></p> <p>Example: GLOCATE:aquila123</p>
10.	<p>Set Odometer To set the Odometer value</p>	<p>Format: set\$<SerialNumber/IMEI>@<Password>#SET_ODOM:<Distance in meter>*</p> <p>Example: set\$140613238@aquila123#SET_ODOM:5000*</p>
11.	<p>Angle Polling To enable & configure the min angle for the angle polling feature</p>	<p>Format: set\$<SerialNumber>@<Password>#CFG_ANGLPOL:<1=Enable/0=disable>,<Angle in degree(Angle range: 30-330)>*</p> <p>Example: set\$140613238@aquila123#CFG_ANGLPOL:1,45*</p>
12.	<p>Output Enable/Disable To activate/deactivate the Digital Output</p>	<p>Format: set\$<SerialNumber>@<Password>#SET_DO1:<0=disable/1=Enable/2=Check speed and disable/3=Check Speed and Enable>*</p> <p>Example: set\$101010119@aquila123#SET_DO1:1* set\$101010119@aquila123#SET_DO1:2*</p>

13.	<p>Digital Input/Output Status Get the status of all digital Inputs & Outputs</p>	<p>Format: GetIO:<Password></p> <p>Example: GetIO:aquila123</p> <p>Response: Device Serial/IMEI, Dout:status<0/1>, Din1:status<0/1>, Din2:status<0/1></p>
14.	<p>UART Configuration Command To configure the different parameters for UART communication</p>	<p>Format: set\$<SerialNumber/IMEI>@<Password>#CFG_UART1:<1=Enable/0=Disable>,<Baudrate>,<No of bits>,<Parity>,<Stopbit>,< Accessory ID >,<start character>,<end character>,<max length>* (please refer appendix section for list of supported values)</p> <p>Example: set\$2345678@aquila123#CFG_UART1:1,9600,8,0,1,10,13,64,01*</p>
15.	<p>Device ID configuration To choose IMEI/SerialNumber/IMEI while sending the data packet</p>	<p>Format: set\$<SerialNumber/IMEI>@<Password>#CFG_DID:<1=IMEI/0=SerialNumber>*</p> <p>Example: set\$140613238@aquila123#CFG_DID:1*</p>
16.	<p>Analog Input Filter To switch On/Off the IIR filter for Analog Input</p>	<p>Format: set\$<SerialNumber/IMEI>@<Password>#CFG_ANFILT:<1=Enable/0=Disable>*</p> <p>Example: set\$140613238@aquila123#CFG_ANFILT:1*</p>
17.	<p>Compress Bitfield (Compressed Packet Format)</p>	<p>Format: set\$<SerialNumber/IMEI>@<Password>#CFG_COMPBF:<1=Enable/0=Disable>*</p> <p>Example: set\$140613238@aquila123#CFG_COMPBF:1*</p>
18.	<p>Harsh Acceleration Configuration To configure Harsh Acceleration threshold</p>	<p>Format: set\$<SerialNumber/IMEI>@<Password>#CFG_HA:<1=Enable/0=Disable>,<speed change (kmph/s)>*</p> <p>Example: set\$140613238@aquila123#CFG_HA:1,20*</p>

19.	<p align="center">Harsh Braking Configuration</p> <p>To configure Harsh Braking threshold</p>	<p>Format: <code>set\$<SerialNumber/IMEI>@<Password>#CFG_HB:<1=Enable/0=Disable>,<speed change(kmph/s)>*</code></p> <p>Example: <code>set\$140613238@aquila123#CFG_HB:1,20*</code></p>
20.	<p align="center">Maintenance Server Force</p> <p>To immediately divert the device to the maintenance server</p>	<p>Format: <code>FORCE_MS:<password></code></p> <p>Example: <code>FORCE_MS:aquila123</code></p>
21.	<p align="center">GPRMC Packet send through UART</p> <p>This command enables the sending of the GPRMC packet every second, through the serial port/UART.</p>	<p>Format: <code>set\$<SerialNumber/IMEI>@<Password>#CFG_GPRMCOUT:<1=Enable/0=Disable>*</code></p> <p>Example: <code>set\$140613238@aquila123#CFG_GPRMCOUT:0*</code></p> <p>Output GPRMC Packet Format: <code>\$GPRMC,133544.000,A,1257.7979,N,07732.0444,E,1.13,144.69,260716,,,A*67</code></p>
22.	<p align="center">Disable First Packet</p> <p>This command can be used to disable the Reboot/First packet.</p>	<p>Format: <code>set\$<SerialNumber/IMEI>@<Password>#CFG_FP:<1=Enable/0=Disable>*</code></p> <p>Example: <code>set\$140613238@aquila123#CFG_FP:0*</code></p>
23.	<p align="center">Password Change</p> <p>This command is used to change the device password</p>	<p>Format: <code>set\$160320029@aquila123#CHG_PASS:<newpassword>*</code></p> <p>Example: <code>set\$160320029@aquila123#CHG_PASS:TS101*</code></p>
24.	<p align="center">Restart</p>	<p><code>restart:aquila123</code></p>

*All commands pushed through the USB serially, need to be terminated with the enter character i.e \r\n

SMS Command Response

The device sends a monosyllable response mentioning "FAILURE" in case the command has failed and "SUCCESS" if the command has executed successfully.

GPRS Commands/ Server Commands

The same configuration commands as mentioned above in the USB/SMS table can be pushed from the server over GPRS by prefixing “#” in the command.

SL NO.	Function	Command Format / Example
1.	APN Settings, IP/DNS, Port To configure the IP/Port and APN settings	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_GPRS:<APN>, , ,<IP Address/DNS>,<Port Number>* Example: #set\$141214426@aquila123#CFG_GPRS:airtelgprs.com, , ,60.243.245.181,3555* #set\$141214426@aquila123#CFG_GPRS:airtelgprs.com, , ,itriangle.com,3555*
2.	Polling Interval To set data polling intervals for IGN On/Off	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_TL:GPRS,<IGN On interval in seconds>S,<IGN Off interval in minutes>M* Example: #set\$141214426@aquila123#CFG_TL:GPRS,10S,1M*
3.	Client ID To configure the client ID parameter	Format: #set\$<SerialNumber/IMEI>@<Password>#IRU_REG:<Client ID>* Example: #set\$141214426@aquila123#IRU_REG:CLIENT_1U*
4.	Admin 1 & Admin 2 To configure Admin 1&2 phone numbers for device status replies	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_GSM:<Admin 1>,<Admin 2>,TEXT* Example: #set\$141214426@aquila123#CFG_GSM:8884007979,990935194,TEXT*
5.	GMT Offset Country specific offset setting	Format: #set\$<SerialNumber/IMEI>@<Password>#CHG_TOF:<Time Zone Offset in seconds >* Example: #set\$141214426@aquila123#CHG_TOF:00*

6.	Over Speed Limit To configure the overspeed limit & interval	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_OS:<Over Speed Limit>,<Duration in seconds>S* Example: #set\$14063238@aquila123#CFG_OS:60,30S*
7.	Set Odometer To set the Odometer value	Format: #set\$<SerialNumber/IMEI>@<Password>#SET_ODOM:<Distance in meter>* Example: #set\$140613238@aquila123#SET_ODOM:00*
8.	Angle Polling To enable & configure the min angle for the angle polling feature	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_ANGLPOL:<1=Enable/0=disable>,<Angle in degree(Angle range: 30-330)>* Example: #set\$140613238@aquila123#CFG_ANGLPOL:1,45*
9.	Output 1 Enable/Disable To activate/deactivate the Digital Output	Format: #set\$<SerialNumber/IMEI>@<Password>#SET_DO1:<0=disable/1=Enable/2=Check speed and disable/3=Check Speed and Enable >* Example: #set\$101010119@aquila123#SET_DO1:1* #set\$101010119@aquila123#SET_DO1:2*
10.	UART Configuration Command To configure the different parameters for UART communication	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_UART1:<1=Enable/0=Disable>,<Baudrate>,<No of bits>,<Parity>,<Stopbit>,<Accessory ID>,<start character>,<end character>,<max length>* (please refer the table at the end for list of supported values) Example: #set\$2345678@aquila123#CFG_UART1:1,9600,8,0,1,01,10,13,64*
11.	Device ID configuration To choose IMEI/SerialNumber/IMEI while sending the data packet	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_DID:<1=IMEI/0=SerialNumber>* Example: #set\$140613238@aquila123#CFG_DID:1*

12.	Analog Input Filter To switch On/Off the IIR filter for Analog Input	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_ANFILT:<1=Enable/0=Disable>* Example: #set\$140613238@aquila123#CFG_ANFILT:1*
13.	Compress Bitfield (Compressed Packet Format)	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_COMPBF:<1=Enable/0=Disable>* Example: #set\$140613238@aquila123#CFG_COMPBF:1*
14.	Data Push through UART To send data through UART (The enable CR/LF bit will include the CRLF characters automatically at the end of the payload)	Format: #set\$<SerialNumber/IMEI>@<Password>#PUSH_UART1:<1=CR Enable/0=CR Disable>,<1=LF Enable/0=LF Disable>,<Data Length>,<Data>* Example: #set\$140613238@aquila123#PUSH_UART1:0,0,5,ABCDE*
15.	Harsh Acceleration Configuration To configure Harsh Acceleration threshold	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_HA:<1=Enable/0=Disable>,<speed change(kmph/s)>* Example: #set\$140613238@aquila123#CFG_HA:1,20*
16.	Harsh Braking Configuration To configure Harsh Braking threshold	Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_HB:<1=Enable/0=Disable>,<speed change(kmph/s)>* Example: #set\$140613238@aquila123#CFG_HB:1,20*
17.	Maintenance Server Force To immediately divert the device to the maintenance server	Format: #FORCE_MS:<password> Example: #FORCE_MS:aquila123

<p>18.</p>	<p>GPRMC Packet send through UART</p> <p>This command enables the sending of the GPRMC packet every second, through the serial port/UART.</p>	<p>Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_GPRMCOUT:<1=Enable/0=Disable>*</p> <p>Example: #set\$140613238@aquila123#CFG_GPRMCOUT:1*</p> <p>Output GPRMC Packet Format: \$GPRMC,133544.000,A,1257.7979,N,07732.0444,E,1.13,144.69,260716,,,A*67</p>
<p>19.</p>	<p>Disable First Packet</p> <p>This command can be used to disable the Reboot/First packet.</p>	<p>Format: #set\$<SerialNumber/IMEI>@<Password>#CFG_FP:<1=Enable/0=Disable>*</p> <p>Example: #set\$140613238@aquila123#CFG_FP:0*</p>
<p>20.</p>	<p>Password Change</p> <p>This command is used to change the device password</p>	<p>Format: #set\$160320029@aquila123#CHG_PASS:<newpassword>*</p> <p>Example: #set\$160320029@aquila123#CHG_PASS:TS101*</p>

*All commands pushed through the server need to be terminated with the enter character i.e \r\n.

Appendix

Supported Values for the UART Configuration Command

1. Baudrate:

Srno	Baud Rate (bps)	Setting Value
1	1200	1200
2	2400	2400
3	4800	4800
4	9600	9600
5	19200	19200
6	38400	38400
7	115200	115200
8	230400	230400
9	460800	460800

2. Number of Bits(Data Size):

Srno	Data size	Setting Value
1	5	5
2	6	6
3	7	7
4	8	8

3. Parity:

Srno	Parity Bits	Setting Value
1	NONE	0
2	ODD	1

3	EVEN	2
4	SPACE	3

4. Stop Bits:

Srno	Stop Bits	Setting Value
1	1	1
2	2	2
3	1.5	3

5. Start Character/ End character:

The setting value has to be the Decimal value of the start/end character from the ASCII table.

6. Max Length:

The maximum length of the data must be within 64bytes.

7. Accessory ID:

The accessory ID can be any number from 0-127. It is used as an identifier for the device connected to the UART.