

## Application Note: Remote Diagnostics

### Scope

AT220A, AT220B, AT240, AT210, AT110

### Overview

Our devices support remote diagnostics via SMS, which are often useful to diagnose GPRS or GPS problems. The \$STAT and \$PARA commands can be sent from a host application or from a mobile phone handset and should be the first course of action to take in the event of a suspected fault.

### Related Documents

The following documents are recommended reading to accompany this application note:

- AT220, AT240, AT210 & AT110 User Guides
- AT220, AT240, AT210 & AT110 Installation Guides

These documents can be obtained from:

<http://www.gps-telematics.co.uk/downloads.htm>

### Device Status Check \$STAT?

The STAT? command is used to request basic status information from a device. Like any OTA command, it can be sent in SMS or TCP mode, but is most often used in SMS mode to diagnose GPRS problems. The device response contains various information fields, separated by semi-colons, as below:

## \$STAT Response Format

The response to an over the air status request is an ASCII text packet with variable length fields, separated by line ends. In TCP/UDP mode, the response goes to the defined IPAD/PORT host and in SMS mode the response goes to the sender of the command.

STATUS:	Fixed packet header
<i>device</i> serial number	15 digit IMEI number (serial number of device)
Software version number	Floating point number
Date of the last GPS fix	dd/mm/yy
Time of the last GPS fix	hh:mm:ss
Latitude of the last GPS fix	Floating point – decimal degrees
Longitude of the last GPS fix	Floating point - decimal degrees
Speed of the last GPS fix	integer - kmh
Heading of the last GPS fix	Integer - degrees
External Input voltage	Floating point - volts
Battery Level Percentage	Integer %
Number of reports queued/stored	integer
SMS used this month/monthly limit	Integer/integer
Network Roaming	"H" for home network and "R" when roaming
GPS current satellites used	Integer
GPS % availability (last 7 days)	Integer %
GSM current signal strength	Integer
GSM % availability (last 7 days)	Integer %
GSM Mobile Network Code	Integer
Ignition status, current	Boolean
ERROR CODES:	
GPS timeout error	<b>0</b> : no error <b>1</b> : GPS timeout <b>2</b> : jammer detected
Modem GPRS attach error	Boolean (0 = no error, 1 = error)
Modem GPRS connect error	Boolean
Modem TCP socket error	Boolean
Modem TCP acknowledgment error	Boolean
Ignition inactivity error	Boolean

Notes on error codes:

### 1. GPS timeout

A value of "1" indicates that no GPS fix has been returned for the specified timeout period (GPST). Could be an indication of a device/antenna fault or simply that the vehicle is parked in covered area (e.g. underground car park).

A value of "2" indicates that the GPS receiver has detected CW interference which could be cause by the use of a GPS jamming device in close proximity, typically within 5-10m (i.e. in the vehicle itself).

### 2. Modem GPRS attach fail

Can be simply due to GSM network coverage, but persistent attach failure is an indication that the GSM SIM card is not enabled for GPRS.

### 3. Modem GPRS connect fail

If the modem is attached, but not connected, this is usually caused by incorrect GPRS access point settings (APAD, APUN and APPW).

4. Modem TCP socket error

The modem has failed to open a socket on the specified IP address and port number. Can be caused by incorrect TCP address settings (IPAD, PORT), a fault at the host server or even wider internet problems.

5. Modem TCP acknowledgment fail

This error code indicates that the *device* can proceed all the way to open a socket and deliver the report packet, but does not get the normal acknowledgment response from the host TCP application. This is normally caused by a fault at the host end.

6. Ignition input inactivity error

This error is set when no ignition events have been detected for more than 24 hours

### **\$STAT Response Example:**

```
STATUS:012346789123456;4.0.17.0;12/9/2012;10:20:49;51.689366;-  
0.224821;0;260;26.8;95;328;8/10;H;0;1;1;0;0
```

The above response tells us the following:

The device IMEI (serial number) is 012346789123456

The device firmware version is 4.0.17.0

Latest GPS fix was:

12<sup>th</sup> Sept 2012, at 10:20 GMT

Lat: 51.689366

Lon: -0.224821

Speed: 0 kmh

Heading: 260 degrees

Input voltage is 26.8 volts

Internal battery is 95% charged

There are 328 reports stored in memory

SMS usage is currently 8 out of a limit of 10 per month

The device is currently registered on its home GSM network (as per the SIM card)

Errors are present – GPRS attach fail and GPRS connect fail

The above is a typical case. The device is working as expected, but there is no GPRS service available, which could be a SIM card issue (particularly with a new SIM) or because there is no GPRS service in that area at this time.

The connect fail error is a direct result of the attach fail.

## Device Parameter Check \$PARA

The \$PARA command is used to query user configuration parameters from a device. The device response contains various information fields, separated by semi-colons, as below:

PARA:	Fixed packet header
Software version number	Floating point number
SERV SMS host number	International format telephone
IPAD1 primary TCP IP address	TCP IP address
PORT1 primary TCP port number	TCP port number – integer
IPAD2 TCP IP address for PTDM mode	TCP IP address
PORT2 TCP port number for PTDM mode	TCP port number – integer
APAD access point address	Text string
APUN access point username	Text string
APPW access point password	Text string
DIST distance report value (metres)	Integer
HEAD heading change report value (degrees)	Integer
JTIM in-journey timed reporting interval (minutes)	Integer
STIM stationary timed report interval (minutes)	Integer
ITIM idling timed report interval (minutes)	Integer
IDLE idle mode start threshold (seconds)	Integer
STPD stop report delay (seconds)	Integer
OSST overspeed threshold (kmh)	Integer
OSHT overspeed hold time (sec)	Integer
OSIT overspeed inhibit time (sec)	Integer
MODE GSM reporting mode	Integer
PROT reporting protocol	Integer
REPL reporting level	Integer
SMSL maximum monthly SMS usage	Integer
IGNM ignition mode	Integer
GPSQ minimum GPS quality	Integer
ROAM network roaming enable	Integer
TCPT TCP mode timeout (seconds)	Integer
IBTN iButton Mode	Integer
CLID cell-ID mode	Integer
PTDM pass through data mode enable	Integer
GSM network operator name	Text string (max 12 chars)
GSM own telephone number	Text string (max 15 chars)
ACMX Max Acceleration Threshold – X axis	Integer
DCMX Max Deceleration Threshold – X axis	Integer
ACMY Max Acceleration Threshold – Y axis	Integer
DCMY Max Deceleration Threshold – Y axis	Integer
COLN Collision Event Threshold	Integer

## What If I don't get a reply?

Replies to \$STAT and \$PARA commands are not subject to OTA password (PASS) or monthly SMS limit (SMSL). A reply should normally be received within a few seconds. If the device does not reply, you should consider the following possibilities:

1. Are you sure that the SMS was sent to the correct number?
2. Are you sure that the command syntax was correct?
3. Device is out of GSM coverage?
4. Device is powered down or in a power-saving mode?
5. Device is faulty.