Intellian

v60E

65 cm Ku-band
Maritime VSAT Antenna System

Installation & Operation User Guide

Serial number of the product

This serial number will be required for all troubleshooting or service inquiries.

Disclaimer

The information in this user manual is subject to change without prior notice through a product life cycle. A printed version of the user manual is periodically updated and may contain inaccuracies or omissions compared to the recent product information. The most up-to-date information is available on our website at intelliantech.com.

Doc. No. UG-KP1020-V1.3

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Chapter 1. Precautions

1.1 Warnings, Cautions, and Notes

WARNING, CAUTION, and NOTE statements are used throughout this manual to emphasize important and critical information. You must read these statements to help ensure safety and to prevent product damage. The statements are defined below.

	**WARNING** WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	**CAUTION** CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury. It may also be used to alert against unsafe practices.
	**NOTE** A NOTE statement is used to notify people of installation, operation, programming, or maintenance information that is important, but not hazard-related.

1.2 General Precautions

Before you use the antenna, make sure that you have read and understood all safety requirements.

	**THIS WAY UP** • Place the boxes/crates on the floor with the arrow pointing up.
	**FRAGILE** • Since the Radome is fragile, handle it with care. Do not apply excessive pressure or shock. These may cause surface cracking or other damage.
	**DO NOT STACK** • Do not stack boxes/crates as there is a risk boxes/crates may fall and be damaged.
	**KEEP DRY** • Always make sure the antenna is stored on a dry surface in a dry, well-ventilated area. • The antenna is designed to withstand a normal rain shower; however, water resistance cannot be guaranteed if the antenna is submerged.

*** DO NOT SHIP VIA RAIL**: Ensure not to ship any system via Rail.

*** DO NOT STORE THE ANTENNA WRAPPED IN A TARP, TENT, VINYL, AND OTHERS:**
To avoid damage to radome paint, do not use a cover on the radome. Using any type of cover may cause paint damage. Intellian radomes are designed to withstand exposure to rain, humidity, and sun/UV rays when assembled according to Intellian instructions, and when the supplied approved hardware and sealants are used. Under no circumstances should an Intellian radome be covered by any protective covering that adheres, bonds, or clings to the surface, whether by self-adhesion or tension.

Chapter 2. Certifications

FCC Declaration of Conformity

Intellian Technologies, manufactures of stabilized maritime VSAT antenna systems for satellite communication at sea, supplies stabilized maritime VSAT antenna systems to the satellite communication service providers for their ESV (Earth Station on Vessels) networks.

FCC §25.218 defines the provisions for blanket licensing of ESV antennas operation in the Ku-band. It defines the antennas radiation, and each article regulates the followings;

§25.218 (f)(1): Regulation for Azimuth Direction & Co Polarization
§25.218 (f)(2): Regulation for Other Direction & Co Polarization
§25.218 (f)(3): Regulation for Cross Polarization

Intellian Technologies, Inc. declares that v80E complies with the threshold level as defined in §25.218(f)(1):, and declares that v80E is in accordance with all defined regulations from §25.218(f)(2) to §25.218(f)(3) at the below stated input power spectral density, with an N value of 1.

Product description	Intellian v60E, 65cm Ku-band maritime VSAT antenna system
EIRP spectral density limit	-21.4 dBW/ 4KHz

Intellian Technologies, Inc. declares that the above antennas will automatically cease the transmission with a mute command to the modem within 100 milliseconds if the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5 degree and will not resume until such angle is less than or equal to 0.2 degree in accordance with the requirements of §25.228 (b) and §25.228 (c).

;-

Radiation pattern data is available upon request to verify the conformance.

Authority: **Kevin Eom**
/ CTO, R&D

Signature: 

Date: March 10, 2020

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RED Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709, Korea declare under our sole responsibility that the product(s) described in the below to which this declaration relates is in conformity with the *essential requirements* and *other relevant requirements* of the Radio Equipment Directive (2014/53/EU).

Product Information:

Product Name(s):	Intellian v60E, 65cm Ku-band Maritime VSAT Antenna System Intellian v80E, 80cm Ku-band Maritime VSAT Antenna System Intellian v100E, 1.05m Ku-band Maritime VSAT Antenna System

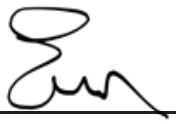
To provide the presumption of conformity in accordance to Annex III(encompassing Annex II) of Directive 2014/53/EU; the following harmonized standards and normative documents are those to which the product's conformance is declared, and by specific reference to the essential requirements of Article 3 of the Directive 2014/53/EU.

2014/53/EU Article	**Standard(s) Applied in Full**	**Result**
SAFETY (Art 3.1.a)	EN 60950-1: A2	Pass
EMC (Art. 3.1.b)	EN 301 843-1	Pass
SPECRTUM (Art. 3.2)	EN 302 340	Pass

Supplementary Information:

Notified Body Involved: (Testing Organization)	DT&C Co., Ltd. 42, Yurim-ro, 154 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do 17042, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-di, Gyeonggi-do 17709, Korea
Place and Date of issue:	Gyeonggi-do, Korea on 28th of Feb. 2020

Authority: **Kevin Eom / CTO, R&D**

Signature: 

Date: **February 28, 2020**

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Doc Number IT20-DC0228-01

Chapter 3. Introduction

3.1 Intellian v60E Introduction

Intellian v60E is a Ku-band 3-axis stabilized VSAT maritime antenna system. The v60E provides VSAT solutions for efficient RF performance with compact and light mechanical design. v60E is equipped with an RF module by a new mounting architecture. The stabilized 3-axial platform and quality approved pedestal design ensure reliable broadband communications for sailing vessels in oceans. The v60E is operator-friendly and easy to install with a single cable connection which combines Tx, Rx, and DC power cables. With the new radome design, the dome-on external single cable connection means that installers do not need to open the radome hatch during installation. Equipped with Intellian's next-generation Antenna Control Software AptusNX, the v60E antenna can be easily monitored and controlled.

3.2 Intellian v60E Features

Efficient RF Performance

Intellian's advanced RF design technology delivers highly efficient performance with compact and light mechanical structure compared to other 65 cm class systems. The v60E has improved tracking precision and reliability in a compact and streamlined mechanical design. The v60E system is only supplied with NJRC 6 W BUC.

Single Coaxial Cable

Combined Tx, Rx and DC power in a Single Cable solution, the v60E enables faster and reduced costs of installation. The single coaxial cable is connected externally on the base of radome with no access inside radome.

Standardized Modular Components Across E-Series

Modular components are used throughout the E-Series product range, such as motors with integrated encoders, main control unit and internal cables.

AptusNX Intelligent Diagnosis

Intellian's all-new integrated M&C platform AptusNX provides a responsive web user interface to manage and control the antenna system regardless of device types. Installation Wizard in AptusNX automates functions for system configuration so that operators are minimally involved in system installation and operation.

Chapter 4. Planning Installation

The antenna installation requires extreme precaution and safety measures given its size and weight. Failure to follow the correct installation process may lead to injury of the installer and/or cause damage to the system. In order to maximize the performance of the system, a thorough review of this installation guide is strongly recommended, as well as executing the installation process as it is noted in this manual.

4.1 Selecting Installation Site

The system should be placed in an area onboard the vessel with little to no RF signal blockage. When the antenna is transmitting, obstacles in way of the beam path will cause decreased satellite signal strength. The antenna unit should have direct line-of-sight with the desired satellite without any obstacles in the beam path. Certain minimum distances between the antenna and other onboard devices must also be considered during installation.

4.1.1 Minimizing Satellite Blockage

Install the antenna in accordance with the following procedures to ensure maximum performance of the antenna. The ideal antenna site should have a clear view of the horizon or satellite with all around clearance. Make sure there are no obstacles within the EL range -20° to +115° from the center of the antenna. Obstacles can interrupt the satellite signal transmission and reception of the antenna.

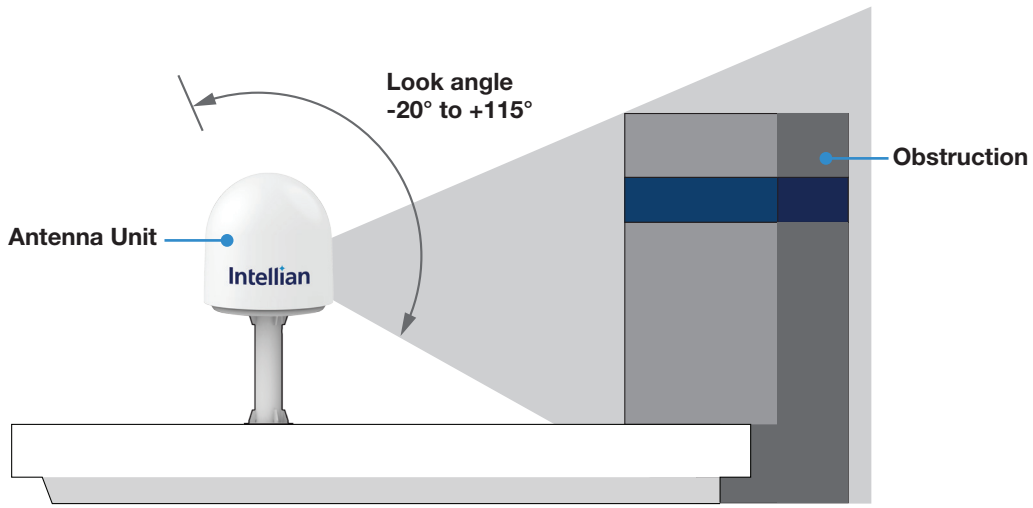


Figure 1: Elevation Limit of Obstacles

4.1.2 Avoiding RF Interference

Do not install the antenna near the high power shortwave radar. Most radar transmitters emit RF energy within an elevation range of -15° to +15°. For this reason, it is recommended to position the antenna at least 4.6 m (15.09 feet) away from the radar.

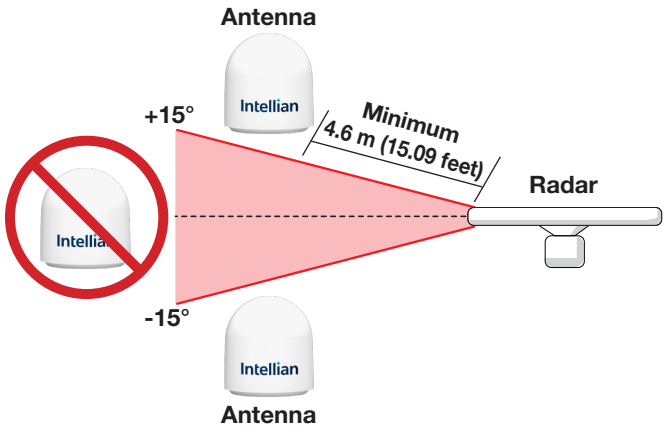


Figure 2: Potential RF Interference

WARNING

Never place the antenna in the beam path of the radar regardless of distance. The high power shortwave radar may impair its performance or damage the antenna.

4.1.3 RF Hazard Precautions

The antenna is designed to be used with radiation transmitting equipment manufactured by others. Exposure to RF radiation, including exposure associated with an improper use of the transmit equipment, may be hazardous to persons close to the above deck unit. Ensure the safety of personnel who work on the system.

During transmission, ensure to keep the minimum safety distance. The recommended minimum safety distance to the reflector on the focal line is about 30 m (98 ft), based on a radiation level of 1 mW/cm² that applies under uncontrolled environment. No hazard exists >20° below the antenna's mounting plane.

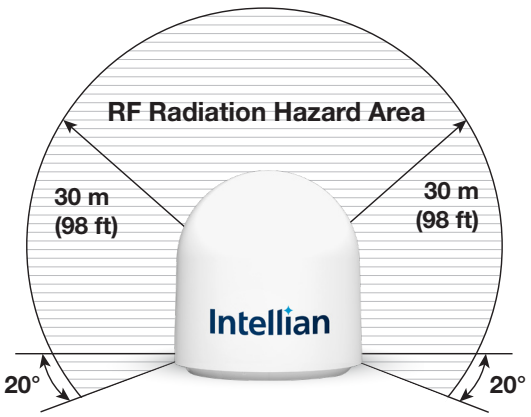


Figure 3: RF Hazard Precautions

4.2 System Package

4.2.1 Above Deck Unit (ADU)

The ADU includes an antenna pedestal inside a radome assembly unit. The pedestal consists of a satellite antenna main dish with RF components mounted on a stabilized pedestal. The radome protects the antenna pedestal assembly unit from the severe marine environment.

Figure 4: Radome and Pedestal

4.2.2 Antenna Control Unit (ACU)

Antenna Control Unit (ACU) controls Antenna system operation. The following functions are supported by ACU.

- LED Indicator
- AptusNX Web application

Figure 5: Front Panel of ACU

Figure 6: Back Panel of ACU

4.2.3 Packing List

Before beginning installation, make sure you have all the included components.

Item	Q'ty	Size	Description
Above Deck Unit (ADU)	1		Radome and Pedestal
Antenna Control Unit (ACU)	1	431 mm x 350 mm x 44.3 mm	Antenna Control Unit
Quick Installation Guide (QIG)	1		Installation guide
RF Hazard Sticker	1		Radiation safety distance (30 m) label
Mounting Template	1		Real size drawing of antenna mounting hole pattern
ACU Rack Mount Bracket	2		For installing ACU to 19-inch rack
Flat Head Screw	10	M4 x 12L	For mounting ACU Rack Mount Bracket on ACU
AC Power Cord (CEEE7/7)	1	1.5 m	ACU Power Cord (220 V)
Ethernet Cable (RJ45 to RJ45)	1	1 m	To connect ACU to PC / network device
RF Cable (F (M) to F (M))	2	1 m	To connect ACU to modem (Tx / Rx)
Hex Bolt (BUMAX)	4	M12 x 60L	Bolt kit for antenna-deck (mast) assembly (1 spare set included)
Flat Washer (BUMAX)	4	M12	
Spring Washer (BUMAX)	4	M12	
Waterproof Foam	1		With an x-shaped cable hole

4.3 System Cables (Customer Supplied)

4.3.1 Antenna RF Cable (Customer Supplied)

Due to the signal loss across the length of RF coaxial cable on L-Band, Intellian recommends to build RF cables using the following 50 Ω coaxial cable types for standard system installation. If you need RF cables that run longer than the maximum cable length recommended, contact Intellian Technical Support for assistance.

- **Cable Requirements**

Coaxial Cable Type	Connector	Max. DC Resistance	Attenuation @ 2 GHz	Max. Cable Length (≤ 16 dB loss @ 2 GHz)
LMR400	N (M) to N (M)	0.8 Ω	0.196 dB/m	60 m
LMR600			0.128 dB/m	100 m

Note:

- Optimal tightening torque for N type RF connector: 1.5 N-m
- Maximum RF loss at 2 GHz: 16 dB including connectors

4.3.2 Gyrocompass Cable (Customer Furnished)

General types of gyrocompass cables are recommended for the compatible connection to Intellian antennas which are used in various environments of vessels.

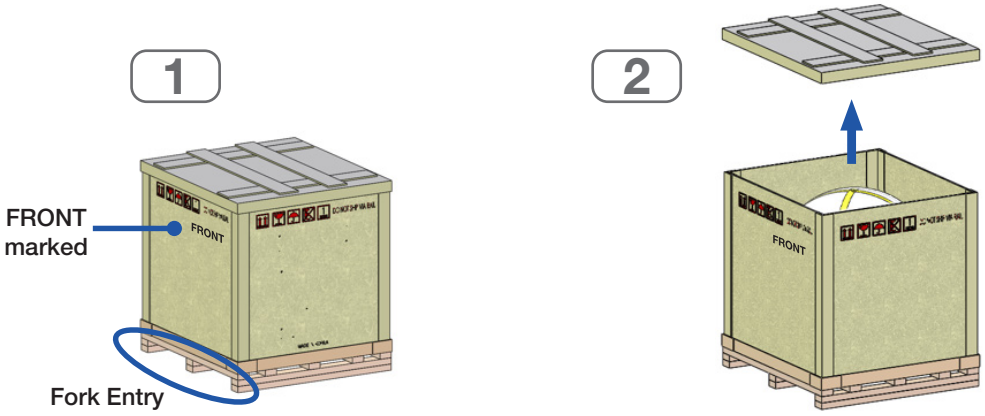
Standard	NMEA 0183
Connector Type	2 pin terminal block connector
Cable Type	2-wire cable with one enclosed shield cable
Heading Information	Supports $HEHDT, baud rate 4800, format 8N1 as standard

4.4 Unpacking System Package

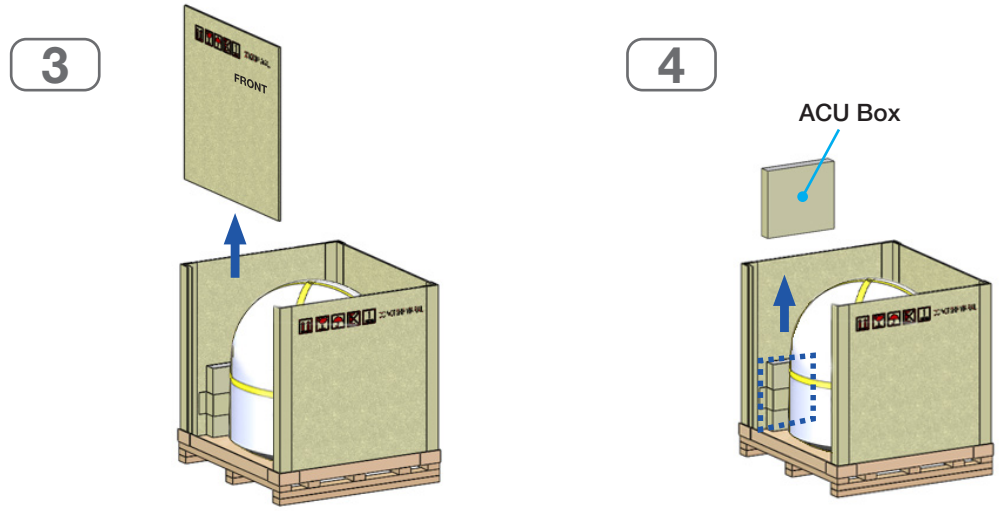
CAUTION

- The package box on the pallet should be lifted by a forklift.
- Follow the steps in order for easy and safe unpacking.

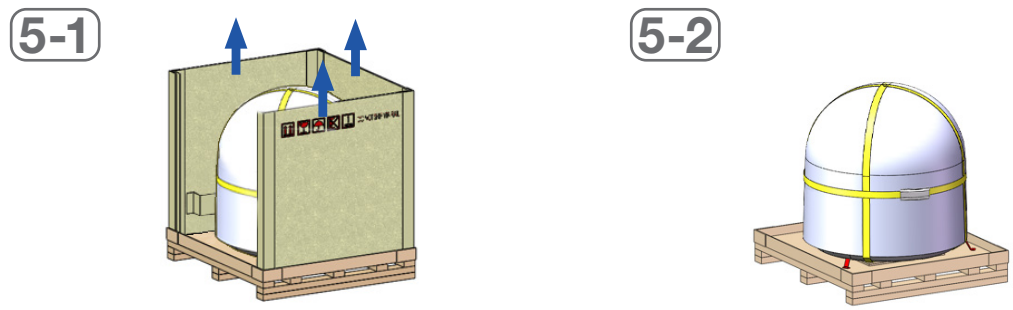
1. Position the "FRONT" marked side of box to the front, then remove all the plastic straps securing the box to the pallet using a cutter.
2. Open the top cover.



3. Lift up and remove the "FRONT" marked panel.
4. The ACU Box is located inside the side panel. Take out the box by both hands.



5. Lift up and remove the rest of the side panels.



Chapter 5. Installing Above Deck Unit (ADU)

5.1 Antenna Dimensions

Confirm the height and diameter of the antenna unit shown in the following figure before installing it. The mounting surface and overall space occupied by the antenna must be sufficient for the fully constructed radome on top of its base frame. Using a crane during the antenna installation is strongly suggested.

Unit: mm (inch)

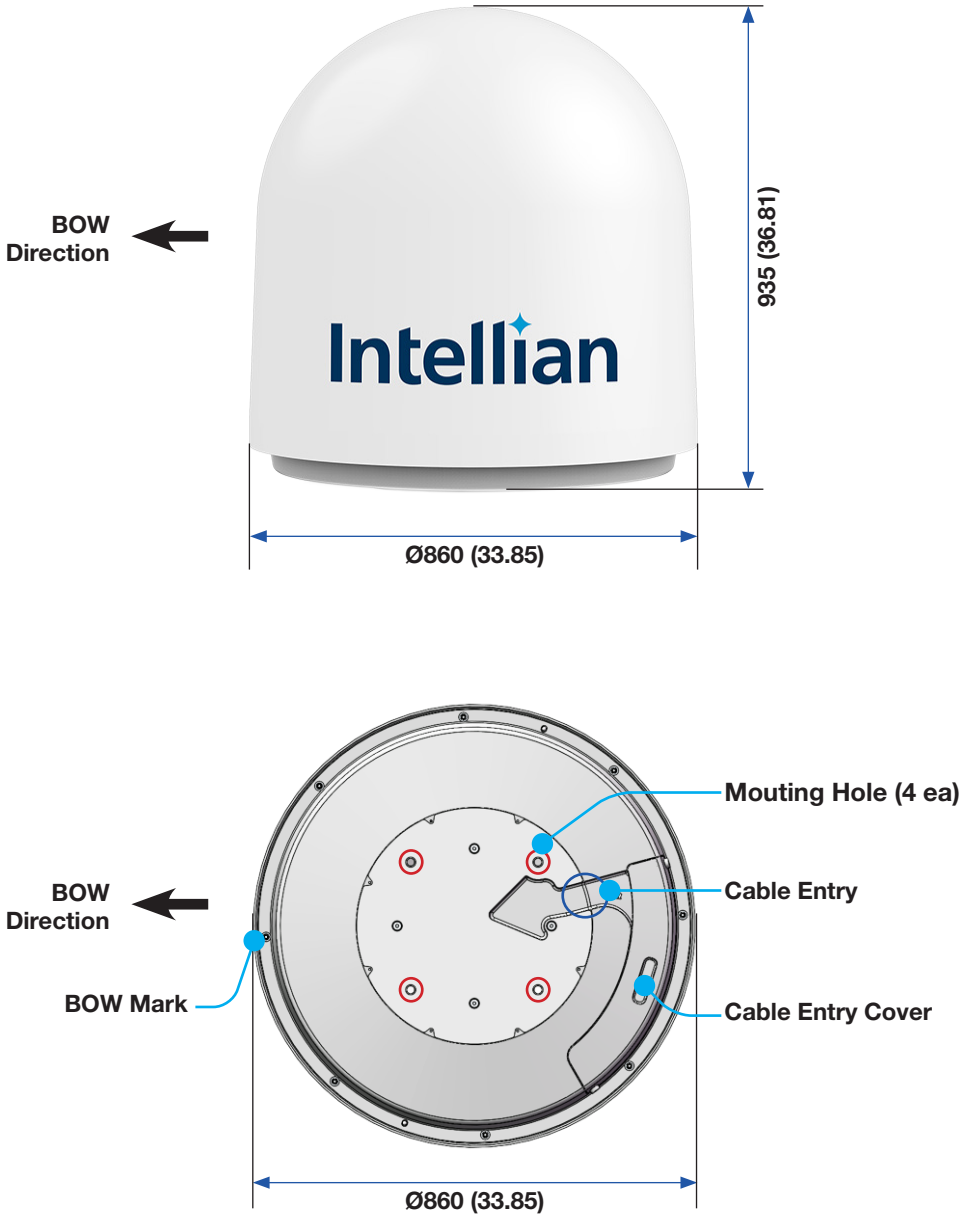


Figure 7: Antenna Dimensions

NOTE

Position the antenna with the BOW direction parallel to the center line of the ship.

5.2 Antenna Mounting Hole Pattern

Use the supplied mounting template when drilling mounting holes on the mast. The hole placement for the antenna must match the mounting hole pattern on the template.

WARNING

When reusing an existing mast, check the condition of holes on the mast and make sure those are proper to use compared to the hole locations and sizes printed on the mounting template.

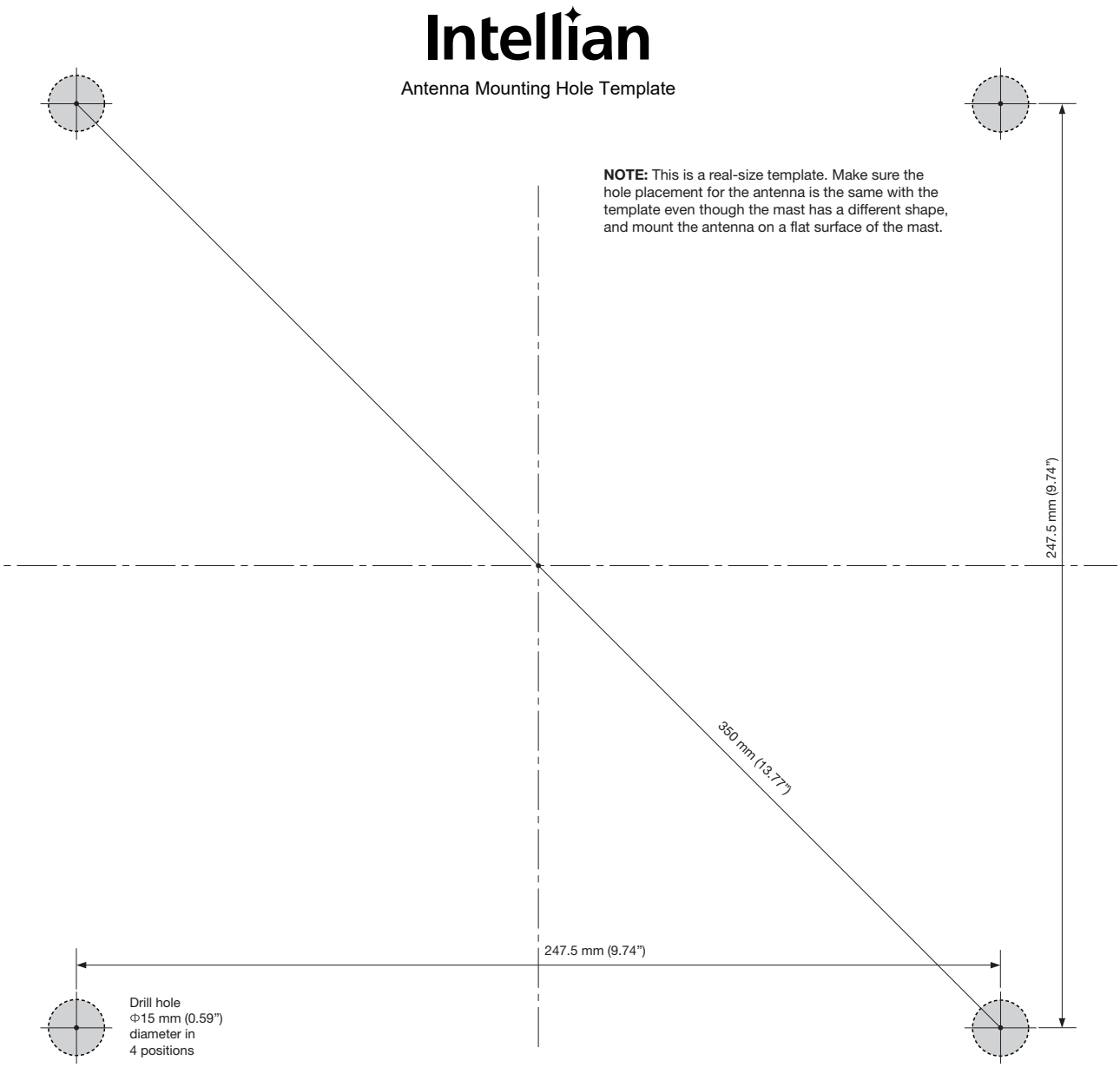


Figure 8: Antenna Mounting Hole Template

5.3 Designing Mast

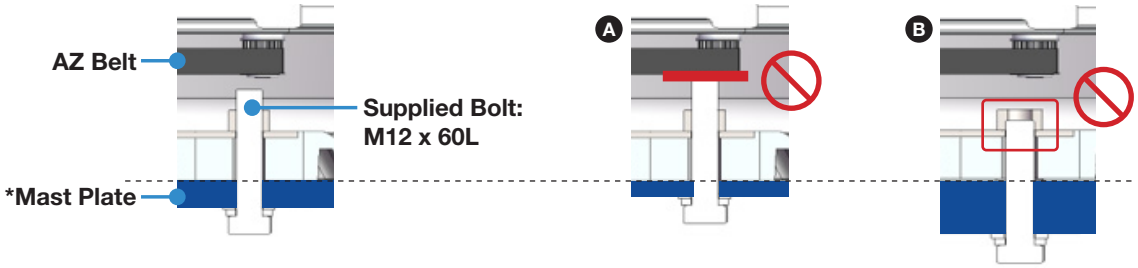
The installation mast must be robust enough to prevent flex, vibration, and sway when an external force is exerted on the mast with antenna and radome. Refer to the following mast drawings for more details.

WARNING

- When designing a mast, consider the minimum and maximum thickness of the mast plate marked on the diagram. If the thickness of the mast plate is different from the recommended size (Min. 10.0 mm/ Max. 15.0 mm), choose right sized bolts for mounting antenna on the mast according to the table below.

Mast Plate Thickness	Recommended Bolt Size
5 ~12 mm	M12 x 55L
10 ~17 mm (Recommended)	M12 x 60L (Supplied)
15 ~ 22 mm	M12 x 65L
20 ~ 27 mm	M12 x 70L
25 ~ 32 mm	M12 x 75L

- To use the supplied bolts (M12 x 60L) for mounting antenna on a mast, the thickness of mast plate must be 10 ~ 15 mm. Ⓐ If the mast plate is thinner than 10 mm, the bolt thread stick-out protruding beyond the nut inside the radome can damage the AZ belt of the antenna. Ⓑ If the mast plate is thicker than 15 mm, the supplied antenna-mast mounting bolts can be too short to mount the antenna on the mast securely.



When the mast plate thickness is 10 ~ 15 mm

When the mast plate is thinner than 10 mm

When the mast plate is thicker than 15 mm

Option 1. When Installing Cable Through Inside Mast

Unit: mm (inch)

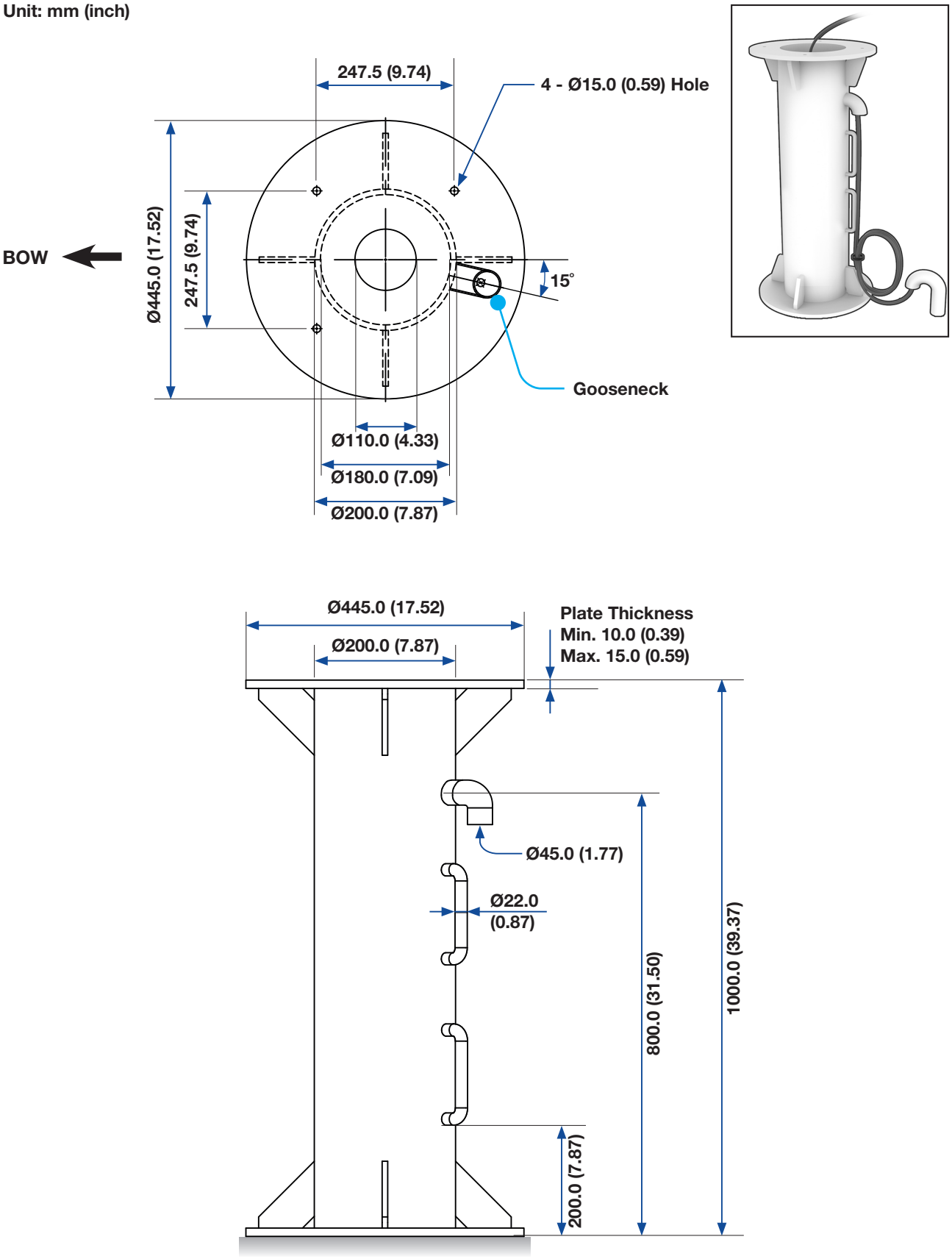


Figure 9: Recommended Size of Mast (Option 1)

Option 2. When Installing Cable on Outside of Mast

Unit: mm (inch)

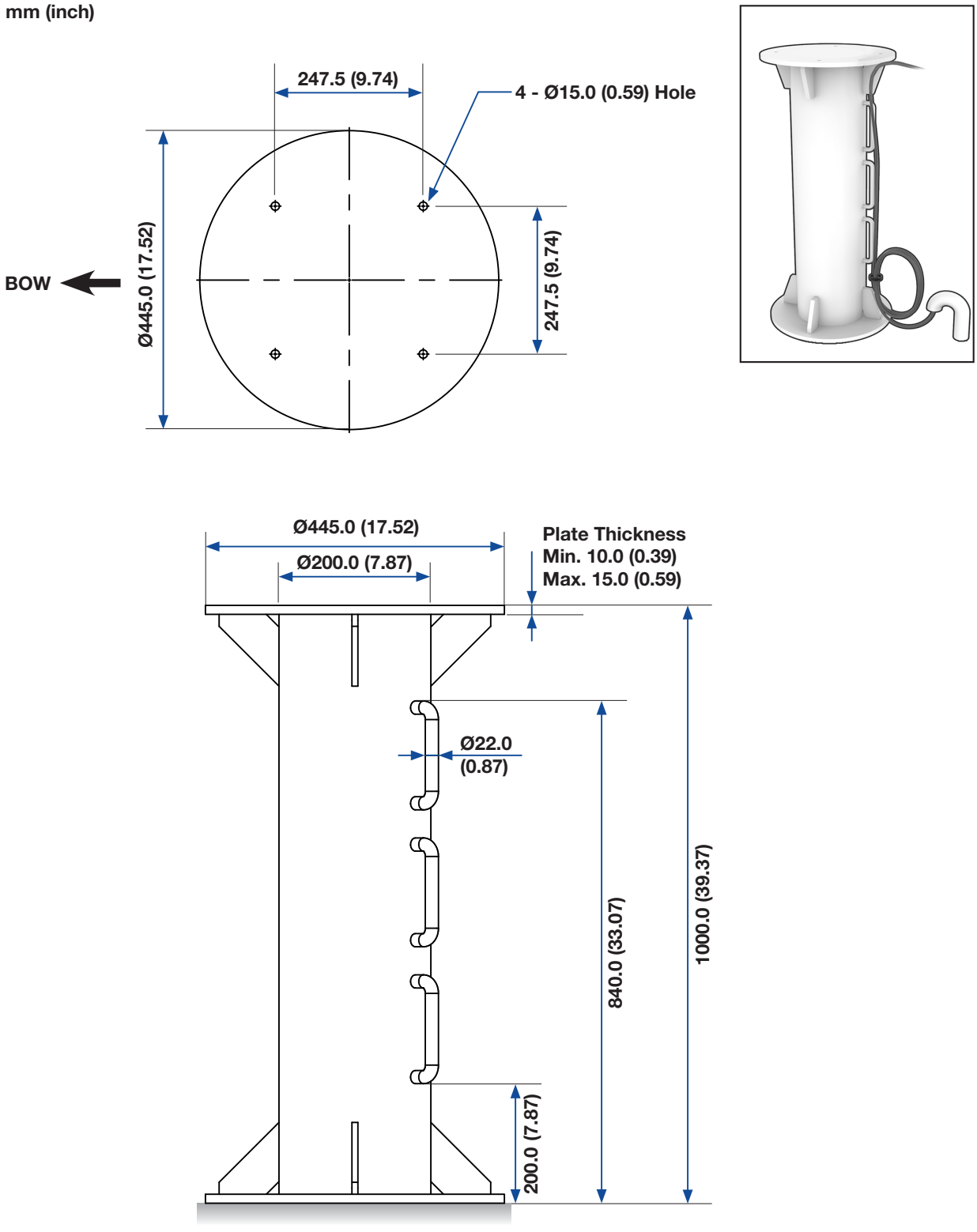
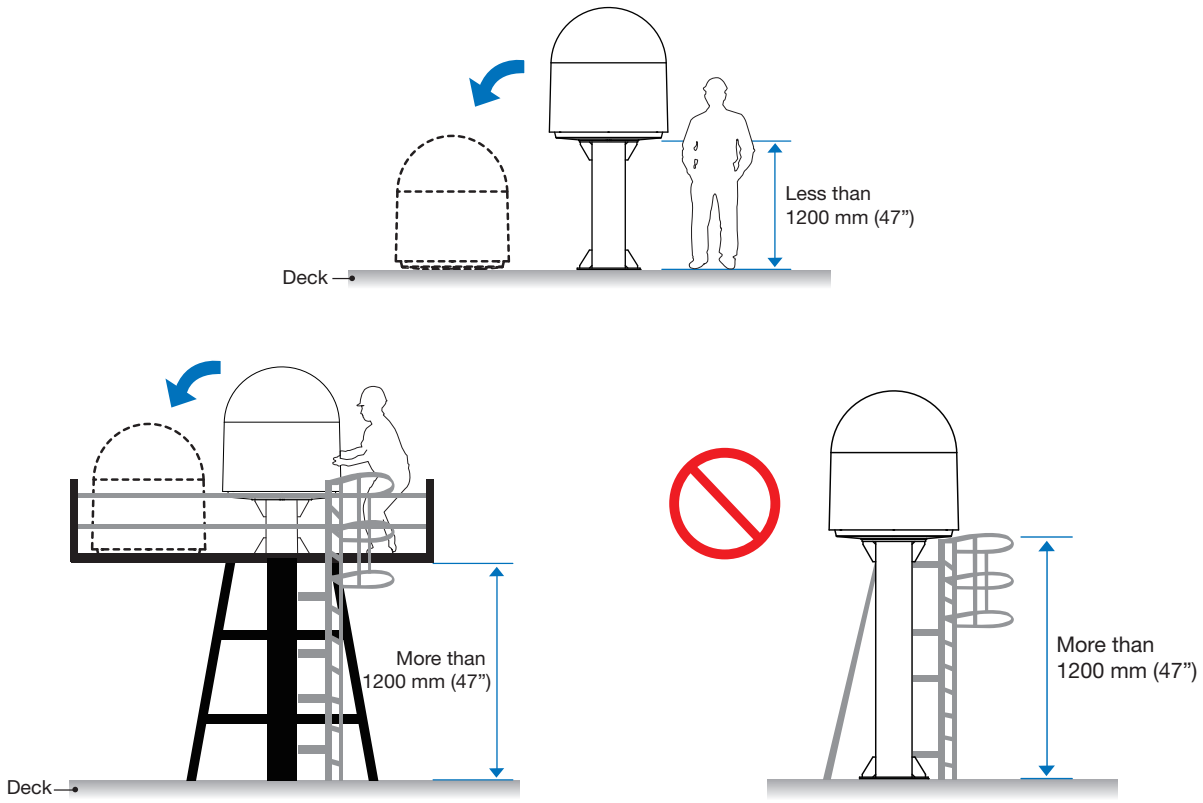


Figure 10: Recommended Size of Mast (Option 2)



WARNING

Intellian strongly recommends installing the antenna less than 1200 mm (47") above the deck for safe access and maintenance. When installing the antenna more than 1200 mm (47") above the deck, make sure to have enough working space around the mast for the installers to move around and put the radome down.

5.4 Routing RF Cable on Mast

The cable must be routed from the antenna and through various areas of the ship to end up at the antenna control unit. When pulling the cables in place, avoid sharp bends, kinking, and excessive force. After placement, seal the deck penetration gland and tie the cable securely in place. The cable bracket must be installed on the mast to fix the relevant cable. The gooseneck must be installed on the side of the mast to protect the relevant cable against water.

WARNING

Ensure that cable has been run through watertight fittings to prevent water entry into the vessel when installation is completed.

Option 1. Routing Cable Through Inside Mast

1. Before placing the radome on the mast, route the cable through the gooseneck on the deck and the built-in gooseneck on the mast for easier placing of the RF Cable through the inside of the mast as shown in the picture.
2. Maintain a sufficient cable length (at least 2 m) when routing the cable on the surface and inside of the mast. After connecting the cable to the connector on the radome, adjust the length and fix the cable on the cable brackets using cable ties.

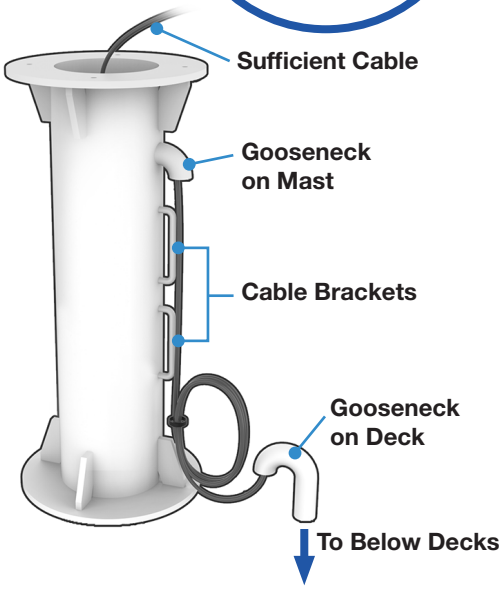


Figure 11: Routing Cable Through Inside of Mast

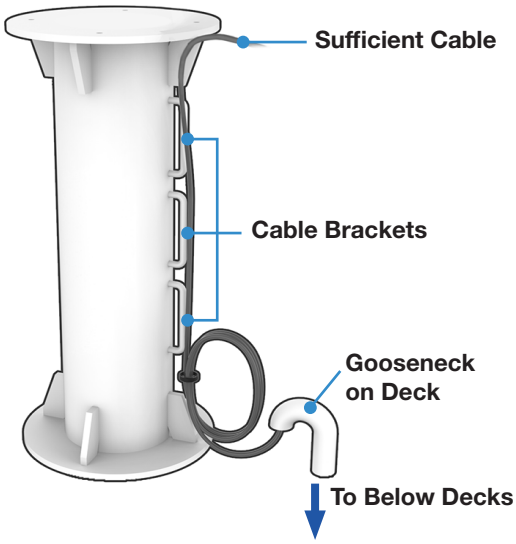


Figure 12: Routing Cable on Outside of Mast

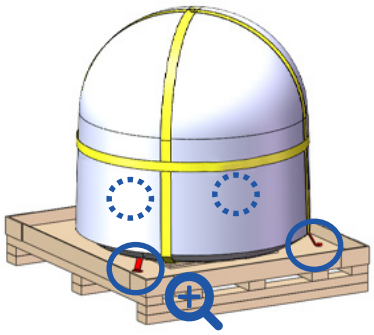
Option 2. Routing Cable on Outside of Mast

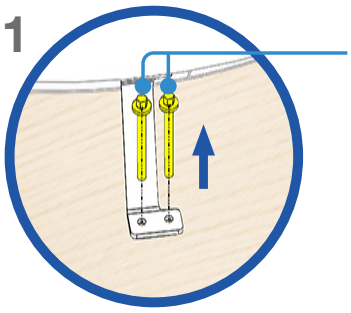
1. Route the cable from the gooseneck placed on the deck to the antenna as shown in the picture.
2. Maintain a sufficient cable length (at least 2 m) when routing the cable on the surface of the mast. After connecting the cable to the connector on the radome, adjust the length and fix the cable on the cable brackets using cable ties.

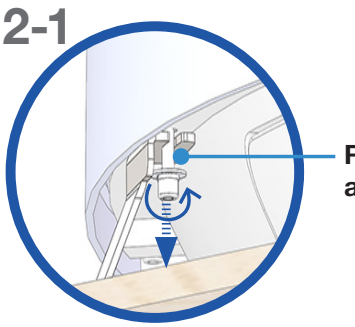
5.5 Removing Antenna from Wooden Pallet

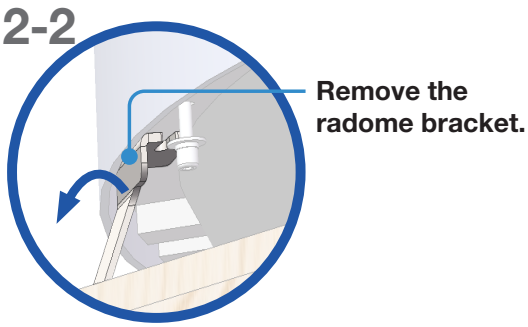
Four radome brackets secure the antenna to the pallet. To remove the radome bracket, follow the procedure below.

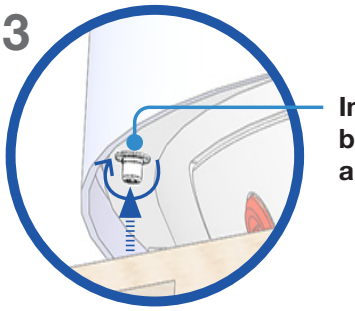
1. Remove the fixing bolts (2 ea) on the radome bracket that secures the antenna to the pallet using a wrench.
2. Remove the radome bolt (1 ea) that secures the radome bracket on the radome with a wrench. Then detach the radome bracket from the radome.
3. After removing radome bracket, install the radome bolt (1 ea) back into the radome using a wrench. To fasten the bolt firmly, apply Loctite #243 to bolt threads before installing.
4. Repeat the procedure to remove all four radome brackets.



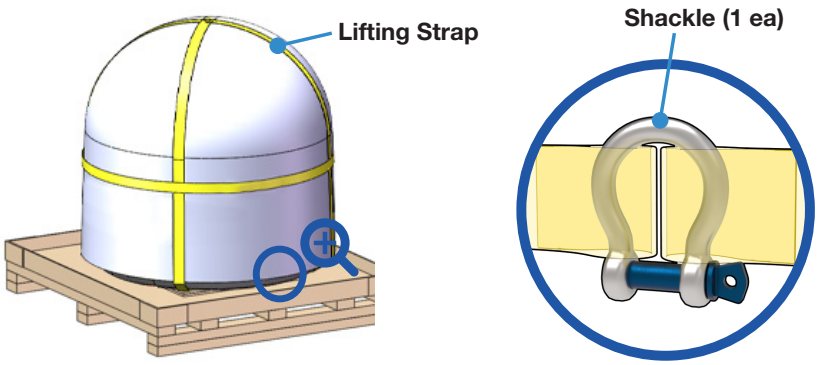








5. Check the condition of lifting strap to make sure the shackle (1 ea) is tightened. Re-wrap the shackle with the existing protection to avoid radome damage.

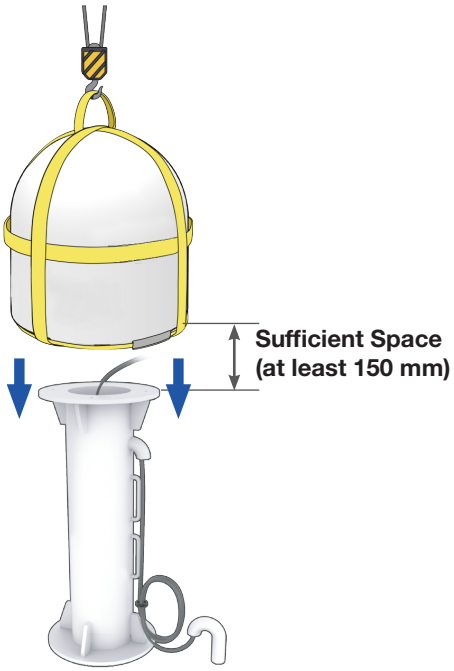


WARNING

Make sure to remove the radome brackets that secure the radome to the pallet before lifting the antenna using the lifting straps.

5.6 Placing Antenna Above Mast

The Intellian antenna comes with the lifting straps pre-mounted from the factory. Check the condition of the lifting strap and ensure the shackle is tightened up. Lift the antenna above the mast using a crane and carefully lower down the antenna toward the mast. Maintain sufficient space (at least 150 mm) between the bottom of radome and the mast for cabling work.



WARNING

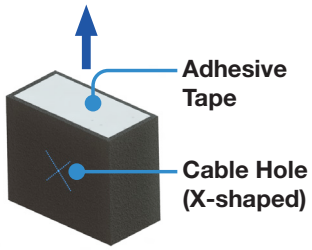
When moving the antenna, it may sway by windy. Be careful when handling the antenna.

NOTE

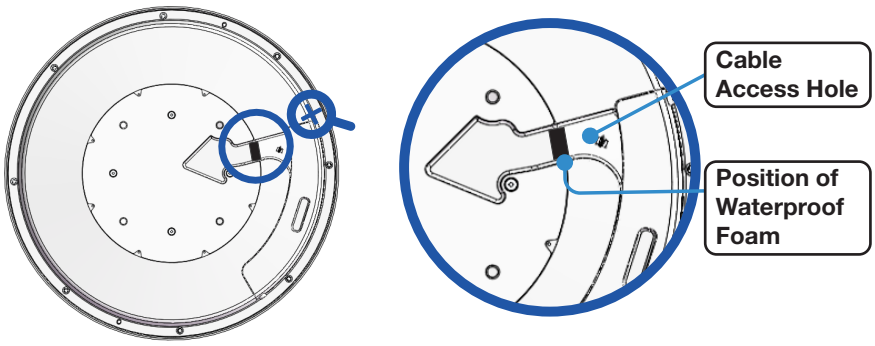
Position the antenna with the BOW direction parallel to the center line of the ship.

5.7 Inserting Waterproof Foam

The supplied waterproof foam must be inserted to prevent water penetration into the radome before mounting the radome on the mast. Make sure the waterproof foam is positioned where the following picture shows.



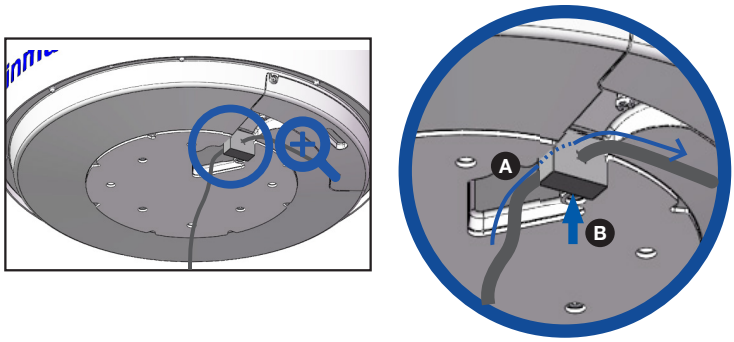
Waterproof Foam



Position of Waterproof Foam

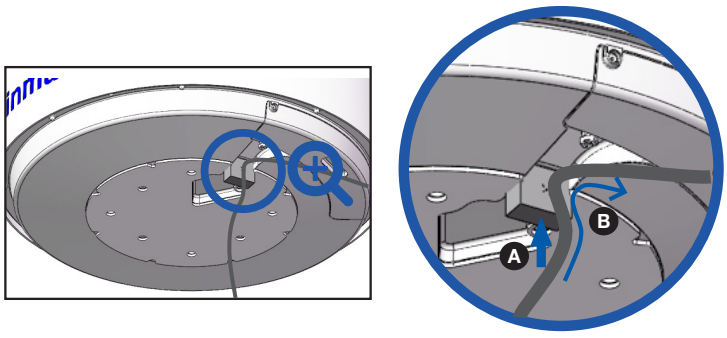
Option 1. When Installing Cable Through Inside Mast

1. Peel off the paper backing of the adhesive tape from the waterproof foam.
2. Extend the RF cable up to the radome from the mast, and pass the cable through the cable hole (X-shaped) of the waterproof form.
3. Then attach the adhesive side of waterproof foam firmly onto the surface of the cable access hole. When moving the radome, be careful with the waterproof foam and cable not to be detached.



Option 2. When Installing Cable on Outside of Mast

1. Peel off the paper backing of the adhesive tape from the waterproof foam.
2. Attach the adhesive side of waterproof foam firmly onto the surface of the cable access hole.
3. Extend the RF cable up to the radome from the mast.



5.8 Mounting Antenna on Mast

1. Bring M12 x 60L Hex Bolt sets (4 ea) for antenna-mast assembly from the ACU box.
2. Place the antenna on the mast and align the mounting holes of the antenna with those of the mast.
3. Before assembling bolts, apply Loctite #263 to the bolt threads to ensure the bolts are fastened firmly. Insert the bolts and washers from under the mast into the radome, and lightly tighten them by hand into the built-in nuts on the bottom of radome. Install 4 bolts in a criss-cross sequence as shown in the figure.
4. After installing all 4 bolt sets, fully tighten the bolts using a torque wrench.
5. After mounting the antenna on the mast, remove the lifting strap.

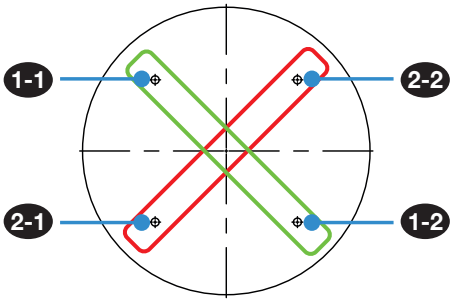


Figure 13: Installing Sequence of Bolts

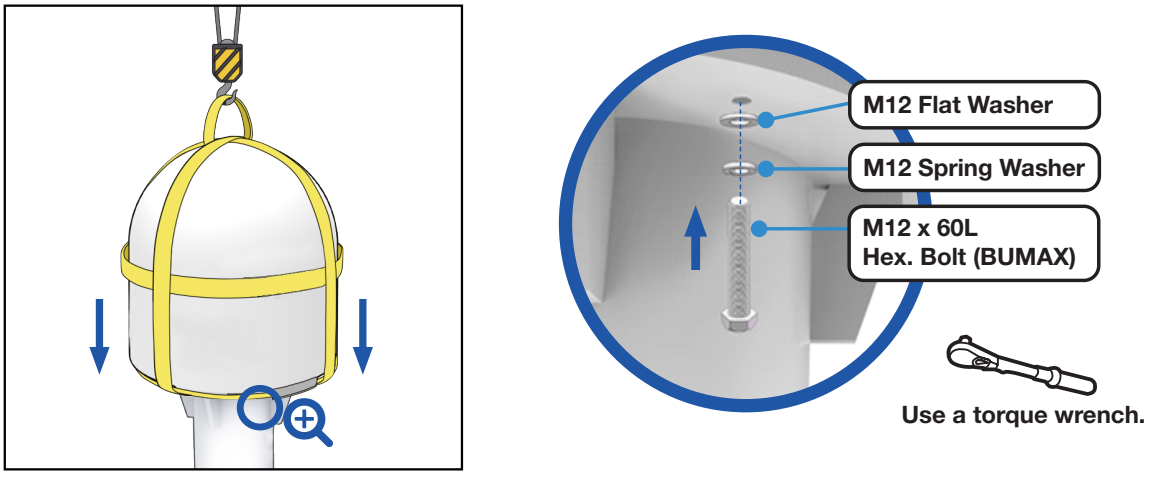


Figure 14: Installing Bolts for Antenna-Mast Assembly

NOTE

- Make sure the cable from the mast is aligned with the cable entry on the bottom of antenna for stable connection.
- Refer to **"12.1 Appendix A. Tightening Torque Specification" on page 89** for the bolt tightening torque.

WARNING

If a bolt does not fit into the mounting hole when installing the bolt by hand, stop installing and check the bolt size. DO NOT tighten the bolts forcefully. It may cause damage to the inner threads of the mounting holes of antenna. In this case, the damage is not covered by the warranty.

5.9 Connecting RF Cable to Antenna

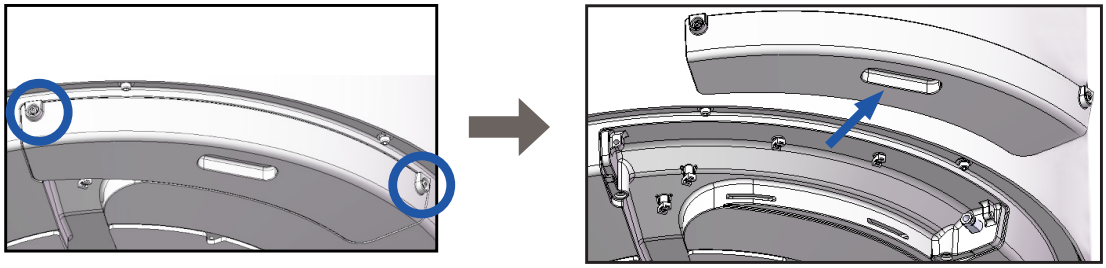
Connect the RF Cable (customer supplied) from the ANTENNA port of the ACU to the RF connector inside the cable entry of radome. Both side of the connection cable should be terminated using suitable tools. After the connection, securely fix the cable in place using cable ties.

NOTE

Make sure the followings before installing system cables.

1. All cables need to be well clamped and protected from the physical damage and exposure to heat and humidity.
2. Don't use any acutely bent cable.
3. Use watertight glands or swan neck tubes at exposed bulkheads or deck heads where the cable passes through.
4. Install recommended size cables. Refer to**"4.3 System Cables (Customer Supplied)" on page 15** to see cable requirements.

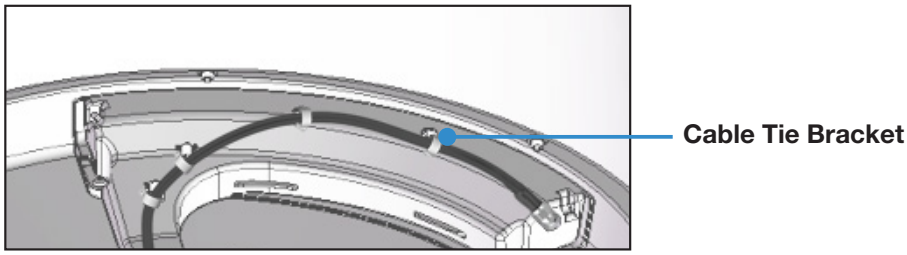
1. Loosen the M4 x 15L wrench bolts (2 ea) by using the wrench set then open the cable entry cover.



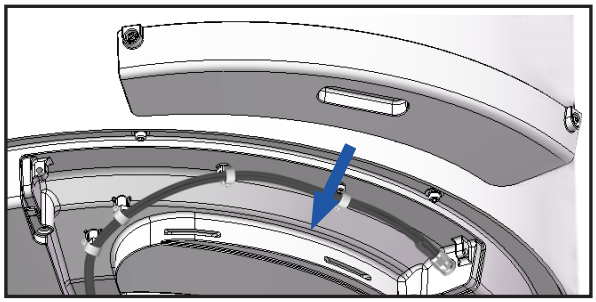
NOTE

Keep the detached cover in a safe place for later use.

2. Terminate N(M) connector on the end of the RF Cable. Intellian recommends using a genuine cable connector and tools. Refer to the cable termination instructions provided by the manufacturer to terminate the N connector.
3. Connect the terminated RF cable to the connector of the radome as the following. Ensure the cable is firmly fastened to the connector. Fix the cable position along the routing path using cable ties, cable mounts or cable clamps.



4. After completing cable connection, put the cover in the right place and close it by tightening the M4 x 15L wrench bolts (2 ea) by using a wrench set.



Chapter 6. Installing Below Deck Unit (BDU)

6.1 Selecting BDU Installation Site

The ACU should be installed below the deck in a location that is dry, cool and ventilated. The front panel of ACU should be easily accessible to users.

6.2 ACU Dimensions

Confirm the dimension of the ACU before installing it.

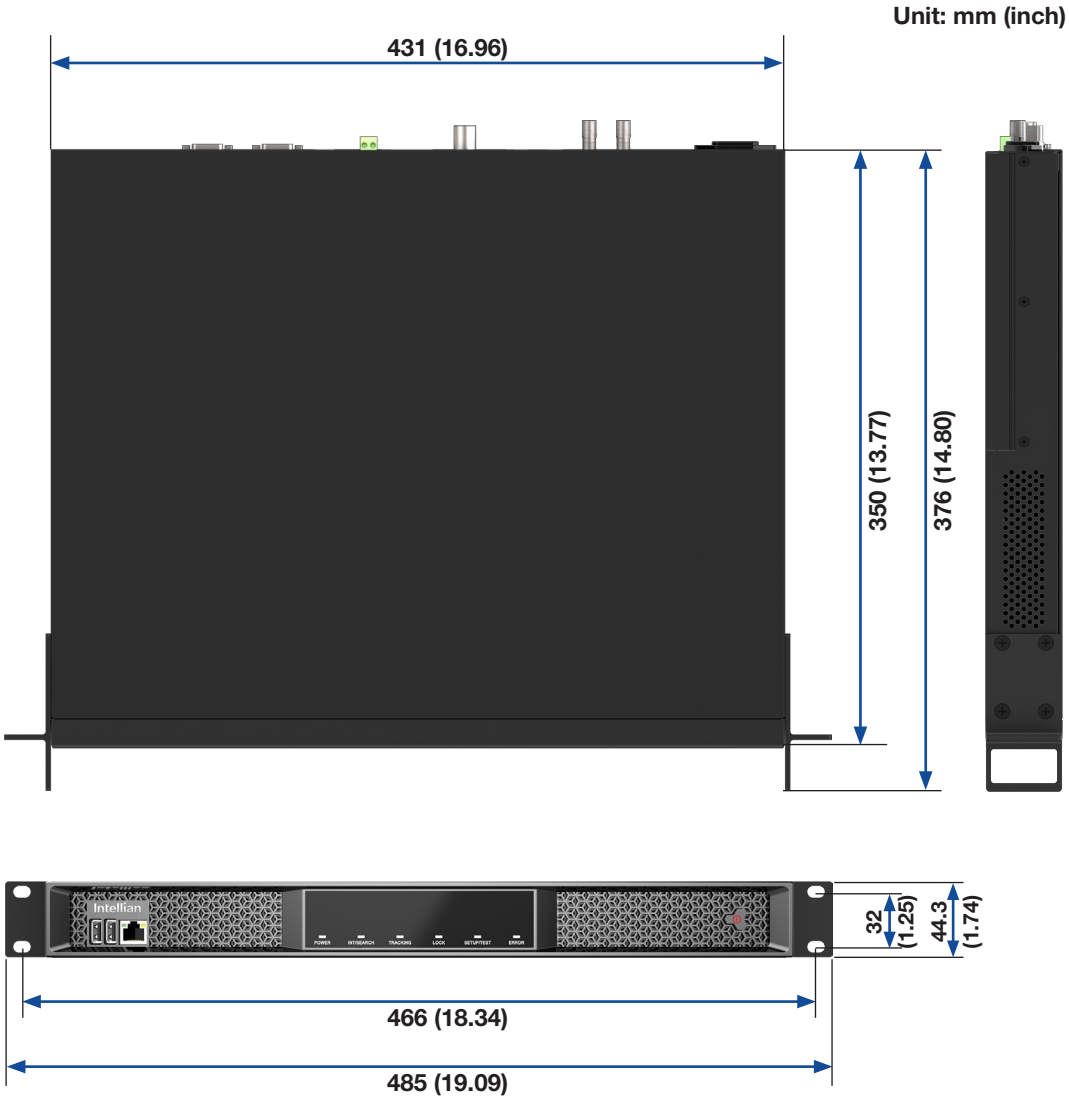


Figure 15: ACU Dimensions

6.3 Mounting ACU on 19-inch Rack

The ACU can installed to 19" rack using the two rack mount brackets which can be found from the ACU box. Attach the rack mount brackets to the sides of the ACU using flat head screws. Connect cables to the back side of the ACU.

Figure 16: 19-inch Rack Mount ACU

WARNING

Ensure that the cables connected to the ACU are long enough to prevent damage when the ACU is pulled out from the rack.

6.4 Antenna System Configuration

For the proper operation of the satellite communication system, the required components must be connected as shown in the figure. Separate purchase of a satellite modem and ship's gyrocompass may be needed.

6.4.1 Single Antenna System Configuration

The basic system consists of one VSAT antenna and one ACU. Connect the cables according to the following configuration.

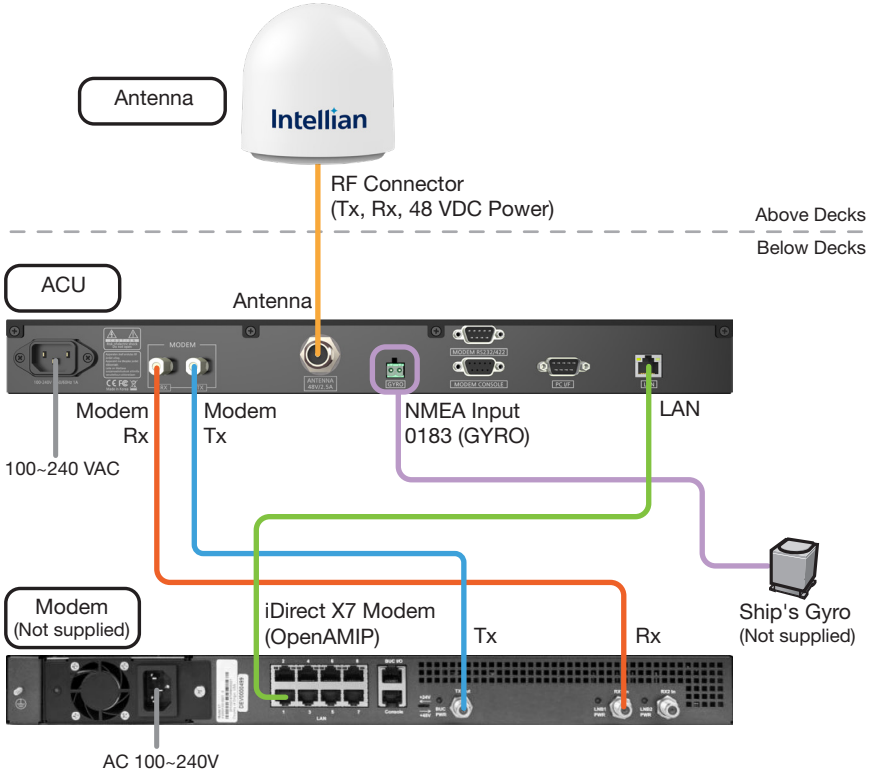


Figure 17: Antenna System Configuration

NOTE

The dual antenna system is not configurable with this system.

6.5 ACU Cable Connection

6.5.1 ACU Back Panel Connectors

The following figure shows the ACU back panel.

Antenna Control Unit (ACU)

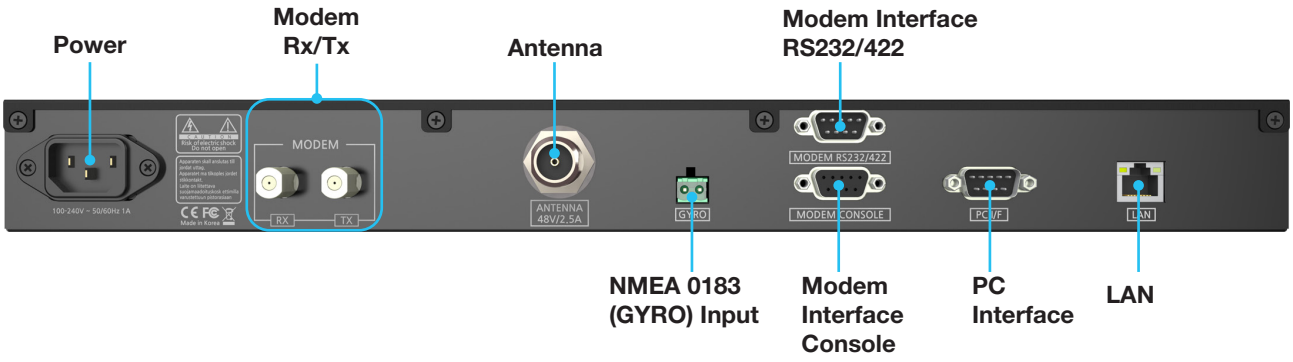
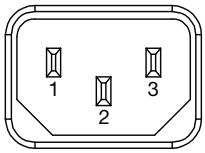


Figure 18: ACU Back Panel Connectors

6.5.2 ACU Connector Pinout Guide

Check the following connector pinout information applied to the connection ports of the ACU.

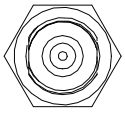
- **Power Connector**



IEC 320 C14 Plug Male

Pin	Signal
1	NEUTRAL
2	GND
3	LIVE

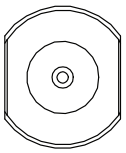
- **Modem Rx and Tx Connectors**



RF F Type Female

Conductor	Function
Inner	DATA
Outer	GND

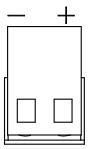
- **Antenna Connector**



RF N Type Female

Conductor	Function
Inner	RX, TX, FSK, REFERENCE, POWER
Outer	GND

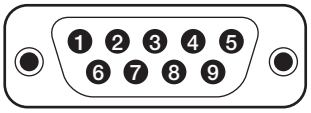
- **NMEA 0183 Input**



2-Pin Terminal Block

Pin	Signal
-	HEADING GND
+	HEADING IN

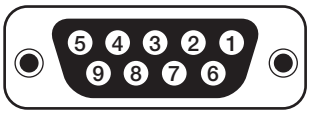
- **Modem Interface - RS232 & RS422 Connector**



D-Sub 9-Pin Male

Pin	Signal
1	N/C
2	MODEM TX / MAX422 RX+
3	MODEM RX / MAX422 TX+
4	N/C
5	GND
6	N/C
7	MAX422 RX-
8	MAX422 TX-
9	N/C

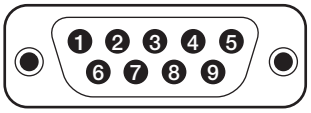
- **Modem Interface - Console Connector**



D-Sub 9-Pin Female

Pin	Signal
1	GND
2	GPS_OUTA
3	MODEM_LOCK
4	MUTE 0
5	N/C
6	GPS_OUTB
7	EXM_AGC
8	MUTE 1
9	N/C

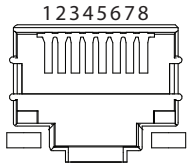
- **PC Interface - RS232 Connector**



D-Sub 9-Pin Male

Pin	Signal
1	N/C
2	PC RX
3	PC TX
4	N/C
5	GND
6	N/C
7	IARM TO PC_ DBG_ TX
8	PC TO IARM_ DBG_ RX
9	N/C

- **LAN Connector**



RJ-45 Female

Pin	Signal
1	TX-
2	TX+
3	RX-
4	N/C
5	N/C
6	RX+
7	N/C
8	N/C

6.5.3 Connecting Power to ACU

Connect the power cord from the power supply to the power connector (100~240 VAC) of ACU.

Figure 19: Connecting Power to ACU

6.5.4 Connecting ACU to Antenna

Connect an **Antenna RF cable (N to N)** (customer supplied) from the **ANTENNA (N) port** of the ACU to the **RF (N) port** of radome (antenna).

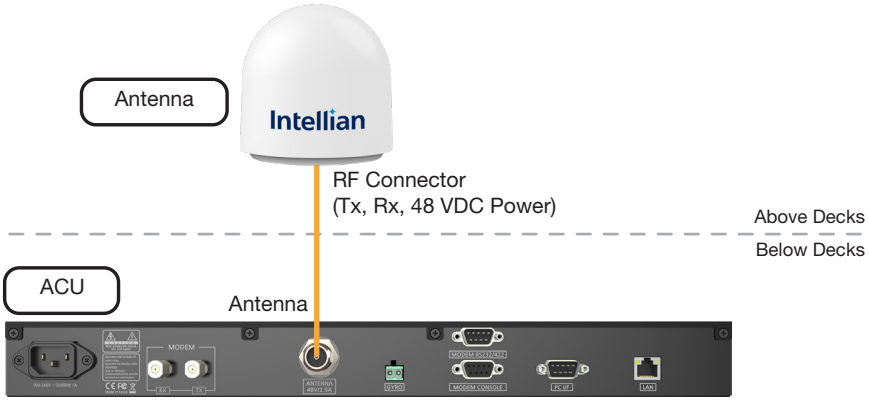


Figure 20: ACU to Antenna Cable Connection

6.5.5 Connecting ACU to Modem

1. Connect a **RF cable (F to F)** from the **MODEM Rx (F) port** of the ACU to the **Rx (F) port** of the modem.
2. Connect another **RF cable (F to F)** from the **MODEM Tx (F) port** of the ACU to the **Tx (F) port** of the modem.
3. When using the OpenAMIP modem protocol, connect an **Ethernet cable** from the **LAN (RJ45) port** of the ACU to a **LAN (RJ45) port** of the modem.

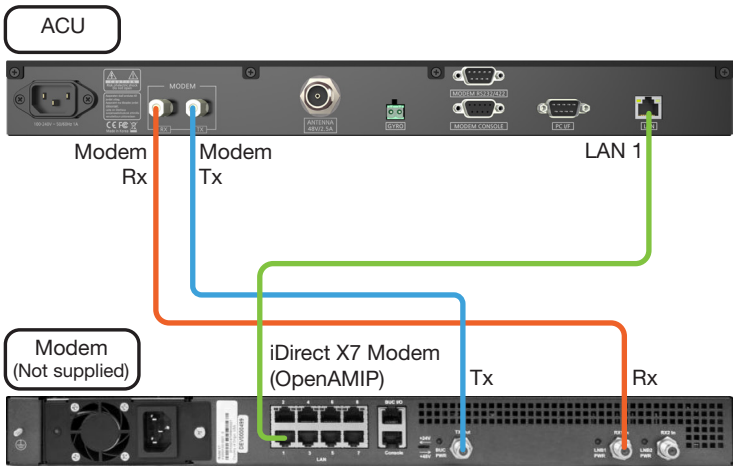


Figure 21: ACU to Modem Cable Connection

6.5.6 Connecting ACU to Ship Gyrocompass

For satellite tracking, connect a gyrocompass used on ship to the antenna system through the gyrocompass interface of the ACU. Intellian ACU supports NMEA 0183 (GYRO) gyrocompass input.

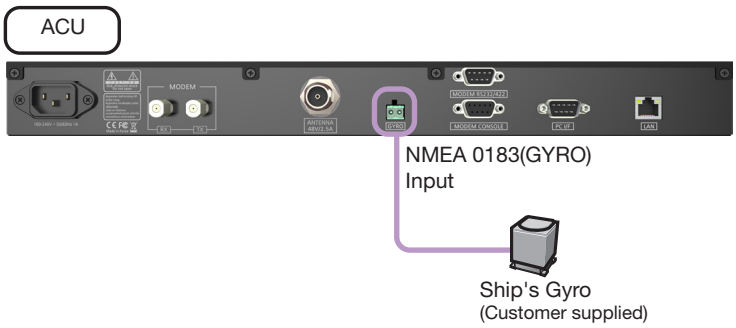


Figure 22: ACU to Ship Gyrocompass Cable Connection

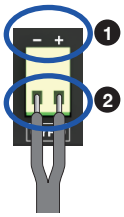
How to Connect NMEA 0183 Gyrocompass Cable

1. Using a Phillips screwdriver, loosen the two screw terminals by rotating them counterclockwise.
2. Connect two wires of NMEA 0183 gyrocompass cable to the terminals.

NOTE

When connecting the NMEA 0183 gyrocompass cable:

1. The polarity of terminal is indicated on the top with + and - marks. Connect the cable correctly in proper polarity.
2. Strip the wires up to 5 mm (0.2"). DO NOT solder the cables.



3. Fully tighten the screws by rotating them clockwise to clamp the wires securely.

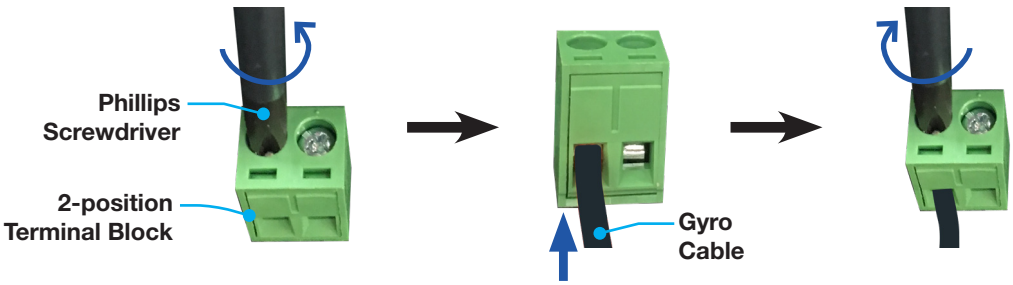


Figure 23: NMEA 0183 Gyrocompass Cable Connection

6.6 ACU to PC Communication Setup

You can establish the data communication between the Antenna Control Unit (ACU) and PC using one of the following methods.

6.6.1 TCP/IP Connection

Connection through Front Panel Management Port

The network is automatically configured by DHCP with no additional PC IP configuration.

1. Connect an Ethernet cable from the Management LAN port on the front panel of ACU to a LAN port of PC.
2. The network connection is established automatically.
3. Use the following IP address to access Intellian *AptusNX* page.

- **IP Address: 192.168.2.1 (Default)**

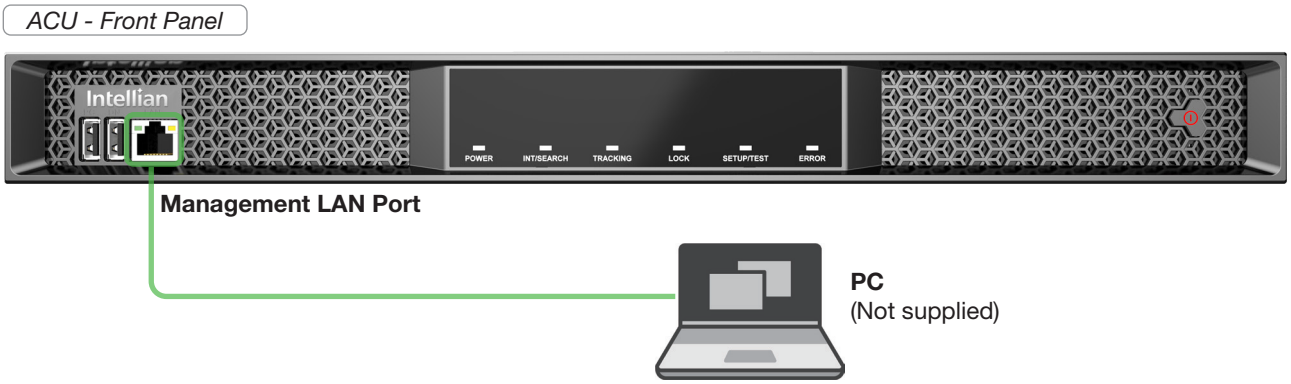


Figure 24: Front Panel Management LAN Port Connection

6.6.2 USB Connection

- **Using Left Side USB (Serial) Port on ACU Front Panel**

Connect a USB Cable (A to A) (customer supplied) from the left side USB (serial) port on the front panel of ACU to PC for monitoring and controlling the antenna system.

NOTE

- The left side USB port is only for certified engineers' use only.
- Accessing AptusNX and iARM upgrade are NOT supported through the serial USB connection.

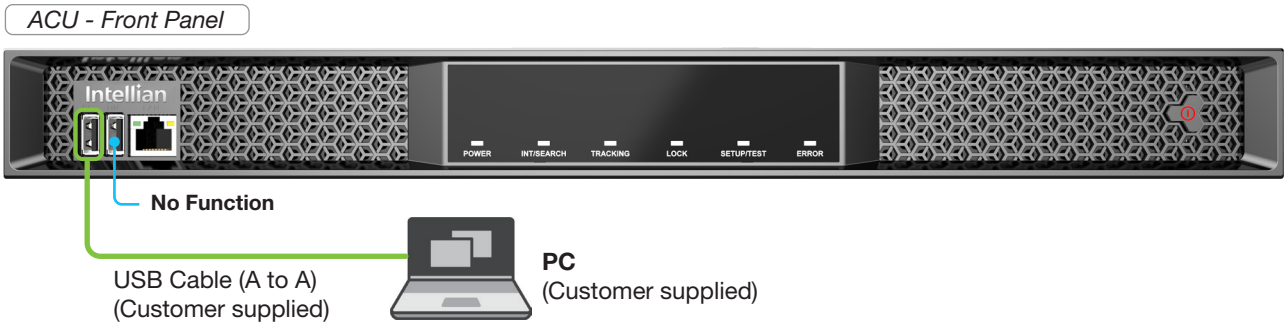


Figure 25: Front Panel USB Port Connection

Chapter 7. Operating Install Wizard

7.1 Turning On System

Make sure the antenna has a clear view of the sky. Press the **POWER** button on the front panel of the Antenna Control Unit (ACU), then wait a few minutes for system startup. Once the antenna finds the satellite, the **POWER** indicator will turn Green.

7.2 Accessing *AptusNX*

The network is automatically configured by DHCP with no additional PC IP configuration.

1. Connect an Ethernet cable from the Management LAN port on the ACU front panel to a LAN port of PC.
2. The network connection is established automatically.
3. Use the following IP address to access Intellian *AptusNX* page.

- **IP Address: 192.168.2.1 (Default)**

4. Log into the *AptusNX* by entering User ID and Password.

- **User ID: intellian (Default)**
- **Password: 12345678 (Default)**

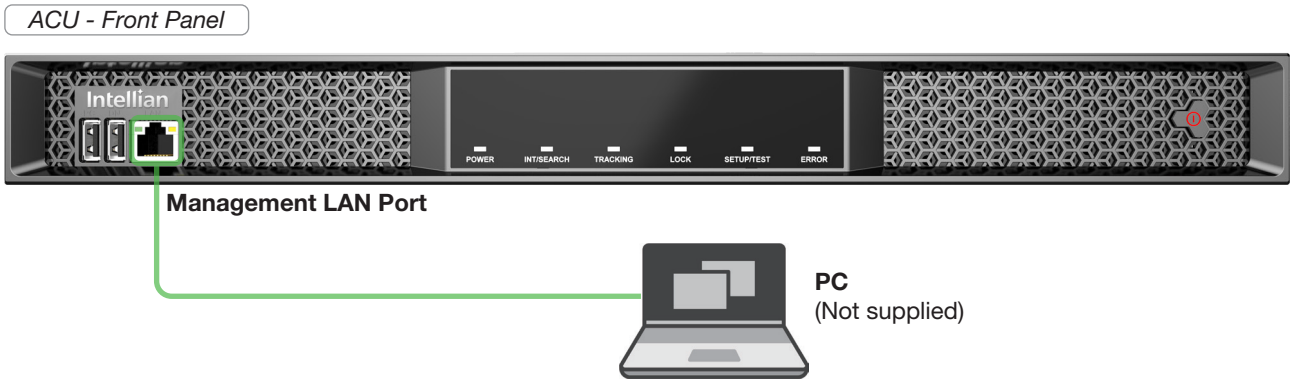
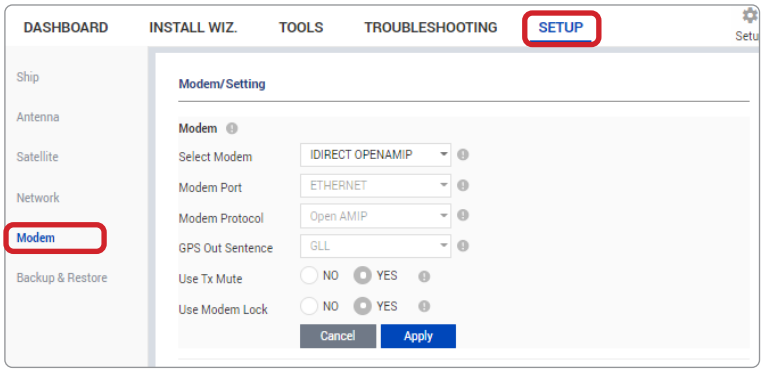


Figure 26: Front Panel Management LAN Port Connection

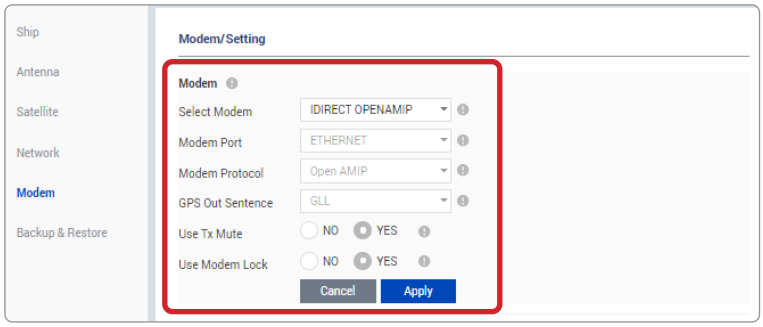
7.3 Modem Configuration

Before starting installation wizard, set up the modem configuration.

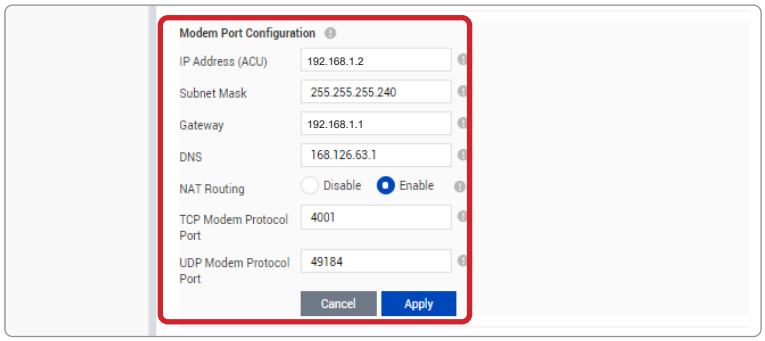
1. After accessing the *AptusNX* main page, go to the **SETUP ➔ Modem** on the main menu then follow these steps.



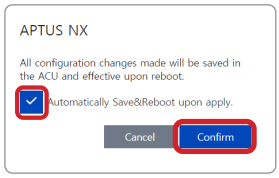
2. Select your modem type from the **Select Modem** drop-down list for loading a pre-configuration of modem. The setting parameters related to the modem interface will be set automatically once the modem type is selected. If you select **USER SETTING** from the **Select Modem** drop-down list, the settings can be changed manually. Click the **Apply** button.



3. Enter the modem setting values to configure the modem. Refer to the information provided by your service provider. Click the **Apply** button.



4. On the pop-up window, select the checkbox if you want the system to perform the **iARM Save & Reboot** automatically. Then, click the **Confirm** button.



5. Reboot the system.

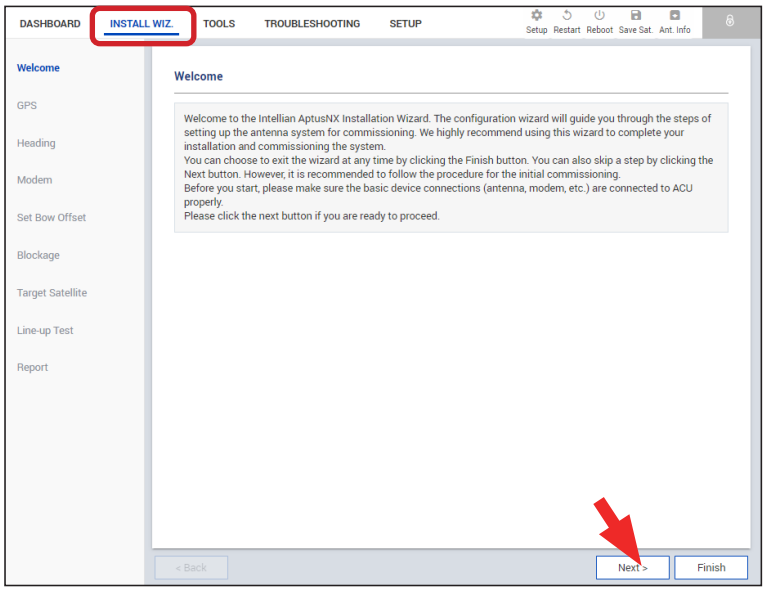
7.4 Starting Install Wizard

The Install Wizard will give you a guide by going through the steps of setup for the antenna system commissioning. We highly recommend using this wizard to complete the installation and commissioning of the system. You can exit the wizard at any time by clicking the **Finish** button. You can also skip steps by clicking the **Next** button. Before you start, make sure the basic devices (antenna, modem, etc) are connected to the ACU properly. After accessing the *AptusNX* main page, go to the **INSTALL WIZ.** on the main menu then follow these steps.

NOTE

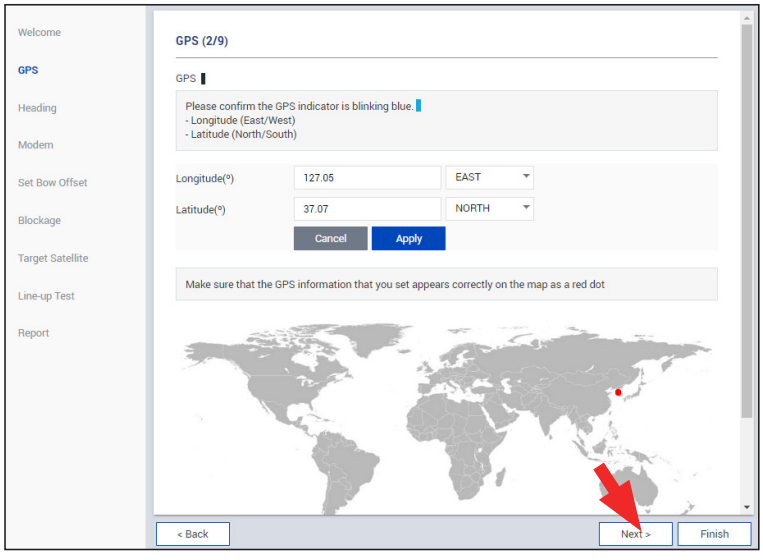
Refer to the **"Chapter 9. Using AptusNX" on page 53** for detailed description of each function.

✓ *Welcome Page*



Welcome message is displayed. Click the **Next** button to start.

✓ *Step 1: GPS*

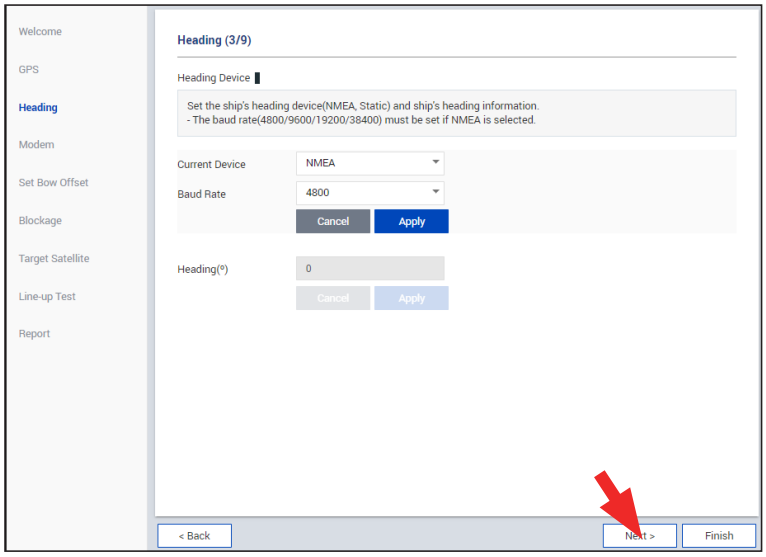


Set the GPS position of the vessel for the satellite searching. Check the GPS status connected to the antenna system. The colored indicator next to the title shows the GPS status. Make sure the GPS indicator is Blue (blinking).

- Blue (blinking): The system received a correct GPS signal.
- Red: The GPS signal is abnormal, or the received value is incorrect (Error).
- Black: The system has not received any GPS signal. You can enter the GPS value manually to set the GPS position.

Click the **Next** button to go to the next step.

✓ *Step 2: Heading*



Set the ship's heading device. The colored indicator next to the title shows the heading device connection status.

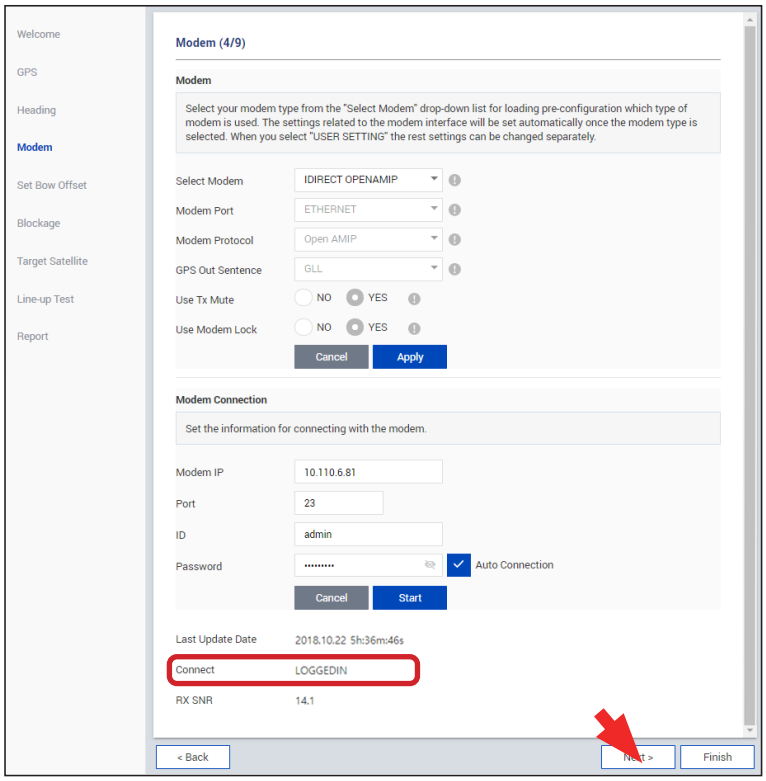
- Blue: Ship's heading device is connected.
- Black: Ship's heading device is not connected.

If a gyrocompass is connected, choose the device type from the **Current Device** drop-down list. Then, click the **Apply** button. If no gyrocompass is connected, choose **NONE** for the **Current Device** from the drop-down list. Then, click the **Apply** button.

NOTE: Skip "Step 4: Set Bow Offset" if no gyrocompass is connected.

Click the **Next** button to go to the next step.

✓ *Step 3: Modem*



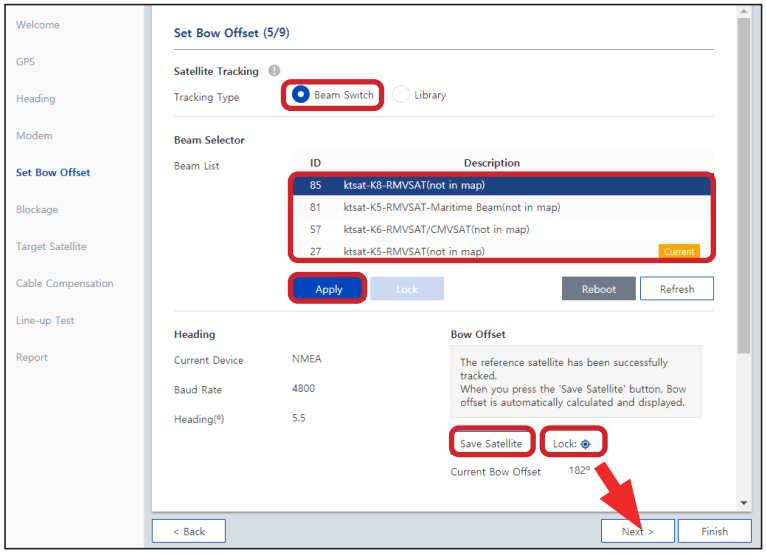
Select your modem type from the **Select Modem** drop-down list for the modem configuration. The setting parameters related to the modem interface will be set automatically once the modem type is selected. If you select **USER SETTING** from the **Select Modem** drop-down list, the settings can be changed manually. Make sure the **Modem Connection** is in **LOGGEDIN** status.

Click the **Next** button to go to the next step.

✓ *Step 4: Set Bow Offset*

For setting the bow offset, a trackable satellite must be selected. There are two methods for tracking a target satellite.

(Option 1: Using Beam Switch Type)



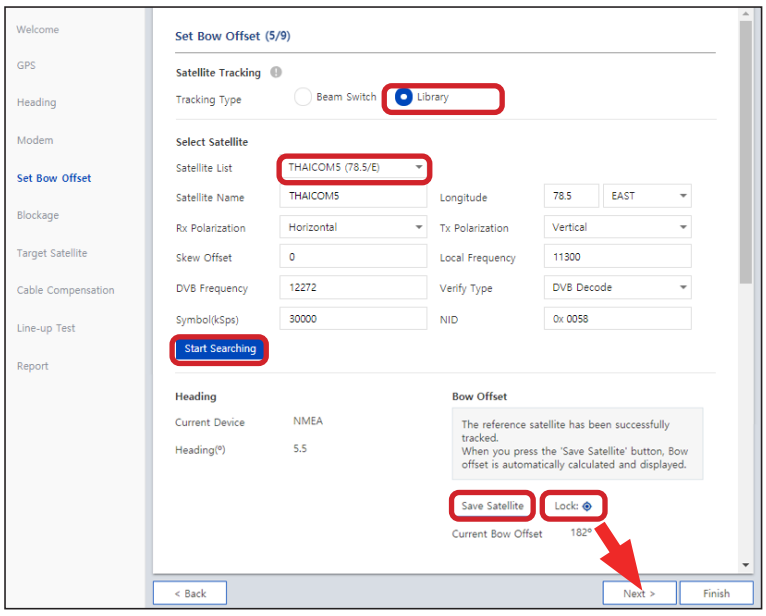
- **Step 1**: Choose the **Beam Switch** for the **Tracking Type**.
- **Step 2**: Select a satellite under the Beam List, then click the **Apply** button.

Wait while the antenna terminal tracks the satellite.

- **Step 3**: Make sure the **Lock** is on**,** then click the **Save Satellite** button in the **Bow Offset** menu to save the BOW offset information to ACU.

Click the **Next** button to go to the next step.

(Option 2: Using Library Type)



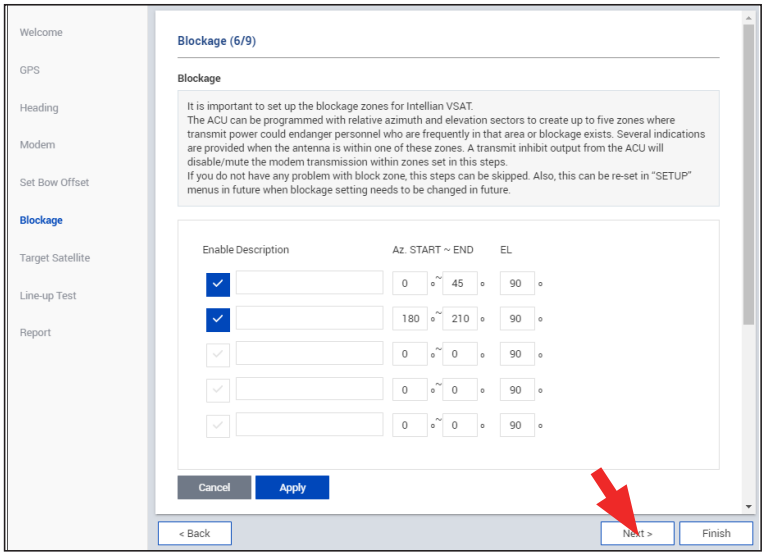
- **Step 1**: Choose the **Library** button on the **Tracking Type**.
- **Step 2**: Select a satellite under the **Satellite List**, then click the **Start Searching** button.

Wait while the antenna terminal tracks the satellite.

- **Step 3**: Turn on the **Lock,** then click the **Save Satellite** button in the **Bow Offset** menu to save the BOW offset information to the antenna.

Click the **Next** button to go to the next step.

✓ *Step 5: Blockage*



It is important to set up the blockage zones for Intellian VSAT. The VSAT system can be programmed with relative azimuth and elevation sectors to create up to five zones for the transmission mute.

The **AZ START** is the relative azimuth angle where the blockage starts, and the **AZ END** is the relative azimuth angle where the blockage ends (Range: 0 ~ 360).

The **EL** is the elevation angle where the blockage is set (Range: 0 ~ 90). The blockage is activated below the elevation angle.

Click the **Next** button to go to the next step.

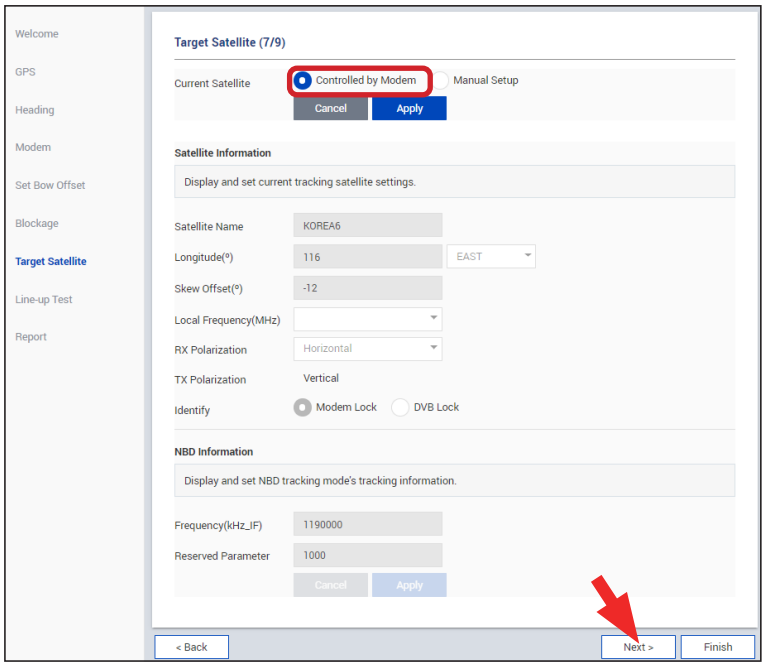
✓ *Step 6: Target Satellite*

Set the target satellite to track. There are two methods for selecting a target satellite.

NOTE

The following images in this step show when the Open AMIP modem is used.

(Option 1: Using Satellite Controlled by Modem)

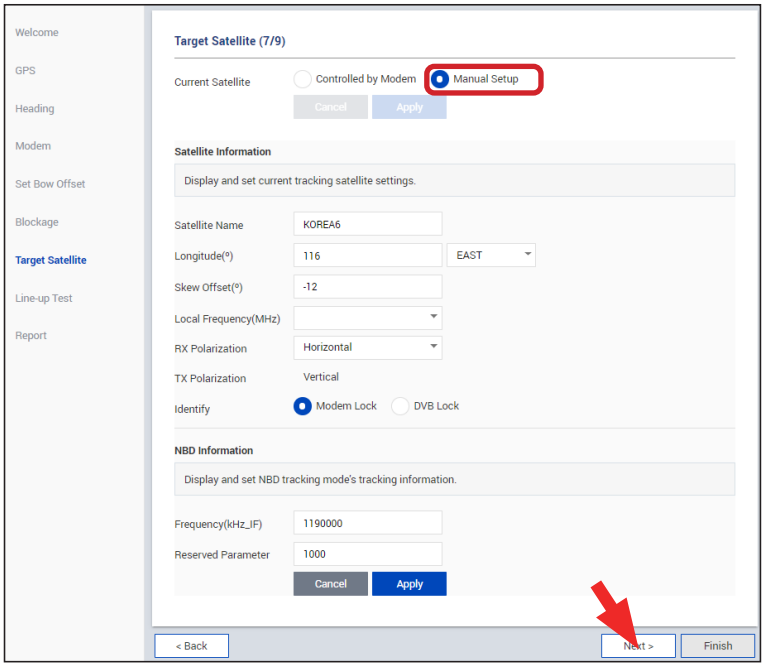


This method is generally recommended.

Select the **Controlled by Modem** for the **Current Satellite**. Then, the current satellite and NBD information will be displayed automatically.

Click the **Next** button to go to the next step.

(Option 2: Using Manual Setup)



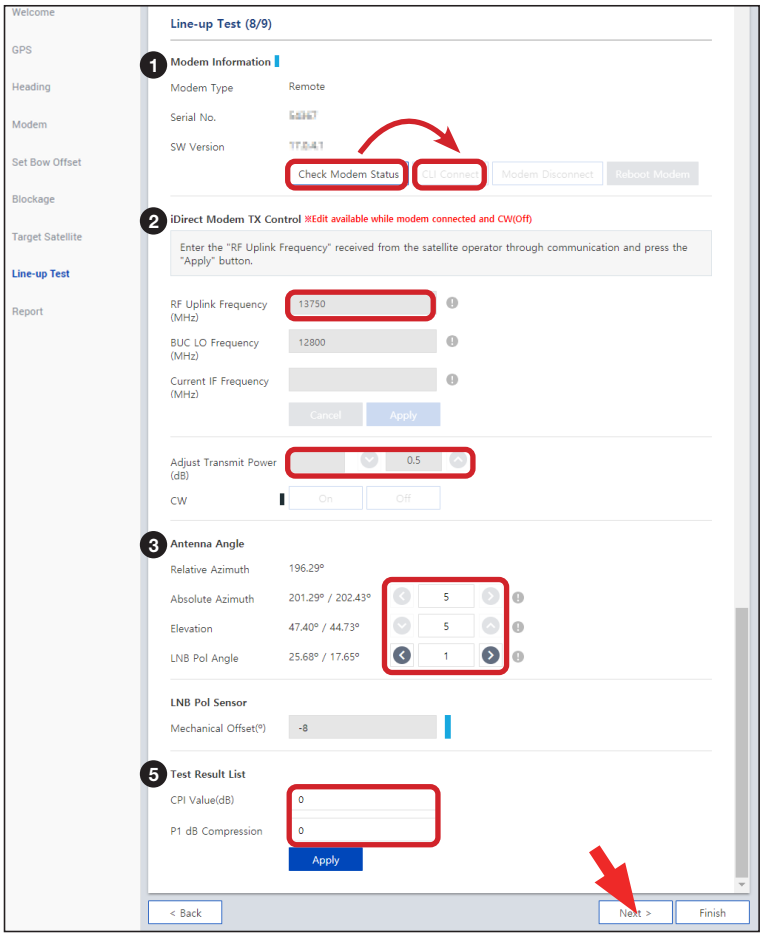
If you did not set the modem connection, select the **Manual Setup** for the **Current Satellite**. Then enter the satellite and NBD information manually to track a satellite. Click the **Apply** button.

Click the **Next** button to go to the next step.

✓ *Step 7: Line-up Test*

Perform a line-up test by the satellite operator to confirm antenna performance and operation status.

(Option 1: Using iDirect Open AMIP Modem)



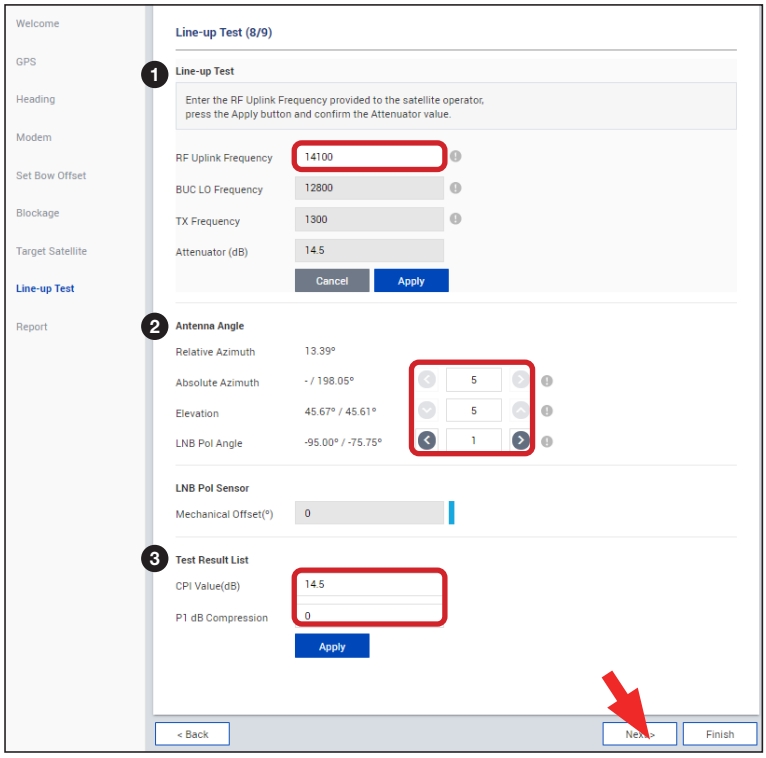
1. Check modem status for connection readiness by clicking the **Check Modem Status** button. Then connect to iDirect Open AMIP modem by clicking the **CLI Connect** button.
2. Enter the CW signal frequency provided by your satellite operator into the **RF Uplink Frequency,** then click the **Apply** button to transmit the signal.
   This menu can be edited when the antenna is connected to iDirect Open AMIP modem and the CW is off.
3. Adjust the **Transmit Power** of the frequency using the arrow keys which increases or decreases by 0.5 dBm.
4. Adjust the **Antenna Angle**.
5. Enter the **Test Result** value received from the satellite operator and click the **Apply** button.

Click the **Next** button to go to the next step.

Refer to the following table for a detailed explanation of each menu.

No.	Item	Description
①	Modem Information	Checks the iDirect Open AMIP modem information. The indicator right of the title shows the device connection status. (Blue: a iDirect Open AMIP modem is connected. Black: a iDirect Open AMIP modem is not connected.) • Modem Type: Displays the iDirect Open AMIP modem type. • Serial No.: Displays the iDirect Open AMIP modem's serial number. • SW Version: Displays the iDirect Open AMIP modem's SW version. - Check Modem Status: Before the CLI connection, check modem status for connection readiness by clicking the **Check Modem Status** button. - CLI Connect : Connect to iDirect Open AMIP modem by clicking the **CLI Connect** button. - CLI Disconnect: Disconnect from iDirect Open AMIP modem by clicking the **CLI Disconnect** button.
②	iDirect Modem Tx Control	Adjusts the modem frequency to receive optimal signal. This menu can be edited when the antenna is connected to iDirect Open AMIP modem and the CW is off. Click the **Apply** button to apply the settings to the system. • RF Uplink Frequency (MHz): Enters the RF uplink frequency provided by your satellite operator. • BUC LO Frequency (MHz): The BUC LO frequency is applied automatically. The value is assigned according to the satellite band. • Current IF Frequency (MHz): The current IF frequency is applied automatically. The value is **RF Uplink Frequency** value - **BUC LO Frequency**. The following menus are performed to adjust the transmit power of the frequency. • Adjust Transmit Power: Adjust the power calibration value using the arrow keys which increases or decreases by 0.5 dBm. • CW: Select whether to use the modulation function or not (On or Off). The indicator next to the title shows the CW status. (Blue: CW is on. Black: CW is off.) To edit the details of the iDirect Modem Tx Control menu, you must keep this function off.
③	Antenna Angle	Adjusts the antenna angle to receive optimal signal. • Relative Azimuth: Displays the relative azimuth angle. • Absolute Azimuth: Adjust the absolute azimuth angle using the arrow keys. • Elevation: Adjust the elevation angle using the arrow keys. • LNB Pol Angle: Adjust the LNB Pol angle using the arrow keys.
④	LNB Pol Sensor	Displays the Mechanical Offset value of the LNB Pol Sensor. The indicator right of the title shows the LNB Pol Sensor status. (Blue: the LNB pol sensor is on. Black: the LNB pol sensor is off.) • Mechanical Offset: Displays the mechanical offset value of the LNB Pol Sensor.
⑤	Test Result List	Enters the test result value received from the satellite operator. • CPI Value (dB): Enter the CPI value. • P1 dB Compression: Enter the P1 dB compression.

(Option 2: Using Other Modems)



1. Enter the CW signal frequency provided by your satellite operator into the **RF Uplink Frequency,** then click the **Apply** button to transmit the signal. (This CW signal frequency must be applied to the modem. The setting process differs depending on the modem, refer to the instruction manual of the modem.)
2. Adjust the **Antenna Angle**.
3. Enter the **Test Result** value received from the satellite operator.

Click the **Next** button to go to the next step.

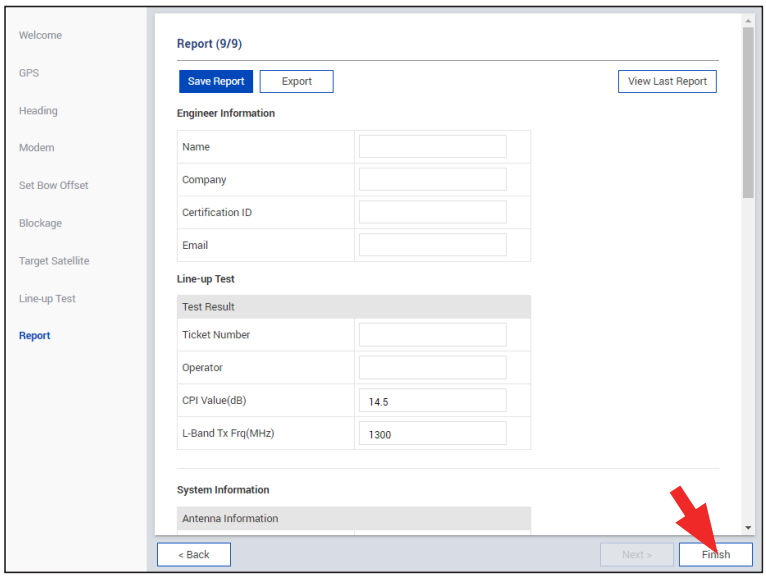
Refer to the following table for a detailed explanation of each menu.

No.	Item	Description
①	iDirect Modem Tx Control	Adjusts the modem frequency to receive optimal signal. Click the **Apply** button to apply the settings to the system. • RF Uplink Frequency (MHz): Enters the RF uplink frequency provided by your satellite operator. • BUC LO Frequency (MHz): The BUC LO frequency is applied automatically. The value is assigned according to the satellite band. • Tx Frequency: The Tx frequency is applied automatically. The value is **RF Uplink Frequency** value - **BUC LO Frequency**. • Attenuator (dB): The attenuator is applied automatically.
②	Antenna Angle	Adjusts the antenna angle to receive optimal signal. • Relative Azimuth: Adjust the relative azimuth angle. • Absolute Azimuth: Adjust the absolute azimuth angle. • Elevation: Adjust the elevation angle. • LNB Pol Angle: Adjust the LNB Pol angle.
③	Test Result List	Enters the test result value received from the satellite operator. • CPI Value (dB): Enter the CPI value. • P1 dB Compression: Enter the P1 dB compression

✓ *Step 8: Report*

NOTE

The following image shows when the system is using the Open AMIP modem.
In case of using other modems, the displayed items on the Report may change.



The configuration report is displayed.

You can save the results to the ACU by clicking the **Save Report** button and download the report file (.json) by clicking the **Export** button.

Click the **View Last Report** to check the recently saved report information including the saved date and time.

After complete the steps, click the **Finish** button.

Chapter 8. Operating ACU

8.1 ACU Front Panel View

The following figure shows the ACU's front panel.

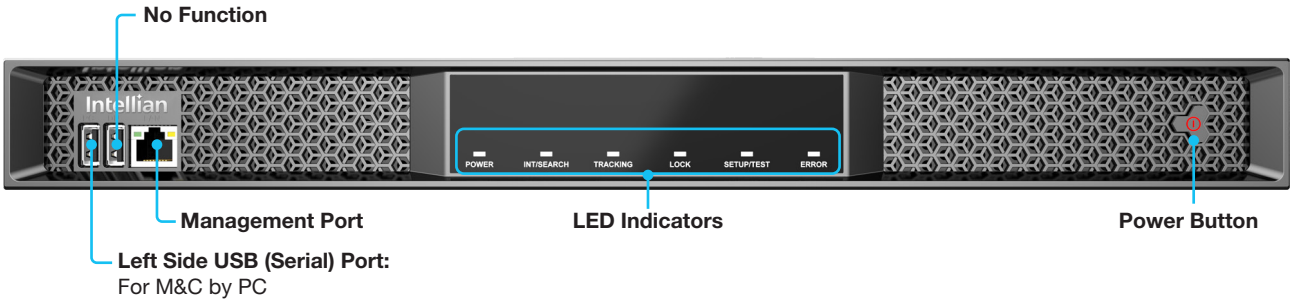


Figure 27: ACU Front Panel View

The following table shows status indicators on the ACU.

LED Indicator	Color	Description
POWER	Steady Green	The ACU is powered on.
	Off	The ACU is powered off.
INT/SERCH	Steady Green	The antenna is searching a satellite.
	Blinking	The antenna is initializing.
TRACKING	Steady Green	The antenna is in tracking mode.
LOCK	Steady Green	The satellite is locked.
SETUP/TEST	Steady Green	The antenna is in Setup mode.
	Blinking	The antenna is in Test mode.
ERROR	Steady Red	The antenna is in error.

Chapter 9. Using AptusNX

9.1 Introduction

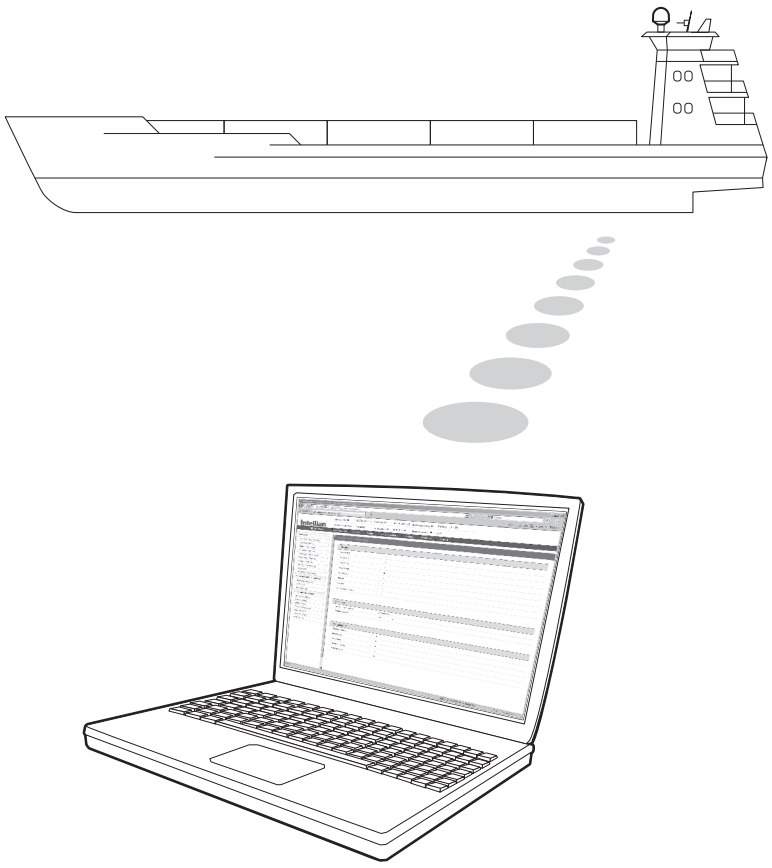
With the embedded *AptusNX* software, the antenna can be monitored, controlled, and diagnosed remotely from anywhere, anytime through TCP/IP protocol. It saves your time and cost generated by various maintenance activities such as operating firmware upgrades, tracking parameter resets, and system diagnosis, etc..

9.2 Accessing AptusNX for ACU

1. Connect an Ethernet cable from the Management LAN port on the front panel of the ACU to a LAN port of PC. This method is generally recommended.
2. Enter the ACU IP address (**Default: 192.168.2.1**) into the address bar of web browser to login into the internal HTML page of ACU.

NOTE

AptusNX works on Internet Explorer 11 or higher (Windows 7 or higher editions), Firefox, Microsoft Edge and Chrome web browsers.

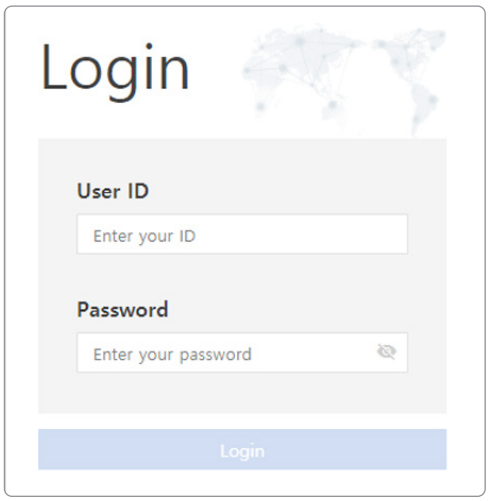


9.3 Main Page (Page Login)

The Intellian software Aptus provides different user access levels to protect the system for safe operation. Depending on the user level, the accessible range of function in the software can be limited.

1. Log into the ACU by typing in User ID and Password. The followings are the factory default values.

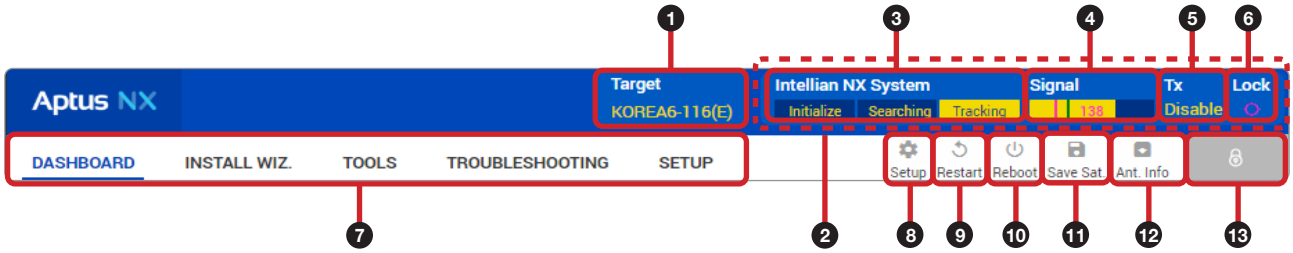
User Type	User ID	Password	Access Authority
Admin	*intellian*	*12345678*	All menus for monitoring and setting
	captain	*12345678*	All menus for monitoring and setting Assigns permissions to users
User	*guest*	*guest*	Limited menus for monitoring (Dashboard, Tools, Troubleshooting)

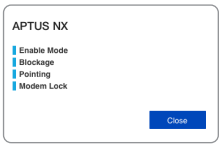


NOTE
After entering with the default password, the user must change the default password to a new password for security.

9.4 Top Menus

Once you log in, the following information and menus are displayed.



No.	Item	Description
①	Target Satellite	Displays the name of the targeted satellite.
②	Quick Status Screen Area	When clicking this top menu area (marked as red dots), the **Quick Status Screen** appears. You can quickly monitor each status of the five items (Enable Mode, Blockage, Pointing, Modem Lock) through the screen (Blue: enable, Black: disable).  <*Quick Status Screen*>
③	Antenna Status Info	Displays the antenna status through a yellow indicator in the SETUP mode. • Initialize: the antenna system is initialized. • Searching: the antenna is searching the target satellite. • Tracking: the antenna is tracking the target satellite.
④	Signal Level	Displays the current signal level.
⑤	Tx Status	Displays whether the antenna is able to transmit data or not.
⑥	Lock	Displays whether the satellite is locked or not.
⑦	Main Menu	Selects the Main Menu (DASHBOARD, INSTALL WIZ, TOOLS, TROUBLESHOOTING, SETUP). Each main menu offers side menus on the left of the screen.
⑧	Setup	Enters the setup mode to modify settings. The following functions are available only in setup mode.

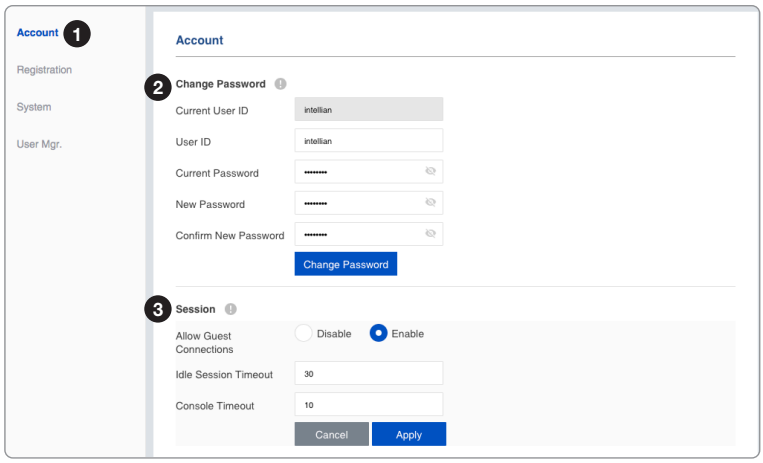
Main Menu	Side Menu	Function
SETUP	Antenna	Antenna Angle
		Dish Scan Range Check
		Sensor Calibration • Tilt Sensor Bias • Rate Sensor Bias
		Antenna Mode • Sets Idle Mode
	Backup & Restore Setting	Antenna Restore

⑨	Restart	Restarts the antenna system.
⑩	Reboot	Reboots the antenna system to become the normal mode when operating in Setup mode.
⑪	Save Sat.	Saves bow offset.
⑫	Ant. Info	Obtains current antenna information.
⑬	Account Button	Select the **Account** button and enter the user management menu. The **Account** and the **Logout** menu will appear. Select the **Account** menu to manage your account details and select the **Logout** menu to log out of the *AptusNX* web page.

9.5 Account Menu

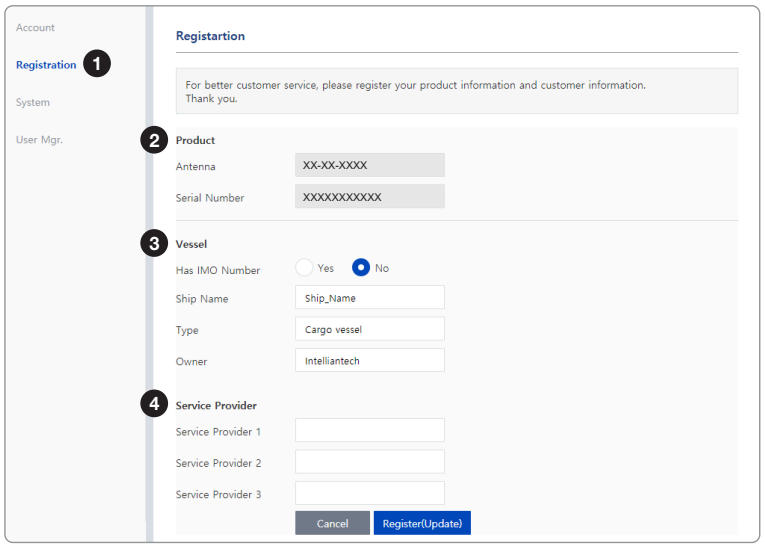
1. Click the button to manage the user account
2. The **Account**, **System**, and **User Mgr.** menus are for the user management. Click the **Logout** button to log-out of the *AptusNX* web page.

9.5.1 Account



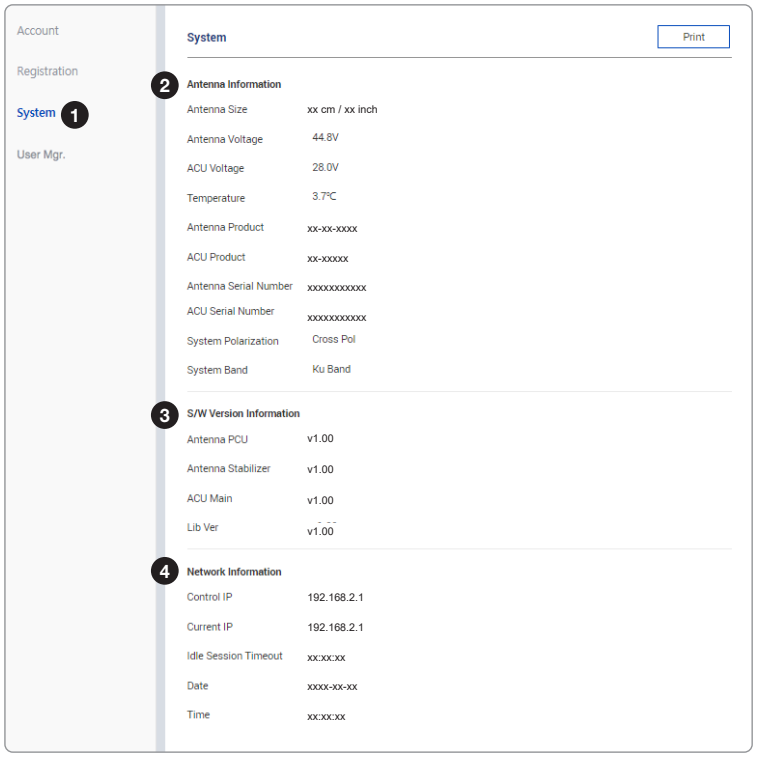
No.	Item	Description
①	Account	Updates your password and sets time-outs.
②	Change Password	You can change your password. • Current User ID: Displays your user ID. • User ID: Enter the current user ID. • Current Password: Enter the current password. • New Password: Enter the new password. • Confirm New Password: Re-enter the new password to verify that it was entered correctly. Click the **Change Password** button to set the password to the new password. For the next login, the new password is required.
③	Session	You can give guests the accessibility to the AptusNX and set time-outs. • Allow Guest Connections: Select the guest's accessibility to the system (Disable / Enable). • Idle Session Timeout: Set the idle session time-out. • Console Timeout: Set the console time-out. Click the **Apply** button to apply the settings to the system.

9.5.2 Registration



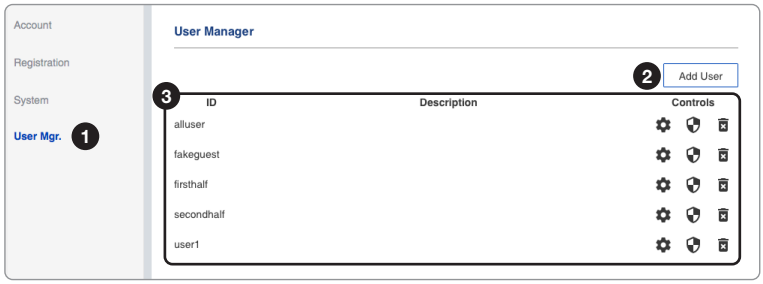
No.	Item	Description
①	Registration	Enter the product registration information for your convenience. Click the **Register (Update)** button to apply the settings to the system.
②	Product	Displays the antenna information. • Antenna: Displays the antenna name. • Serial Number: Displays the antenna serial number.
③	Vessel	Enter the vessel information. You can choose either using the IMO number or not. If you have the IMO number, select **Yes** and enter the number. If you do not have the IMO number, select **No** and enter the Ship Name, Type, and Owner information. • Has IMO Number: Select whether using the IMO number or not. • IMO Number: Enter the IMO number. • Ship Name: Enter the ship name. • Type: Enter the ship type. • Owner: Enter the owner's name.
④	Service Provider	Enter the information of your service provider. • Service Provider 1/2/3: Enter the names of service providers.

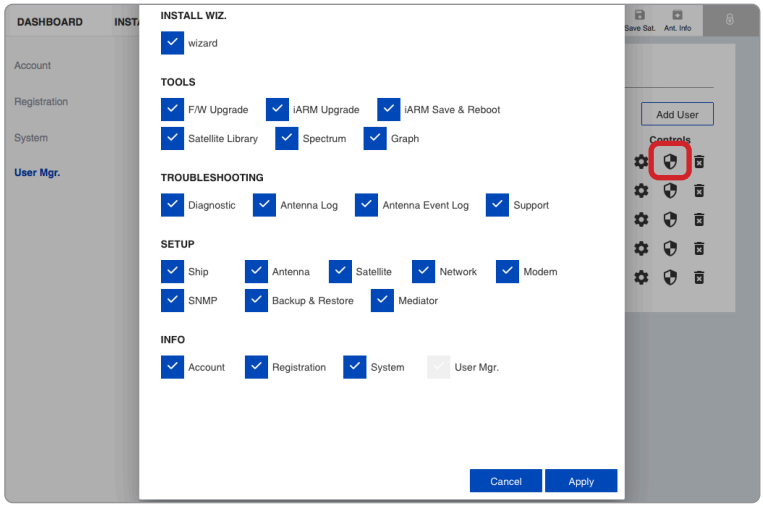
9.5.3 System



No.	Item	Description
①	System	Displays system information such as the antenna, S/W version, and network IP address.
②	Antenna Information	Displays antenna information.
③	S/W Version Information	Displays S/W version information.
④	Network Information	Displays network information.

9.5.4 User Manager



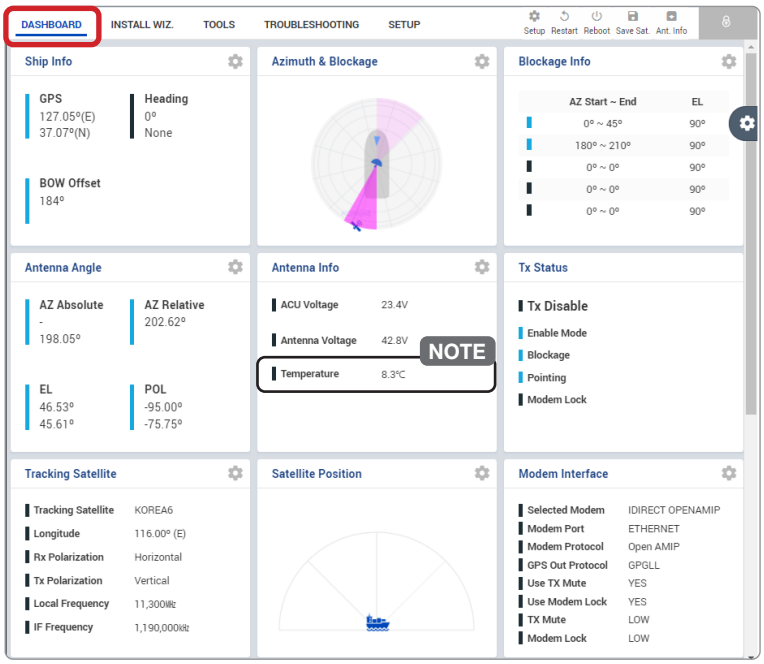


Editable User Permissions Menu

No.	Item	Description
①	User Manager	The captain with admin permissions can control and manage user permissions separately.
②	Add User	To create a new user, click the **Add User** button. Then the pop-up window is opened. Enter the new user ID and password, then click the **Add User**.
③	User Management List	Displays the user management state and can control and manage through the control buttons. • ID: displays the registered user ID. • Description: Displays the user's description. • Controls: Each user can be controlled and managed by individual settings. - User Setting: Reset the user ID by clicking the **Update User** button, and changes the password by clicking the **Reset Password** button. - Edit Menu Permission: Choose user permissions to give by selecting the checkboxes, then click the **Apply** button. The user can access only the permitted options. - Delete User: Deletes the user.

9.6 Dashboard

The Dashboard menu is displayed as below to provide quick monitoring of the antenna status. The Dashboard helps you arrange panels on a single screen while providing you with a broad view of a variety of information at once. The dashboard contains multiple panels, which can easily customize the structure of your dashboard and arrange your panels in various ways to make them more readable and user-friendly.



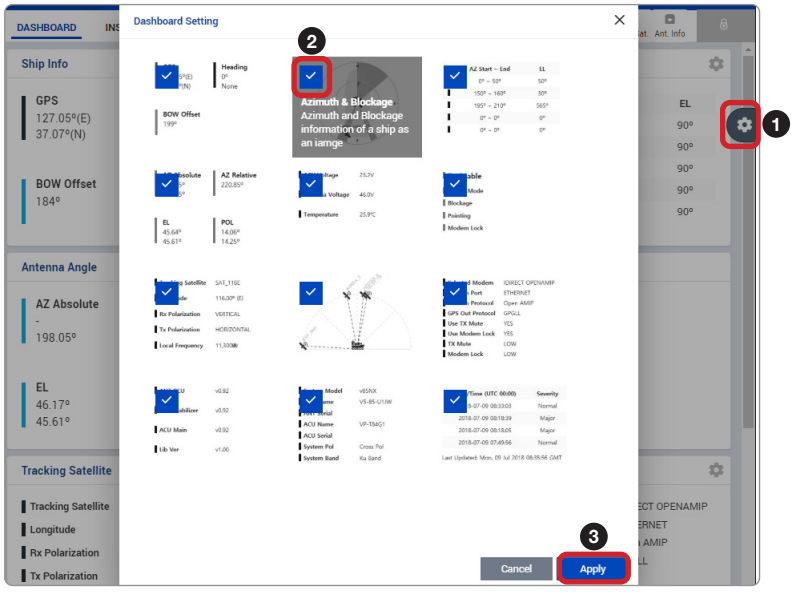
NOTE

The measured temperature can be different from the actual temperature.

9.6.1 How to Add & Remove Panels (Dashboard Setting)

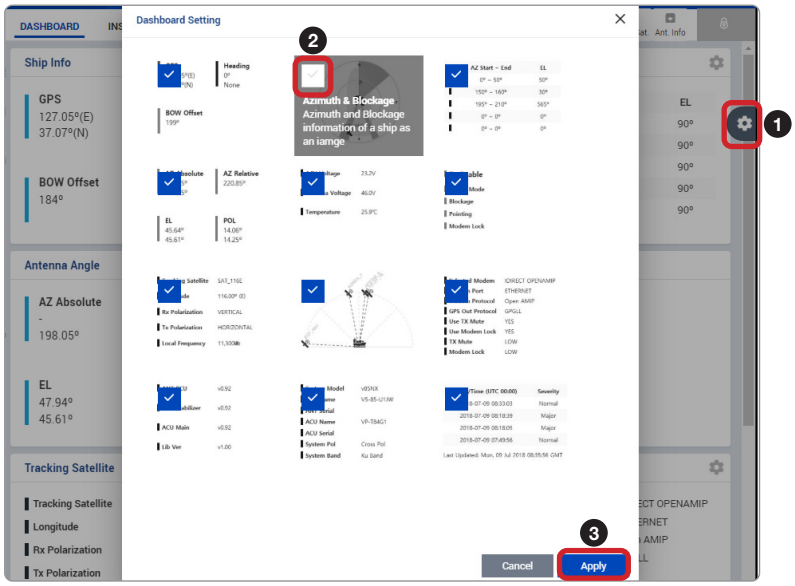
Adding Panels

1. On the right side of the page, you will see the gear icon to edit your dashboard. To start editing, click on the gear icon.
2. Check the box of the panel that you wish to add to the dashboard.
3. Click the **Apply** button to apply the settings to the system.
4. Once the panel is added, it will be automatically placed at the bottom of the page.



Removing Panels

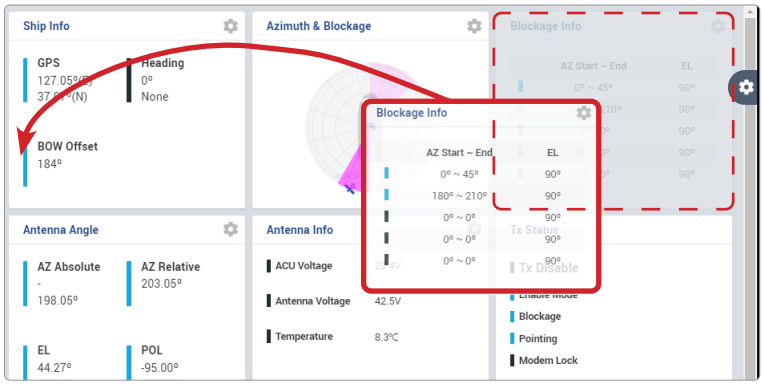
1. On the right side of the page, you will see the gear icon to edit your dashboard. To start editing, click on the gear icon indicated by the red mark.
2. Uncheck the box of the panel that you wish to remove from the dashboard.
3. Click the **Apply** button to apply the settings to the system.



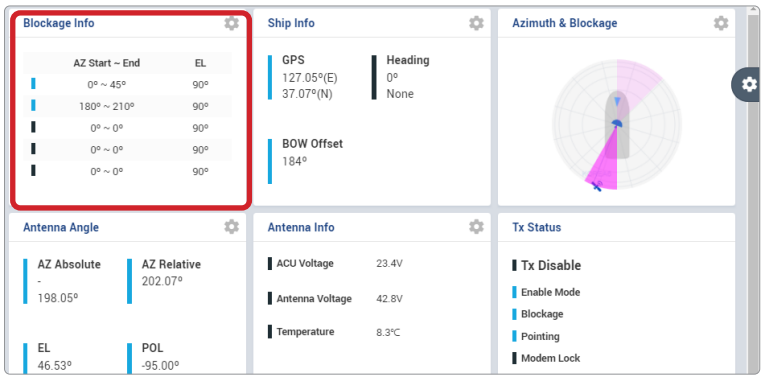
9.6.2 How to Arrange Dashboard Layout

You can customize the dashboard by rearranging panels as you wish.

1. Click and hold the left mouse button on a panel's title and then drag-and-drop in the desired position.



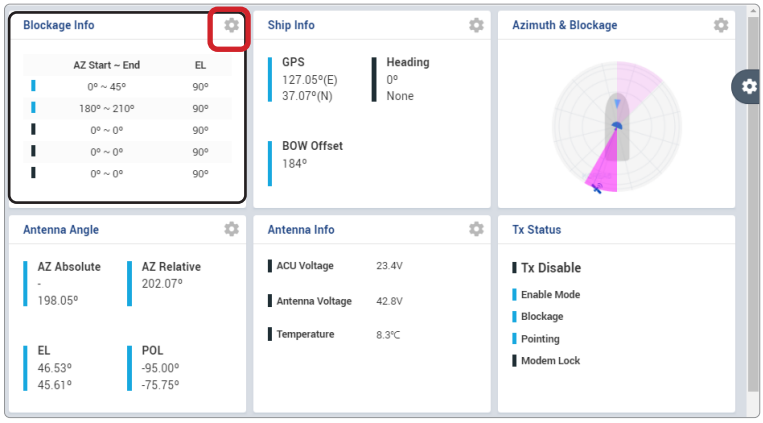
2. This time, the selected panel will be moved to the desired position. You can also move multiple panels into a customized layout in the same manner.



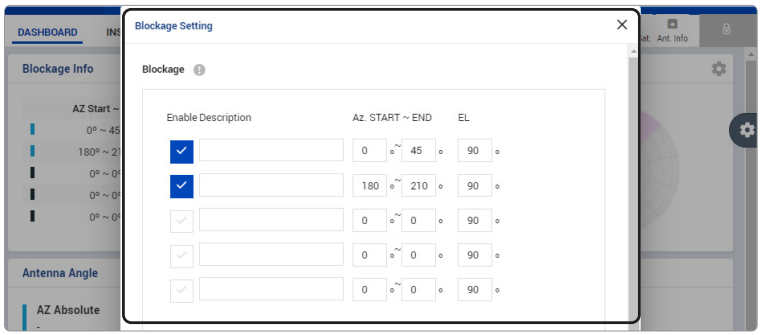
9.6.3 How to Use Shortcut Settings

Each panel on the dashboard provides a shortcut function. Using the **Shortcut** button on right side of the panel, you can easily access the detailed information and manage the each panel's settings.

1. Click the **Shortcut** button indicated by the red mark to open the setting page.

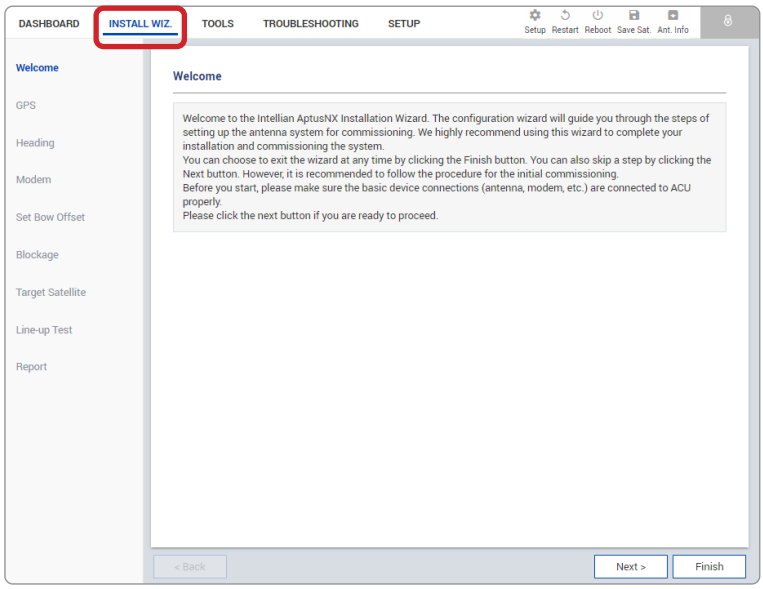


2. The setting page will appear on the individualized web page. You can check the detailed information and quickly apply settings that you wish.



9.7 Install Wizard

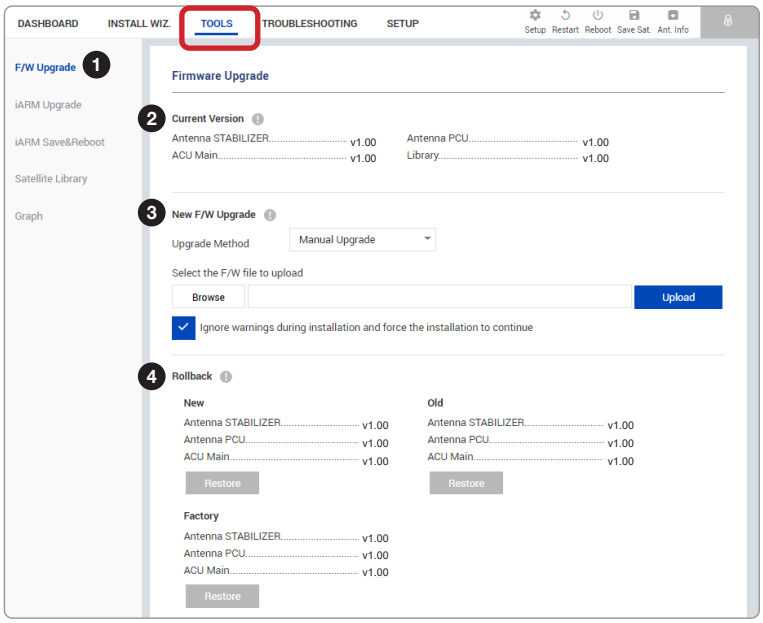
The description of this menu is written on the previous page. Refer to the **"7.4 Starting Install Wizard"** on page 44 for more details.



9.8 System Tools

This menu sets and displays the F/W Upgrade, iARM Upgrade, iARM Save&Reboot, Satellite Library, and Graph function.

9.8.1 Firmware Upgrade



No.	Item	Description
①	Firmware Upgrade	Displays current firmware versions and upgrades antenna firmware.
②	Current Version	Displays current firmware versions (Antenna STABILIZER, Antenna PCU, ACU Main, Library)
③	New F/W Upgrade	Upgrades antenna firmware. The update may take a few minutes to complete. The upload time may vary due to a variety of factors such as the speeds of your network. Uploading an incorrect firmware file may cause serious damage to your antenna and ACU. Check firmware version before uploading firmware. • Upgrade Method: selects an upgrade method between **Manual Upgrade** or **Auto Upgrade**. **NOTE**: When using the **Manual Upgrade** method, refer to the following "**Antenna Firmware Update (Manual Upgrade method) Procedures**" page for more details.
④	Rollback	Displays the previous and latest versions of the firmware package and restores them. Other function cannot be operated while rollback is in process. • **New**: Most currently upgraded version of firmware • **Old**: Previous version of firmware before the upgrade • **Factory**: Initial version of firmware which was installed by the factory The new, old or factory version of firmware can be restored by clicking on the **RESTORE** button.

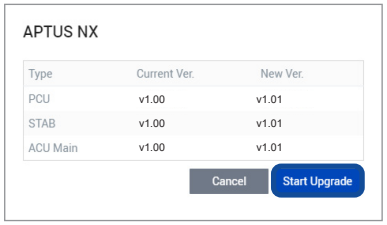
Antenna Firmware Upgrade (Manual Upgrade method) Procedures:

1. Choose **Manual Upgrade** from the pull-down menu of Upgrade Method. Browse and select the upgrade package file to upload. Click on the **Upload** button to transfer the Firmware package file ("*.fwp") to iARM module.

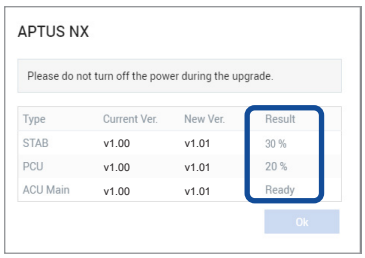
NOTE

If you select the box **"Ignore warnings during installation and force the installation to continue"**, warning messages do not appear during the upgrade.

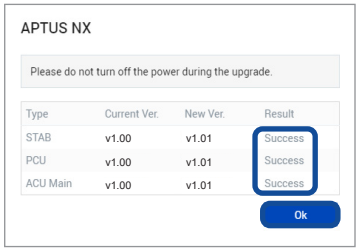
2. The antenna firmware versions are displayed on the pop-up window. Check the current version installed and the new version available for each type of firmware, then click the **Start Upgrade** button.



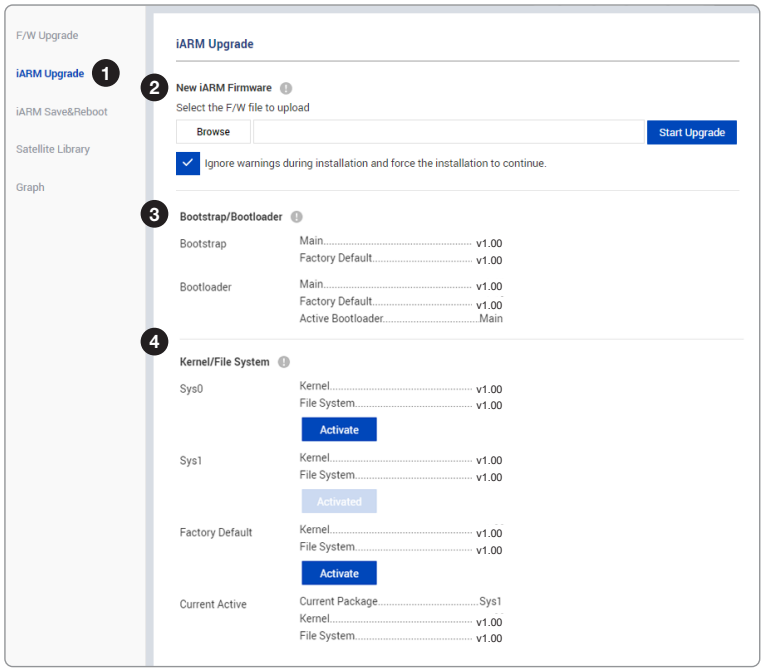
3. The upgrade of each firmware type is performed in order, and the process is displayed on the window. If the current version matches with the new version of the firmware, the upgrade process is skipped.



4. If the firmware is successfully upgraded, the result is marked as "Success". Click the **Ok** button to close the pop-up window.



9.8.2 iARM Upgrade



No.	Item	Description
①	iARM Upgrade	Upgrades the firmware of iARM module.
②	New iARM Firmware	Browse and select the iARM firmware file to upload and click **Start Upload** button. The update may take a few minutes to complete. The upload time may vary due to a variety of factors such as the speeds of your network. Uploading an incorrect firmware file may cause serious damage to your antenna and ACU. Check the firmware version before uploading firmware. **NOTE**: refer to the following "**iARM Upgrade Procedures**" page for more details.
③	Bootstrap/ Bootloader	Displays current bootstrap and bootloader version. • Bootstrap: displays the Bootstrap Version (Main, Factory Default). • Bootloader: displays the Bootloader Version (Main, Factory Default, Active Bootloader)
④	Kernel/File System	The ACU has three storage parts the Sys0, the Sys1 and the Factory Default. Selects the desired storage part and click the **Activate** button. Then perform the"9.8.3 iARM Save & Reboot" on page 67 to apply the settings to the system. • Sys0: displays the Sys0 version. • Sys1: displays the Sys1 version. • Factory Default: displays the Factory Default version. The **Current Active** displays activated storage part Information. • Current Active - Current Package: displays the activated storage part's name (Sys0, Sys1 or Factory Default). - Kernel, File System: displays the activated storage part's file version.

iARM Upgrade Procedures:

1. Browse and select the iARM firmware file (.tgz) that you wish to upgrade. Click on **Start Update** button to update the iARM firmware. Wait until the page is loaded.

NOTE

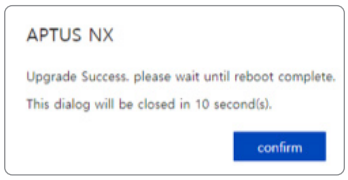
If you select the box **"Ignore warnings during installation and force the installation to continue"**, warning messages do not appear during the upgrade.

2. Once the update starts, the update process will be displayed on the screen. It will take about two minutes to complete the firmware upgrade.

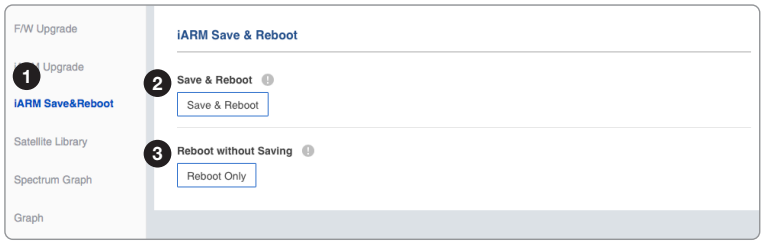
WARNING

Do not turn off the device power if the firmware upgrade page is displayed. Failure to comply may lead to damage and/or malfunction of the system.

3. Once the upgrade is completed, the iARM module will automatically reboot in 10 seconds.

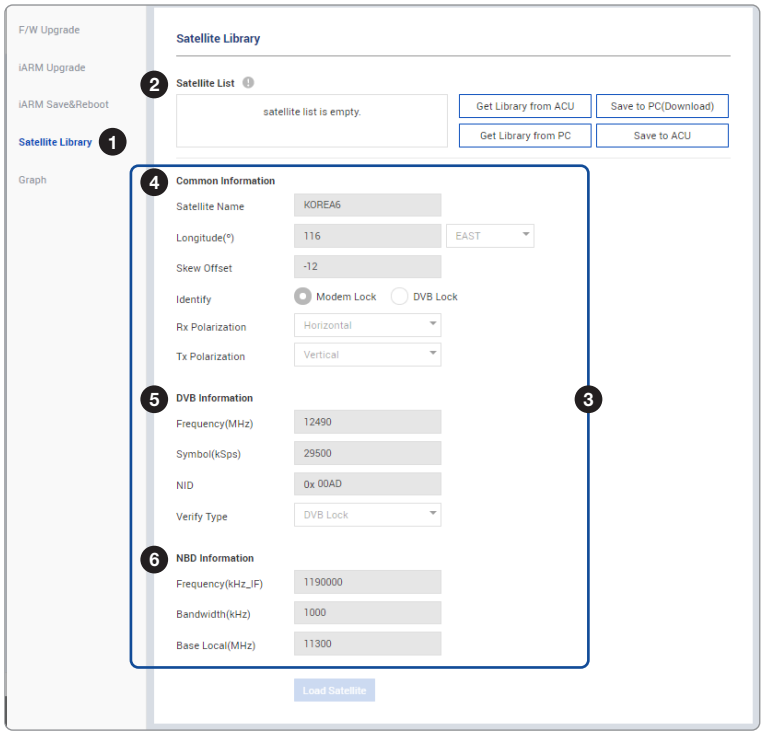


9.8.3 iARM Save & Reboot



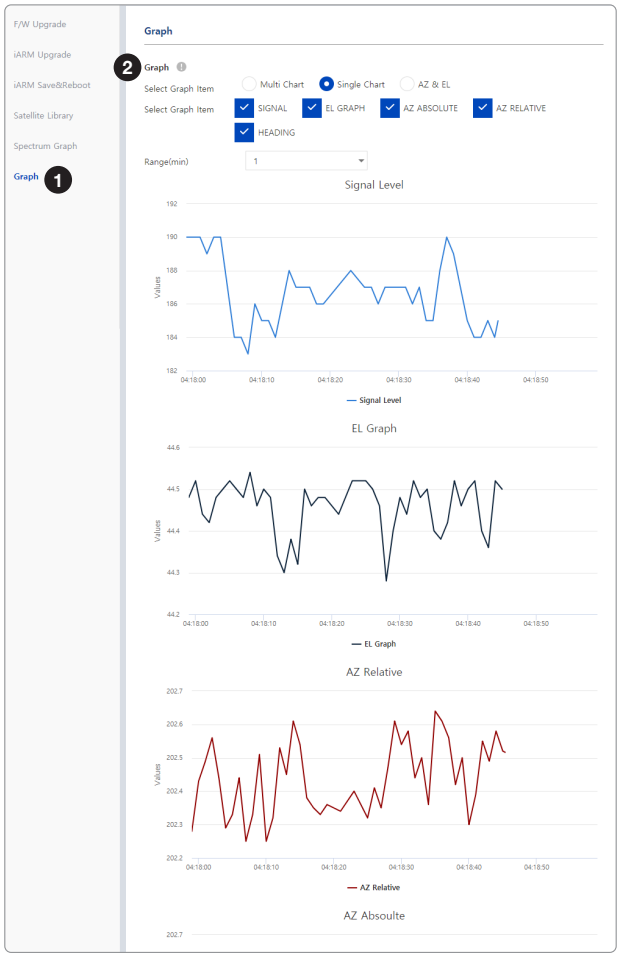
No.	Item	Description
①	iARM Save & Reboot	Save settings for the iARM and reboot the system.
②	Save & Reboot	Saves the modified settings for the iARM, and reboots the system. All configuration changes made will be saved in the ACU and effective upon the reboot. Click the **Save & Reboot** button.
③	Reboot without Saving	Reboots the system without saving the modified settings of the iARM . All configuration changes made will be lost upon the reboot. Click the **Reboot Only** button.

9.8.4 Satellite Library

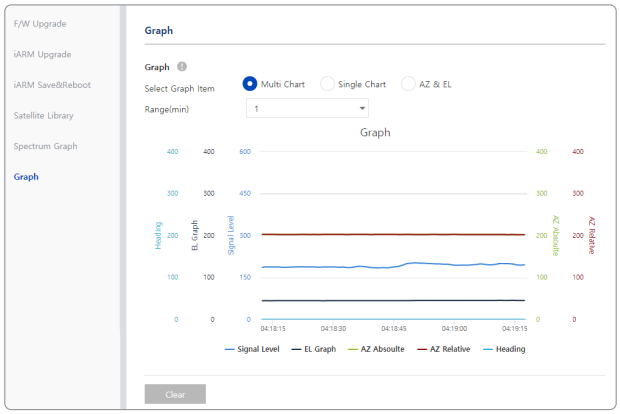


No.	Item	Description
①	Satellite Library	Sets the satellite library information.
②	Satellite List	Reads or manages satellite information from the library. • Get Library from ACU: obtains satellite library file from the ACU. • Get Library from PC: obtains the satellite library file from the PC. • Save to PC (Download): saves the current library file to the PC. • Save to ACU: saves the current library file to the ACU.
③	Satellite Information	Select one of the satellites in the **Satellite List** then Click the **Load Satellite** button to load the satellite information.
④	Common Information	Displays selected satellite information. • Satellite Name: displays the satellite name. • Longitude(°): displays satellite orbit position. • Skew Offset: displays the Skew offset. • Identify: displays the lock setting type (Modem Lock / DVB Lock) for satellite tracking. • Rx Polarization: displays the current Rx polarization. • Tx Polarization: displays the current Tx polarization.
⑤	DVB Information	Displays DVB mode's tracking information. • Frequency (MHz): displays the tracking frequency. • Symbol (kSps): displays the symbol rate. • NID: displays the network ID. • Verify Type: displays the verification type.
⑥	NBD Information	Displays NBD mode's tracking information. • Frequency (kHz_IF): sets the tracking frequency. • Bandwidth (kHz): sets the detection bandwidth. • Base Local (MHz): sets the base local.

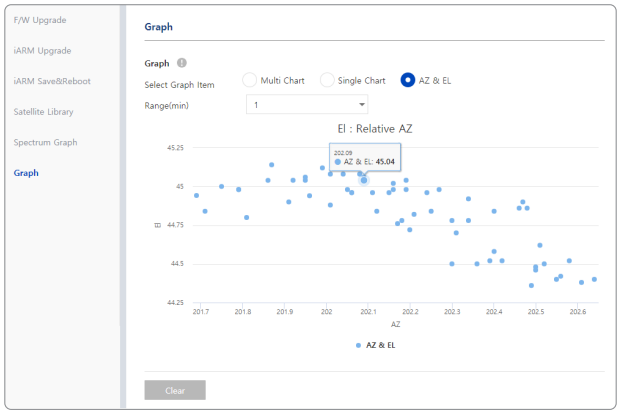
9.8.5 Graph



Single Chart View



Multi Chart View



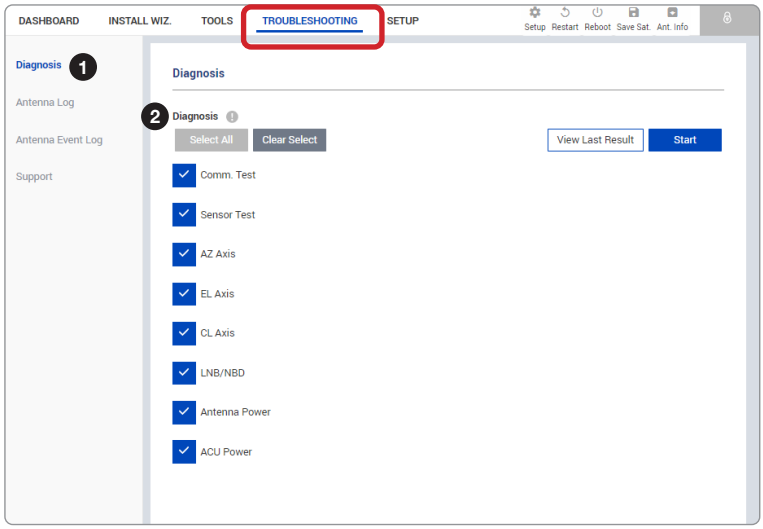
AZ & EL View

No.	Item	Description
①	Graph	This view provides information on the Signal Level, EL Graph, AZ Absolute, AZ Relative, Heading in the Multi Chart, Single Chart or AZ & EL formats.
②	Graph	Sets detailed options for the graph. • Select Graph Item: shows the graphs of only the checked item(s) in the Multi Chart, Single Chart or AZ & EL formats. - Multi Chart: displays multiple graph Items in one graph View. - Single Chart: displays the checked graph Item in each graph View. - AZ & EL: displays the AZ / EL angle value in one graph View. • Range(min): displays the data for the set time. By clicking the **Clear** button, the existing displayed graph is cleared and a new graph is displayed.

9.9 System Troubleshooting

This menu sets and displays the Diagnosis, Antenna Log, Antenna Event Log and Support function.

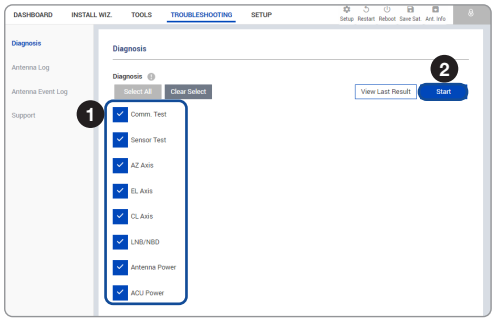
9.9.1 Diagnosis



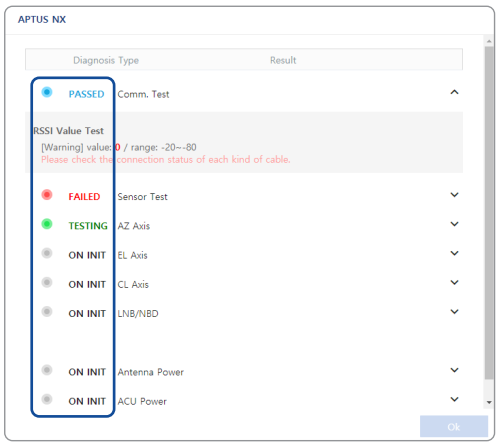
No.	Item	Description
①	Diagnosis	Executes antenna diagnosis test to check the antenna status.
②	Diagnosis	Select the checkbox (full diagnosis test or single diagnosis test) before modifying the settings. • Select All: select to run a full diagnosis test. • Clear Select: select to run a single diagnosis test. • View Last Result: displays the recently saved diagnosis result. • Start: executes the diagnosis test.

Diagnosis Procedures:

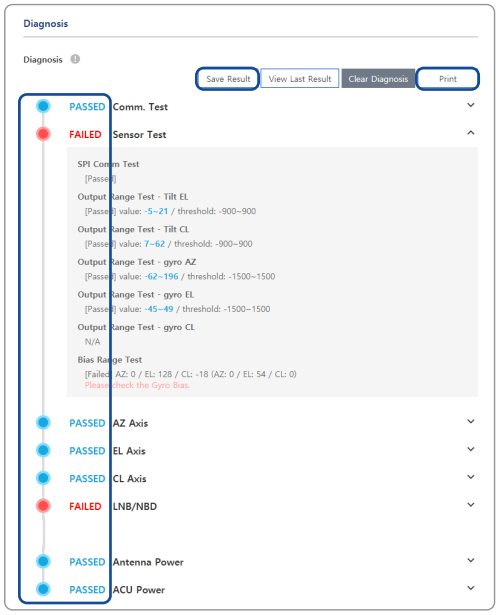
1. Select the checkbox (full diagnosis test or single diagnosis test) before modifying the settings. Click on the **Start** button to run the diagnostic test.



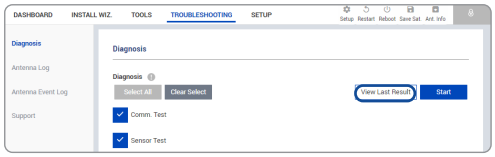
2. Once the diagnosis starts, the page will indicate test status. It should take a few minutes to complete the test.

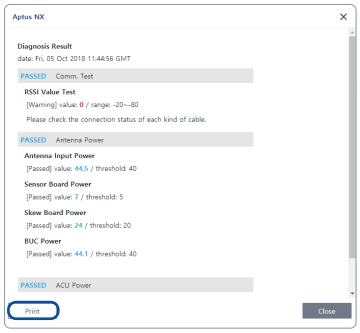


3. After the diagnosis is completed the system shows the diagnosis results of each item. You can save the results to the ACU by clicking the **Save Report** button and print this page by clicking the **Print** button. To remove the result, click the **Clear Diagnosis** button.

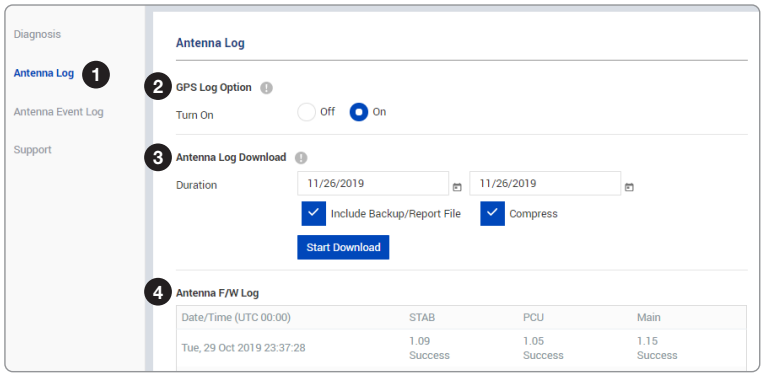


4. When you want to check the recently saved diagnosis results, click the **View Last Report** button. The pop-up page of the diagnosis results, including the save date and time, will appear. You can print this page by clicking the **Print** button.



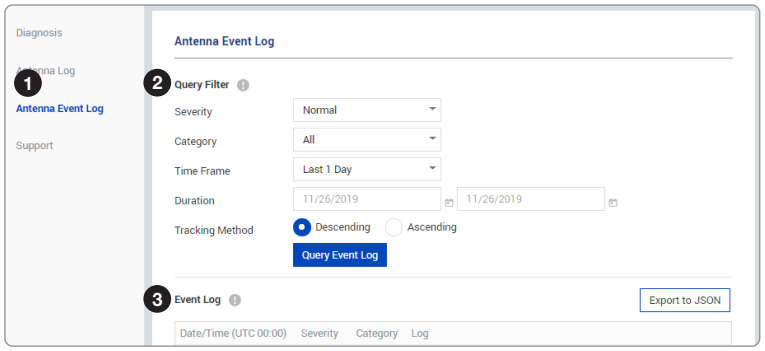


9.9.2 Antenna Log



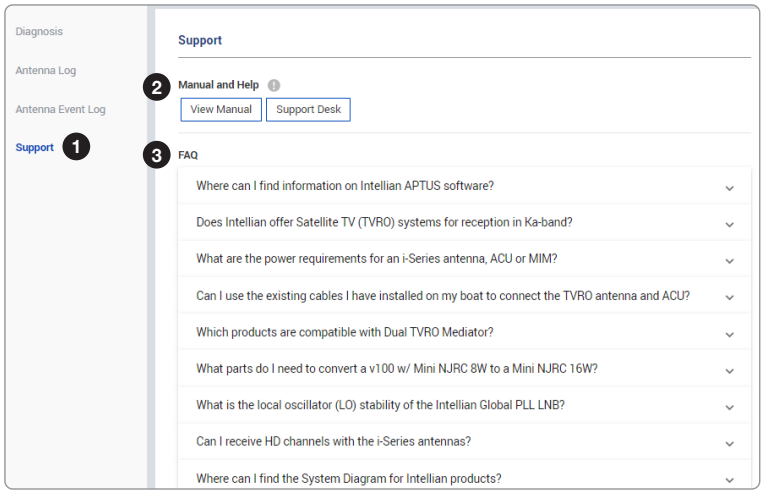
No.	Item	Description
①	Antenna Log	Displays the antenna log data.
②	GPS Log Option	Turns on/off the GPS log download option. Click the **Apply** button to apply the settings to the system.
③	Antenna Log Download	Any log data within three months can be downloaded. Select the duration on the calendar view that you want to show. Then click the **Start Download** button. **NOTE**: when selecting the box **Include Backup/Report File** before downloading, the Backup/Report File will download together. When selecting the box **Compress** before downloading, log files are downloaded in a compressed format.
④	Antenna F/W Log	Displays log information about firmware upgrade.

9.9.3 Antenna Event Log



No.	Item	Description
①	Antenna Event Log	Displays the antenna system and user log information by setting urgency level.
②	Query Filter	Sets the log message option to display the event log. • Severity: sets the urgency level. • Category: sets the target that caused the message. • Time Frame: sets the time limit that you want to show. • Duration: sets the duration on the calendar view that you want to show. • Tracking Method: sets the sorting type (Descending / Ascending). Click the **Query Event Log** button to apply the settings to the system.
③	Event Log	Displays event log information.

9.9.4 Support

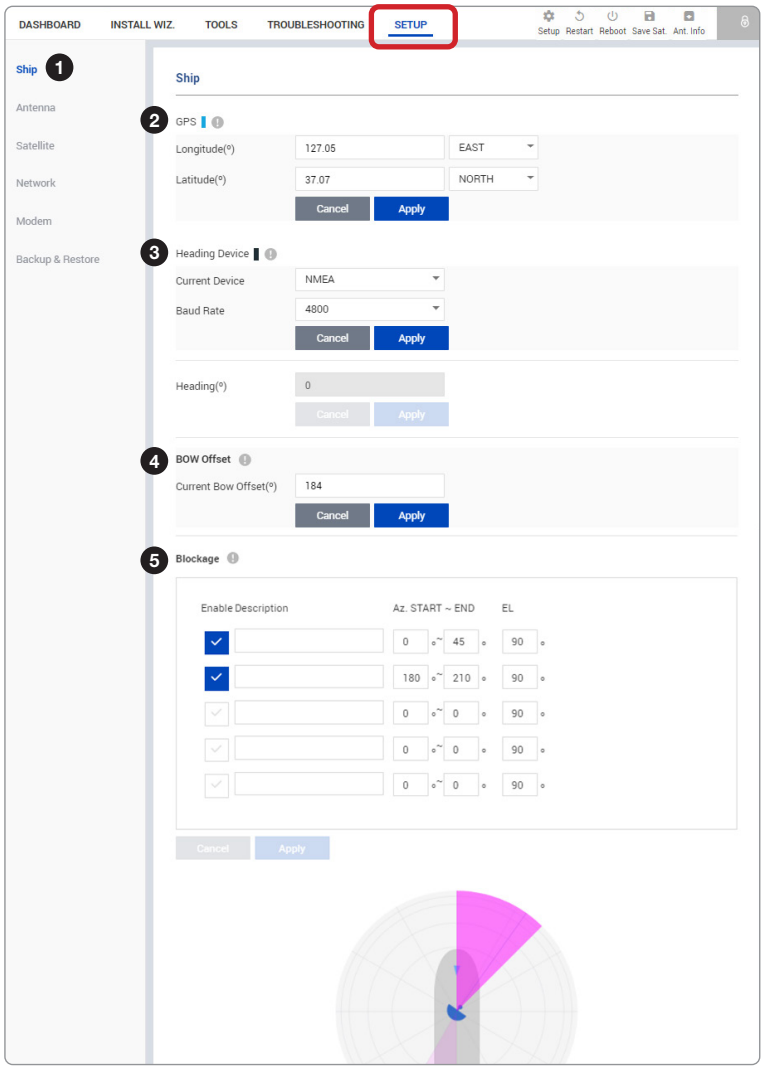


No.	Item	Description
①	Support	Supports the manual web page, support desk and FAQ list.
②	Manual and Help	Shows the manual web page and support desk information. • View Manual: click the **View Manual** button to open the manual web page. • Support Desk: click the **Support Desk** button to open Intellian's contact details for support.
③	FAQ	Provides answers to frequently asked questions about the product.

9.10 System Setting

This menu sets and displays the Ship, Antenna, Satellite, Network, Modem, and Backup & Restore function.

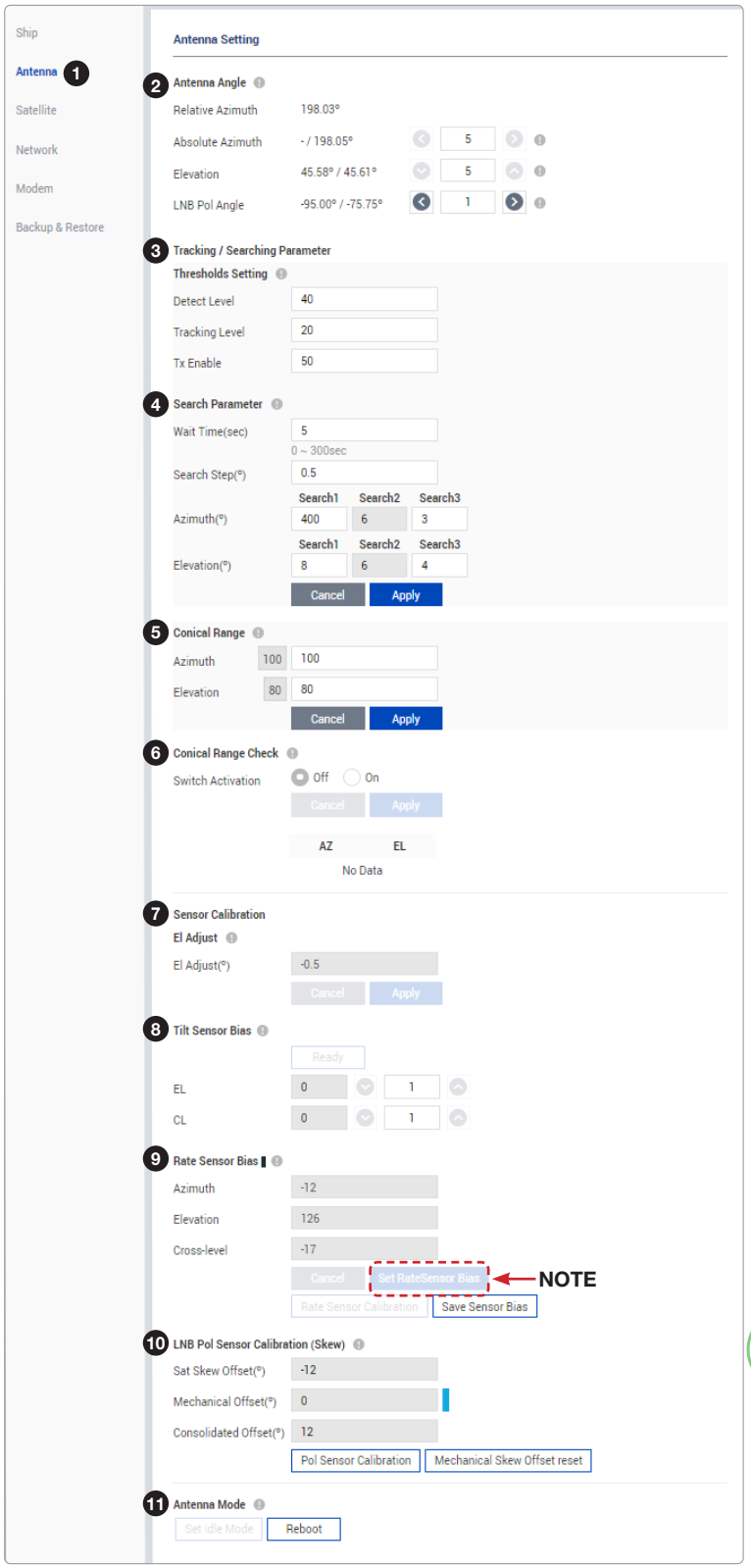
9.10.1 Ship Setting



No.	Item	Description
①	Ship	Sets the ship information and block zone.

No.	Item	Description
②	GPS	Sets the GPS position of the vessel for searching for a satellite. Check the GPS status connected to the antenna system. The indicator left of the help button shows the GPS status. Make sure the GPS indicator is Blue (blinking). (Blue (blinking): the system received a correct GPS input. Black: the system has not received a GPS input. You can enter the GPS value manually to set the GPS position.) • Longitude(º): sets Longitude information (East / West). • Latitude(º): sets Latitude information (North / South). Click the **Apply** button to apply the settings to the system.
③	Heading Device	Sets the ship's heading device. Choose the device type from the **Current Device** drop-down list. The indicator left of the help button shows the device connection status. (Blue: a ship's heading device is connected. Black: a ship's heading device is not connected.) • Current Device: select the heading device (None, NMEA (0183), Static). • Baud Rate: select the band rate (4800, 9600, 19200, 38400). It must be set when **NMEA** is selected on the **Current Device** list. • Heading(º): enter the heading information. Click the **Apply** button to apply the settings to the system.
④	BOW Offset	For setting bow offset, you need to select a satellite which is trackable in satellite library information. When the antenna tracks the selected satellite, bow offset will be set up automatically. • Current Bow Offset (º): Enter the Bow Offset Range (0 – 360°). Click the **Apply** button to apply the settings to the system.
⑤	Blockage	It is important to set up the blockage zones for Intellian VSAT. The VSAT system can be programmed with relative azimuth and elevation sectors to create up to five zones for transmission mute. It is indicated when the antenna is within one of the zones. A transmit inhibit output from the ACU will disable/mute the modem transmission within the blockage zones. The AZ START is the relative azimuth angle where the blockage starts, and the AZ END is the relative azimuth where the blockage ends (Range: 0 ~ 360). The EL is the elevation angle where the blockage is set (Range: 0 ~ 90). The blockage is activated below the elevation angle. Click the **Apply** button to apply the settings to the system.

9.10.2 Antenna Setting



NOTE

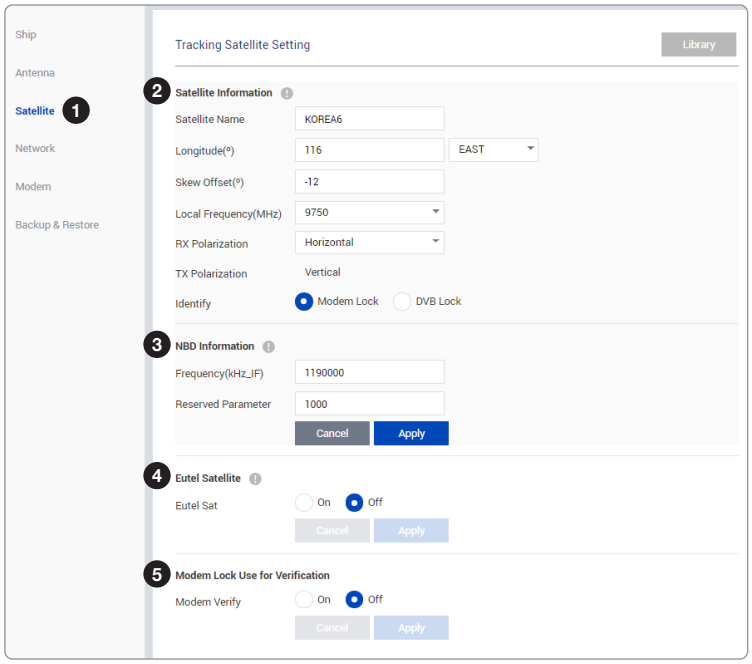
The **Set Rate Sensor Bias** function must be used by experienced engineers only.

No.	Item	Description
①	Antenna Setting	Sets current antenna position and search parameters. These parameters should only be changed by an authorized service technician. Improper setting of these parameters will render your system inoperable.

No.	Item	Description
②	Antenna Angle	Enter **Setup Mode** to modify settings. Sets current antenna position and LNB pol angle. You can move the antenna's azimuth and elevation position and LNB pol angle by using the arrows or inputting a value to find the desired satellite manually. • Relative Azimuth: Displays the antenna relative azimuth angle. • Absolute Azimuth: sets the antenna absolute azimuth angle. • Elevation: sets the elevation angle. • LNB Pol Angle: sets the LNB pol angle
③	Thresholds Setting	Sets current detect level threshold and tracking level threshold. • Detect Level: sets the current detect level threshold. • Tracking Level: sets the current tracking level threshold. • Tx Enable: sets the Tx enable threshold. Click the **Apply** button to apply the settings to the system.
④	Search Parameter	Sets the time-out, search step and search range. • Wait Time (sec): sets the time-out for automatic initiation of a search after the signal level drops below the pre-defined threshold value. • Search Step(º): sets increment step size. • Search1/3: sets Search 1 & 3 search range. Search is conducted in a two-axis pattern consisting of alternate movements in azimuth and elevation to form an expanding square. • Search2: this is reserved for future use. Click the **Apply** button to apply the settings to the system.
⑤	Conical Range	The relative force of the motors controlling azimuth and elevation. Sets the conical range while the antenna is in tracking mode. Click the **Apply** button to apply the settings to the system.
⑥	Conical Range Check	Enter **Setup Mode** to modify settings. Monitors the Azimuth and the elevation value when the conical range is modified. • Switch Activation: choose whether to use the switch activation function or not (On / Off). Click the **Apply** button to apply the settings to the system.
⑦	Sensor Calibration	Enter **Setup Mode** to modify settings. Adjusts the elevation to offset the angle difference between the mechanical elevation angle and actual elevation angle. Click the **Apply** button to apply the settings to the system.
⑧	Tilt Sensor Bias	***NOTE**: The tilt values of the elevation and cross-level axes were calibrated to the optimal condition at the factory prior to shipment. However, when the antenna MCU unit or fixed sensor unit is replaced, the elevation and the cross-level axes must be checked by adjusting tilt and rate sensor value. Refer to the replacement manual for detailed procedures. The separate device (e.g. level indicator) for manual adjustment is not provided by Intellian.* Enter **Setup Mode** to modify settings. Maintain the elevation and the cross-level axes in order to keep the pedestal parallel to the horizon. • Ready: click the **Ready** button to bring the elevation and cross-level to 0. • EL/CL: select **EL/CL** and click the Up and Down arrow keys to adjust the elevation and cross-level. Click the **Restart** button on the top menu to restarts the antenna system.

No.	Item	Description
⑨	Rate Sensor Bias	***NOTE**: The rate values of the azimuth, elevation, and cross-level axes were calibrated to the optimal condition at the factory prior to shipment. If the additional rate adjustment is required, make sure that the antenna is placed on a rigid and flat platform. During the calibration process, the antenna must avoid any motion as it can affect the antenna's performance.* Enter **Setup Mode** to modify settings manually. Calibrates DC voltage output from the three rate sensors used to sense antenna motion in azimuth, elevation and cross-level axes. These are used to sense antenna motion that corresponds to the ship's motion (roll, pitch, and yaw) for stabilizing the pedestal. The DC voltage output from each of the rate sensors may vary by an amount which is directly proportional to the direction and rate of motion induced on it. • Rate Sensor Calibration: click the **Rate Sensor Calibration** button to calibrate the rate sensor automatically. The indicator left of the help button shows the rate sensor calibration status. (Black: the calibration is ready to start. Blue: the calibration is completed. Red: the calibration is failed. Green: the calibration is in process.) • Save Sensor Bias: click the **Save Sensor Bias** button to save the calibrated value of the rate sensor to the system.
⑩	LNB Pol Sensor Calibration (Skew)	Calibrates the LNB pol angle when the control board, the skew motor or belt is replaced. • Sat Skew Offset: Displays the skew offset value. • Mechanical Offset: Displays the skew offset value. The indicator right of the value box shows the skew offset status. - Blue: Mechanical skew offset value is less than ±10 degrees. - Red: Mechanical skew offset value is greater than ±10 degrees. • Consolidated Offset: Displays the consolidated offset value. • Pol Sensor Calibration: Calibrates the skew motor and checks the skew range. • Mechanical Skew Offset Reset: To reset the mechanical skew offset value to 0, click on the **Mechanical Skew Offset Reset** button. The mechanical skew offset is pre-set with a factory default value (0, 1 or 2) depending on the assembly condition. You may need to reset the mechanical skew offset when the satellite skew offset is unknown (consolidated skew offset = satellite skew offset + mechanical skew offset). Mechanical skew offset is set automatically by moving the Pol Angle left or right in the search or tracking mode. **NOTE**: Each satellite has its own skew offset. Intellian recommends you to contact your service provider or satellite operator to get the satellite skew offset value. To set the satellite offset value, go to **SETUP** menu → **Satellite** → **Satellite Information** → **Skew Offset**.
⑪	Antenna Mode	Sets the motor to idle mode to check the antenna's balance. • Set Idle Mode: Enter **Setup Mode** to modify settings. Releases the elevation and cross-level motor. • Reboot: Reboots the system.

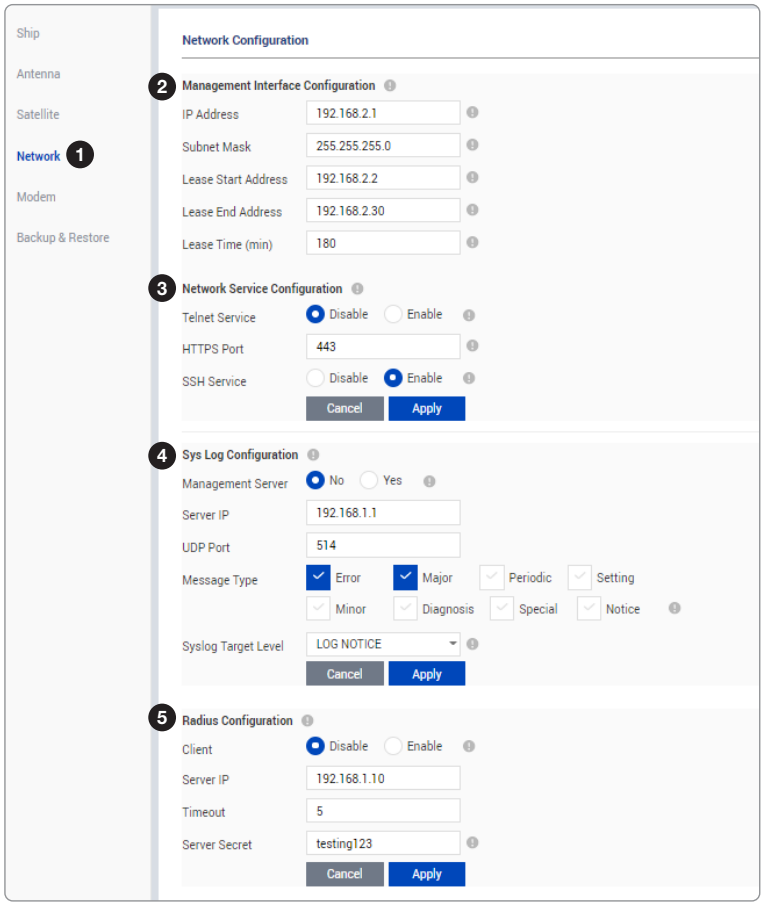
9.10.3 Tracking Satellite Setting

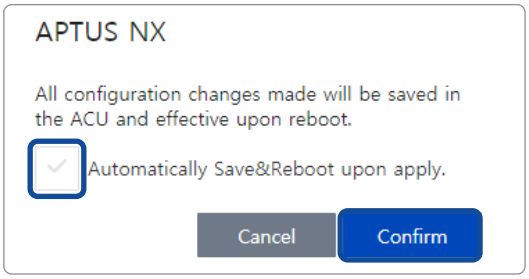


No.	Item	Description
①	Tracking Satellite Setting	Sets the current tracking satellite settings.
②	Satellite Information	Sets the current tracking satellite settings. • Satellite Name: sets the satellite name. • Longitude(°): sets the satellite orbit position. • Skew Offset(°): sets the skew offset. • Local Frequency (MHz): sets the local frequency. • Rx Polarization: sets the current Rx polarization. • Tx Polarization: displays the current Tx polarization. • Identify: sets the lock setting type (Modem Lock / DVB Lock) for satellite tracking. Click the **Apply** button to apply the settings to the system.
③	NBD Information	Sets NBD mode's tracking information. • Frequency (kHz_IF): sets the tracking frequency. • Reserved Parameter(kHz): sets the reserved parameter. Click the **Apply** button to apply the settings to the system.
④	Eutel Satellite	Select **ON** when the antenna is tracking the Eutelsat satellite. With this option enabled, a defined skew angle for each Eutelsat satellite is automatically applied without allowing a manual modification to the skew offset value. Click the **Apply** button to apply the settings to the system.
⑤	Modem Lock Use for Verification	Verifies modem lock status (modem lock function: active/inactive). • Modem Verify: choose whether to use the modem lock function or not. (On / Off) Click the **Apply** button to apply the settings to the system.

9.10.4 Network Configuration

This function is available after performing the "9.8.3 iARM Save & Reboot" on page 67.





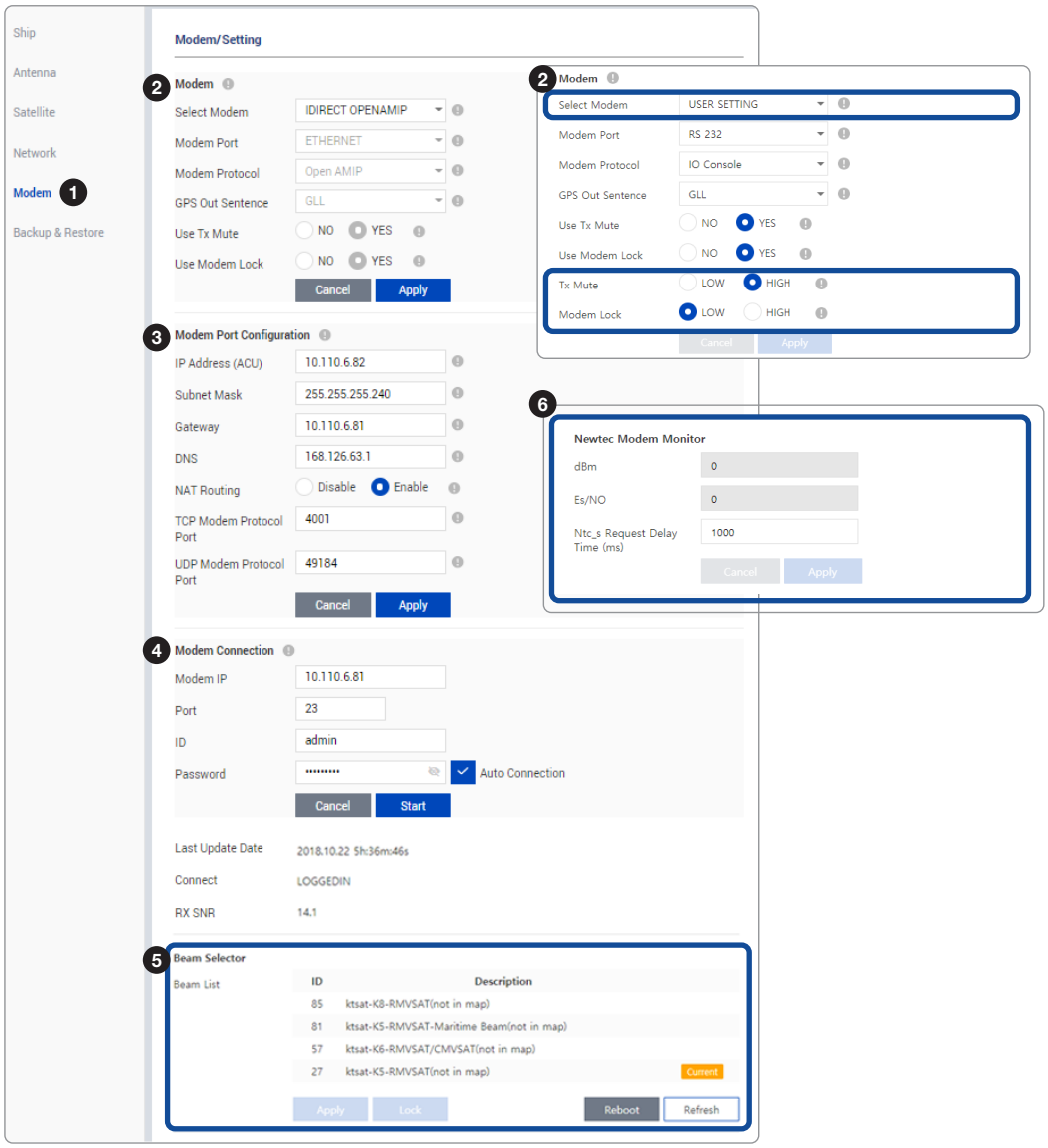
NOTE

When clicking the **Apply** button after editing the system settings, this pop-up message will appear. If you want to automatically save and reboot the system, select the checkbox and click the **Confirm** button.

No.	Item	Description
①	Network Configuration	Sets the ACU's Internal IP address and ports.
②	Management Interface Configuration	Sets the Management Port's network configuration. The Management Port is located on the ACU front panel. • IP Address: sets the network IP address (Factory default: 192.168.2.1). • Subnet Mask: sets the subnet mask (Factory default: 255.255.255.0). • Lease Start Address: sets the lease IP address start range. • Lease End Address: sets the lease IP address end range. • Lease Time: sets the lease IP address update time. Click the **Apply** button to apply the settings to the system.

No.	Item	Description
③	Network Service Configuration	Sets the network service configuration • Telnet Service: sets the telnet service (Disable / Enable). • HTTPS Port: sets the HTTPS port number. • SSH Service: sets the SSH service status (Disable / Enable). Click the **Apply** button to apply the settings to the system.
④	Sys Log Configuration	Sets the system log configuration. Antenna sends log messages according to the emergency level. Enabling this function sends the message to your management server. • Management Server: sets the management server status (No / Yes). • Server IP: sets the management server IP address. • UDP Port: sets the management port. • Message Type: selects message type (Intellian message level) to send to the management server (Lower number indicates higher emergency). • Syslog Target Level: if you select this target level, the management server receives a log message equal to or less than this level. Click the **Apply** button to apply the settings to the system.
⑤	Radius Configuration	This menu is used when the network administrator needs to authorize user connections using Radius server. • Client: sets the Radius authentication (Disable / Enable). • Server IP: sets the Radius server IP Address. • Timeout: sets the Timeout value in seconds for the authentication process. • Server Secret: sets the Pass-Phase. This should be matched between server and ACU. Click the **Apply** button to apply the settings to the system.

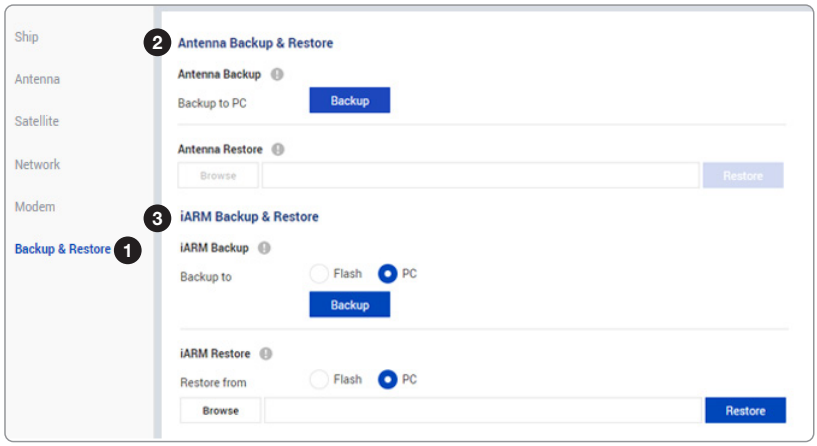
9.10.5 Modem Setting



No.	Item	Description
①	Modem Setting	Sets parameters for the modem.
②	Modem	Sets the interface between the ACU and the satellite modem. • Select Modem: Select your modem type from the **Select Modem** drop-down list (IDIRECT OPENAMIP, COMTECH ROAM, SATLINK VACP, NEWTEC AMIP) for loading a pre-configuration for the type of modem used. The settings related to the modem interface will be set automatically once the modem type is selected. When you select **USER SETTING** the other settings can be changed independently. • Modem Port: Select a proper data communication port of the ACU for the satellite modem interface. • Modem Protocol: Select a proper communication protocol of the ACU for the modem interface. • GPS Out Sentence: Select the GPS out sentence type. • Use Tx Mute: Select whether to use the **Tx Mute** function for the modem or not. • Use Modem Lock: Select whether to use **Modem Lock** function for the modem or not. • Tx Mute: This function can be edited when **User Setting** option is selected in the **Select Modem** menu. It selects the Tx Mute option. The Tx Mute is a transmit inhibit output from the ACU to disable/mute the modem transmit through a 5 V (HIGH) or 0 V (LOW) current whenever the antenna is blocked, searching, or pointed 0.5 degrees off from peak satellite position. • Modem Lock: This function can be edited when **User Setting** option is selected in the **Select Modem** menu. It selects the Modem Lock option. The Modem Lock provides a logic input through a 5V (HIGH) or 0 V (LOW) current to the ACU to identify when the system is on the correct satellite. Click the **Apply** button to apply the settings to the system.
③	Modem Port Configuration	This function is available after performing the "9.8.3 iARM Save & Reboot" on page 67. Sets the ACU's internal IP address, routing, and ports. • IP Address: Enter the network IP address. • Subnet Mask: Enter the subnet mask. • Gateway: Enter the gateway. • DNS: Enter the current default DNS address. • NAT Routing: Select the NAT routing (Enable / Disable). • TCP Modem Protocol Port: Enter the TCP port number for modem protocols using TCP as transport. • UDP Modem Protocol Port: Enter the UDP port number for modem protocols using UDP as transport. Click the **Apply** button to apply the settings to the system.

No.	Item	Description
④	Modem Connection	Enter the connection information of the modem (IDIRECT OPENAMIP, COMTECH ROAM, SATLINK VACP, NEWTEC AMIP). • Modem IP: Enter the modem IP address. • Port: Enter the connection port. • ID: Enter the connection ID. • Password: Enter the connection password. • Auto Connect: By enabling the auto connect, the connection information is saved and the modem is connected automatically when the system reboots. • Last Update Date: Displays the last update date and time. • Connect: Displays last updated data and time of the modem data. • Rx SNR: Displays the Rx SNR data.
⑤	Beam Selector	*This menu can be edited when* **IDIRECT Open AMIP Modem** *option is selected in the* **Select Modem** *menu.* Selects the target satellite that you want to track. • Beam List: Choose the target satellite in the list. • Apply: Click the **Apply** button to apply the selected beam to the system, it will switch to the beam desired. • Lock: Within condition given for test or commissioning, if the user wishes to stay on a selected beam, the user can lock the beam by clicking the **Lock** button. This will lead modem stays with the user-selected beam. • Reboot: If you do not want to lock the beam, click the **Reboot** button. • Refresh: Click the **Refresh** button to load the latest satellite list.
⑥	Newtec Modem Monitor	*This menu can be edited when* **NEWTEC AMIP** *option is selected in the* **Select Modem** *menu.* Sets the Newtec Modem options. • dBm: Displays the signal level from the Newtec Modem. • Es/NO: Displays the Es/NO value from the Newtec Modem. • Ntc_s Request Delay Time (ms): Set the delay time of the system for receiving the signal level (dBm) and Es/NO value from the Newtec Modem. Click the **Apply** button to apply the settings to the system. Then perform the **"9.8.3 iARM Save & Reboot" on page 67**.

9.10.6 Backup & Restore



No.	Item	Description
①	Backup & Restore	Backs up & Restores the antenna setting files and the iARM files.
②	Antenna Backup & Restore	• Antenna Backup: Back up antenna settings and parameters to PC by clicking on the **Backup** button. • Antenna Restore: Restore the antenna setting by uploading the saved backup file from PC. **Browse** the backup file, then click the **Restore** button to restore it.
③	iARM Backup & Restore	• iARM Backup: Back up iARM setting to internal Flash drive in ACU or PC by clicking the **Backup** button. • iARM Restore: Restore the iARM settings by uploading the saved backup file from internal Flash drive in ACU or PC. **Browse** the backup file, then click the **Restore** button to restore it.

Chapter 10. Specification

10.1 Technical Specification

Antenna System		
Antenna Radome Height		935 mm (36.81")
Antenna Radome Diameter		Ø860 mm (33.85")
Antenna Reflector Diameter		Ø650 mm (25.59")
Antenna Unit Weight (With Radome)		<42 kg (92.59 lbs)
Platform		3-axis: Azimuth, Elevation, Cross-level
Positioning		3-axis Velocity Mode Servo Control: Azimuth, Elevation, Cross-Level
Pedestal Motion Range	Azimuth Range	Unlimited
	Elevation Range	-20° to +115°
	Cross-level Range	Up to ±37°
Pointing Stabilization Accuracy		0.2° max in presence of specified ship motions
Ship's motion	Roll	±25° at 6 second
	Pitch	±15° at 6 second
	Yaw	±8° at 6 second
	Turning rate	10°/sec²
AZ/EL/CL motor		BLDC Motor
Motor Brake		Without motor brake
Sensor		3 axis Gyro-Rate Sensor & 2 axis Tilt Sensor (Fixed Sensor)
Rx	Frequency	10.7 ~ 12.75 GHz Ku-band
	Gain	Min. 36.3 dBi @ 11.7 GHz (without radome)
	G/T over Rx Range	Min. 15.4 dB/K @ 12.75 GHz (30˚ EL, with Radome)
Tx	Frequency	13.75 ~ 14.5 GHz Ku-band
	Gain	Min. 37.7 dBi @ 14.25 GHz (without Radome)
	EIRP	Min. 44.5 dBW @ 14.25 GHz (6 W BUC, with Radome)
	Cross Pol isolation	30 dBc
Tx to Rx Isolation		80dBc @ 13.75~14.5GHz
Polarization		Cross-Pol Only
BUC		NJRC 6W Ku-band BUC (Model no. NJT8376UN, N type)
LNB		Universal VSAT PLL LNB (Low band: 9.75 GHz, High band: 10.6 GHz)
ACU to ADU Cable (Antenna Cable)		Single 50 Ω coax RF cable connected from ACU to ADU for Rx, Tx, FSK, Reference and Power
Input power		48 V DC (max 300 W) through a single RF cable

Antenna Control Unit (ACU)	
ACU Size	431 mm x 350 mm x 44.3 mm
ACU Weight	5.2 Kg
LED Indicator	Six LEDs for POWER, INT/SEARCH, TRACKING, LOCK, SETUP/TEST, ERROR
Ship's Gyrocompass Interface	NMEA 0183
PC Interface	Front: Ethernet port, USB (PC, DN: Not working) Back: RS-232C (57600 bps 8, N, 1)
Modem Interface	Ethernet port, RS-232/422, I/O Console
Ethernet port	Front: RJ-45 Management LAN port (1 ea) Back: RJ-45 LAN port (1 ea)
RF Port	Antenna: N-Type (1 ea) Modem Tx/Rx: F-Type (2 ea)
Input Power	100 ~ 240 V AC, 50/60 Hz, 1A

10.2 Environmental Specification

Test	Intellian Standard	
Temperature (ADE)	Operational	-25 °C to +55 °C (IEC-60945)
	Survival	-40 °C to +80 °C (IEC-60945)
	Storage	-40 °C to +85 °C (IEC-60945)
Temperature (ACU)	Operational	-15 °C to +55 °C (IEC-60945)
	Survival	-25 °C to +70 °C (IEC-60945)
	Storage	-40 °C to +85 °C (IEC-60945)
Vibration	Operational	IEC-60945
	Survival	IEC-60721-3-6 Class 6M3
Shock	Operational	IEC-60068-2-27 Method Ea 20g, 7 ms
	Survival (Transient)	IEC-60721-3-6 Class 6M3 type II 30g, 6 ms
	Survival (Bump)	IEC-60068-2-29 Method Eb 25g, 6 ms
Salt Mist	Saline solution: 5 ±1 % NaCl Storage period: 7 Days (IEC-60945)	
Water Proofing	IPX6 (IEC-60529)	

Chapter 11. Warranty

Intellian systems are warrantied against defects in parts and workmanship, these warranties cover TWO (2) YEAR of parts and TWO (2) YEAR of factory repair labor to return the system to its original operational specification. Warranty periods commence from the date of shipment from Intellian facility.

Intellian Technologies warranty does not apply to product that has been damaged and subjected to accident, abuse, misuse, non-authorized modification, incorrect and/or non-authorized service, or to a product on which the serial number has been altered, mutilated or removed. Intellian Technologies, will (at its sole discretion) repair or replace during the warranty period any product which is proven to be defective in materials or workmanship, in accordance with the relevant product warranty policy. All products returned to Intellian Technologies, during the warranty period must be accompanied by a Service Case reference number issued by the dealer/distributor from Intellian Technologies, and (where applicable) a copy of the purchase receipt as a proof of purchase date, prior to shipment. Alternatively, you may bring the product to an authorized Intellian Technologies, dealer/distributor for repair.

Chapter 12. Appendix

12.1 Appendix A. Tightening Torque Specification

This table shows the recommended values of tightening torques.

Bolt Size	Tightening Torque (N-m)
M2	0.5
M2.5	1
M3	1.5
M4	3
M5	6
M6	12
M8	27
M10	50
M12	85
M14	130
M16	200