

NOTE 2 SEP = Spherical Error Probability: The radius of the sphere, centered at the antenna's True position, containing 50% of the fixes.

NOTE 3 One of this limit can exceeded but not both.

1.1.4 Environmental Characteristics

- Operating Temperature : from 0°C to +60°C
- Storage Temperature : from -20°C to +85°C
- Relative Humidity : 95% non-condensing
- Water Resistance : IPX7

1.2 WIRING

See the following tables for a functional description of each wire in the GPS cable.

1.2.1 Diagram for GSU with connector

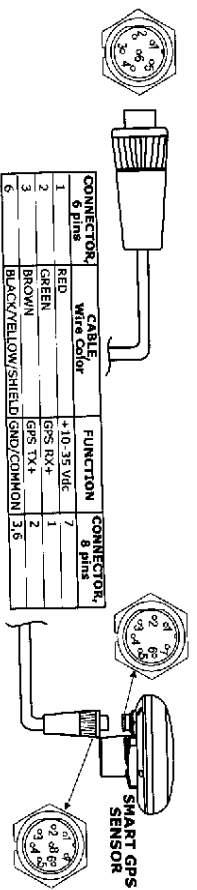


Fig. 1.2.1 - GPS Connection for GSU with connector

1.2.2 Diagram for GSU

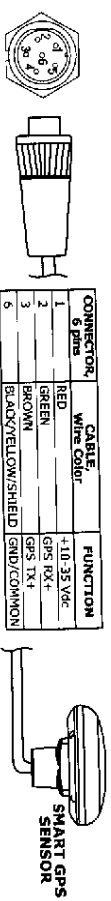


Fig. 1.2.2 - GPS Connection for GSU

WARNING!!! Cross check the connection on the User Manual of the device connected to the GPS.

1.3 SOFTWARE INTERFACE

The GPS products interface protocol design is based on the National Marine Electronics Association's NMEA 0183 ASCII Interface specification. These standards are defined in "NMEA 0183 Version 2.0" (for more information see NMEA, www.nmea.org).

1.4 MECHANICAL CHARACTERISTICS & MOUNTING

1.4.1 Installing

Choose a location for the antenna that has a clear view of the sky. Ensure there are no major obstructions or fixtures in the immediate proximity to the antenna. The antenna relies on direct "line of sight" satellite reception. If you are unable to find a suitable location, it may be advisable to mount the antenna temporarily in a manner to verify correct operation. The thread used on the antenna (1", 14 TPI) is an industry standard thread used on a wide range of mounting brackets, including the swivel joints commonly used for angled surfaces. However, due to the manufacturing process of these mounting brackets you may see some difficulty when tightening down the antenna to the bracket. This is a concern however as the antenna must be tightened until the antenna stops rattle on the antenna mounting bracket.

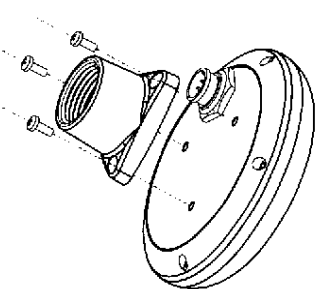


Fig. 1.4.1 - Installing GPS Antenna (I)

The antenna design also allows for easy flush mounting.

1. Apply the adhesive mounting template sheet in the area that was verified to receive satellite signal well.
2. Then, following template instruction, drill a 1" (25 mm) hole and three 0.13" (3.2 mm) holes.

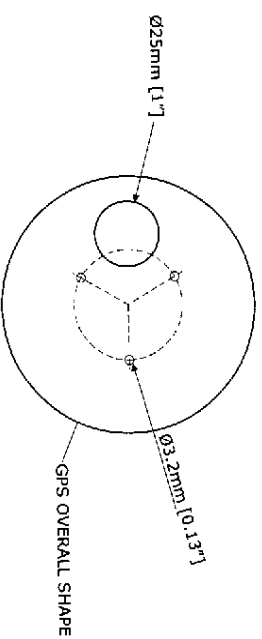


Fig. 1.4.1a - Installing GPS Antenna (II)

3. Remove the template and let the cable go through the central hole.
4. Apply a small coat of RTV to the underside of the antenna.
5. Place the antenna and then screw it with the three M3 screws.

1. Smart DGPS WAAS Receiver

This Smart DGPS WAAS receiver is based on a ultimate 16 channels GPS e that delivers accuracy better than three meters by decoding the GPS corr signals from the satellite-based WAAS (*Wide Area Augmentation System*) GPS engine, interface electronics and the passive antenna are enclosed insic water-proof plastic housing. This provides advanced state of the art GPS per ance in an easy to use package.

1.1 TECHNICAL SPECIFICATIONS

1.1.1 Physical Characteristics

- Color : Ivory white
- Dimensions : 97mm in diameter x 32mm in height (flus mounted) or 61.5mm on flag-pole mouir
- Weight : 160 grams (without cable)
- Cable GSU : white 15 meter 8x28AWG cable with pins female connector
- Cable GSU with connector : white 15 meter 8x28AWG cable with pins female and 8 pins female connector

1.1.2 Electrical Characteristics

- Input Voltage : 10 Vdc to 35 Vdc unregulated
- Power Consumption : 0.8 W max
- Electrical Interface : TTL voltage levels, RS-232 polarity

1.1.3 Performance

- Receiving Method : 16 channels parallel (up to 3 for WAA: Satellites)
- Receiving Frequency : 1575.42MHz (L1, C/A code)
- Receiving Sensitivity : Less than -134 dBm
- Time to First Fix (TTFF)
 - Warm Start : 33 seconds (typical)
 - Cold Start : 40 seconds (typical)
- Accuracy
 - Position : Less than 2.5mCEP¹ 5.0mSEP²; GPS:(SA=OFF; HDOP<4; Less than 2.0mCEP¹ 3.0mSEP²; DGPS:(SA=OFF; HDOP<4;
- Dynamics
 - Acceleration : Strong Signals <= 4g
Weak Signals typical 1g
 - Altitude³ : 18000m
 - Velocity³ : 1850Km/h (515 m/sec)
- DGPS format : WAAS; EGNOS; MSAS
- Output format : NMEA-0183 Baud rate 4800 N81
- NMEA Output messages : GGA, RMC, GSA, GSV, TXT
- Geodetic Datum : WGS84

NOTE¹ CEP = Circular Error Probability: The radius of a horizontal circle, centered at the antenna's True position, containing 50% of the fixes.

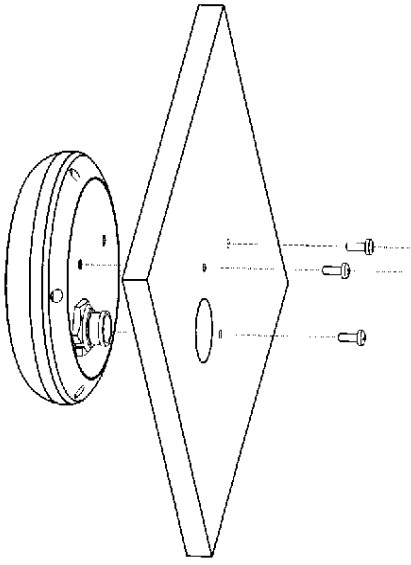


Fig. 1.4.1b - Installing GPS Antenna (III)

1.4.2 Dimensions

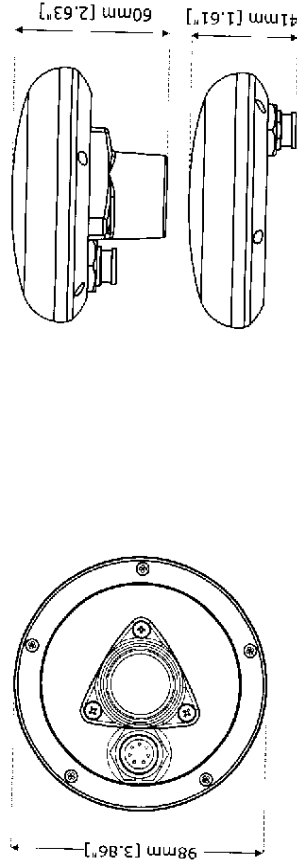


Fig. 1.4.2 - GPS Antenna Dimensions

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1.5 MECHANICAL CHARACTERISTICS & MOUNTING GSU MODEL

1.5.1 Installing

Choose a location for the antenna that has a clear view of the sky. Ensure there are no major obstructions or fixtures in the immediate proximity to the antenna. The antenna relies on direct "line of sight" satellite reception. If you are unsure that the chosen location is suitable it may be advisable to mount the antenna in a temporary manner to verify correct operation. The thread used on the mounting brackets, including the swivel joints commonly used for angled surfaces. How due to the manufacturing process of these mounting brackets you may see there is some slop when tightening down the antenna to the bracket. This is a concern however as the antenna must be tightened until the antenna stops rotating on the antenna mounting bracket.

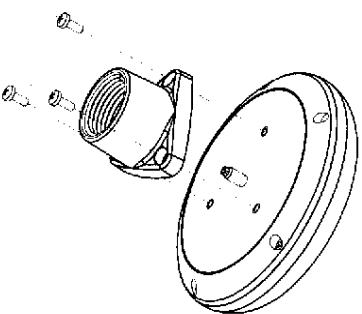


Fig. 1.5.1 - Installing GPS Antenna (1)

The antenna design also allows for easy flush mounting.

1. Apply the adhesive mounting template sheet in the area that was verified to receive satellite signal well.
2. Then, following template instruction, drill a 0.31" (8 mm) hole and three 0.13" (3.2 mm) holes.

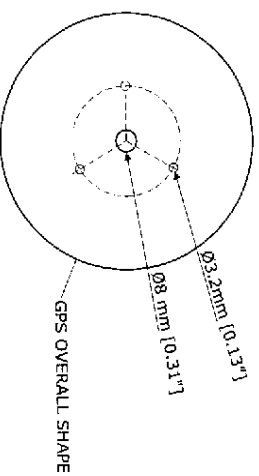


Fig. 1.5.1a - Installing GPS Antenna (11)

3. Remove the template and let the cable go through the central hole.
4. Apply a small coat of RTV to the underside of the antenna.
5. Place the antenna and then screw it with the three M3 screws.

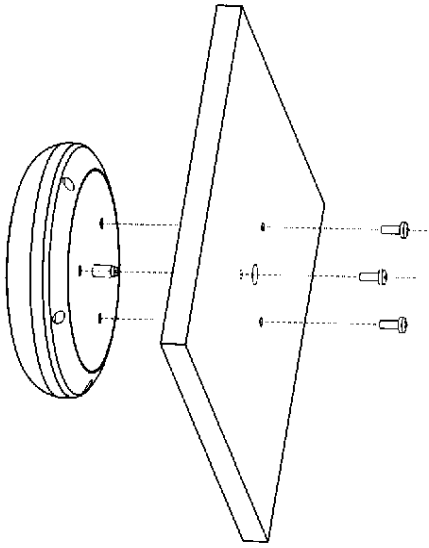


Fig. 1.5.1b - Installing GPS Antenna (III)

1.5.2 Dimensions

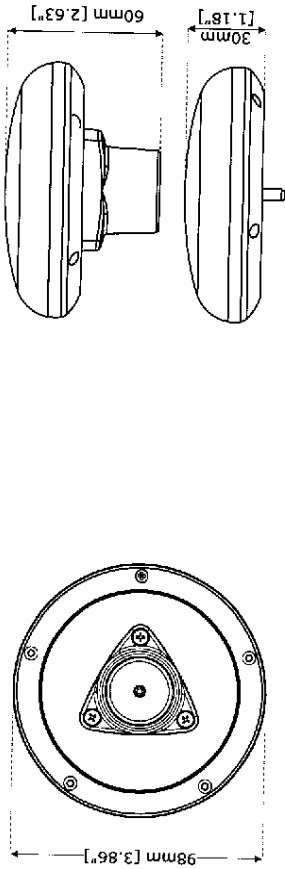


Fig. 1.5.2 - GPS Antenna Dimensions

Important Information

CAUTION

The Smart DGPS WAAS "GSU series" units are believed to be accurate and reliable, but they can be misinterpreted. For this reason we suggest that you carefully read this User Manual and make sure you understand with its contents using the Smart DGPS WAAS "GSU series" units. For a safe navigation information received from GPS to all available navigation indications received from other electronic navigation aids that you carry on board.

Do not open the Smart DGPS WAAS "GSU series" units. There are not service parts inside. Repairs should only be made by an authorized electronic technician. Please contact your local dealer (any unauthorized repair could result in damage to the unit and this damage may not be covered by the warranty).

LIMITED WARRANTY

The manufacturer warrants each Smart DGPS WAAS "GSU series" unit to be free from defects in material and workmanship under normal use and service for a period of 24 months from original retail purchase. During the warranty period the manufacturer will repair or replace any component which fails in normal use without charges for parts or labour.

To receive warranty service, contact your local authorized dealer for shipping instructions. The Smart DGPS WAAS "GSU series" unit should be securely packaged with its tracking code clearly written on the outside of the package, shipping paid by the customer. Include a copy of the original sales receipt as the proof of purchase. The manufacturer will return the Smart DGPS WAAS "GSU series" unit to the purchaser freight prepaid.

This limited warranty does not extend to any Smart DGPS WAAS "GSU series" unit which has been subjected to misuse, neglect, accident, incorrect wiring or improper installation. The manufacturer reserves the right to repair or replace the Smart DGPS WAAS "GSU series" unit at its sole discretion.

This warranty is in lieu of all other warranties either expressed or implied. THIS IS THE ONLY WARRANTY. THE MANUFACTURER EXPRESSLY DISCLAIMS ALL OTHER WARRANTIES INCLUDING WARRANTIES OF SUITABILITY, FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL THE MANUFACTURER BE LIABLE FOR CONSEQUENTIAL DAMAGES OR LOSS OF USE. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS WHICH MAY VARY FROM STATE TO STATE.

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