

## AT100 Installation Guidelines

### Location and Mounting

We recommend that the AT100 is mounted within the cabin (driver and passenger area) of the vehicle. If mounting externally or in the engine bay, additional environmental protection will be required. The mounting lugs allow the AT100 to be secured using M3 self-tapping screws or bolts. An alternative is to fix the AT100 to a clean, flat surface using double-sided adhesive foam tape. Note that the case of the AT100 is common with the ground input.

### Power Supply

The AT100 should be connected to a permanent power source. Input voltage range is 6 to 30 VDC. Average power consumption is 300mW (25mA @ 12VDC or 12mA at 24VDC). The internal power conditioning incorporates over-voltage, reverse voltage and over-current protection (self-resetting fuse). We recommend the use of a 1.0A in-line fuse, fitted to both POSITIVE and GND wires of the power feed cable.

The AT100 will shutdown when the input voltage drops to approx. 5.5VDC.

### Ignition Sense Input

The white wire included in the standard power loom is used to sense the vehicle's ignition state. In most cases this wire must be connected to a source which goes high (12 or 24V) only when the vehicle ignition is on. Current limiting resistors are NOT REQUIRED on the AT100 inputs.

### Antenna

The AT100 requires 2 antennas – one for GPS and another for GSM communication. In most cases, these 2 antennas are combined in a single housing.

The most critical element here is the GPS antenna. This must ideally be mounted on the vehicle roof with a clear and unobstructed view of the sky. It is often acceptable to mount the antenna in the vehicle windscreen or even under the dashboard, but inevitably will result in occasional loss of GPS. Windscreen or dashboard mounted GPS antennas are not recommended for vehicles with:

- heated front windscreens
- steeply raked windscreen
- bodywork overhanging the windscreen (e.g. Luton vans)

The mounting and location of the GSM antenna is much less critical. The most important issue to consider is potential interference with other equipment, such as in-car entertainment systems. Again, the best location is to mount the antenna on the vehicle roof, although windscreen and under-dash locations are often perfectly acceptable.

### Covert Installations

Where a fully covert installation is required, the most practical solution is to mount the AT100 and antenna under the dashboard. Avoid locating the GSM antenna close to the audio equipment and loudspeakers to reduce the chance of GSM interference. It is also advisable to tape over the AT100 LEDs to avoid the chance of them being seen at night.

## Installation of the GSM SIM card

The AT100 must be fitted with a SIM card for normal operation. The SIM card is installed in a small slot in the side of the AT100. Correct orientation of the SIM card is important for correct operation and to avoid damage to the SIM. Push the SIM card into the slot until the edge is flush with the AT100 case. Removal of the SIM card requires the use of tweezers.



Note: The AT100 requires a 3V SIM card.

After the SIM has been fitted, we recommend that the SIM slot is taped over (with insulation tape or tamper-proof label) to avoid ingress of dirt etc.

## LED Indicators

GPS Status (green):	Constant ON Flash (1Hz) Constant OFF	Searching for initial fix GPS 3D navigation Lost GPS signal
GSM Status (blue):	Constant ON Slow flash (0.5Hz) Quick flash (1Hz) Constant OFF	GSM ON, searching for network GSM registered on network GSM communication in progress GSM Modem OFF

In covert applications, it is advisable to tape over the LEDs (with black insulating tape) to prevent easy identification the AT100 location.

**Note:** During normal operation, both LEDs will be flashing, but this does not necessarily indicate successful initialisation and operation of the AT100. We strongly recommend that you confirm successful initialisation before replacing vehicle panels and leaving the site. This can be done by use of the \*STAT?# command by SMS or by contacting your fleet management application service provider to confirm that the device is online.

## Data Connector Pin Reference

Pin Number	Signal Name	Wire Colour	Termination
1	GND	black	DB9 pin 5
2	NMEA TXD	green	DB9 pin 2
3	GS64 TXD		
4	RESERVED		
5	NMEA RXD	dark blue	DB9 pin 3
6	GS64 RXD		
7	RESERVED		
8	GND	grey	
9	GND		
10	USBDP		
11	USBDN		
12	VUSB		
13	GS64 SERVICE		
14	GPS BOOT	yellow	
15	GPS RESET		
16	RESERVED		
17	RESERVED		
18	RESERVED		
19	RESERVED		
20	RESERVED		
21	LOAD SWITCH 2		
22	LOAD SWITCH 2		
23	LOAD SWITCH 1		
24	LOAD SWITCH 1		
25	GND		
26	GND		
27	ADC IN	pink	
28	GND		
29	GND		
30	GND		
31	DIGITAL INPUT 1	white	IGNITION SENSE
32	DIGITAL INPUT 2	orange	PANIC BUTTON
33	DIGITAL INPUT 3	light blue	
34	DIGITAL INPUT 4	purple	
35	DIGITAL INPUT 5	red	
36	DIGITAL INPUT 6	brown	

### Hardware Issues

All Input/output features of the AT100 are provided via the 36 pin Hirose connector. The serial port, ADC, digital inputs and load switches are terminated to this connector. Details of the required mating connector can be found in the AT100 Integration Guide.

Inputs are opto-coupled and de-bounced internally. All inputs will default to a LOW state due to the design of the opto-coupler. Inputs can be driven from sources up to 30V absolute maximum.

### Ignition Input

The function of the ignition input is determined by the value of the IGNM parameter. If IGNM is greater than zero, the ignition input is used for journey START and STOP reports. In most cases, the ignition input should be wired to a signal which goes high when the vehicle ignition is live and low when the vehicle ignition is off. This signal must actually reflect the state of the vehicle's engine ignition (usually goes live on the 2<sup>nd</sup> position of the key).

## Troubleshooting Guide

If you are experiencing problems in getting your AT100 application up and running, please run through the following check list. If the following diagnostics do not resolve your application problems, then please contact your local Astra Telematics for support. If at all possible, please ensure that you have run through the following checks before calling for technical support, as the information gained will be of great assistance to the support engineer.

Problem	Possible Causes
Will not power up (LEDs stay off)	<ol style="list-style-type: none"> <li>1. Voltage and polarity of power source?</li> <li>2. Fuse?</li> <li>3. Ensure that GPS Boot and GSM Boot wires are not shorted to GND</li> </ol>
Blue LED does not flash (stays ON)	<ol style="list-style-type: none"> <li>1. Is SIM card is inserted correctly (see p.6)</li> <li>2. Ensure SIM has PIN code disabled</li> <li>3. GSM antenna?</li> <li>4. Network coverage availability?</li> <li>4. Contamination or damaged connector?</li> </ol>
Green LED does not flash	<ol style="list-style-type: none"> <li>1. GPS antenna connected?</li> <li>2. GPS antenna placed with 'view' of the sky?</li> <li>3. GPS antenna suitable for 3.3V operation?</li> <li>4. Contamination or damaged connector?</li> <li>5. Faulty GPS antenna?</li> </ol>
LEDs both flashing, but latest device location has not appeared on the website	<ol style="list-style-type: none"> <li>1. Device configured on website with correct IMEI?</li> <li>2. Device configured with correct GPRS and/or SMS protocols?</li> <li>3. Correct GPRS Access Point settings on AT100?</li> <li>4. Correct IPAD and PORT settings on AT100?</li> <li>5. Send *STAT?# command to check unit status</li> <li>6. Send *PARA?# command to check unit settings</li> </ol>
STAT? response ERROR code 1	(GPS Timeout) <ol style="list-style-type: none"> <li>1. Check position of vehicle with respect to GPS availability (view of the sky).</li> <li>2. Check GPS antenna an installation</li> </ol>
STAT? response ERROR code 2	(GPRS attach failed) <ol style="list-style-type: none"> <li>1. SIM card GPRS enabled?</li> <li>2. Network service/coverage?</li> </ol>
STAT? response ERROR code 4	(Failed to open TCP Socket) <ol style="list-style-type: none"> <li>1. Check IPAD and PORT setting with *PARA?#</li> <li>2. Check that service provider is online</li> </ol>
STAT? response ERROR code 5	(Failed to get acknowledgment to GPRS report) <ol style="list-style-type: none"> <li>1. Check that service provider is online</li> </ol>

## Troubleshooting Notes:

### 1. Correct connections:

GPS antenna (RED sleeve)	⇒	SSMB (centre connector)
GSM antenna (BLUE sleeve)	⇒	MCX (left hand side)
Power connector	⇒	red & black wire tail (right hand side)

### 2. DC power applied:

The AT100 operates from a DC power source in the range 6 to 30VDC. Maximum current demand will depend on the voltage used, worst case being approx 0.5A at the lower voltage range.

If power is correctly applied, the front panel LEDs will illuminate, approximately 2 seconds after applying power to the unit. Note that the LEDs only flash when a GPS fix and GSM network registration is available.

If the LEDs do not light within 5 seconds of applying power, please check the voltage and polarity of the DC power source.

### 3. SIM card installed

The AT100 requires a GSM SIM card to be installed before operation. The SIM card **PIN request feature must be disabled** for operation with an AT100.

If the SIM card is missing, invalid or incorrectly fitted, an error message will be displayed on the debug terminal during start up and initialisation of the GSM modem. See below for instructions on how to view the debug information.

### 4. Host Server details properly set

For GPRS mode, it is necessary to set the Host Server IP Address (IPAD) and Port Number (PORT) to the those of your tracking service provider. Default settings are configured to suit the Astra Telematics Demo Internet Tracking Service. If you are not using our service, please contact your service provider for the correct IPAD and PORT settings.

The GSM Server Number (SERV) is the destination telephone number for delivery of SMS format reports. If you are using SMS mode or require SMS mode as a fallback to GPRS mode (i.e. sends SMS reports if GPRS fails), then this should be set to the GSM number of your tracking service provider. If using GPRS mode and you do not require fallback to SMS, the GSM Server Number should be set to "NONE".

### 5. GPRS Access Point settings for your chosen network

For GPRS mode, it is necessary to set the Network Access Point details to those of your GSM network service provider. There are 3 parameters:

Access Point Address	APAD
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Access Point Username	APUN
Access point Password	APPW

The correct settings for most GSM networks worldwide can be found in Appendix E of this document.

## 6. GPS and GSM status LEDs

These are a useful indication of basic operational status.

The blue LED indicates GSM status and should start flashing approx. 15-30 seconds after power on. If the blue LED remains on constantly, check network coverage, antenna and SIM card.

The green LED indicates GPS status and should normally start flashing within 30-180 seconds after power on. If the green LED remains on constantly, check that the GPS antenna is connected and deployed with a clear view of the sky.

## 7. Antennas are suitably placed

The most critical element here is the GPS antenna. This must ideally be placed outside with a clear and unobstructed line of sight to the sky. It may be possible to get a GPS fix from the window of a building or vehicle, but this will be unreliable and less accurate than when the antenna is in the open.

The GSM antenna must be able to receive GSM network coverage. You may be able to check this by looking at the signal strength on your mobile telephone handset.

## 8. AT100 debugger error messages

The AT100 provides output debugging information in RS232 ASCII format (4800, 8 bits, 1 stop, no parity, no flow control). The information displayed via the debugger is invaluable for troubleshooting by the end-user or via Astra Telematics technical support. The information contained in this text output will describe the unit parameters and highlight any application problems or errors.

To use this feature, apply power to the AT100 and connect to the PC using the serial lead supplied. Open a HyperTerminal session at 4800 baud, no flow control.

Once you have the debugger up and running, check the text for error messages that may help you decide where the problem lies. If you are still unsure about the problem, you can save a short section of the debug text and e-mail to Astra Telematics for prompt technical support. To save the text, go to the "transfer" menu at the top of HyperTerminal and choose the "Capture Text" option. A dialogue box will be displayed - enter a suitable filename for the debug text (e.g. c:\my documents\AT100log.txt). Now that you are saving to a file, power up the AT100 and place antennas in a suitable position. Leave the system running for around 30 minutes and then terminate the file by again selecting "transfer", "Capture text" and "stop". Send the file to

# **astra telematics**

[support@gps-elematics.co.uk](mailto:support@gps-elematics.co.uk) for advice about your application problem.