

User Manual



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Should you require further assistance please contact your local dealer or the OmniSTAR Perth office.

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parts found to be defective, provided such defects, in their opinion, are due to faulty material or workmanship and are not caused by unauthorised or improper repair or abuse, or normal wear. Purchaser shall be responsible for shipping and insurance of the returned product for repair under this warranty. OmniSTAR will pay shipping and insurance for the product's return to purchaser provided that the product returned proves to be defective under this limited warranty.

This warranty applies only to normal usage of the product. It does not apply to units or electronic circuit boards defective due to improper installation or handling. Physical damage due to lightning or other electrical discharge and units subjected to fresh or salt-water contamination is not covered. OmniSTAR reserves the right not to warrant the product if, upon request, sufficient proof of recommended installation compliance as laid out in this manual is not provided. No other warranties are expressed or implied. No other warranties exist.

OmniSTAR assumes no responsibility for any consequential or incidental losses or damages of any nature with respect to the use of this product.

REVISION HISTORY		
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through an Auxiliary port.

Position accuracy is typically less than one metre and the receiver is suitable for both ground and air applications. Six LEDs on the front panel show operational status at a quick glance. The 3100LR8 can have a one-pulse-per-second output signal synchronised to GPS time.

The 3100LR8 receiver is easily configured using TSIP commands. Baud rate, position update rate, common NMEA string output and binary data output are among the variables which can be controlled using the TSIP commands.

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A typical 3100LR8 package will consist of the following items:

- 3100LR8 (receiver)
- Data Logger
- Data cable
- Power cable
- RF cable(s)
- Antenna(e)
- User manual

plugged into the DGPS socket on the rear panel of the receiver.

A system equipped with a single DGPS antenna is illustrated in Figure 1.

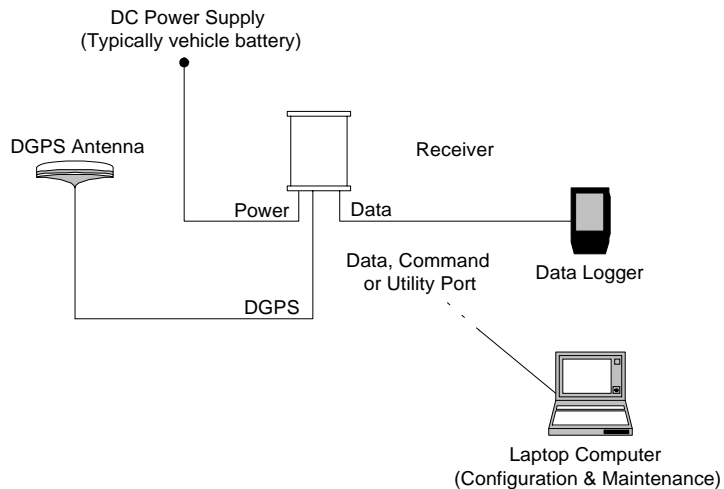


Figure 1 3100LR8 with DGPS Antenna

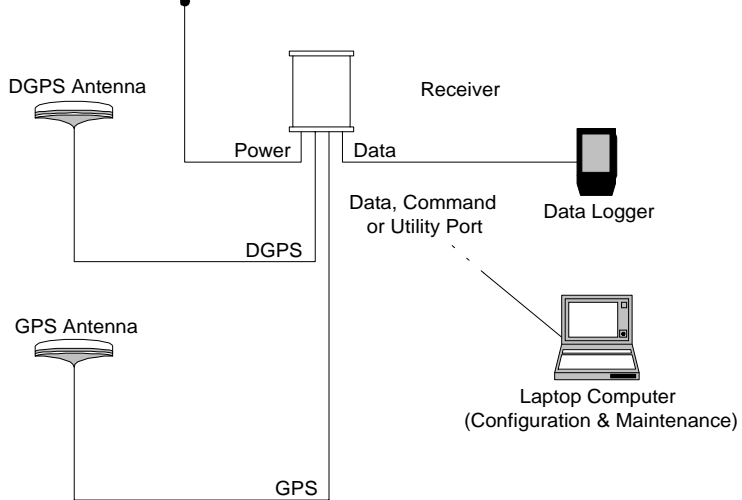


Figure 2 3100LR8 with GPS and DGPS Antennae

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The rear panel of the receiver is illustrated in Figure 3.

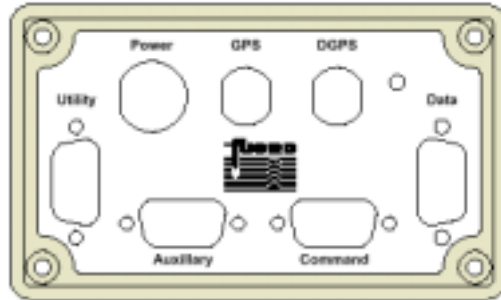


Figure 3 3100LR8 Rear Panel

To get you up and running quickly, carry out the following steps:

1. Connect the power cable to a suitable 10 V – 32 V DC power supply, taking care to check the correct polarity.

Red +V DC
Black –V DC

When installed in a vehicle this will typically be the vehicle battery supply, accessed via the cigarette lighter socket.

2. You need to install the antenna, or antennae if two are provided, so that there is a clear 360° unobstructed view of the sky through an elevation of 10° through 90°.

indicators and power ON/OFF switch, is illustrated in Figure 4.

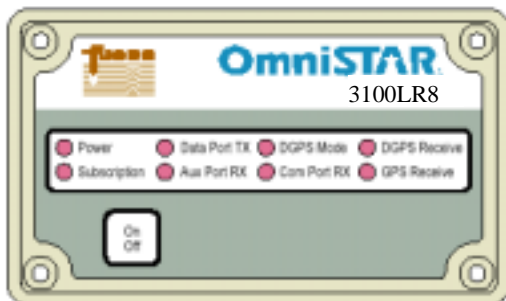


Figure 4 3100LR8 Geographic Locator Front Panel

6. The front panel LEDs provide indication of signal reception and data activity. (See 'Receiver Interfaces' section for LED indicator details).

At this point it is important to confirm that the **Subscription** LED is NOT illuminated. If this LED is illuminated it indicates that your OmniSTAR subscription has expired and you will not receive correction data.

7. The GGA output message, when viewed on a data logger or laptop computer plugged into the Data port, will indicate a non-corrected stand alone position with a '1' after the 'E'.

A differentially corrected position is indicated by a '2' directly after the 'E' in the GGA message from the Data port.

The power input has reverse polarity protection. However, as the negative terminal is also attached to the housing ground, large currents can flow to any ground attachments made to the housing. Reverse polarity must therefore be avoided to prevent damage to the vehicle supply.

At Voltages below 10 V the unit will reset itself to prevent any data loss. At Voltages below 8.5 V the receiver will turn itself off.

Power is connected to the unit via a 2 metre long, black sheath, red & black 2-core cable. The cable is terminated with a 3-pin Switchcraft EN3C3F female connector.

The connector pin layout is illustrated in Figure 5.

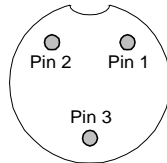


Figure 5 Pin layout of Switchcraft EN3C3F Female Connector

The Switchcraft EN3C3F connector is terminated as follows:

Pin 1 + DC voltage (red)

Pin 2 – DC voltage (black)

Pin 3 Not connected

powered up, this voltage is present at the antenna socket on the rear panel. Therefore, care must be taken not to connect or disconnect an antenna when power is on.

Data

The Data port is a standard DB9 female socket. Data logging can be carried by plugging a Data logger into this port. A laptop computer can also be plugged into the Data port for data logging and position information retrieval.

The pin assignment for the Data port is shown in Table 1.

Pin Number	Signal
1	CNT+*
2	TXD2
3	RXD2
4	CNT-*
5	GND2
6	
7	
8	
9	ANT STEERING*

Table 1 Pin Assignment for Data Port

A special Data cable is supplied, terminated as shown in Table 2.

DB9 Male Pin number	2 metre cable	DB9 Female Pin number
2	-----	2
3	-----	3
5	-----	5

Table 2 Data Cable Pin Assignment

Pin Number	Signal
1	DCD
2	TXD1
3	RXD1
4	DSR
5	GND1
6	DTR
7	CTS
8	RTS
9	

Table 3 Pin Assignment for Command Port

Utility

The Utility port is a standard DB9 female socket. The GPS engine can be configured via this port, using a laptop computer with proprietary software.

The pin assignment for the Utility port is shown in Table 4.

Pin Number	Signal
1	
2	GPS CNTRL TXD Note: Can be RS232C or TTL
3	GPS CNTRL RXD
4	
5	GPS CNTRL GND/GND4
6	TXD4/MON
7	RXD4/MON
8	
9	

Table 4 Pin Assignment for Utility Port

Pin Number	Signal
1	1 DIAG*
2	TXD3
3	RXD3
4	RESET*
5	GND3
6	CAN L*
7	CAN H*
8	TEMPT MON*
9	Q DIAG*

Table 5 Pin Assignment for Auxiliary Port

LED Indicators

The front panel LEDs provide equipment, signal and data status indication.

Each LED indicates is shown in Table 6.

LED	Indication
Power	'On' steady when DC power is present and unit is switched on.
Subscription	'Off' when your OmniSTAR subscription is current. This LED will be on if your subscription has expired.
Data Port TX	'Flashing' when data is active
Aux Port RX	'Flashing' when data is active
DGPS Mode	
Com Port RX	'Flashing' when data is active
DGPS Receive	'On' steady when receiving correct RF signal.
GPS Receive	'On' steady when receiving correct RF signal.

Table 6 Front Panel LED Indication

- Determine the preferred location for each unit. Consider cable length, connector attachment space (cable bend radius), stowing excess cable, moisture, chemical corrosion, vibration and heat exposure.
- Before drilling holes, consider using existing hardware and locations where equipment was previously installed. Avoid drilling holes that may damage other equipment (e.g. structural frame members, electrical cables or fluid lines).
- High vibration and high temperature locations should be avoided whenever possible.
- In application where vibration exceeds 5 G's acceleration, shock mounts are required. (Refer to Customer support for mounting recommendations).
- Vehicle primary power has voltages that may be harmful to personnel and equipment. Disconnect the battery cable from the battery –ve (negative) terminal before making connection to any power terminal within the vehicle.

Electrical Grounding Requirements

The 3100LR8 requires a vehicle chassis connection that is a perfect ground. There should be a zero ohm reading between the receiver power socket –ve (negative) input and the point where the vehicle battery –ve (negative) terminal is connected to ground.

CEMF is produced by equipment such as the following:

- Electric fan brakes
- Air conditioners
- Starter relays
- Electric pump relays

CEMF is more than sufficient to damage or cause erratic operation of any electronic system that is also connected to the same vehicle DC power supply.

CEMF can be eliminated by installing diodes at the relays and solenoids that cause the problem, and more importantly at the power supply cable connections on the receiver.

A 47 V, 5 W, Zener diode (1N5368 or equivalent) should be connected between the receiver +ve (positive) power input terminal and ground, as illustrated in Figure 6.

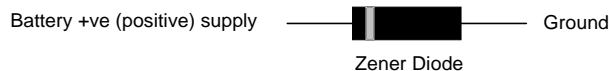


Figure 6 Zener Diode Connected

- If at all possible, do not run L-Band receiver antenna cables parallel to other radio system cabling closer than 30 centimetres.
- If cables must cross, ensure that they cross at an angle of 90 degrees. This minimises the possibility of interference.
- As far as is practicable, ensure that cables and I/O connectors are unique and fit only in their allocated location.
- Avoid routing cables along-side power generator cabling and other high electrical noise sources. This can cause interference.
- Do not kink or force cables into sharp bends that may damage the cables and cause system failure.
- After installation, ensure that excess cable is looped and clamped or tied safely away from any control cables, fuel lines, hydraulic lines or moving parts.

When stowing over length cables, form loops not less than 150mm minimum cable bend radius.

- Cable routing must avoid high temperature exposure (e.g. exhaust manifold).

may cause overloading of receiver RF circuits.

- The antenna should be mounted at the highest practical point that will give a good view of the horizon and be as near level as possible.
- The antenna must be located along the vehicle centre-line, or at a relevant reference point on the vehicle.

Vibration: 3G/30 Hz/x, y & z axes
Shock: Max 7G, 5-20m sec
zero rebound
Acceleration: 4G (with optional software)

Date inputs and outputs

Three serial Ports: Auxiliary, Data & Command
Electrical Interference: RS-232-C
Data Rates: 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 56700
Message Rate: Typically 1-2 seconds
output
Plug Types: DB-9 and RJ 45 connectors

Connectors

LNA Input from Antenna: SMA
LNA Output to Receiver: TNC

Directives

RF Input to Receiver: TNC
Power Connector: KYCON

Power

Power Supply: 9 V DC to 16 V DC
Power Consumption: 250 - 500 mA at 12 V DC

Antennae

Satellite Signal: Plate and Helix antenna
Frequency Range: 1525 MHz to 1559 MHz
Gain: 2 dBi to 8 dBi
Polarisation: RHC
Elevation Angles: 5 - 20 or 20 - 45 or 45 - 90

Approvals
and

Complies with European
USA EMI/EMC

GLL	Geographic position (NMEA standard)
GPS	Global Positioning System
GSA	Global Positioning System, dilution of position, active satellite (NMEA standard)
GSV	GPS satellites in view
LED	Light Emitting Diode
LNA	Low Noise Amplifier
NCC	Network Control Centre
NMEA	National Marine Electronics Association (Standard for interfacing marine electronic devices)
RF	Radio Frequency
RTCM	Radio Technical Commission Maritime
TSIP	Trimble Standard Interface Protocol
VTG	'Track mode good' and 'ground speed' (NMEA standard)
ZDA	Time and date (NMEA standard)

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