



WARP 1.0 INSTALLATION GUIDELINES

Location and Mounting

We recommend that the WARP 1.0 unit 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 WARP 1.0 unit to be secured using M3 self-tapping screws or bolts. An alternative is to fix the WARP 1.0 unit to a clean, flat surface using double-sided adhesive foam tape. Note that the case of the WARP 1.0 unit is common with the ground input.

Power Supply

The WARP 1.0 unit should be connected to a permanent power source. Input voltage range is 6 to 30 VDC. Average power consumption is 350mW (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 in the power feeder cable.

The WARP 1.0 unit will shutdown when the input voltage drops to approx. 5.5VDC.

Antenna

The WARP 1.0 unit 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 windscreens,
- 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 WARP 1.0 unit 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 WARP 1.0 unit LEDs to avoid the chance of them being seen at night.

Installation of the GSM SIM card

If the WARP 1.0 unit has been supplied without a SIM card, it will be necessary to install one. The SIM card is installed in a small slot in the side of the WARP 1.0 unit. 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 WARP 1.0 case. Removal of the SIM card requires the use of tweezers.

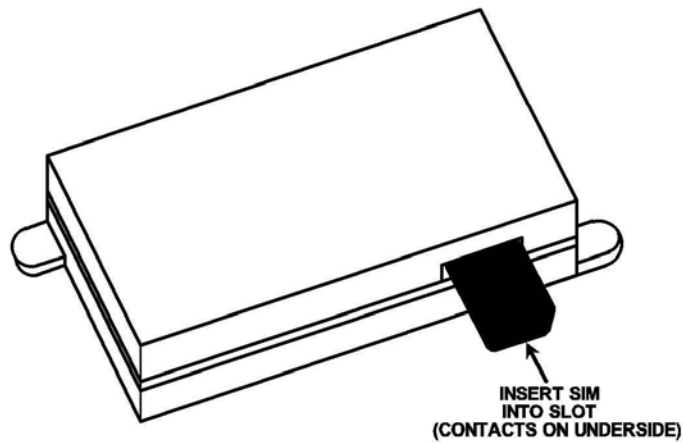


Illustration Note: The WARP 1.0 unit requires a 3V SIM card.

LED Indicators

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

Note: During normal operation, both LEDs will be flashing, but this does not necessarily indicate successful initialization and operation of the WARP 1.0 unit. We strongly recommend that you confirm successful initialization (e.g., confirm latest device location is shown on the Warp Wireless™ Network Operations Center) before replacing vehicle panels and leaving the site.

Data Connector Pin Reference

Signal Name	Pin No.	Color (Suyin)	Color (JAE)	Color (Flint)	Termination
GND	1	Brown	Brown	Blue/White	DB9 1 pin 5
RXD1	2	Red	Red	Green/White	DB9 1 pin 3
TXD1	3	Orange	Orange	Grey/White	DB9 1 pin 2
TXD2	4	Yellow	Yellow	Brown/White	DB9 2 pin 2
RXD2	5	Green	Green	Orange/White	DB9 2 pin 3
CTS2	6	Blue	Blue	Blue/Red	DB9 2 pin 7
RTS2	7	Violet	Violet	Green/Red	DB9 2 pin 8
GND	8	Grey	White	Grey/Red	DB9 2 pin 5
GND	9	White	Pink	Brown/Red	
GND	10	Pink	Brown/White	Orange/Red	
GPS BOOT	11	Lt. Green	Orange/White	Blue/Black	
ADC IN	12	Lt. Blue	Blue/White	Green/Black	
DIGITAL INPUT 4	13	White/Red	Violet/White	Orange/Black	Panic button
DIGITAL INPUT 3	14	Brown/White	Brown/Grey	White/Blue	Ignition
DIGITAL INPUT 2	15	Red/Black	Red/Grey	White/Green	Alarm
DIGITAL INPUT 1	16	Orange/Black	Orange/Grey	White/Grey	Voice control
V SWITCH	17	Yellow/Black	Yellow/Grey	White/Brown	
DIGITAL OUTPUT 1	18	Green/Black	Green/Grey	White/Orange	
DIGITAL OUTPUT 2	19	Blue/White	Blue/Grey	Red/Blue	
DIGITAL OUTPUT 3	20	Violet/White	Violet/Grey	Red/Green	
DIGITAL OUTPUT 4	21	Grey/Black	White/Grey	Red/Grey	
GSM SELECT	22	White/Black	Pink/Grey	Red/Brown	
SPEAKER(+)	23	Pink/Black	Red/White	Red/Orange	
SPEAKER(-)	24	Lt. Green/Black	Yellow/White	Black/Blue	
MIC(+)	25	Lt. Blue/Black	Green/White	Black/Green	
MIC(-)	26	White/Blue	Grey/White	Black/Orange	

Digital Inputs

The digital inputs are dedicated to monitoring of:

- Ignition status,
- Panic button activation,
- Alarm activation,
- Control of voice calls.

These inputs are constantly monitored in all modes (including sleep mode). The state of all inputs and outputs is reported with each position report. Additional functions are described below.

Hardware Issues

All Input/Output features of the WARP 1.0 unit are provided via the 26-pin JAE connector. The serial ports, audio, ADC and 8 digital I/O lines are terminated to this connector. Details of the required mating connector are given at the start of this document.

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, but current-limiting resistors must be used to limit the current drive to the opto-coupler. An internal 1k resistor is fitted, but additional external resistance should be added according to the voltage level used to drive the input. The recommend resistor size is calculated by dividing the drive voltage by 5×10^{-3} (5mA). For example, with a 12-volt digital input, the recommended resistor value is $12/0.005=2400\Omega$, the nearest preferred value being 2k2 Ω .

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. If IGNM is 2, the WARP 1.0 unit will power down 5 minutes after the ignition is turned OFF and wake up when the ignition is turned ON.

Panic Input

A Panic Alarm is triggered by a low to high transition on the panic input. This causes a position report with Panic bit set in the Reason byte. If an ALRM number is defined, a text SMS is sent to this number.

Alarm Input

This generic Alarm is triggered by a high to low transition on the Alarm input. This causes an SMS text message to be sent to the ALRM number (if defined).

Voice Control Input

This input is used to control the voice call features. The response to activation (low to high) of the voice control input is dependent on the call mode, as follows:

IDLE	Dials the user-specified VOUT number
RINGING	Answers the incoming call
IN CALL	Ends the current call

Note that calls can also be answered automatically (see ATOA parameter).

Troubleshooting Guide

If you are experiencing problems in getting your WARP 1.0 unit application up and running, please run through the following checklist. If the following diagnostics do not resolve your application problems, then please contact your local Warp Wireless™ representative 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">1. Voltage and polarity of power source2. Fuse3. Ensure that GPS Boot and GSM Boot wires are not shorted to GND
Blue LED does not flash (stays ON)	<ol style="list-style-type: none">1. Is SIM card is inserted correctly (see p. 6)2. Ensure SIM has PIN code disabled3. GSM antenna4. Network coverage availability5. Contamination or damaged connector
Green LED does not flash	<ol style="list-style-type: none">1. GPS antenna connected2. GPS antenna placed with 'view' of the sky3. GPS antenna suitable for 3.3V operation4. Contamination or damaged connector5. Faulty GPS antenna
LEDs both flashing, but latest device location has not appeared on the website	<ol style="list-style-type: none">1. Device configured on website with correct IMEI2. Device configured with correct GPRS and/or SMS protocols3. Device 'active' box checked4. Correct GPRS Access Point settings on WARP 1.0 unit5. Correct IPAD and PORT settings on WARP 1.0 unit (see also SCES Internet Tracking FAQ)6. Send *STAT?# command to check unit status7. Send *PARA?# command to check unit settings
STAT? response ERROR code 1	<p><i>(GPS Timeout)</i></p> <ol style="list-style-type: none">1. Check position of vehicle with respect to GPS availability (view of the sky).2. Check GPS antenna and installation.
STAT? response ERROR code 2	<p><i>(GPRS attach failed)</i></p> <ol style="list-style-type: none">1. SIM card GPRS enabled2. Network service/coverage3. Reboot modem with *RSET#
STAT? response ERROR code 4	<p><i>(Failed to open TCP Socket)</i></p> <ol style="list-style-type: none">1. Check IPAD and PORT setting with *PARA?#2. Check that service provider is online
STAT? response ERROR code 5	<p><i>(Failed to get acknowledgment to GPRS report)</i></p> <ol style="list-style-type: none">1. Check that service provider is online

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 WARP 1.0 unit operates from a DC power source in the range 6 to 30VDC. Maximum current demand will depend on the voltage used, from approximately 2A at the lower voltage range to approximately 250mA at the higher end of the 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 WARP 1.0 unit requires a GSM SIM card to be installed before operation. The SIM card PIN request feature must be disabled for operation with a WARP 1.0 unit.

If the SIM card is missing, invalid or incorrectly fitted, an error message will be displayed on the debug terminal during start up and initialization 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 those of your tracking service provider. Default settings are configured to suit the Warp Wireless™ SCES Hosted 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
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 approximately 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. WARP 1.0 unit debugger error messages:

The WARP 1.0 unit 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 Warp Wireless™ 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 WARP 1.0 unit and connect to the PC using the serial lead supplied (red port). Open a HyperTerminal session at 4800 baud, no flow control. Instructions for creating a HyperTerminal session are given earlier in this document.

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 Warp Wireless™ 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\warp1_0.txt). Now that you are saving to a file, power up the WARP 1.0 unit 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 support@warp-wireless.com or to your local Warp Wireless™ representative for advice about your application problem.

INFORMATION TO USERS

FCC Part 15.19:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

FCC Part 15.21:

Warning: Changes or modifications not expressly approved by Vostek electronics could void the user's authority to operate the equipment.

FCC Part 15.105:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

WARNING!

This product is designed to be used with an external antenna with a maximum gain of 1 dBi or less. The use of an antenna of a higher gain is strictly prohibited and violates FCC regulations. Changes or modifications not expressly approved by the manufacturer may void the user's authority to operate the equipment.

NOTICE: During transmitter operation, a minimum distance of 20cm shall be maintained between the antenna and personnel, in order to meet the maximum permissible exposure.