

## AVL-08 GPRS Data Protocol

### 1. Data Format

This is the AVL02 GPRS data format communication protocol, this protocol is defined to make available a datagram mode of packet communication, it provides a procedure for application programs to send messages to other device.

Command Format Specification

Note: All multi-byte data is based on high-byte first, low-byte after for organization in this protocol.

Code	Explanation
\$\$	2Bytes, indicates header of command from tracker unit to call centre, in ASCII code (hex is 0x24).
Len	2Bytes, indicates length of all command, including header and end (the array is first high to low).
IMEI	15Bytes, at most 20 bytes.
Alarm type	2Bytes, the GPRS data trigger type.
DATA	GPRMC string
	PDOP
	HDOP
	VDOP
	Status (12bytes)
	RTC (14bytes)
	Voltage(8bytes)
ADC	8bytes,the ADC value.
LACCI	Location information elements
Temperature	Temperature information
Odometer	Mileage data
Serial ID	4Bytes, sign every GPRS data, the range is [0001-9999], then circle it again from 0001 to 9999.
RFID	10Bytes, show the information of the RFID card
Checksum	2Bytes, means CRC check of all the data ahead, CRC-16 modbus (Polynomial = 0xA001, initialize data is 0xffff) checksum, not including its own byte and end characters. For example: (hex format) 24 24 00 11 13 61 23 45 67 8f ff 50 00 80 43 0d 0a 0x8043 = CRC-16 modbus (24 24 00 11 13 61 23 45 67 8f ff 50 00).
\r\n	2Bytes, end char (hex format is 0x0d,0x0a).

Format: \$\$ (2 Bytes) + Len (2 Bytes) + IMEI (15 Bytes) + | + AlarmType (2 Bytes) + GPRMC + | + PDOP + | + HDOP + | + VDOP + | + Status (12 Bytes) + | + RTC (14 Bytes) + | + Voltage (8 Bytes) + | + ADC (8 Bytes) + | + LACCI (8 Bytes) + | + Temperature (4 Bytes) | + Mile-meter + | + Serial (4 Bytes) + | + RFID (10 Bytes) + | + Checksum (4 Byte) + \r\n (2 Bytes)

- Alarm type
  - 0x01 SOS button is pressed
  - 0x49 Button A is pressed
  - 0x09 Auto Shutdown Alarm
  - 0x10 Low battery Alarm
  - 0x11 Over Speed Alarm
  - 0x13 Recover From Over Speed
  - 0x30 Parking Alarm
  - 0x42 Out Geo-fence Alarm
  - 0x43 Into Geo-fence Alarm
  - 0x50 IO-1 Close
  - 0x51 IO-1 Open
  - 0x52 IO-2 Close
  - 0x53 IO-2 Open
  - 0x54 IO-3 Close
  - 0x55 IO-3 Open
  - 0x56 IO-4 Close
  - 0x57 IO-4 Open
  - 0x60 Begin Charge
  - 0x61 End Charge
  - 0x66 Find a new RFID
  - 0x88 Heartbeat
  - 0x91 Into Sleep Mode
  - 0x92 Wakeup From Sleep Mode
  - 0xAA Interval GPRS data
- Status (12 Bytes) — Status:
  - Byte 01 — SOS button
  - Byte 02 — Button A button (reserve)
  - Byte 03 — Button B button (reserve)
  - Byte 04 — Button C button (reserve)
  - Byte 05 — Input 1
  - Byte 06 — Input 2
  - Byte 07 — Input 3 (reserve)
  - Byte 08 — Input 4 (reserve)
  - Byte 09 — Out 1
  - Byte 10 — Out 2
  - Byte 11 — Out 3 (reserve)
  - Byte 12 — Out 4 (reserve)
- Voltage (8 Bytes) — Value of the voltage:
  - Format: ABBBBIII

- A —— Charge Status (0 = Off Charge , 1 = On Charge)
- BBB —— Battery Voltage (For example, 367 mean 3.67V)
- IIII —— Input Charge Voltage (For example, 1251 mean 12.51V)
- ADC(8 Bytes) —— AD collection:
  - Format: CCCCDDDD
  - CCCC —— ADC0 collect (For example, 1251 mean 12.51V)
  - DDDD —— ADC1 collect (For example, 1251 mean 12.51V) (reserve)
- LACCI(8 Bytes) —— Location information elements:
  - Format: LLLLCCCC
  - LLLL —— Location area code
  - CCCC —— Cell ID
- Temperature(4 Bytes) —— Temperature (reserve for the device has no temperature sensor):
  - Format: STTT
  - Precision is 0.1°C
  - The first byte “S” mean sign, such as “0/1/-”
  - Eg: 0345 mean +34.5°C, 1234 mean +123.4°C, -123 mean -12.3°C
- Mile-meter(14 Bytes) —— Location information elements:
  - Format is AAAA.BBBBKm.
  - Four bytes after the radix point.
- Serial(4 Bytes) —— Serial number:
  - Format: SSSS
  - Every time reboot the device or reset, the serial number will initialize to 0001.
  - Every GPRS message send out will add one
  - After the serial number to 9999, restart from 0001 again.
- RFID(10 Bytes) —— RFID information:
  - Format: SSSS
  - Show the information of the RFID.

**The link of the explain about the CRC-16(modbus):**

<http://www.lammertbies.nl/comm/info/crc-calculation.html>