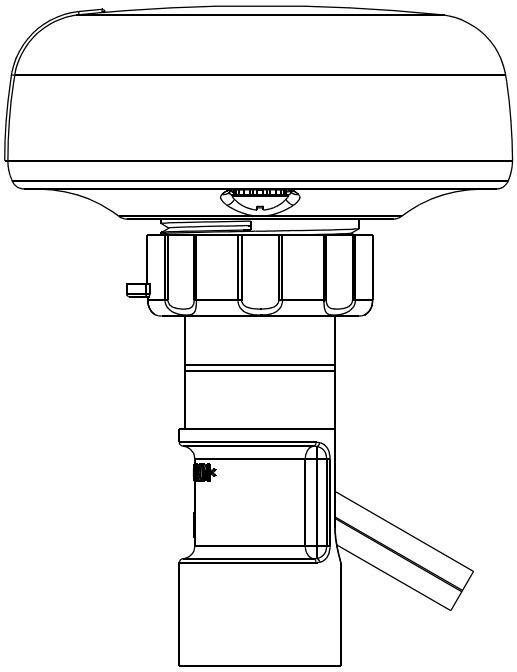
AIRMAR®
TECHNOLOGY CORPORATION

Owner's Guide & Installation Instructions

GPS Receiver

Model G2183



Record the serial number found on the GPS Receiver.
Serial No._____ Date of Purchase_____

17-484-01 rev. 02 04/01/09

Table of Contents

***IMPORTANT**: Please read the instructions completely before proceeding with the installation. These instructions supersede any other instructions in your instrument manual if they differ.*

Introduction

Thank you for purchasing the Airmar's GPS Receiver and combined antenna. This sensor fixes position using Wide Area Augmentation System (WAAS). The compact housing is waterproof with a single removable cable. Data is output in digital NMEA 0183 and NMEA 2000® formats.

Functions

- GPS with WAAS and EGNOS

Features

- Waterproof housing
- Waterproof cable system
- Fast response time
- Simultaneously outputs data in digital NMEA 0183 and NMEA 2000® formats
- Pole, rail or flush mount

WARNING

Navigation Aid Only—The GPS receiver is only an aid to navigation and should never be solely relied upon. It is not a replacement for traditional navigation aids and techniques. Only official government charts contain all the information needed for safe navigation.

WARNING: **GPS Accuracy**
The GPS position and velocity accuracies are controlled by the U.S. Department of Defence. Therefore the position accuracy described in the specifications cannot be guaranteed.

WARNING: **Correct Installation Important**
The GPS receiver must be installed and operated according to the instructions in this owner's guide. Failure to do so may result in poor product performance, damage to the boat, and/or personal injury.

WARNING: **Electrical Safety**
The power supply voltage must be 12VDC (±3VDC). Any other voltage may damage the product and/or result in fire, causing damage to the boat and/or personal injury.

WARNING: **Fuse or Circuit Breaker**
A safe installation requires a 1 amp fast-blow fuse or circuit breaker. Failure to do so may damage the product and/or result in fire, damage to the boat, and/or personal injury.

WARNING: **Installation Safety**
Always wear safety goggles and a dust mask when installing to avoid personal injury.

CAUTION: **Disassembly**
Do not disassemble the sensor. Removing the screws from the sensor unit (part A) will damage the waterproof seal, thus voiding the warranty.

IIMPORTANT: **Battery**
Make power connections to a 12 VDC power source that is isolated from the engine start battery(s). Voltage drops may cause the GPS receiver to lose information and/or change operating mode.

Cables & Converting/Connecting Hardware

The GPS receiver can be connected in several ways. **You must have the correct cable(s) and any needed junction box before beginning the installation.**

Cables

***NOTE**: Additional cable lengths are available.*

- NMEA 0183 Cable 10m Part No. 33-862-02
- NMEA 2000® Cable 6m Part No. 33-1029-02
- NMEA 2000® Cable 10m Part No. 33-1029-06

Junction Boxes

- NMEA 0183 to USB Converter Part No. 33-801-01
- NMEA 0183 Combiner Part No. 33-800-01
- NMEA 2000® CAN to USB Converter
- NMEA 0183 & NMEA 2000® Junction Box Kit 15m
- NMEA 0183 & NMEA 2000® Junction Box Kit 30m

Tools & Materials

***NOTE**: The sensor has standard marine 1"-14 threads.*

Pole/rail mounting hardware (some installations)
Safety goggles
Dust mask
Screwdrivers (Pole/Rail Mount installation)
Teflon pipe thread tape, 1/2" wide (some installations)
Pencil (some installations)
Electric drill (some installations)
Drill bits and hole saws (some installations):

Pilot hole	3mm or 1/8"
Flush mount stud holes	6mm *or* 1/4"
Flush mount cable hole	38mm *or* 1-1/2"

Deck gland (some installations)
Loctite® 242® or other removable thread locker (Flush Mount installation)
Grommets (some installations)
Cutting pliers (some installations)
Heat-shrink tubing (some installations)
Wire strippers (some installations)
Cable ties (some installations)

Choosing the Mounting Location

For a reliable GPS signal, selecting the best location for the receiver is very important. It can be mounted on a pole, rail, or flat surface. Choose a location that balances the requirements below.

- The GPS receiver *must* have a clear view of the sky to the horizon in all directions. However, the lower it can be mounted, the more stable it will be, to better track satellites low on the horizon.
- Mount away from any VHF radio, satellite, radar, or other antennas to avoid mutual interference (see Figure 1).
- The compass safe distance for standard and steering compasses is 0.30m (1'). Observe this distance to prevent interference to a magnetic compass.
- Mount above or below any radar beam. *Do not* mount within a radar beam.
- Mount reasonably level with the earth's surface—*not* tilted to one side.
- Do not mount on top of a sailboat mast. The sway will cause jitter in the data.
- Do not mount where the GPS receiver could be a tripping hazard or be tread upon. Note that frozen water spray on the unit may degrade reception.
- Be sure there is access to the underside of the mounting surface.
- Be sure the cable(s) can be routed to reduce electrical interference from other electrical wiring and any on-board equipment with strong magnetic fields such as radar equipment, radio transmitters, boat engines, generators, etc., separate the cables by at least 1 m (3').

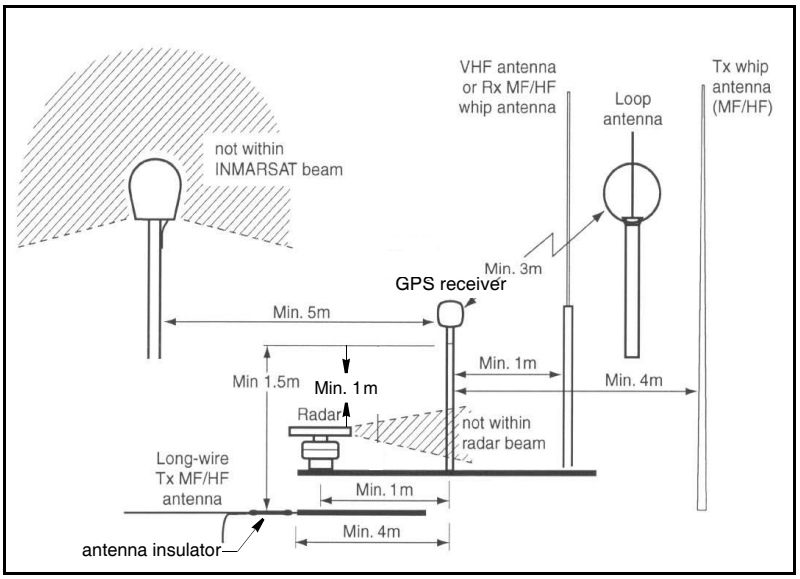


Figure 1. Minimum distance from GPS receiver

Courtesy of Northstar, Acton, MA

Installing

IMPORTANT: Plan the cable route between the GPS receiver and the display and/or network before beginning the installation.

Pole or Rail Mount

The nut assembly supplied has standard marine 1"-14 threads that can be screwed to a standard marine antenna mount, extension pole, or rail-mount bracket. Before beginning the installation, plan for securing the pole/rail bracket to the boat and purchase all the necessary hardware. It may be helpful to fasten the pole/rail bracket to the boat before proceeding.

WARNING: Always wear safety goggles and a dust mask.

1. Remove the label from the sensor unit's socket (see Figure 2). Fasten the mount base (part C) to the sensor unit (part A) with the two machine screws and lock washers supplied. The torque for the screws is 1.35 Nm.

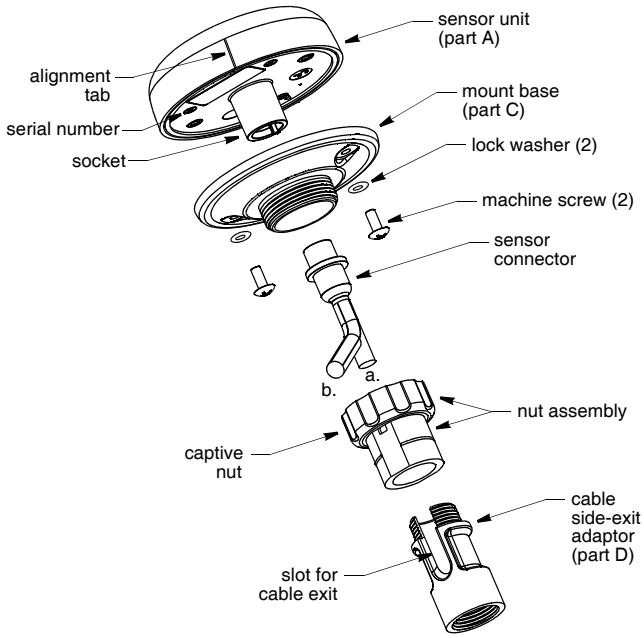


Figure 2. Pole/Rail mount

2. Decide if you want the cable to exit through the center or along the side of the pole/rail bracket. Slide the nut assembly onto the cable at the 9-pin *sensor* connector end. *Do not connect the sensor at this time.*
   a. **Center exit**—Pass the *instrument* connector end of the cable down through the center of the pole. *Be sure to leave several inches of cable extending beyond the nut assembly.*
   b. **Side exit**—Place the cable side-exit adaptor (part D) over the cable. *Being sure the cable is passing through the slot in the side, s*crew the nut assembly onto the adaptor. **Hand-tighten only**. *Do not* over tighten.

   NOTE*: Use the adaptor supplied as it has smooth edges that will not chafe the cable. Do not use a purchased part.*

CAUTION: If you use a thread locker, use teflon pipe thread tape. Do not use a liquid thread locker as it may weaken the plastic, causing it to swell and crack.

3. Screw the extension pole/rail bracket onto the nut assembly /side-exit adaptor. **Hand-tighten only**. *Do not* over tighten.
4. Remove the protective cap from the sensor connector on the cable. (Save the cap to protect the connector, when the receiver is removed.) Plug the cable firmly into the sensor.
5. With the alignment tab on the sensor facing forward, slide the captive nut upward and screw it onto the mount base. **Hand-tighten only**. *Do not* over tighten.

Flush Mount

WARNING: Always wear safety goggles and a dust mask.

1. Remove the label from over the sensor unit's socket (see Figure 3). Apply *removable* thread locker to the two studs supplied. Screw the studs into the underside of the sensor unit (part A).

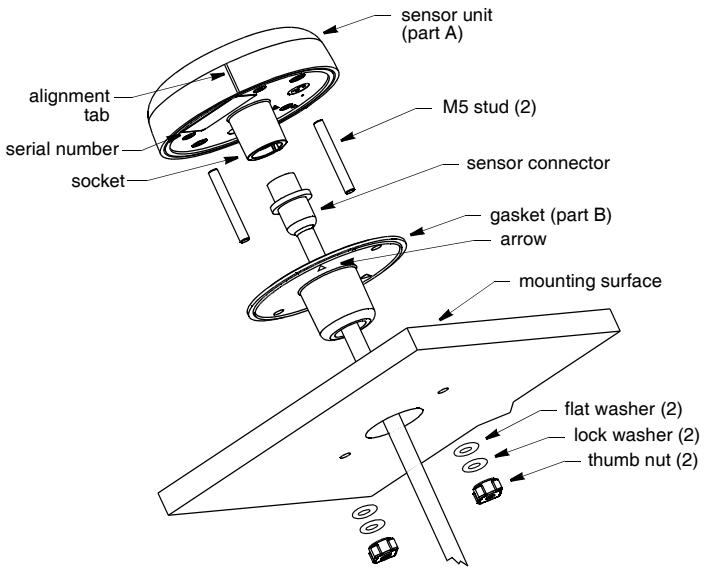


Figure 3. Flush mount

2. Using the gasket (part B) as a template, position it at the selected mounting location *upside down* with the arrow facing forward. Mark the position for the two mounting holes and the center hole for the cable.
3. Using a 3mm or 1/8" bit, drill the pilot holes. Using a 6mm or 1/4" bit, drill the two mounting holes for the studs. Drill the cable hole with a 38mm or 1-1/2" hole saw. **Fiberglass**—Minimize surface cracking by running the drill in reverse until the gelcoat is penetrated.
4. Pass the *instrument* connector-end of the cable through the center of the gasket and down through the center mounting hole in the boat.
5. Plug the cable firmly into the sensor unit.
6. Orient the gasket with the arrow facing in the same direction as the alignment tab on the sensor unit. Push the gasket onto the studs and slide it over the connector.

   ***NOTE**: The gasket fits one way only. A groove in the gasket fits over the alignment tab on the connector.*
7. With the sensor unit's alignment tab pointing forward, push the studs through the mounting surface. *Check to be sure the gasket is tucked under the lip of the unit.* From underneath the mounting surface, slide a flat washer and lock washer onto each stud. Fasten them with the thumb nuts. **Hand-tighten** only. *Do not* over tighten.

Cable Routing & Connecting Guidelines

WARNING: Always wear safety goggles and a dust mask when installing.

CAUTION: To reduce electrical interference from other electrical wiring and any on-board equipment with strong magnetic fields such as radar equipment, radio transmitters, boat engines, generators, etc., separate the cables by at least 1m (3').

CAUTION: Do not remove the waterproof connector(s) to ease cable routing. If the cable must be cut and spliced, use Airmar's splash-proof Junction Box No. 33-035 and follow the instructions provided. Removing the waterproof connector or cutting the cable, except when using a water-tight junction box, will void the sensor warranty.

CAUTION: Be careful not to tear the cable jackets when passing them through bulkheads and other parts of the boat. Use deck glands and grommets to prevent chaffing.

CAUTION: Use a multimeter to check the polarity and the connections to the 12 VDC power supply before applying power to the sensor.

CAUTION: Coil any excess cable(s) and secure with cable ties to prevent damage.

Connecting to an NMEA 0183 Display

1. Route the sensor cable to the display. *Do not* fasten the cable in place at this time.
2. Connect the sensor to the display in one of two ways.
   a. **Connector**—If your sensor cable has a connector on the display end, and it can be plugged into the port on your NMEA 0183 display, do so now. Coil any excess cable and secure it with cable ties to prevent damage. Fasten the cable in place.
   b. **No connector**—If your sensor cable does not have a connector on the display end, it must be hard wired. Refer to the owner's manual that came with your display and connect the colored wires as shown in the table below and Figure 4.

GPS Function	GPS Wire Color	Display Function
NMEA input A/+	Yellow	NMEA output A/+ (see Note 2)
NMEA input B/–	Orange	NMEA output B/–
NMEA output A/+	White	NMEA input A/+
NMEA output B/–	Blue	NMEA input B/–
12 VDC +	Red (see Note 1)	12 VDC + (see Note 3)
12 VDC –/ground	Black	12 VDC –/ground
Shield	Bare	Shield

***NOTE 1**: The sensor must be supplied with 12 VDC (±3 VDC) at 0.5 amp.*

***NOTE 2**: If your display does not have NMEA 0183 output connections, the yellow and orange wires are not needed and their ends should be taped separately. (Alternatively, yellow and orange wires can be connected to an external sensor.)*

***NOTE 3**: The display power may be wired directly to the sensor cable, or it may be wired separately.*

No Connector—Wiring

1. Allowing an extra 25 cm (10") for wiring ease, cut the cable to length.
2. Strip 60mm (2-1/2") of the outer jacket and foil shielding from the cut end of the cable (see Figure 4).
3. Strip 10 mm (3/8") of conductor insulation from the end of each colored wire.
4. Protect the cable's foil shielding from causing a short by using heat-shrink tubing around the jacket where the wires emerge from the cable. The tubing must overlap the wires a minimum of 6mm (1/4").
5. Connect the wires to the display (see Figure 4).
6. Fasten all cable in place.
7. Your installation is complete. To begin receiving data, refer to the owner's manual that came with your display.

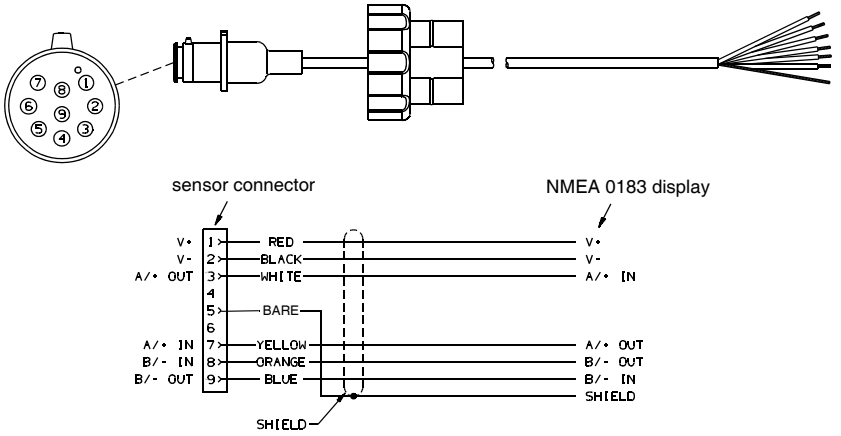


Figure 4. NMEA 0183 cable

Connecting to an NMEA 2000® Network

CAUTION: Only two termination resistors are required on an NMEA 2000 network. More than two will degrade the bus performance.

IMPORTANT: When using a cable that is longer than 6m (20'), remove the termination resistor at the last node/tee on the NMEA 2000 network. Insert the male-to-male pin into socket 5 of the sensor connector to activate the termination resistor located inside the sensor (see Figure 6). *Note that using a termination resistor inside a sensor deviates from the published NMEA 2000 installation practices*.

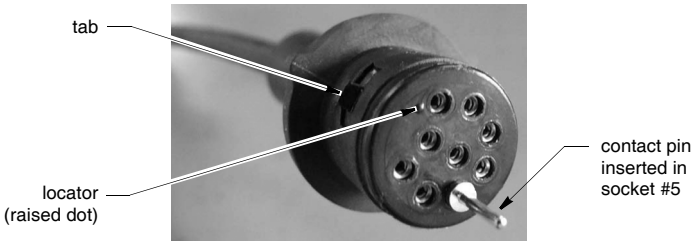


Figure 6. Inserting the male-to-male pin in the sensor connector

Route the sensor cable to the NMEA 2000 network. Plug the NMEA 2000 connector into the network node (see Figure 5). Coil any excess cable and secure with cable ties to prevent damage.

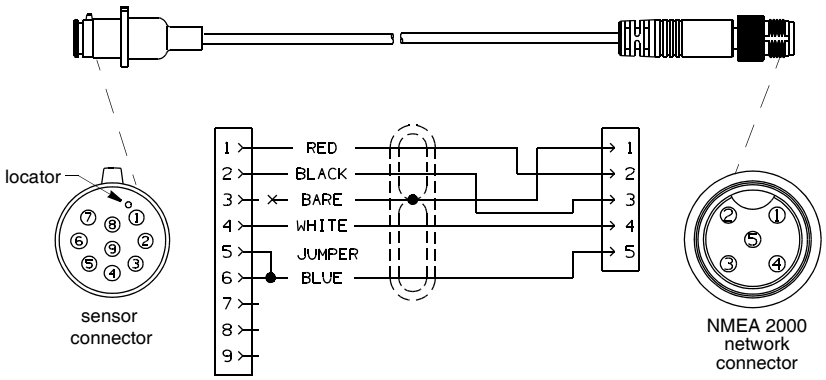


Figure 5. NMEA 2000® cable

Maintenance & Updates

Firmware Revisions

Airmar may release updated versions of the firmware. The latest revision will be available for download through an email to you, from Airmar's website, www.airmar.com, or a CD can be mailed by Airmar's technical support personnel.

Troubleshooting

No GPS Fix

- Is there power to the GPS receiver?
- Are all the connections tight?
- Does the GPS receiver have a clear view of the sky?
- Is there interference from other antennas or instruments?
- Is the cable-run free of kinks or damage?
- Is there damage to the GPS receiver?
- Is there ice on the GPS receiver?

Specification

NMEA 2000® Load Equivalency Number (LEN).....3

Where to Purchase Parts

Lost, broken, or worn parts should be replaced immediately. Obtain parts from your instrument manufacturer or marine dealer.

Gemeco	Tel:	843.210.7000
(USA)	Fax:	843.210.7170
	Email:	sales@gemeco.com
Airmar EMEA	Tel:	+33.(0)2.23.52.06.48
(Europe, Middle East, Africa)	Fax:	+33.(0)2.23.52.06.49
	Email:	sales@airmar-emea.com

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Notes

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