

# TC-100 PROTOCOL

Bluetooth



GSM



Battery



GNSS



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SL#	Version	Prepared by	Date
1	VTS_GPRS_LH_V2.2	Vijith V.Nair	18/10/2018

## Protocol

0x20START CHARATERSIGNATUREIMEI, GPS DATA(\$GPRMC STRINGS) (80 CHAR)\$LOC, LOCATION NAME, #I1I2I3I4I5I6I7I8I9I10I11I12I13I14, ADC value(2Sg), 0,0, ODO READING(7Sg), On-Board Temp., Internal battery voltage(3Sg), GSM signal strength(%2), MCC(3 digit), MNC(3 digit), LAC(6 char), CellID(5Digits)SIGNATURE END CHARACTER Checksum

### Example :-

- Live data

```
0x200x01ATL356895037533745,$GPRMC,111719.000,A,2838.0045,N,07713.3707,E,0.00,,120810,,,A*75$,#01100111001010,6.5,0,0,12345.67,24.4,4.2,21,MCC,MNC,LAC,CellIDATL0x020x7A
```

- Memory data

```
0x200x03ATL356895037533745,$GPRMC,111719.000,A,2838.0045,N,07713.3707,E,0.00,,120810,,,A*75$,#01100101101010,6.5,0,0,12345.67,24.4,4.2,21,MCC,MNC,LAC,CellIDATL0x040x7A
```

- Bulk Packets

```
0x200x01ATL356895037533745,$GPRMC,111719.000,A,2838.0045,N,07713.3707,E,0.00,,120810,,,A*75$,#01100111001010,6.5,0,0,12345.67,24.4,4.2,21,MCC,MNC,LAC,CellIDATL0x020x7A
0x200x01ATL356895037533745,$GPRMC,111719.000,A,2838.0045,N,07713.3707,E,0.00,,120810,,,A*75$,#01100111001010,6.5,0,0,12345.67,24.4,4.2,21,MCC,MNC,LAC,CellIDATL0x020x7A
0x200x01ATL356895037533745,$GPRMC,111719.000,A,2838.0045,N,07713.3707,E,0.00,,120810,,,A*75$,#01100111001010,6.5,0,0,12345.67,24.4,4.2,21,MCC,MNC,LAC,CellIDATL0x020x7A
0x200x01ATL356895037533745,$GPRMC,111719.000,A,2838.0045,N,07713.3707,E,0.00,,120810,,,A*75$,#01100111001010,6.5,0,0,12345.67,24.4,4.2,21,MCC,MNC,LAC,CellIDATL0x020x7A
```

## Protocol Description

The protocol is having the following parts

- 0x20
  - Starting character
  - Signature of protocol
  - IMEI number of device
  - GPRMC strings
  - Alerts
  - Signature
  - End character
  - Checksum
- 
- 0x20----Fixed(Space)
  - 0x01/0x03 ----Starting Character of protocol  
0x01—for live data and 0x03---for Memory data
  - ATL ---Signature of the Protocol
  - 356895037533745 - IMEI -15 CHAR
  - GPRMC- GPS DATA - 66 CHAR

**THIS SECTION RELATES TO GPS DATA. \$GPRMC STRING CONTAINS 13 FIELDS, WHICH ARE AS FOLLOWS:**

- \$GPRMC - GPS DATA -66 CHAR

\$GPRMC,220516,A,5133.82,N,00042.24,W,173.8,231.8,130694,004.2,W,A\*70

Info	Description
\$GPRMC	Fixed
220516	TIME STAMP (GMT)
A	VALIDITY A- VALID, V - INVALID
5133.82	CURRENT LATITUDE
N	NORTH/SOUTH(S)
00042.24	CURRENT LOGITUDE
W	WEST /EAST(E)
173.8	SPEED IN KNOTS
231.8	TRUE COURSE
130694	DATE STAMP (DDMMYY)
004.2	MAGNETIC VARIATION DEGREE
W	WEST/ EAST(E) of magnetic variation
A	Mode indicator, (A=Autonomous, D=Differential, E=Estimated, N=Data not valid)
*70	CHECKSUM

**• ALERTS**

THIS SECTION RELATES TO VARIOUS ALERTS RAISED ON THE BASIS OF SYSTEM STATUS.

#0110010011101,6.5,2345,0,12345.67 24.4,4.2,21,MCC,MNC,LAC,CellID

1
2
3
4
5
6
7
8
9
10
11
12
13

Sl.No.	Value	Description
1	#	Fixed
2	11011001001010	Status of various i/o from i1 to i14
3	6.5	ADC Voltage
4	0	1 Wire temprature reading*
5	0	1 Button Data*
6	12345.90	Odometer reading
7	24.4	ON-Board temp./Device Version
8	4.2	Device internal battery voltage
9	21	GSM signal Strength
10	MCC	Mobile country code[3 digits]
11	MNC	Mobile Network Code[3 digits]
12	LAC	Location area code(Mobile)[6 digits]
13	CellId	GSM cell ID[5 digits]

Note:- In field number 7 there may be two different values in protocol.

1. Temperature of module OR
2. Firmware version \_mobile no. ( if mobile number is not available, the IMSI number would come

- ATL -----Signature
- 0x02/0x04 -----end charactor
- 0x02 -----for live data and 0x04 -----for memory data
- 0x7A-----check sum

Note:-

- The start character and end character are ASCII in protocol need to convert to hex.
- The checksum is ASCII in protocol need to convert to hex.
- If checksum is FF read it as 1B, due to some data sending limitation we cannot send 1B. So adjust the same at server end.

## Checksum Calculating Method :-

```
voidchksum_gprs(char * ptr)
{
  unsignedint i = 0;
  charchksum=0;
  for(i=0;i<1000 && *ptr != 0x00;i++)
  {
    chksum ^= *ptr++;
  }
  return(chksum);
}
```

NOTE: FOR ALL DATA PACKETS, AT LAST YOU WOULD GET

CHECKSUM OF ALL BYTES IN PACKET BETWEEN STARTING CHARACTER AND END CHARACTER (INCLUDING BOTH STARTING CHARACTER AND END CHARACTER).

## Input Details

INPUTS	Use	Description
I1	High Sense	Ignition, 0=OFF&1=ON
I2	Low sense	Reserved for future use
I3	Low sense	SOS
I4	Low sense	Reserved for future use
I5	Low sense	Reserved for future use
I6	High Sense	Reserved for future use
I7	Low sense	Reserved for future use
I8	High Sense	Main Power(Fixed), 0=OFF and 1=ON
I9	Harsh speeding	0=normal, 1=HA
I10	Harsh braking	0= normal
I11	ARM/DIASRM	1=ARM & 0=DISARM
I12	Sleep Status	1=Not in Sleep & 0= in Sleep
I13	General relay status	Reserved for future use
I14	Movement Status	1=In motion& 0= Not in motion

## GPRS Commanding

The format for GPRS command would be

\$MSG,Command&

Sl.No.	Content	Discription
1	\$MSG	Fixed header of command
2	Command	Command to device
3	&	End field

## Sample Command

GPRS command to check Version is

\$MSG,VERSION<6906>&

**Note1:-** The protocol structure is for standard hardware, some hardware may not have the values for all field.

**Note2:-** Please refer user manual of product for commands.

TC100 devices will send data as a bulk packet when there are multiple data packets available in memory. The bulk packet would contain multiple packets with same protocol format including start character, end character and checksum. The bulk packet may contain maximum of 6 individual packets