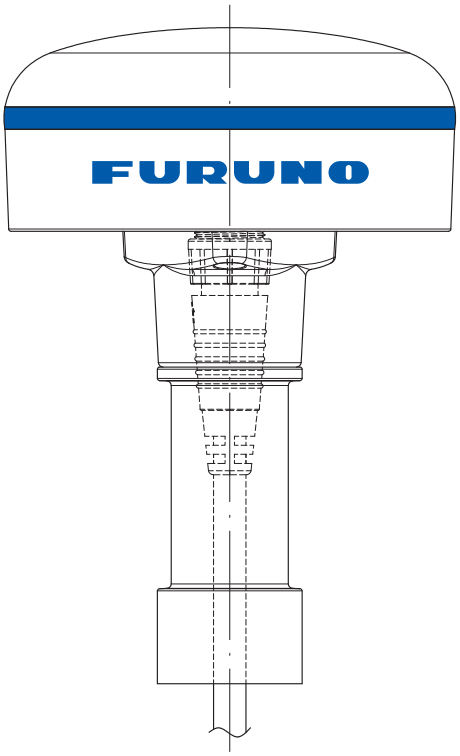
FURUNO

Mackay
Marine Electronics &
Satellite Communications

GP340 GNSS Receiver

(Global Navigation Satellite System)

Installation Guide



FURUNO USA, INC.
www.furuno.com

IMPORTANT NOTICES

GENERAL

This manual has been authored with simplified grammar, to meet the needs of international users. The operator of this equipment must read and follow the descriptions in this manual. Wrong operation or maintenance can cancel the warranty or cause injury. Customers may print one copy of this manual for their own use.

The contents of this manual and equipment specifications can change without notice. The example screens (or illustrations) shown in this manual can be different from the screens you see on your display. The screens you see depend on your system configuration and equipment settings.

Save this manual for future reference. Any modification of the equipment (including software) by persons not authorized by FURUNO will cancel the warranty. All brand and product names are trademarks, registered trademarks or service marks of their respective holders.

HOW TO DISCARD THIS PRODUCT

Discard this product according to local regulations for the disposal of industrial waste. For disposal in the USA, see the homepage of the Electronics Industries Alliance (http://www.eiae.org/) for the correct method of disposal.

CE/UKCA declaration

With regards to CE/UKCA declarations, please refer to our website (www.furuno.com), for further information on RoHS conformity declarations. Disclosure of Information about China RoHS. With regards to China RoHS information for our products, please refer to our website (www.furunousa.com)

SAFETY INSTRUCTION

The operator of this equipment must read these safety instructions before attempting to operate the equipment.

⚠ WARNING	Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

⚠ Warning, Caution ⃠ Prohibitive Action ❗ Mandatory Action

⚠ WARNING

❗ Always wear safety goggles and a dust mask when installing to avoid personal injury.

⚠ CAUTION

⃠ **Do not disassemble the unit.**

Disassembling the unit will damage the waterproof seal. Further, there are no user-serviceable parts inside.

⚠ GPS position and velocity accuracies are controlled by the U.S. Department of Defense. Therefore, the position accuracy described in the specifications cannot be guaranteed.

❗ **No one navigation device should ever be solely relied upon for the navigation of a vessel.**

Always confirm position against all available aids to navigation, for safety of vessel & crew.

❗ **The compass safe distance for standard and steering compasses is 0.30 m.**

Observe this distance to prevent interference to a magnetic compass.

⃠ **Do not use high-pressure cleaners to clean this equipment.**

This equipment has the waterproof rating outlined in the specifications, at the back of this manual. However, the use of high pressure cleaning equipment can cause water ingress, resulting in damage to, or failure of, the equipment.

❗ **The input voltage shall be 12 - 24 Vdc**

Any other input voltage can damage the equipment.

❗ **Make power connections to a 12-24 Vdc power source that is isolated from the engine start battery(s).**

Voltage drop may cause the GPS receiver to lose information and/or change operating mode.

⚠ A safe installation requires a 0.5 amp fast-blow fuse or circuit breaker.

Table of Contents

Note: The Packing Lists, Outline Drawings, and Interconnection Diagram are located in this manual.

Foreword

A Word to the Owner of the GP340

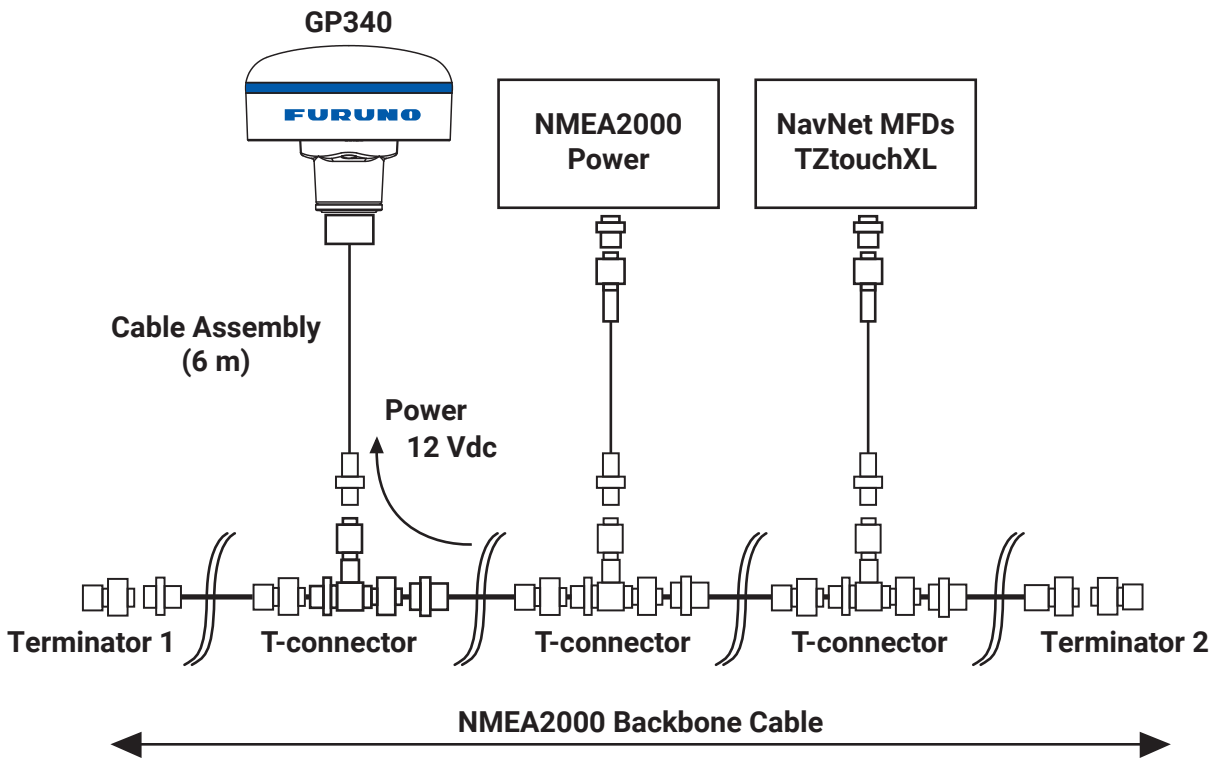
Congratulations on your choice of the FURUNO GP340 GNSS Receiver.

This equipment is designed and constructed to meet the rigorous demands of the marine environment. However, no machine can perform its intended function unless installed, operated and maintained properly. Please carefully read and follow the recommended procedures for installation and maintenance.

Product Overview and Features

- **Compatible with GPS L1/L5, GLONASS L1, Galileo E1/E5, QZSS L1/L5, and Beidou B1/B2**
- **Compatible with SBAS (WAAS, EGNOS, MSAS, GAGAN)**
- **75 Channel GNSS core**
- **Waterproof rating of IPX6**
- **High position accuracy < 3M 95% of the time**
- **10hz update rate**
- **Ideal position-fixing sensor for NAVnet series, including TZtouch, TZtouch2, TZtouch3, and TZtouchXL**
- **NMEA 2000 Certified**
- **Output in NMEA 2000 or NMEA 0183 format depending on cable used (NMEA 0183 cable is an option)**
- **Operating voltage is 12-24vdc/30mA-20mA**

System Configuration



Equipment List

PART DESCRIPTION	QUANTITY
A) GP340 GNSS Receiver	1
B) Mount Base Adapter	1
C) Mount Base Adapter Screws	6 (3ea are spare)
D) Cable Side Exit Adapter	1
E) Bracket Mount	1
F) Bracket Mount Screws	3
G) User Manual	1
H) 6m NMEA 2000 Drop	1

Optional Supply

- GP3-400-183-06 ——— 6m NMEA 0183 Cable
- GP3-400-2K2-06 ——— 6m GP340 NMEA 2000 Cable
- AIR-033-745 ——— NMEA 2000 starter kit
- AIR-052-531 ——— NMEA 2000 T-Connector, Female/Female/Male
- AIR-335-781 ——— NMEA 2000 Micro Field Connector, Male
- AIR-335-782 ——— NMEA 2000 Micro Field Connector, Female
- AIR-335-791 ——— NMEA 2000 Micro Terminator, Male
- AIR-335-792 ——— NMEA 2000 Micro Terminator, Female
- FI5002 ——— NMEA 2000 Junction Box
- IF-NMEA 2K2 ——— Interface Converter NMEA 2000-NMEA 0183
- AIR-335-661 ——— NMEA 2000 Power Tee, 8 Meter
- ACT-A2K-SBN-1 ——— Dedicated 4-port NMEA 2000 network bus, non-expandable
- ACT-A2K-SBN-2 ——— Dedicated 8-port NMEA 2000 network bus, non-expandable

Choosing the Mounting Location

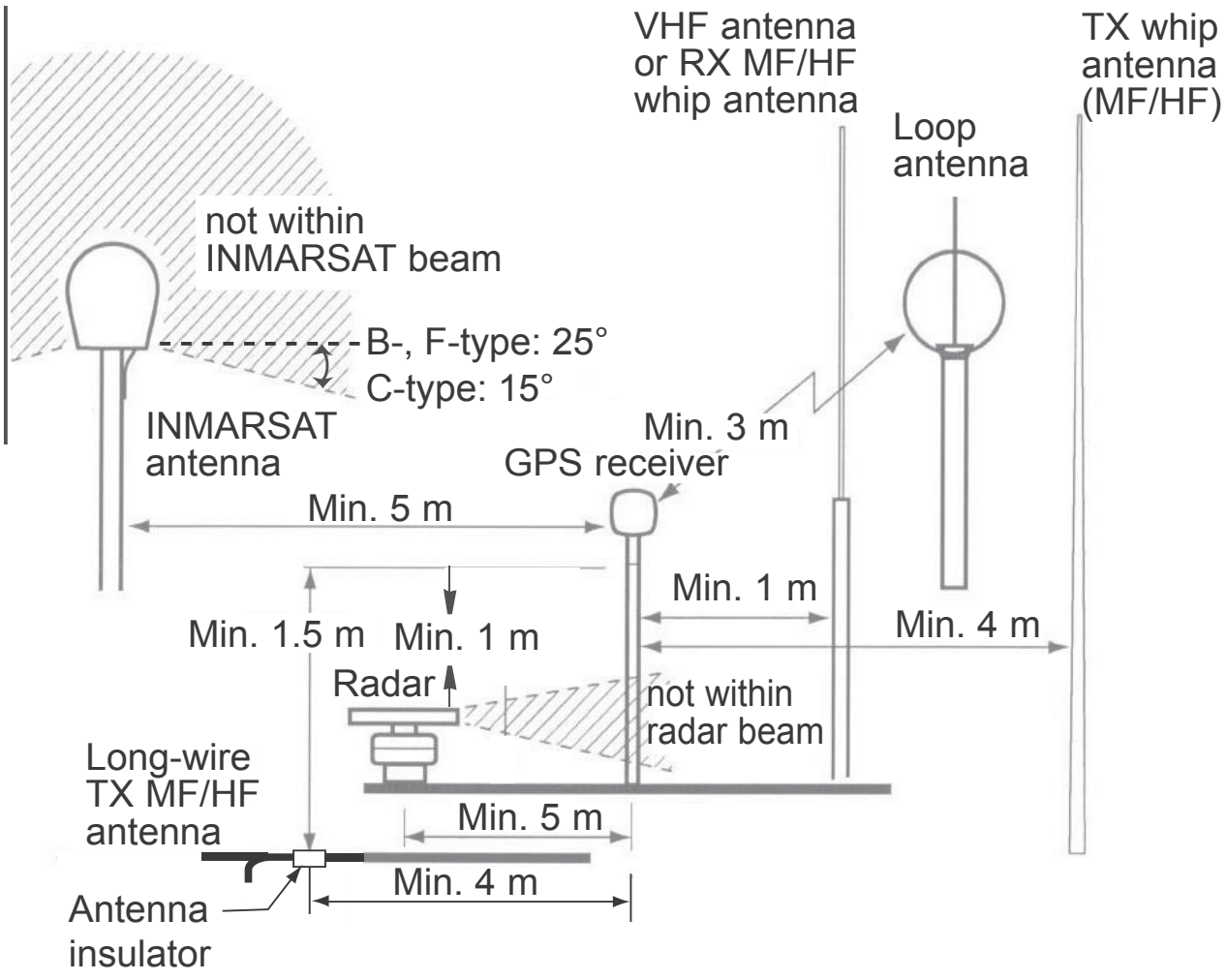
For a reliable GNSS signal, selecting the best location for the receiver is very important. It can be mounted on a pole, rail, or flat surface. Choose a location that balances the requirements below:

- The GNSS receiver must have a clear view of the sky to the horizon in all directions. Note that frozen water spray may degrade reception.
- Referring to the figure below for distances, mount away from any VHF radio, satellite communications equipment, radar, or other antennas to avoid mutual interference.

Choosing the Mounting Location (...Continued)

- Mount above or below any radar beam. Do not mount within a radar beam. Damage to the GP340 may occur.
- 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 GP340 receiver could be a tripping hazard or stepped on.
- 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 equipment with a strong magnetic field such as radar, radio transmitters, engines, generators, etc. Separate the cables by at least 1 meter (3 feet).
- For best performance and minimal interference, you should mount your GPS antenna at least 3 to 6 feet (1 to 2 meters) away from your Starlink antenna.

Mounting Information

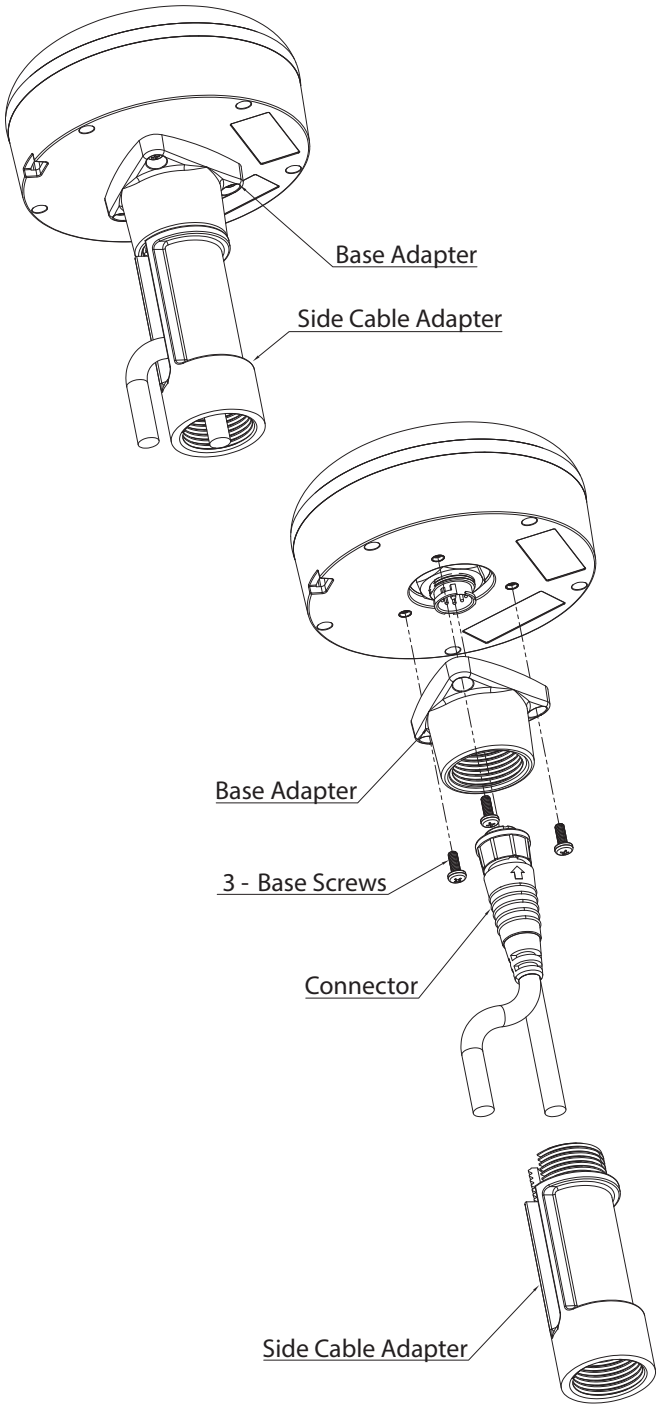


MOUNTING: Pole / Rail (Pipe) Mount

Tools & Materials

- ✓ **Electric Drill, Drill bits, Screwdrivers, Teflon tape, pencil, and silicone sealant (some installations)**
- ✓ **Mounting hardware with standard 1”-14 UNS threads for Pole/Rail Mount installations**
- ✓ **Safety goggles and dust mask**

Pole / Rail (Pipe) Mount



REVIEW INSTRUCTIONS BELOW

Step 1

The Mount Base Adapter and the Cable Side Exit Adapter both have standard 1”-14 UNS 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 additional hardware in advance.

IMPORTANT – Do NOT USE standard Loctite thread locking compound on the plastic (ABS) threads or system components! Damage will occur!! Instead use silicone sealant, Teflon pipe thread tape, or a compatible thread locking compound like “Loctite 425” to secure the antenna.

Cables that connect to the antenna feature a lock mechanism, activated or released by rotating the connector’s flange.

Step 2

Decide whether to use the Cable Side Exit Adapter. When using the Cable Side Exit Adapter, pass and pull the cable through the adapter to the end.

Step 3

Attach the cable to the GP340 GNSS Receiver using the attached 7-pin connector. Then fasten the Mount Base Adapter to the GNSS Receiver with the supplied 3 screws and spring washers using a #1 phillips/plus screwdriver. (Note: If there is slack in the cable and the pole extension provides enough space to use a #1 Plus/Phillips screwdriver under the GP340 GNSS Receiver, it may be possible to attach the Mount Base Adapter as a final step and Step 6 will not be necessary.)

Step 4

“Center Exit” installation: Pass the GP340 connector end of the cable down through the center of the pole. Be sure to leave at least 15 cm (6 inches) or more of cable extending beyond the mount assembly.

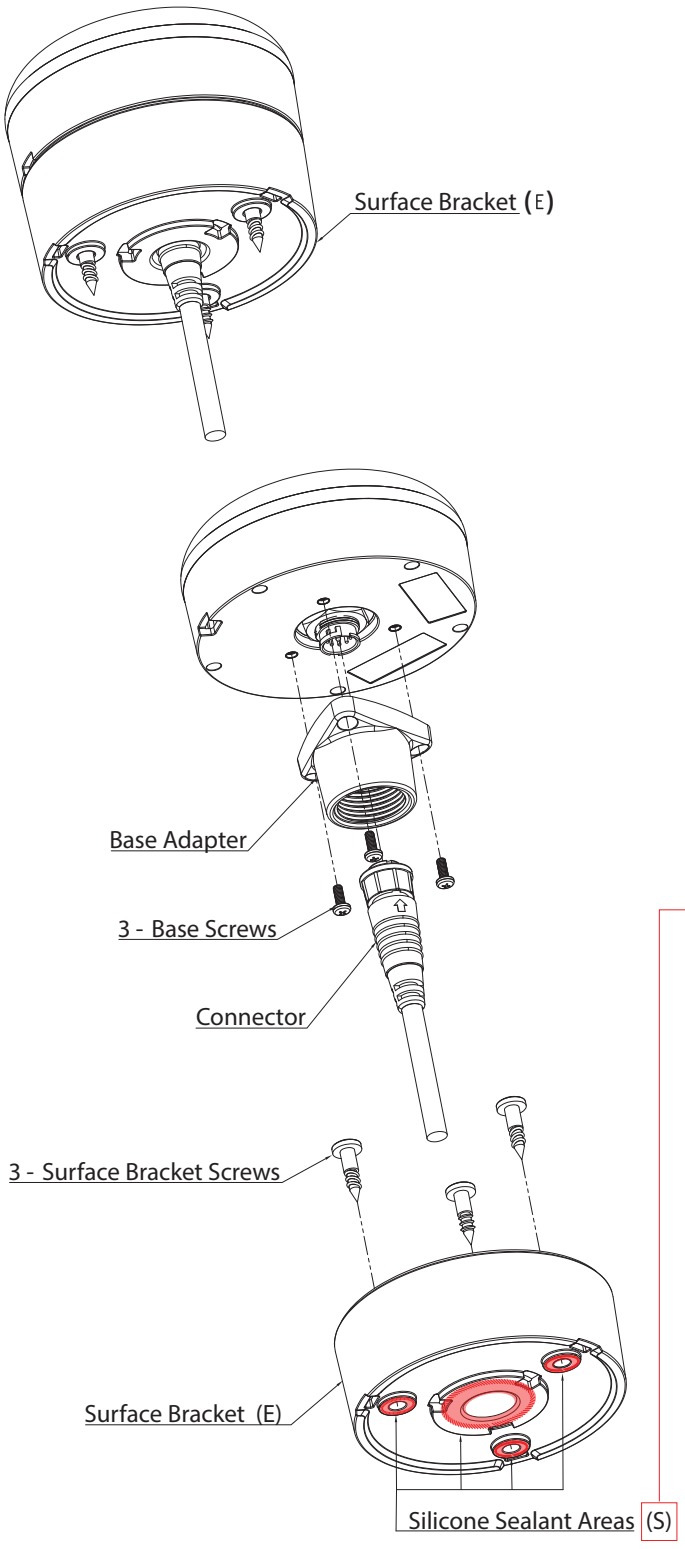
Step 5

“Side Exit” installation: Place the cable side-exit adapter over the cable. Being sure the cable is passing through the slot in the side, screw the Mount Base Adapter onto the Side cable adapter. Hand-tighten only. Do not over tighten.

Step 6

With either Step 4 or Step 5, “Backwind” the GP340 GNSS Receiver cable three and one-half turns before engaging the threads so that the cable is not twisted or bound when fully tightened. Hand-tighten only. Do not over tighten.

Deck Mount



REVIEW INSTRUCTIONS

Step 1
All parts are provided for a Deck Mount installation only. Some silicone sealant will be necessary during installation.

Step 2
Temporarily attach the Mount Base Adapter to the GP340 GNSS Receiver and then screw the Bracket Mount to the Mount Base Adapter.

Step 3
At the selected deck installation location, position the surface bracket and place a pencil mark at the forward facing position. Unscrew the Bracket Mount from the Mount Base Adapter. Using the Bracket Mount as a template, mark the position for the three mounting screws and the center hole for the cable.

Step 4
Using a 3 mm or 1/8” bit, drill the pilot holes. Using 5.1 mm or #7 bit, drill the three mounting holes. Drill the cable hole with a 25 mm or 1” bit.

Tip: If installing in fiberglass, use blue tape over the area to be drilled and run the drill in reverse until through the gelcoat. This will prevent the fiberglass from chipping.

Step 5
At the location shown in the figure (left), coat the surface bracket (part E) with silicone sealant. Do not coat the entire bracket, there are drain holes. Note: Refer to specific areas to apply silicone sealant (S).

Step 6
Apply silicone sealant to the three #10 x 3/4” self-tapping screws to seal the deck. With the pencil mark facing forward, fasten the surface bracket in place. Do not block the drain slots. They will allow any water that accumulates inside the surface bracket to escape.

Step 7
Attach the cable to the GP340 GNSS Receiver using the attached 7-pin connector. Then fasten the Mount Base Adapter to the GNSS Receiver with the supplied 3 screws and spring washers.

Step 8
Pass the cable through the Bracket Mount and into the deck.

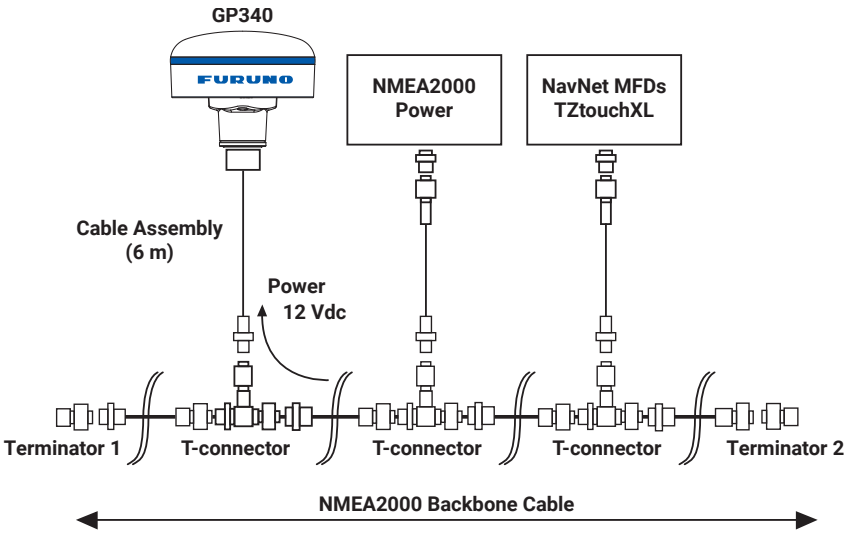
Step 9
“Backwind” the cable three and one-half turns before engaging the threads so that the cable will not be twisted or bound when fully tightened.

Step 10
Screw GPS receiver onto the installed Bracket Mount. Hand-tighten only. Do not over tighten.

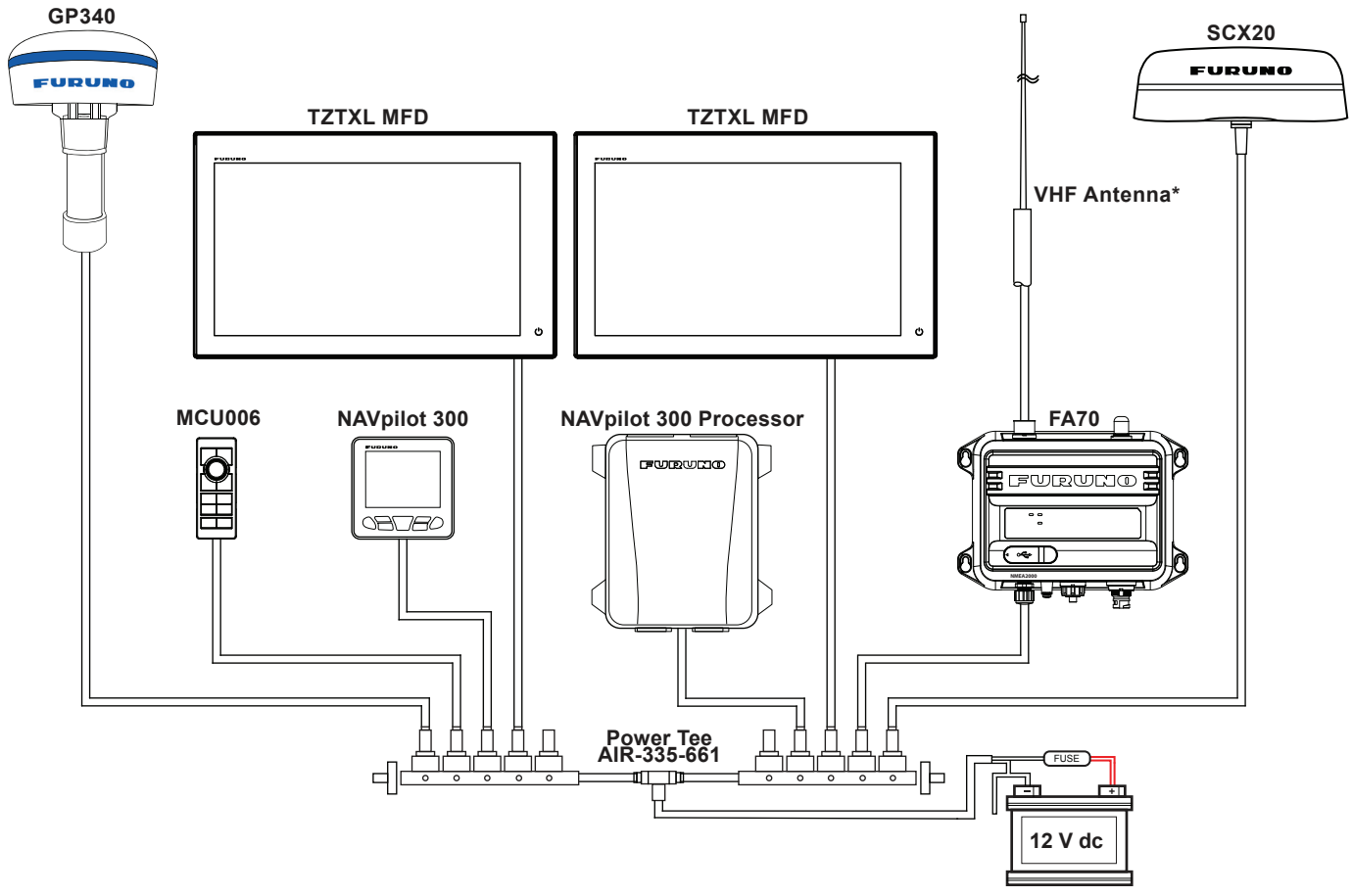
What is NMEA 2000?

NMEA 2000, also known as a CAN bus, is a communication protocol that shares multiple data and signals through a single backbone cable. Connect any NMEA 2000 device onto the backbone cable to expand your network. With NMEA 2000, IDs are assigned to all the devices in the network, and the status of each sensor in the network can be detected.

How to connect the GP340 GNSS receiver to the NMEA 2000 network:



System Example: Below is a typical example of a basic system.



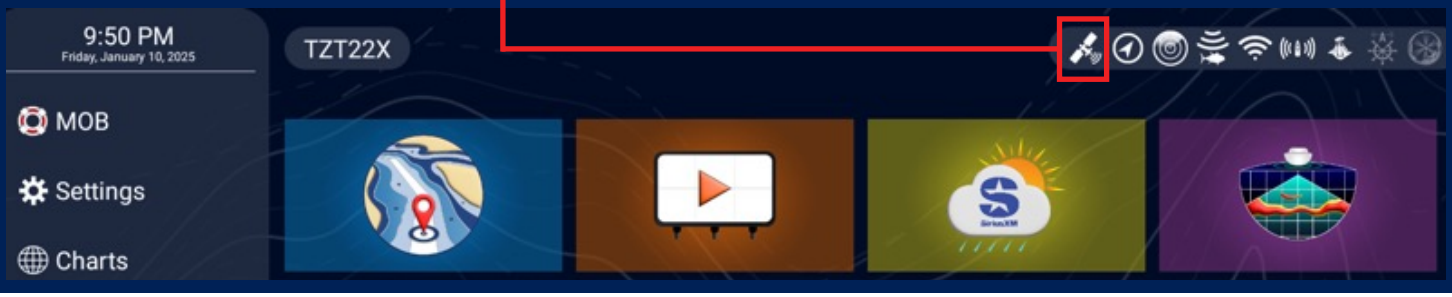
GP340 Status Check Using Furuno MFD

Once the GP340 is installed and power is applied, perform a test to verify operation. It may take up to one minute for the GP340 to acquire a position fix the first time that the GP340 is powered on from your location. Make sure to have a clear view of the sky. For a 2D fix, at least three satellites are needed, while a 3D fix requires four or more. These satellites can be a combination of the different systems, such as GPS, GLONASS, Galileo, etc.

TZtouch2, TZtouch3, and TZtouchXL Operational Check

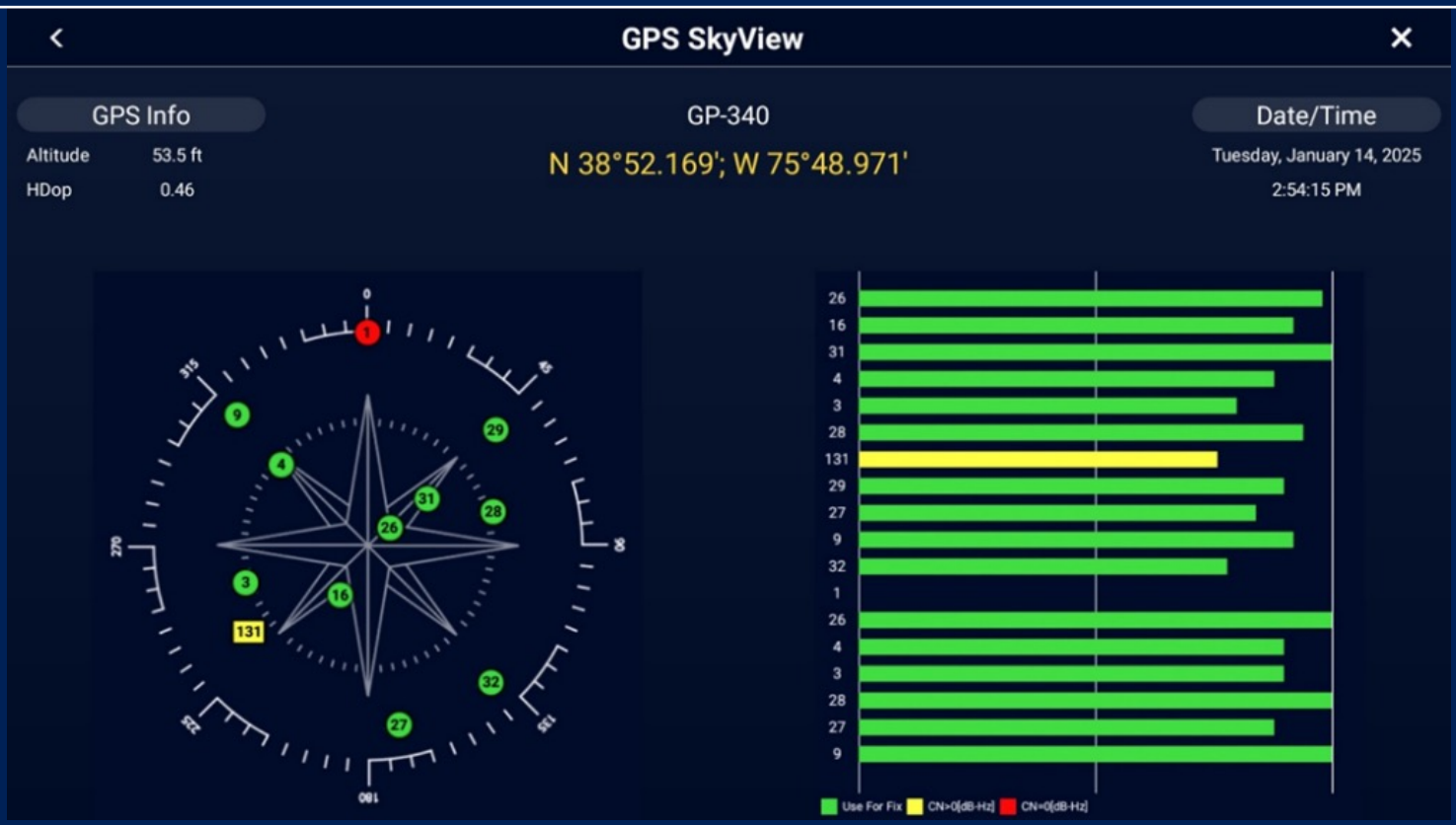
When the GP340 acquires a valid position, you will notice that the **Point Icon** next to the **Home Button** on your NAVnet TZtouch MFD has changed from grayed out to white. A grayed-out icon indicates no position. A white icon indicates a good position fix. You can also check for a valid position on the Swipe Out Data box on the left-hand side of the screen as well as see acquired satellite status information on the satellite status page.

Press **Home Button**, then press the **Satellite Icon** on top right of screen.



Only GPS satellite status is displayed.

TZtouch2/3/XL Satellite Status Page



* If more than one position source is on the NMEA 2000 Network

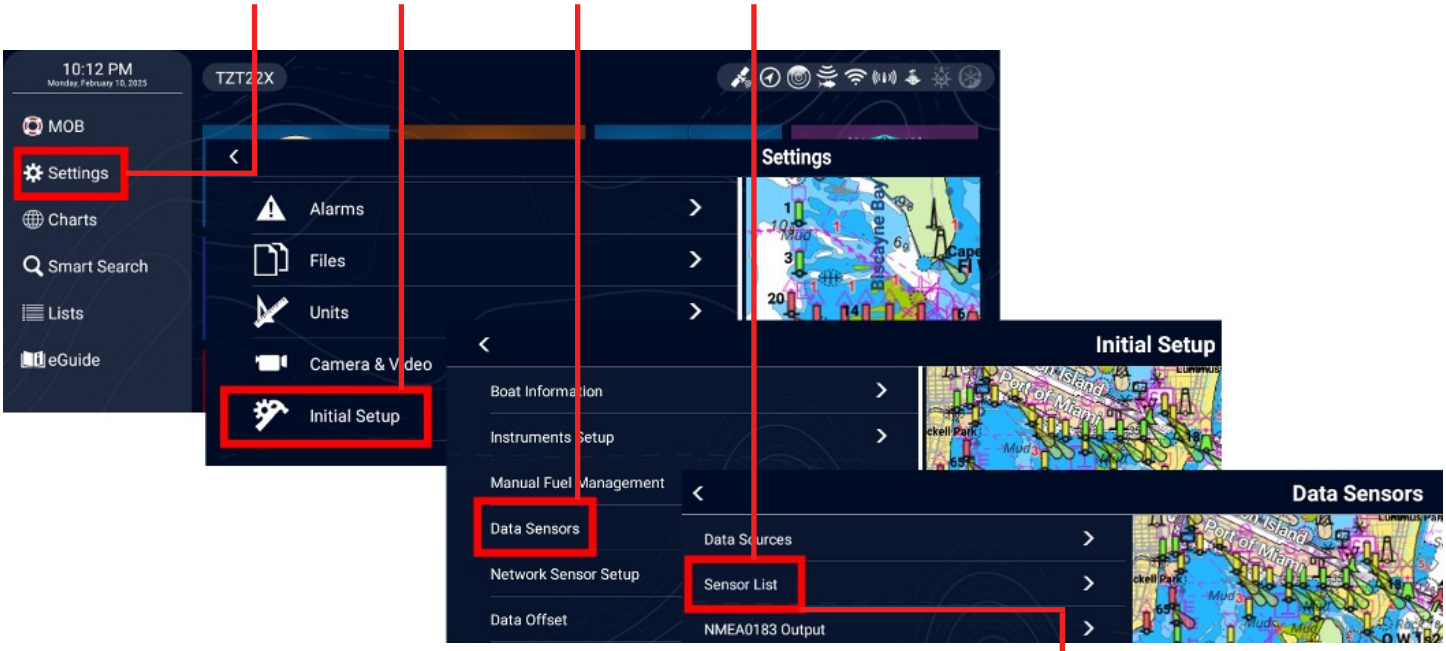
If you have more than one position source on your NMEA 2000 network, it is recommended that you give priority to one of these devices. This is called instancing. Examples of additional position sources are other standalone GNSS sensors, Satellite compasses, GPS sensors inside MFDs, etc. Below is an overview of the procedures to instance devices using a Furuno MFD. For complete instructions refer to your MFDs installation or operator's manual.

Data Instance Setup via NAVnet TZtouch2/TZtouch3, and TZtouchXL

NAVnet TZtouch2/3/XL MFDs have the ability to configure (change) the instance number of Furuno NMEA 2000 products as well as many other NMEA 2000 devices.

To change the instance number of the GP340, make sure the device is connected to an MFD via a properly configured NMEA 2000 network.

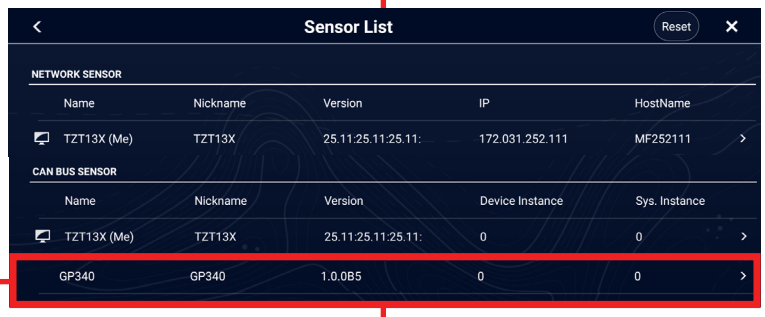
1) Press Home > Setting > Initial Setup > Data Sensors > Sensor List

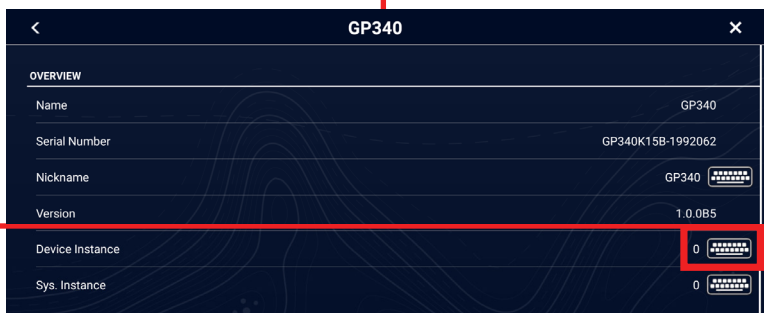


2) Select GP340 under Sensors menu

3) Tap the keyboard icon

4) Enter an instance between 0 - 10. Zero (0) has the highest priority





Note: An instance of 0 (highest priority) should be given to the primary position source. Then 1 to the next highest and so on. All NMEA 2000 position sensors should be instanced in the order of priority using ascending numbers for each like type device.

NMEA 0183 Connection

Requires optional NMEA 0183 pigtail cable, Part # GP3-400-183

GP340 Optional 6m NMEA 0183 Cable Part #GP3-400-183			
Function	**Wire Color**	**AWG**	**Note**
PWR +	Red	22	
PWR -	Black	22	
Shield	Drain	22 (Drain Wire)	
N.C.			
N.C.			
TXB	Blue	24	] Twisted Pair
TXA	White	24	
RXB	Green	24	] Twisted Pair
RXA	Yellow	24	

Maintenance

The GP340 is virtually maintenance free. However, it is recommended to wipe it with a water moistened cloth periodically to remove accumulated dirt and water deposits. Never pressure wash.

Troubleshooting

If position is not found within a reasonable amount of time, check the following items.

- **Is there power to the GNSS receiver?** (Check that the NMEA 2000 bus is powered ON.)
- **Are all the antenna and NMEA 2000 connections tight**?
- **Does the GP340 GNSS receiver have a clear view of the sky?**
- **Is there interference from other antennas or instruments?**
- **Is cabling damaged?**
- **Is the cable run free of kinks or damage?**
- **Is there damage to the GP340 GNSS receiver?**

NMEA 2000 and Can bus reference guides

Furuno CAN bus Network Design Guide

Furuno NMEA 2000 Installation Guide

These reference guides can be found in the GP340 product page, under interfacing and installation.

Technical Information

NMEA 2000 PGNs

Input

59904	ISO Request
60160	ISO Transport Protocol, Data Transfer
60416	ISO Transport Protocol, Connection Management - BAM group function
65240	ISO Commanded Address
126208	NMEA Request/Command/Acknowledge group function

Output

59392	ISO Acknowledge
60928	Address Claim
126208	NMEA Request/Command/ Acknowledge group function
126464	TX/RX PGN List
126992	System Time
126993	Heartbeat
126996	Product Info
126998	Configuration Information
129025	Position, Rapid Update
129026	COG & SOG, Rapid Update
129029	GNSS Position Data
129044	Datum
129538	GNSS Control Status
129539	GNSS DOPs
129540	GNSS Sats in View

NMEA 0183 Sentences

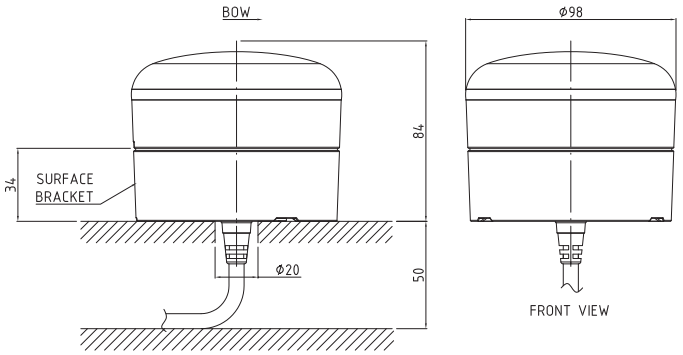
GPGGA, GPGLL, GPGSA, GPGSV, GPRMC, GPVTG, and GPZDA. Speed is fixed at 38.4k baud.

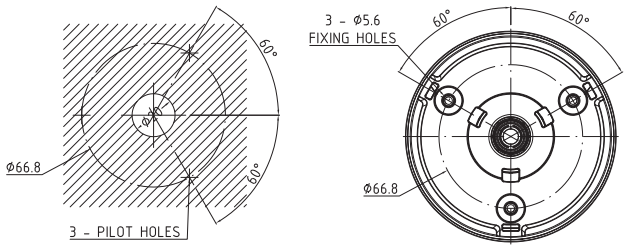
Specifications

GNSS Compatibility	**GPS L1/L5, GLONASS L1, Galileo E1/E5,QZSS L1/L5, and Beidou B1/B2**
SBAS Compatibility	**WAAS, EGNOS, MSAS, GAGAN**
Accuracy	**1m CEP, < 3m 95%**
Position Fixing Time	**Less than 60 seconds' cold start. 1 second for hot start.**
Tracking Velocity	**999 knots**
Position Update Interval	**10hz**
NMEA 2000	**6m cable included**
NMEA 0183	**Optional 6m pigtail cable**
Power Supply	**12-24Vdc 30mA - 20mA, 1LEN**
Size	**98mm (4") x 75mm (3")**
Mounting Method	**Pole/Pipe Mount 1"-14, Deck/Surface Mount**
Production Location	**Made in Italy**
Waterproof Rating	**IPX6**
Temperature	**-25°C to + 70°C**

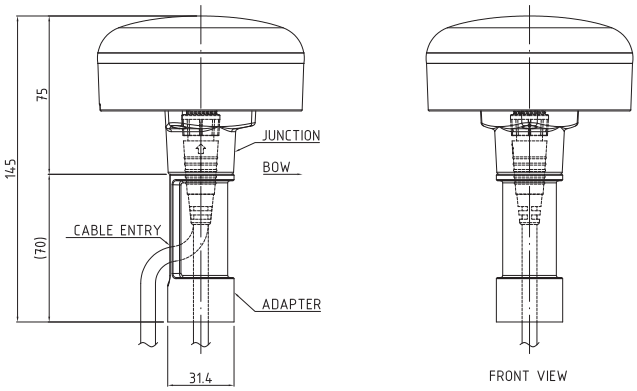
Dimensions

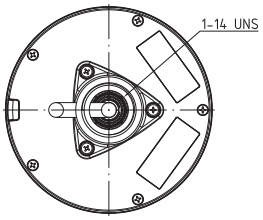
Deck Mount

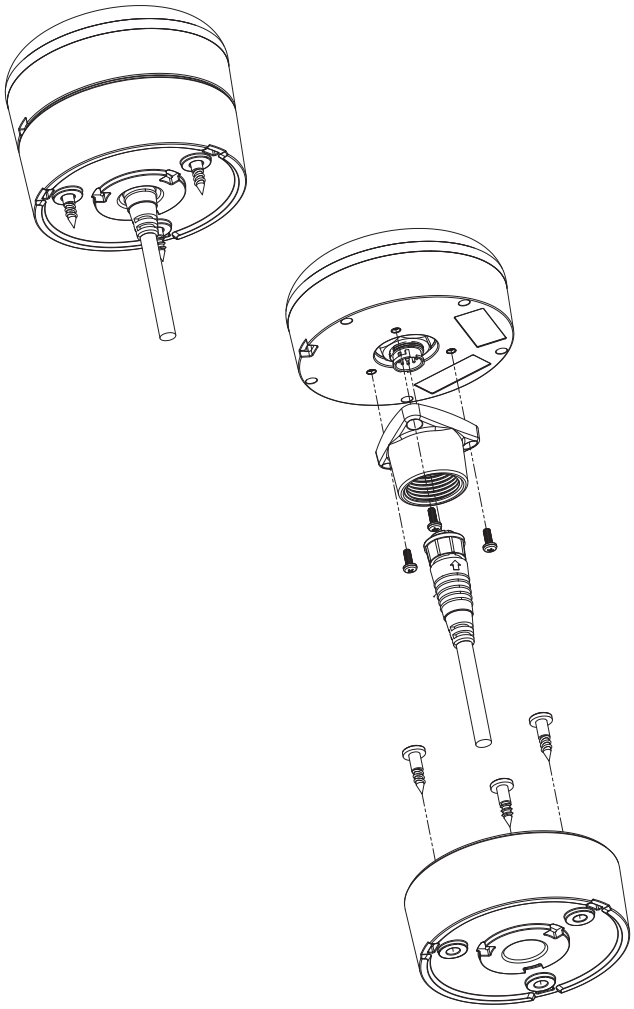


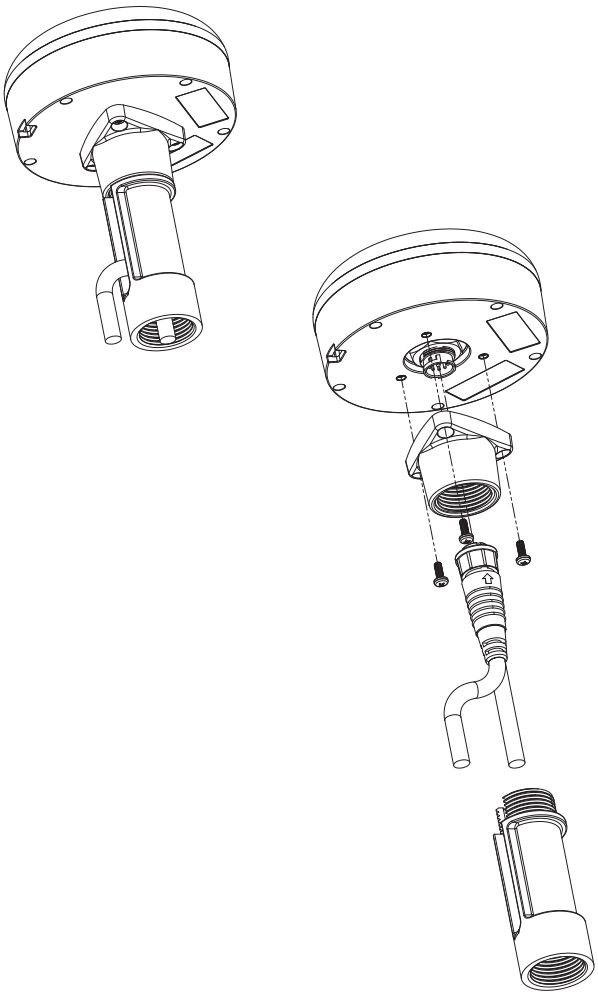


Pole / Rail(Pipe) Mount









FURUNO Warranty Information

FURUNO Worldwide Warranty for Pleasure Boats (Except North America)

For purchases outside of the Americas and Caribeean, contact your local Furuno National Distributor.

FURUNO Warranty for North America

The Furuno USA Limited Warranty applies for products purchased in the Americas. Please visit FurunoUSA.com/warranty for more details.

Warranty Registration and Information

To register your product for warranty, as well as see the complete warranty guidelines and limitations, please visit www.furunousa.com and click on “Support”. To expedite repairs, warranty service on Furuno equipment is provided through its authorized dealer network. If this is not possible or practical, please contact Furuno U.S.A., Inc. to arrange warranty service.

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