



v100NX Ka(XCVR)

1.05 m Ka-Band
Maritime VSAT Antenna System

Installation & Operation User Guide

Serial number of the product

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



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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 Part 15 Subpart B Declaration of Conformity

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon (Chungho-ri), 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 requirement of the FCC Part 15 Subpart B.

Product Information:

Product Name:	Intellian v100NX Ka, 105cm Ka-band Maritime VSAT Antenna System
----------------------	---

Test Result:

Standard	Test	Rule Section	Test Report Number	Result
FCC Part 15 Subpart B	AC Power line conducted emission	FCC Part 15.107(a), ICES-003, Section 3.2.1	DREKFCC2106-0100	Pass
	Radiated emission	FCC Part 15.109(a), ICES-003, Section 3.2.2	DREKFCC2106-0100	Pass

Supplementary Information:

Notified Body Involved: (Testing Organization)	DT&C Co., Ltd. 42 Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 17042
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon (Chungho-ri), Pyeongtaek-si, Gyeonggi-do 17709 Korea
Place and Date of Issue:	Gyeonggi-do, Korea on June 11, 2021

Authority: Kevin Eom
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Date: 07th January, 2022

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FCC Part 25 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 off-axis EIRP density envelopes for FSS earth stations transmitting in certain frequency bands. This section applies to applications for fixed and temporary-fixed FSS earth stations transmitting to geostationary space stations in the conventional C-band, extended C-band, conventional Ku-band, extended Ku-band, or conventional Ka-band, and applications for ESIMs transmitting in the conventional C-band, conventional Ku-band, or conventional Ka-band, except for applications proposing transmission of analog command signals at a band edge with bandwidths greater than 1 MHz or transmission of any other type of analog signal with bandwidths greater than 200 kHz. Earth station applications subject to this section may be routinely processed if they meet the applicable off-axis EIRP density envelopes set forth in this section. It defines the antennas radiation, and each article regulates the followings;

§25.218 (i) (1)(3): For co-polarized transmissions in the plane tangent to the GSO arc

§25.218 (i) (2)(3): For co-polarized transmissions in the plane perpendicular to the GSO arc

§25.218 (i) (4): For cross-polarized transmissions in the plane tangent to the GSO arc and in the plane perpendicular to the GSO arc

Intellian Technologies, Inc. declares that v100NX Ka complies with the threshold level as defined in §25.218(i) (1)(2)(4)

Product description	Intellian v100NX Ka, 105cm Ka-band Maritime VSAT Antenna System
EIRP spectral density limit	3.84dBW/Mhz

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

Signed by: Kevin Eom / CTO, R&D

Signature: 

Date: 07st January 2022

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Doc Number IT22-DC0107-02

RED Declaration of Conformity

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Product Information:

Product Name(s):	Intellian v100NX Ka, 105cm Ka-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	Test Report Number	Result
SAFETY (Art 3.1.a)	IEC 62368-1:2020+A11:2020	DRSCCEL2106-0101	Pass
EMC (Art. 3.1.b)	EN 301 843-1 V2.2.1	DRECEE2106-0332	Pass
SPECRTUM (Art. 3.2)	EN 301-360 V2.1.1 EN 301-459 V2.1.1 EN 303-978 V2.1.2	DRTCET2106-0241(1) DRTCET2106-0242 DRTCET2106-0243	Pass

Supplementary Information:

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Doc Number IT22-DC0107-03

UK-CA Declaration of Conformity

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Product Information:

Product Name(s):	Intellian v60Ka 2 65cm Ka-Band Maritime VSAT Antenna System Intellian v85NX Ka 85cm Ka-band Maritime VSAT Antenna System Intellian v100NX Ka, 105cm Ka-band Maritime VSAT Antenna System Intellian v150NX Ka, 150cm Ka-band Maritime VSAT Antenna System
Model Number(s):	V5-60K-U2XX V5-85K-U2XX V5-11K-U2XX V5-15K-U2XX

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 62368-1	Pass
EMC (Art. 3.1.b)	EN 301 843-1	Pass
SPECTRUM (Art. 3.2)	EN 301-360 EN 301-459 EN 303-978	Pass

Authority: Yeonho.Kim
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Chapter 3. Introduction

3.1 Intellian v100NX Ka(XCVR) Introduction

Intellian v100NX Ka is a Ka-band 3-axis stabilized VSAT maritime antenna system. The v100NX Ka provides advanced VSAT solutions for Ka-band satellite services that are also designed to be convertible to Ku-band network. v100NX Ka is equipped with a new mounting architecture RF module.

The v100NX Ka system uses an integral unit of multi-band Transceiver and LNB arranged in a 4.5W transceiver. The system with transceiver can use dual-polarization for both Tx and Rx with several possible topologies. The v100NX Ka can be easily upgraded with the 9W high power transceiver. There is no need to replace the ACU and no additional components are required. Simply and easy upgrade 9W transceiver to benefit from a high throughput service.

The antenna's 3-axis stabilized platform and advanced shock-resistant and vibration damping design of the Pedestal is fully optimized to withstand the demanding maritime conditions and to ensure reliable broadband communications.

The v100NX Ka is even more operator-friendly in that it combines Tx, Rx and DC power into one cable, simplifying installation. With the new radome design, the dome-on external single cable connection means that installers do not need to remove the radome during installation.

Equipped with Intellian's next generation Antenna Control Software AptusNX, the v100NX Ka antenna can be easily accessed, monitored and controlled. This new simply configured tool can alert an operator to possible problems with its enhanced diagnostic capabilities and can also provide automatic alerts when preventative maintenance may be required.

3.2 Intellian v100NX Ka(XCVR) Features

2.5GHz Wide Ka-band Support

The v100NX Ka has a full range-optimized reflector and radome supporting high-speed Ka-band services, which covers the entire commercial Ka 2.5GHz wide frequency band range. v100NX Ka supports dualpolarization and can transmit and receive both LHCP and RHCP of Ka-band circular polarization.

High Power Upgradable

The v100NX Ka antenna system uses an integral unit of multi-band BUC and LNB arranged in a 4.5W transceiver. The system with transceiver can use dual-polarization for both Tx and Rx with several possible topologies. The v100NX Ka can be easily upgraded with the 9W high power transceiver. There is no need to replace the ACU and no additional components are required. Simply and easy upgrade 9W transceiver to benefit from a high throughput service.

Quick & Easy Installation

The v100NX Ka is designed to be easy to install and reduce costs for users. The system includes a single cable design, combining Tx, Rx, and DC power into one single solution. The single coaxial cable is connected externally on the base of the radome with no requirement to access the inside of the radome, reducing complexity for the customer during installation and maintenance.

Embedded Dual Antenna Mediator Function

Intellian's new ACU fully supports dual antenna operation without additional hardware such as a separate mediator, RF splitters and cables. Eliminate loss of signal due to blockage by using dual antenna systems.

AptusNX Intelligent Diagnosis

Intellian's all new integrated M&C platform **AptusNX** provides 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, including automatic cable loss compensation, line-up test and auto diagnostics.

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 Minimize 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 $+115^{\circ}$ from the center of the antenna. Obstacles can interrupt the satellite signal transmission and reception of the antenna.

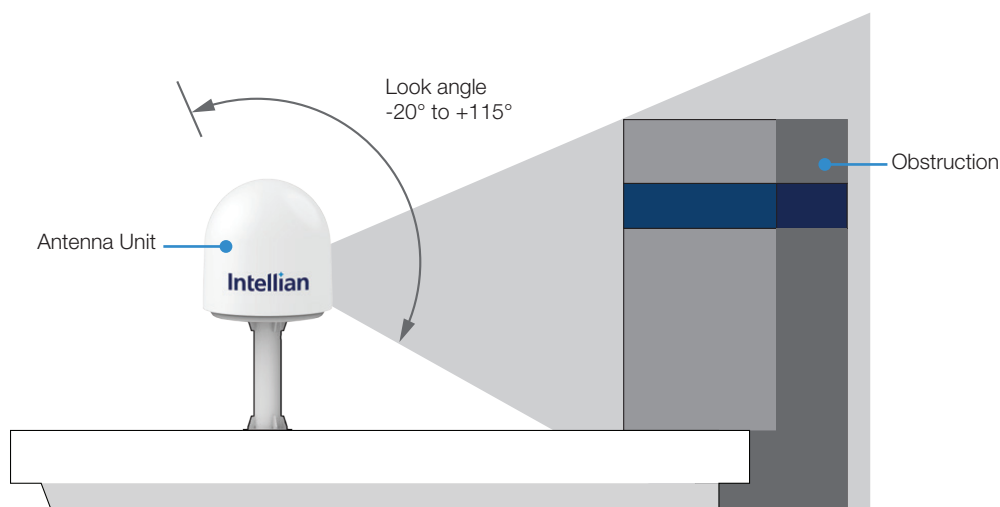


Figure 1: Elevation Limit of Obstacles

4.1.2 Avoid 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 $+15^{\circ}$. For this reason, it is recommended to position the antenna at least 4.6 m (15.09 feet) away from the radar.

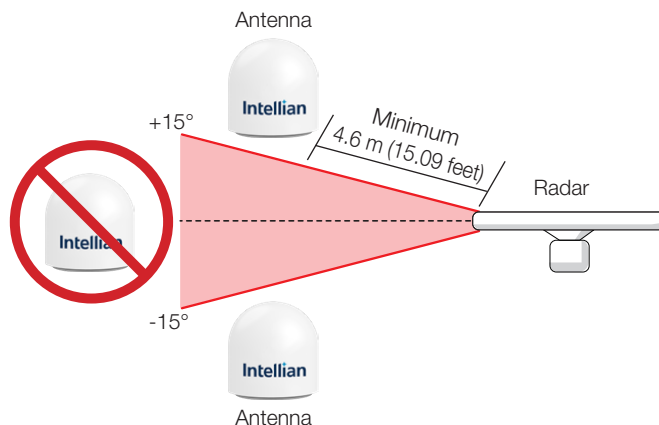


Figure 2: Potential RF Interference



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 50 m (164 ft), based on a radiation level of 1 mW/cm^2 that applies under uncontrolled environment. No hazard exists $>20^{\circ}$ below the antenna's mounting plane.

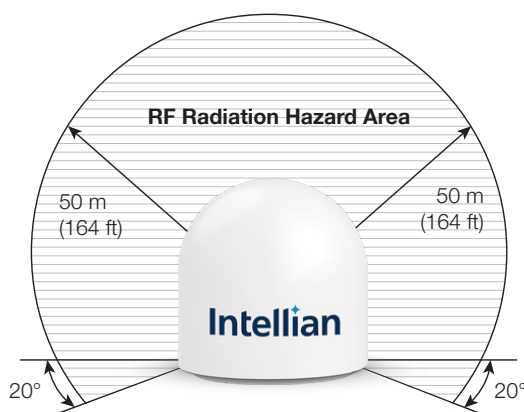


Figure 3: RF Radiation Hazard Area

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.

- High power supply for the high power Transceiver
- Mediator function included
- Spectrum analyzer function included
- OLED display
- USB Log download & Firmware upgrade (No PC required)
- Wi-Fi access
- 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 (50 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
USB Cable (A to A)	1	1.8 m	To connect ACU (front panel left USB port) to PC
AC Power Cord (CEE7/7)	1	1.5 m	ACU Power Cord (220 V)
RF Cable (F (M) to F (M))	2	1 m	To connect ACU to modem (Tx / Rx)
Modem Interface Cable (DB-9 (M) to RJ45)	1	1.5 m	To connect ACU to modem (iDirect Modem)
Transceiver Interface Cable (DB-9 (F) to RJ45)	1	1 m	To connect Transceiver Interface of ACU to Transceiver I/O of Modem
Ethernet Cable (RJ45 to RJ45)	2	1 m	To connect ACU to PC / network device
WIFI Dongle	1		For Wi-Fi connection
Attenuator	1		10 dB attenuator with DC pass (F type)
Hex Bolt (BUMAX)	5	M12 x 80L	Bolt kit for antenna-deck (mast) assembly (1 spare set included)
Flat Washer (BUMAX)	5	M12	
Spring Washer (BUMAX)	5	M12	
Hex Head Wrench Bolt	5	M6 x 40L	Bolt kit for radome assembly (1 spare set included)
Spring Washer and Flat Washer	5	M6	
Radome Door Key	2		To open radome hatch
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, it must only use the RF cables using the 50 Ω coaxial cable types for standard system installation. The use of different type of cables (75 Ω coaxial types etc.) can cause problems. 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 ($\leq$ 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 2000	NMEA 0183
Connector Type	Mini-C 5 pin connector	2 pin terminal block connector
Cable Type	5-wire single cable	2-wire cable with one enclosed shield cable
Heading Information	Supports PGN, 127250: Vessel Heading	Supports \$HEHDT, baud rate 4800, format 8N1 as standard

4.4 Unpacking System Package



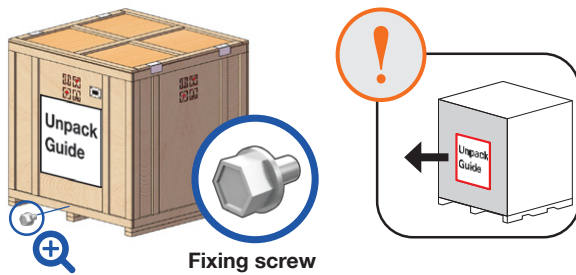
CAUTION

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

1. Open the side panel with an attached sticker paper (**Wooden Crate Unpack Guide**) by removing the fixing screw (1 ea) and clips (6 ea).

1-1

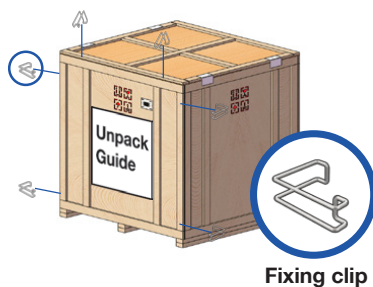
: 1 ea



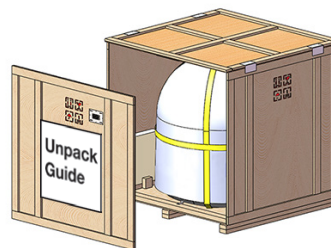
Fixing screw

1-2

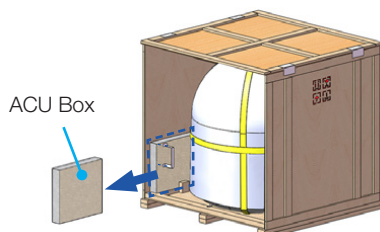
: 6 ea



Fixing clip

1-3

2. The ACU box is placed on a side panel inside the crate. Remove fixing screws (2 ea) from the ACU bracket, then take out the ACU box from the crate.

2-1

ACU Box

3. **Running Diagnostic Tests: This step is optional.** After removing one of the side panels, you can run the diagnostic tests easily to verify the condition of the antenna. First, prepare an RF Cable (Customer Supplied) to connect the antenna and the ACU.

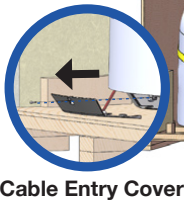
3-1. Remove the M4 x 15L Wrench Bolt using the wrench set, then open the cable entry cover.

3-2. Connect the RF Cable (Customer Supplied) from the ANTENNA connector on the back of ACU to the RF connector inside the cable entry of radome (Antenna).

3-3. Execute diagnostic tests (Full Diagnosis Test) via ACU and check the real-time diagnosis result.

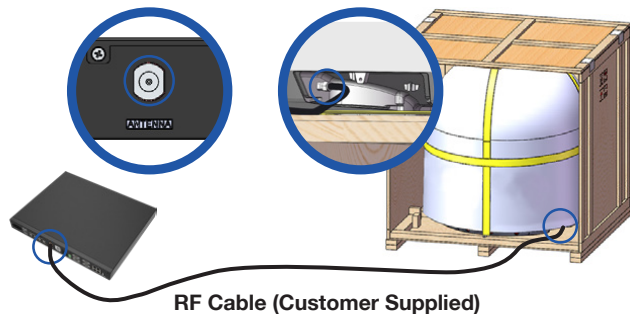
Optional

3-1



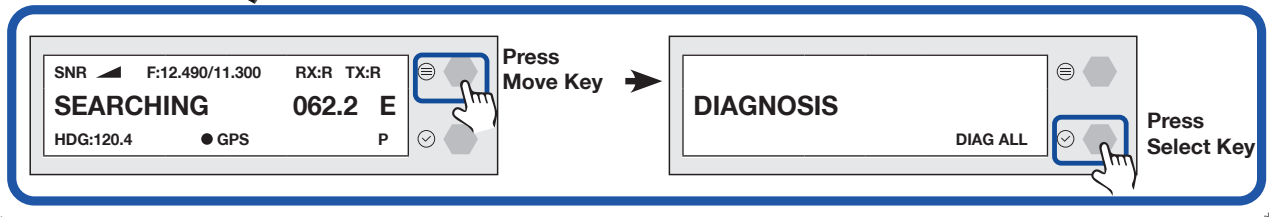
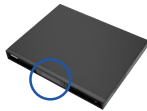
Cable Entry Cover

3-2



RF Cable (Customer Supplied)

3-3



4. Remove the clips (6 ea) that attach the top panel, then carefully slide the top panel out from the crate as shown.

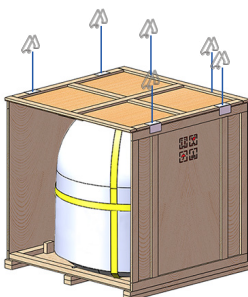


WARNING

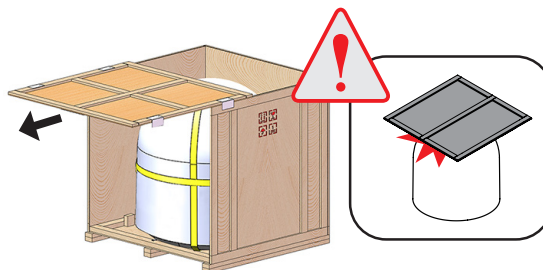
The brackets installed at top two edges help the top panel to move stably. When removing the top panel, ensure that it doesn't fall on the radome.

4-1

⚠ : 6 ea



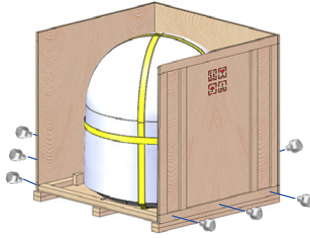
4-2



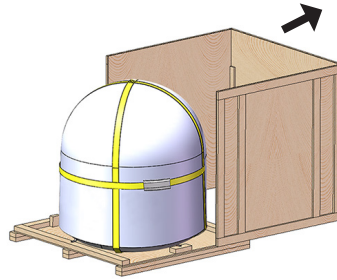
5. Remove the fixing screws (7 ea) that secures the three side panels, then detach all the panels remaining the antenna on the pallet.

5-1

 : 7 ea



5-2



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)

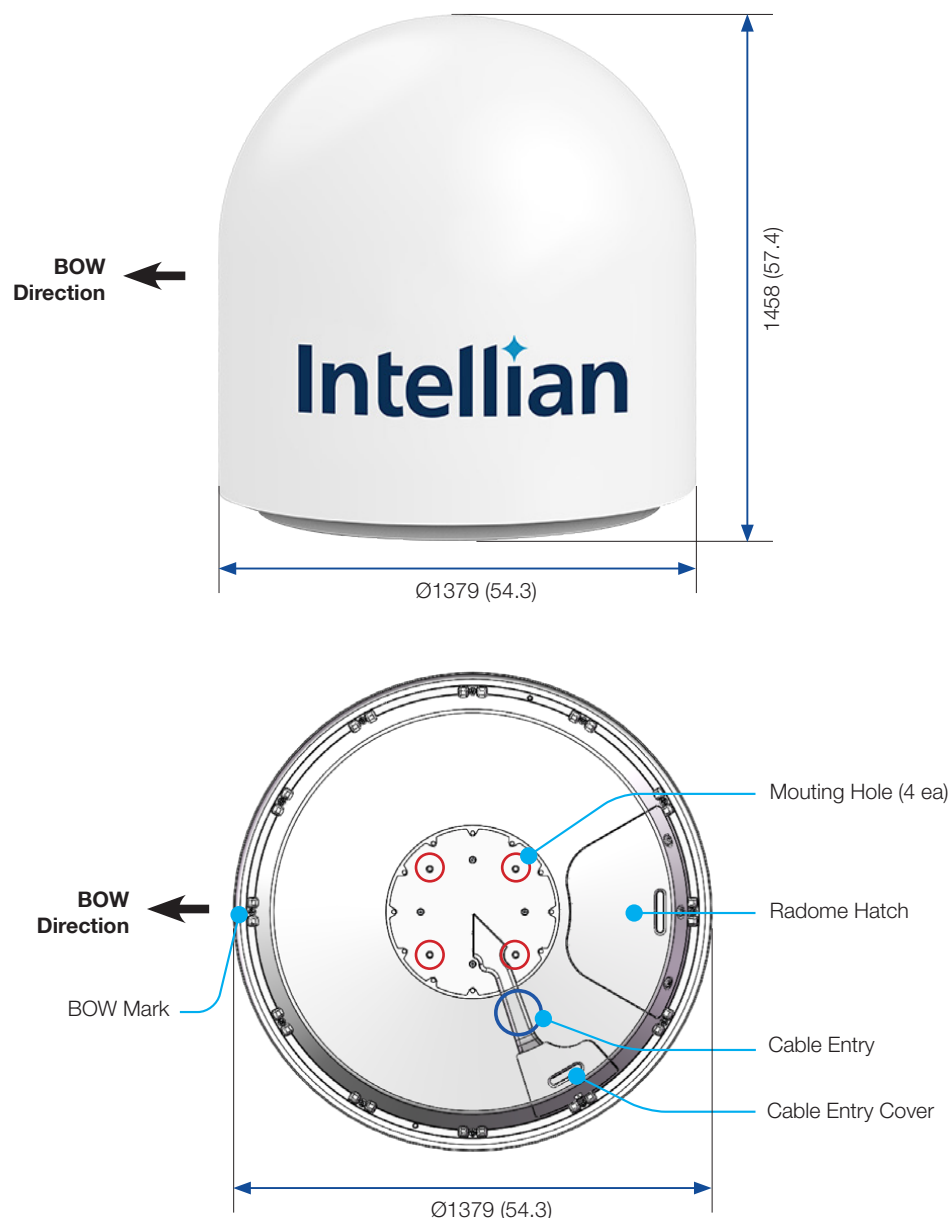


Figure 7: Antenna Dimensions



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.

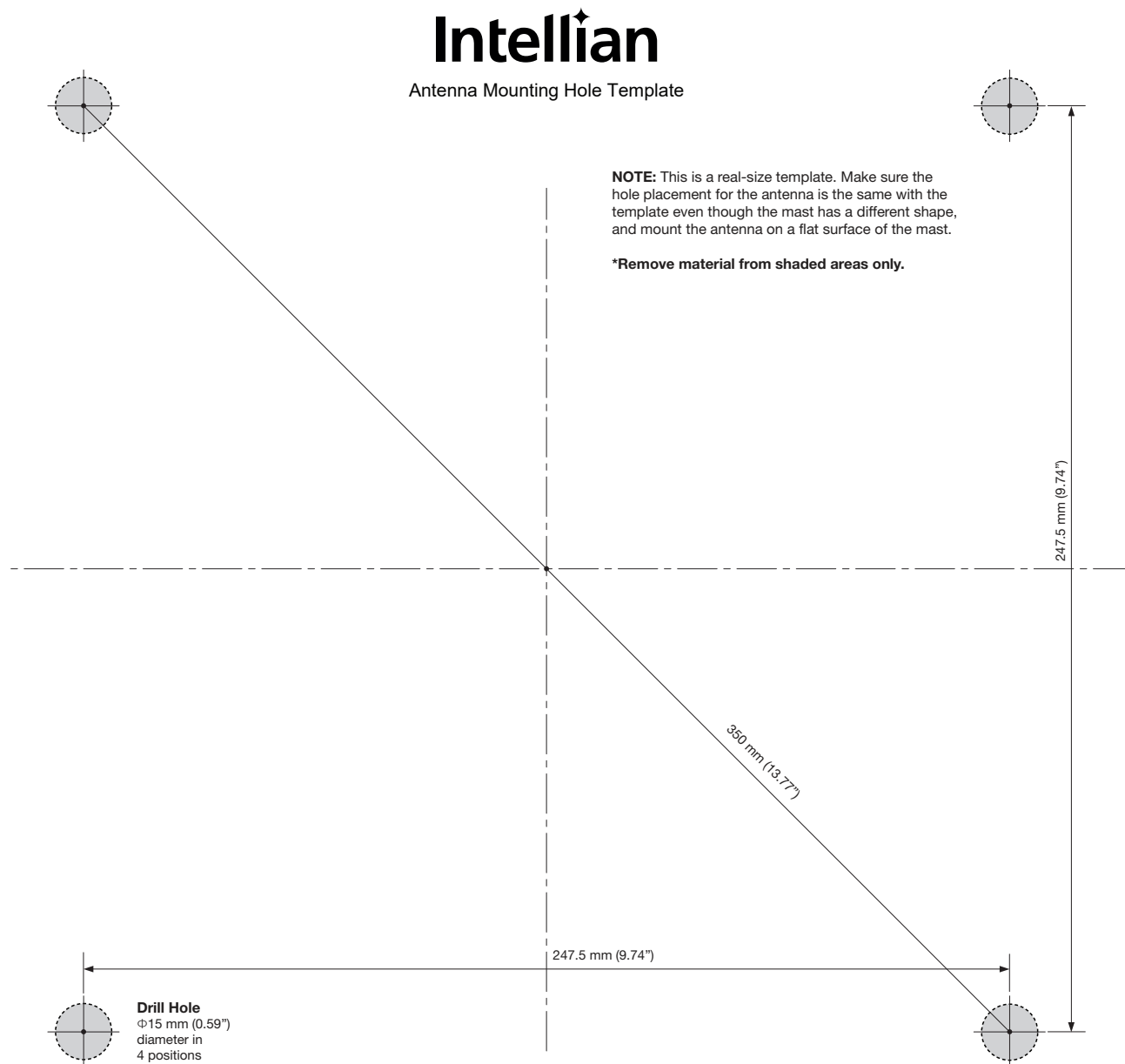


Figure 8: Antenna Mounting Hole Template

5.3 Designing Mast (Example Only)

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.



NOTE

- This is a general example of designing a mast. The shape of mast may differ depending on the ship's environment.
- Follow the installation recommended by Intellian for safety.



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. 20.0 mm), choose right sized bolts for mounting antenna on the mast according to the table below.

Mast Plate Thickness	Recommended Bolt Size
10 ~ 28 mm (Recommended)	M12 x 80L (Supplied)
28 ~ 35 mm	M12 x 90L

- To use the supplied bolts (M12 x 80L) for mounting antenna on a mast, the thickness of mast plate must be 10 ~ 20 mm. The minimum thickness of the mast plate is 10 mm. If the mast plate is thicker than 20 mm, the supplied antenna-mast mounting bolts can be too short to mount the antenna on the mast securely.

Option 1. When Installing Cable on Outside of Mast

This method is generally recommended.

Unit: mm (inch)

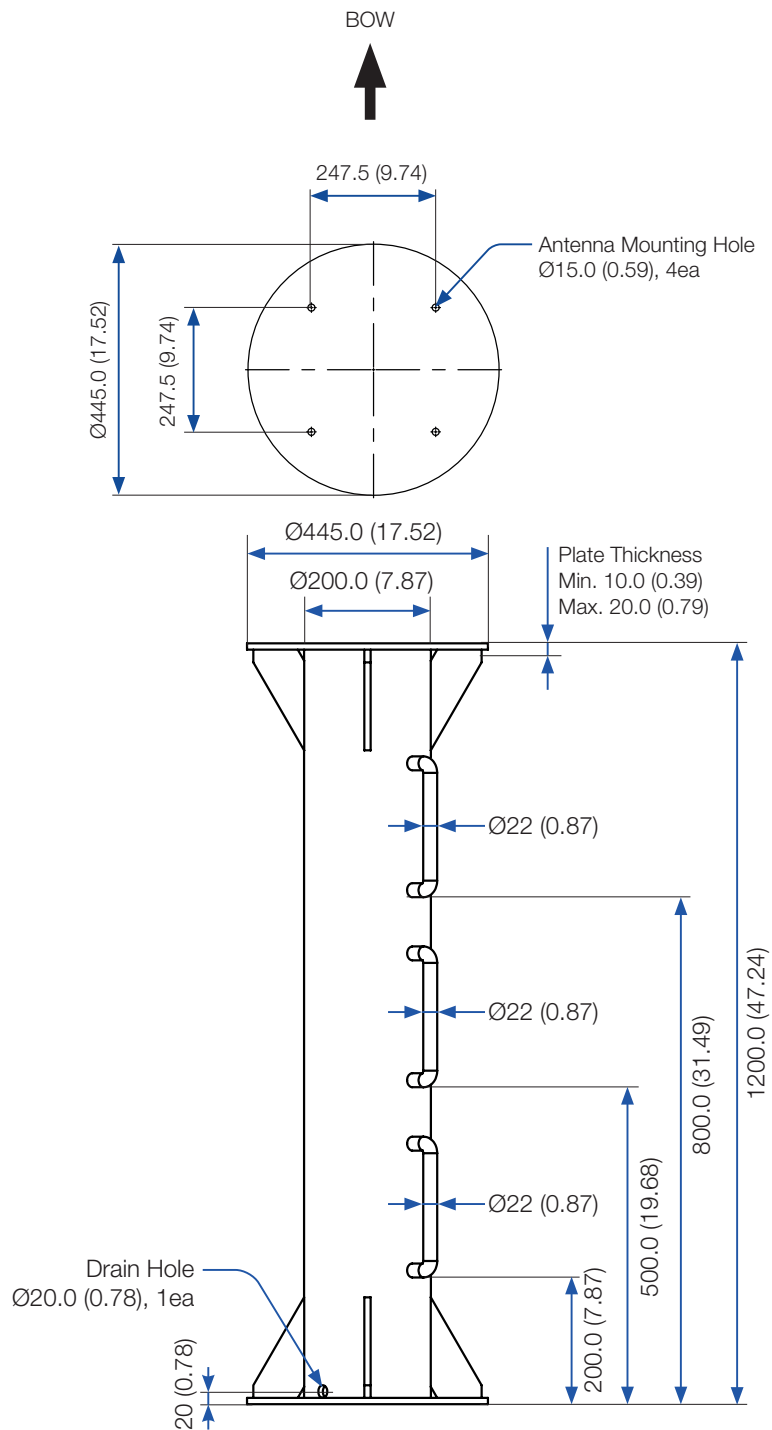


Figure 9: Antenna Mounting Hole Template

Option 2. When Installing Cable Through Inside Mast

Unit: mm (inch)

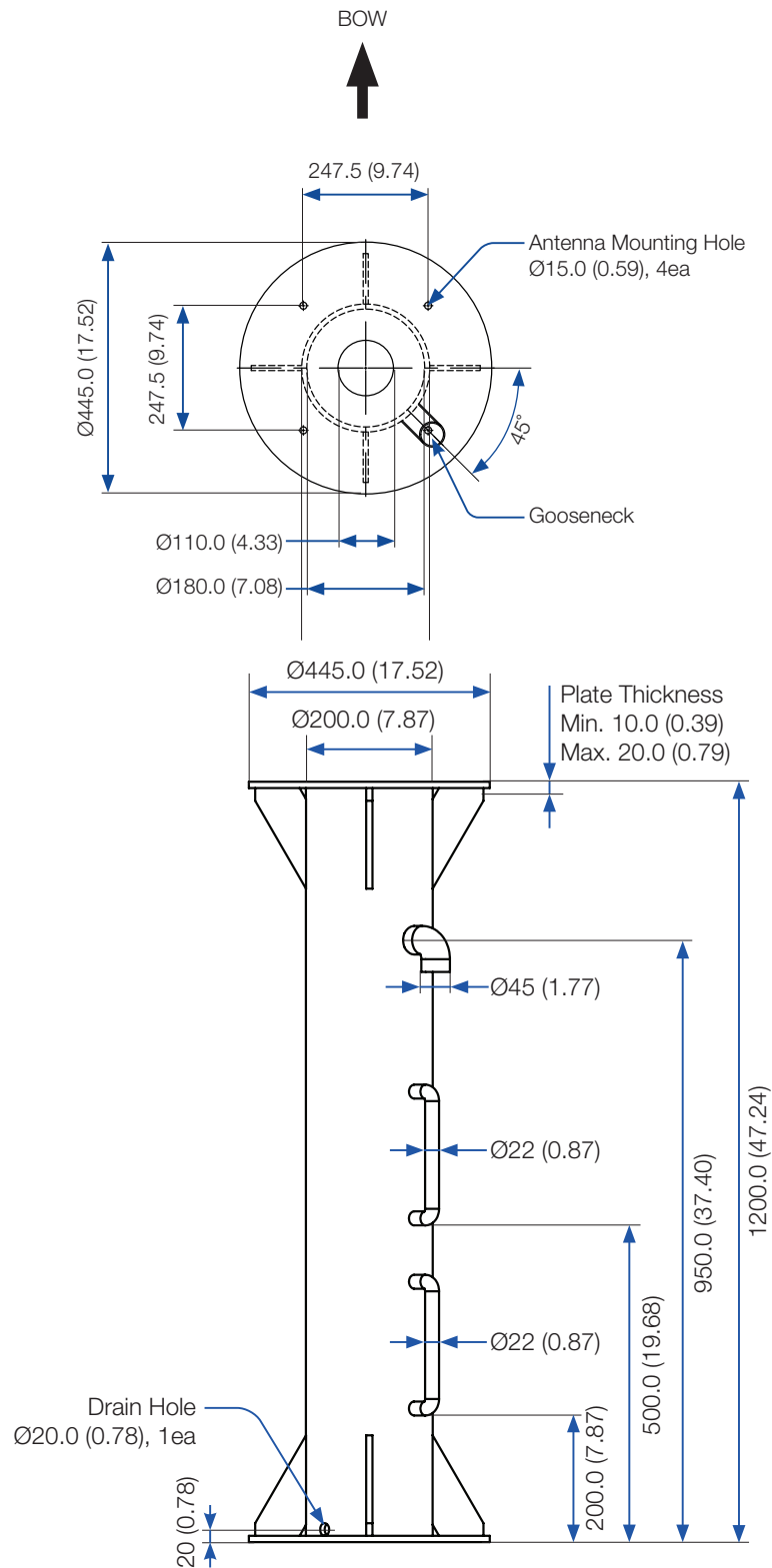


Figure 10: Antenna Mounting Hole Template

5.4 Routing RF Cable on Mast (Example Only)

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.

**NOTE**

This is a general example of routing cables on the mast. The routing method may differ depending on the ship's environment.

Option 1. Routing Cable on Outside of Mast

This method is generally recommended.

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.

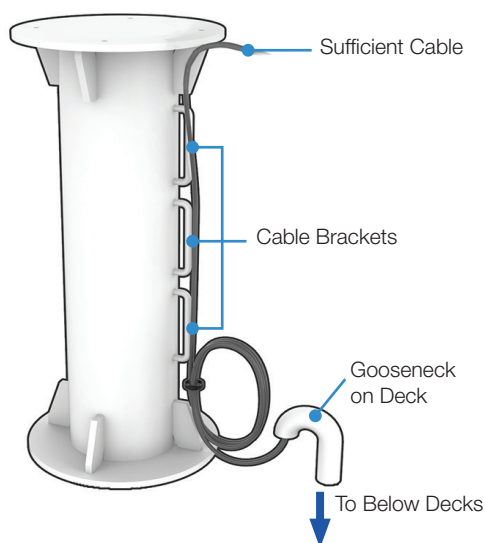


Figure 11: Routing Cable Through Outside of Mast

Option 2. 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.

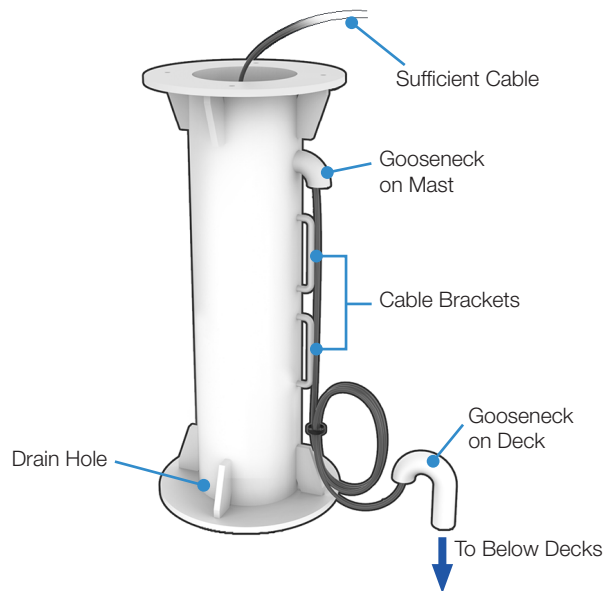


Figure 12: Routing Cable Through Inside of Mast

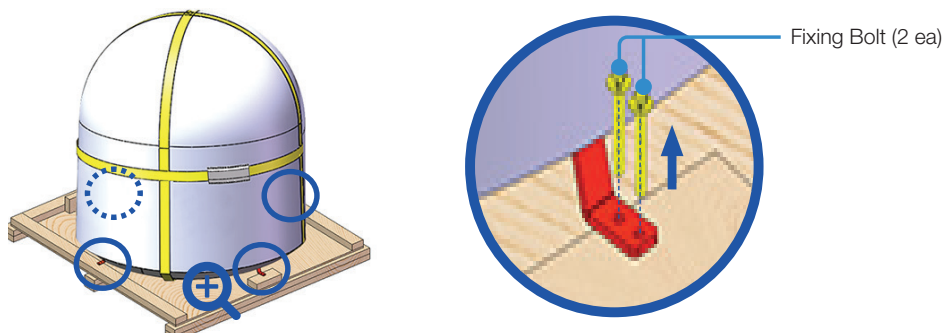
**CAUTION**

Do not leave the cables on the top surface of the mast. When putting down the antenna on the mast, there is a risk of damage to the cable connector if the cable is located on the top surface of the mast.

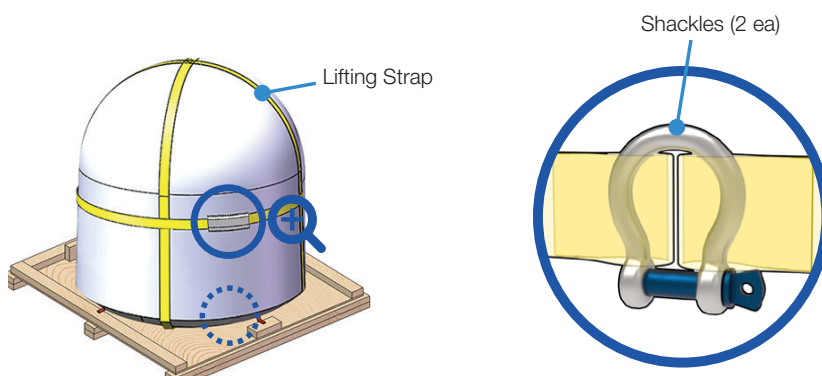
5.5 Removing Antenna from Wooden Pallet

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

1. Remove the hex head wrench bolts (2 ea) on each radome bracket using a wrench.



2. Check the condition of lifting strap to make sure the shackles (2 ea) are tightened. Re-wrap the shackles with the existing protection to avoid radome damage.

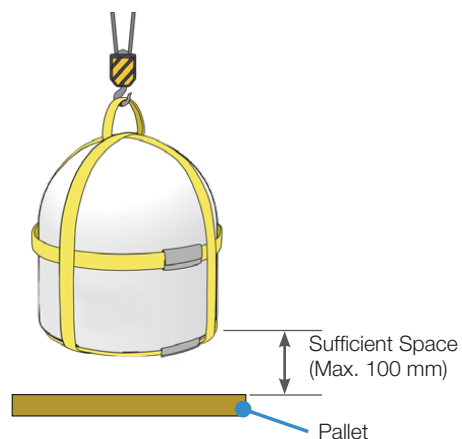


3. Lift the antenna above the pallet using a crane, and maintain a sufficient space (max. 100 mm) between the bottom of antenna and pallet to remove the shipping brackets.

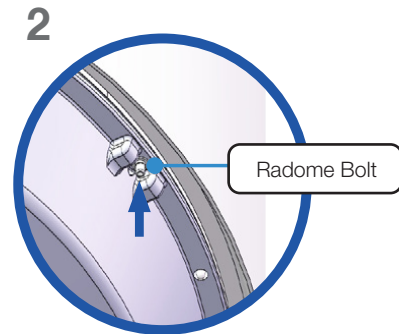
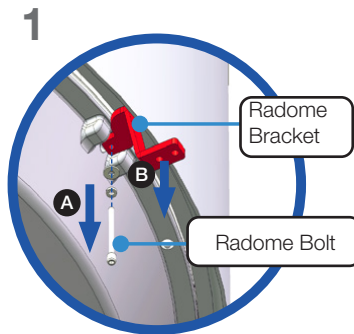


WARNING

- When lifting the antenna using the lifting straps, make sure to remove the securing radome brackets to separate antenna from the pallet.
- Be careful when lifting heavy objects. Incorrect handling of heavy objects may lead to personal injury or significant equipment damage.



4. Remove the radome bracket bolt (1 ea) using a wrench, then detach the radome bracket from the radome.
5. Find the supplied Hex Head Wrench Bolts (M6 x 40L), Spring Washers, and Flat Washers from the ACU box. Apply Loctite #243 on the bolt, and assemble the bolt and washers to the radome by turning it clockwise using a wrench. DO NOT reuse the removed bolt and washers.
6. Repeat the procedure to remove all four radome brackets.



Fully Tighten Radome Bolt.



CAUTION

- Fully tighten the radome bolt.
- Use the radome bolt and washers supplied in the ACU box.
- DO NOT reuse the removed bolt and washers.

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.

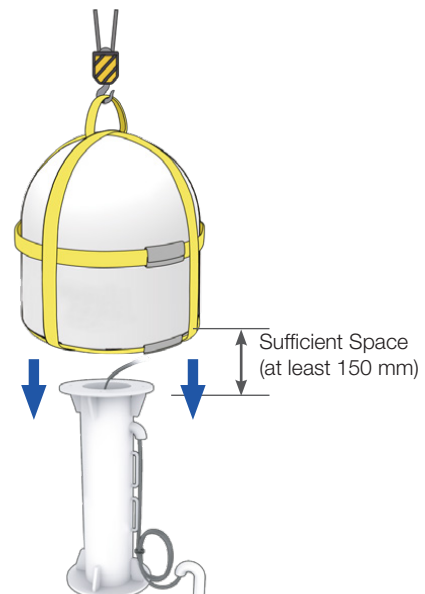


Figure 13: Placing Antenna Above Mast

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.

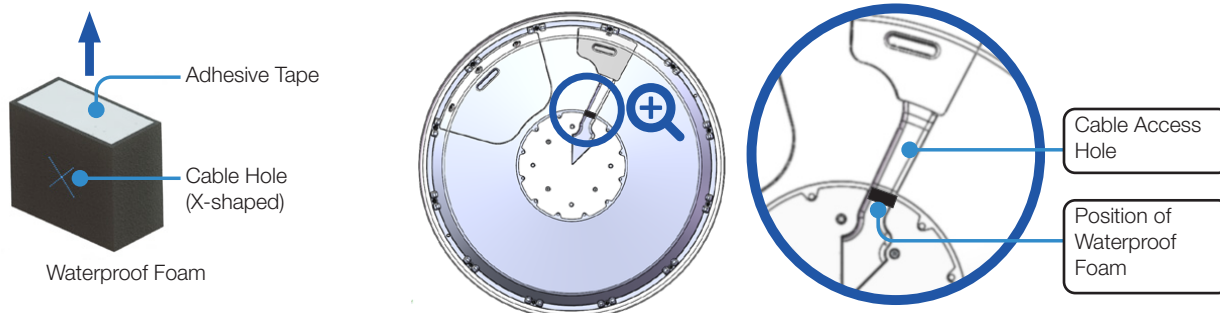
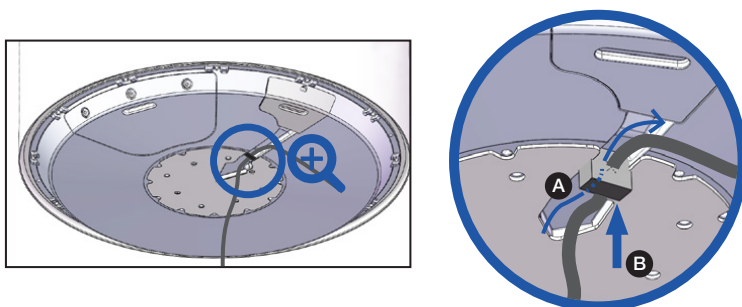


Figure 14: Attaching Position of Waterproof Foam

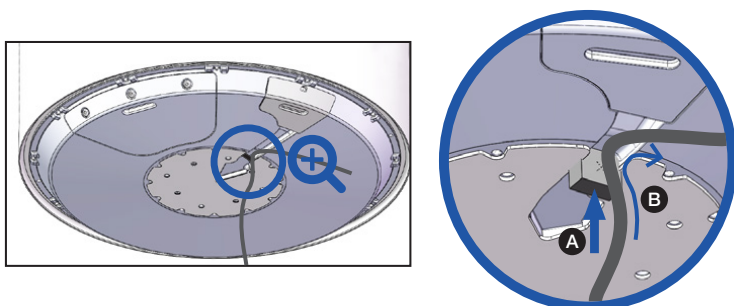
Option 1. When Installing Cable Through Inside Mast

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 80L 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.

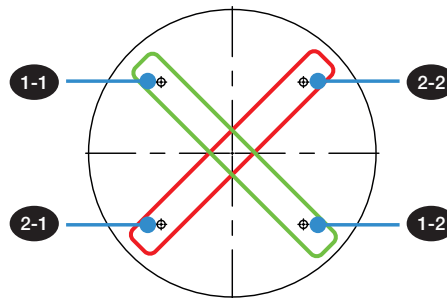


Figure 15: Installing Sequence of Bolts

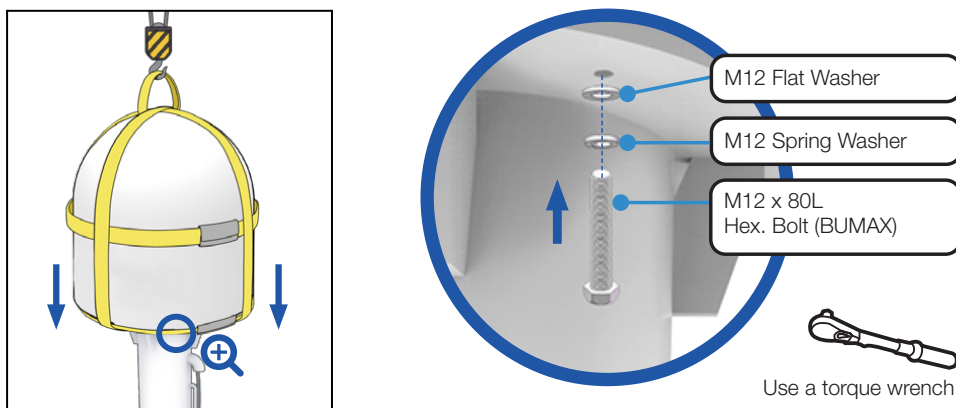


Figure 16: Installing Bolts for Antenna-Mast Assembly



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 113 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.

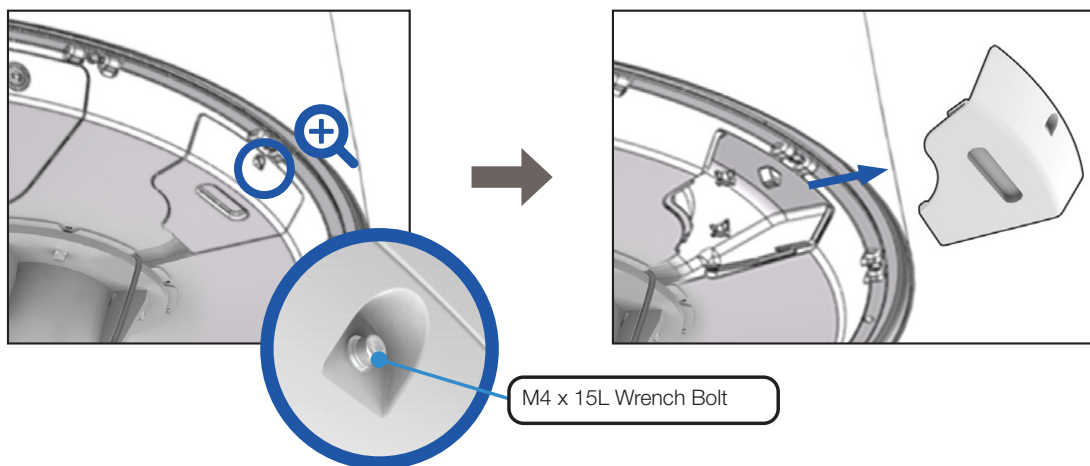


NOTE

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 19 to see cable requirements.

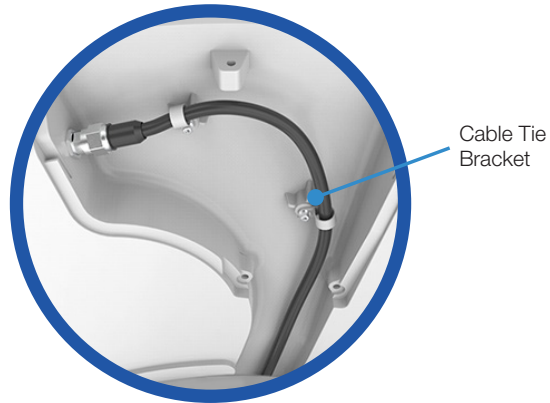
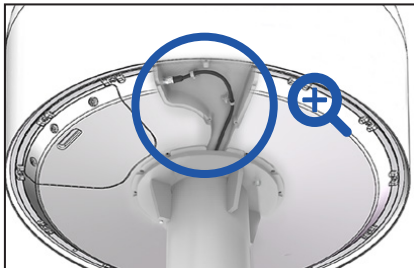
1. Remove the M4 x 15L Wrench Bolt by using the wrench set then open the cable entry cover.



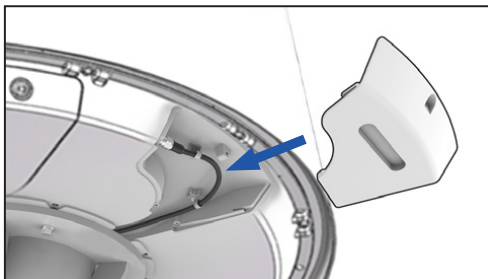
NOTE

After removing the M4 x 15L Wrench Bolt from the cover of cable entry, Keep it in a safe place for the next step. When closing the cover of cable entry, this bolt must be used.

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 as the following figure. Ensure the cable is firmly fastened to the connector. Fasten the cable with cable ties using the cable mount or cable clamp along the routing path.



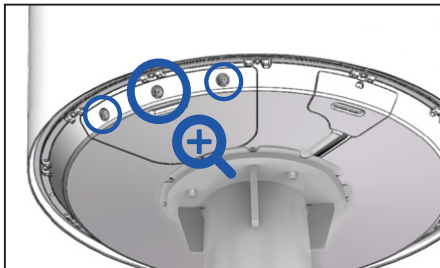
4. After completing cable connection, put the cover in the right place and tighten the M4 x 15L Wrench Bolt by using the wrench set.



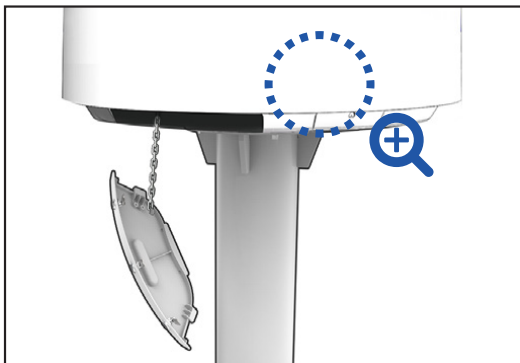
5.10 Switching On Power Box

Access the ADU modules inside the radome to check that the power switch is on through the radome hatch. Make sure that there is sufficient free space underneath the ADU to open the radome hatch.

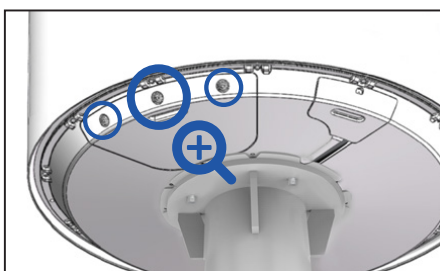
1. Bring the radome door key from the ACU box. Open the radome hatch by turning the fixed bolts counterclockwise by using the radome door key.



2. The power box switch was turned on and shipped from the factory. Check the power box inside the radome is switch on. If not, switch on the power box.



3. Put the radome hatch in the right place. Close the radome hatch by turning the fixed bolts clockwise by using the radome door key.



Door Key Provided



NOTE

After using the door key, store it in a safe place for future use.

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.

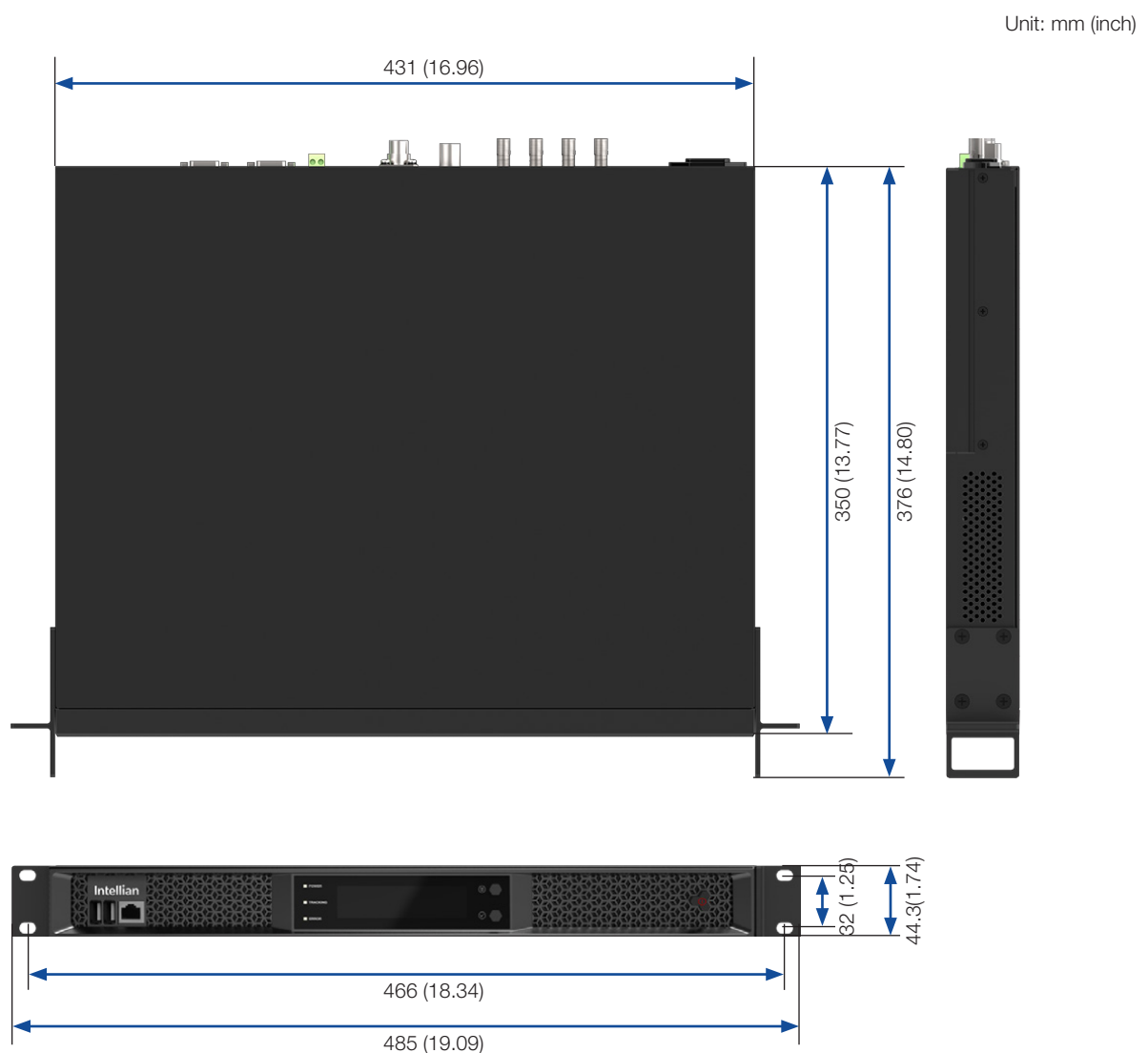


Figure 17: ACU Dimensions

6.3 Mounting ACU

Mounting ACU on 19-inch Rack

The ACU can be 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 18: 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, switch router and ship's gyrocompass may be needed.

6.4.1 Single Antenna System Configuration (Basic Antenna System)

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

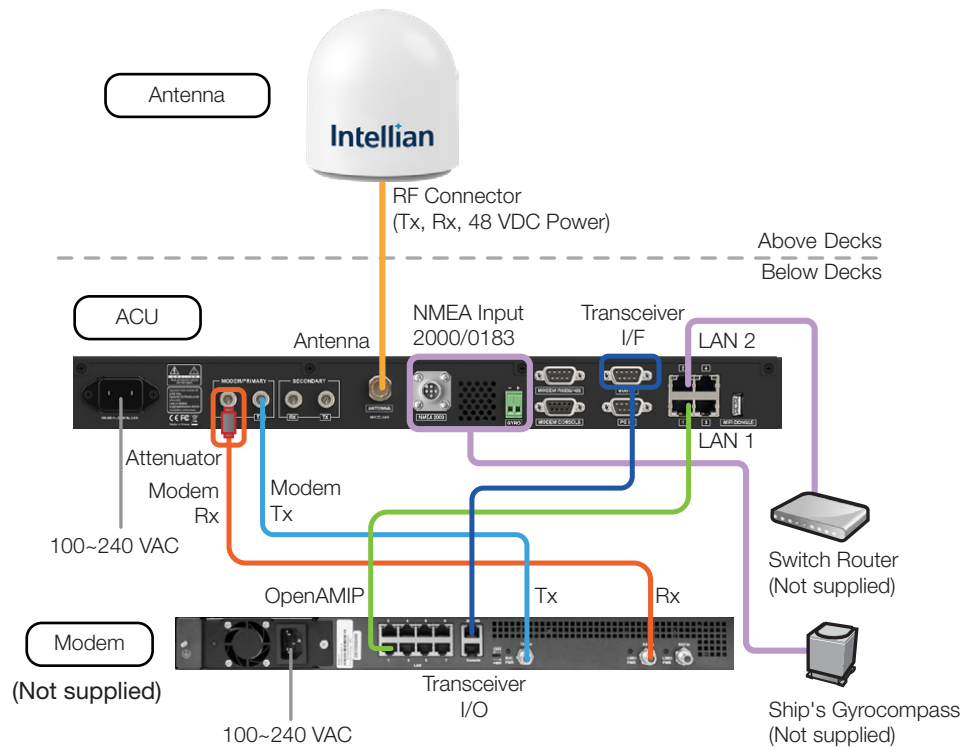
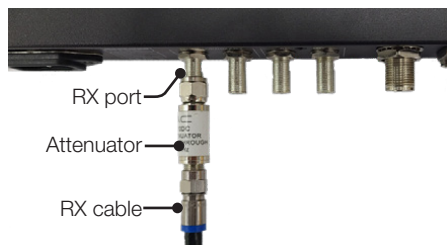


Figure 19: Single Antenna System Configuration



NOTE

Make sure that the attenuator in the ADU bolt kit box must be connected between RX port on the ACU and Rx cable.



6.4.2 Dual Antenna System Configuration (Optional)

The dual system consists of two VSAT antennas and two ACUs. The ACUs have the embedded Dual Antenna Mediator function, which is capable of controlling and managing two VSAT antenna systems simultaneously. As shown in the configuration, connect the cables correctly.

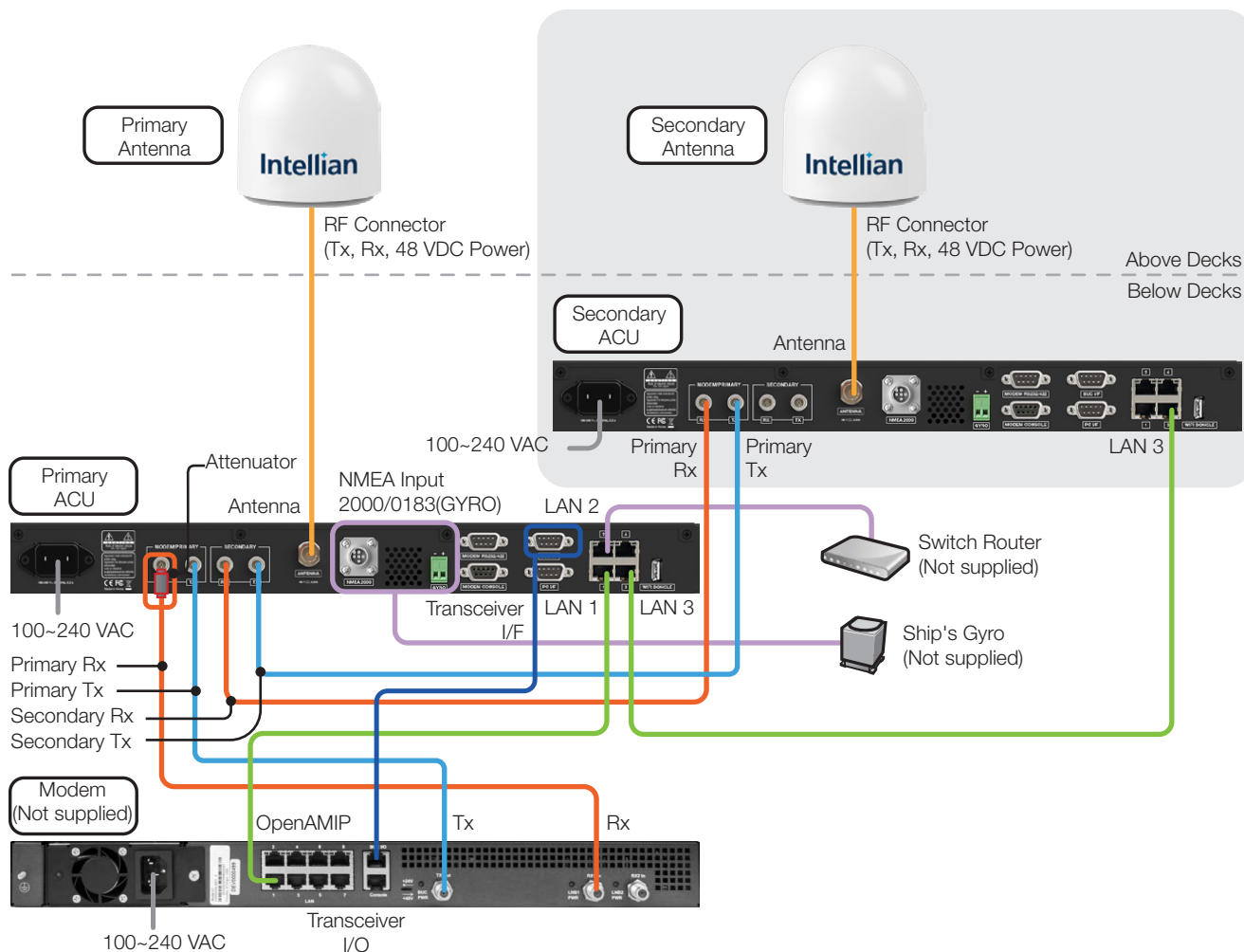


Figure 20: Dual Antenna System Configuration

6.5 ACU Cable Connection

6.5.1 ACU Back Panel Connectors

The following figure shows the ACU back panel.

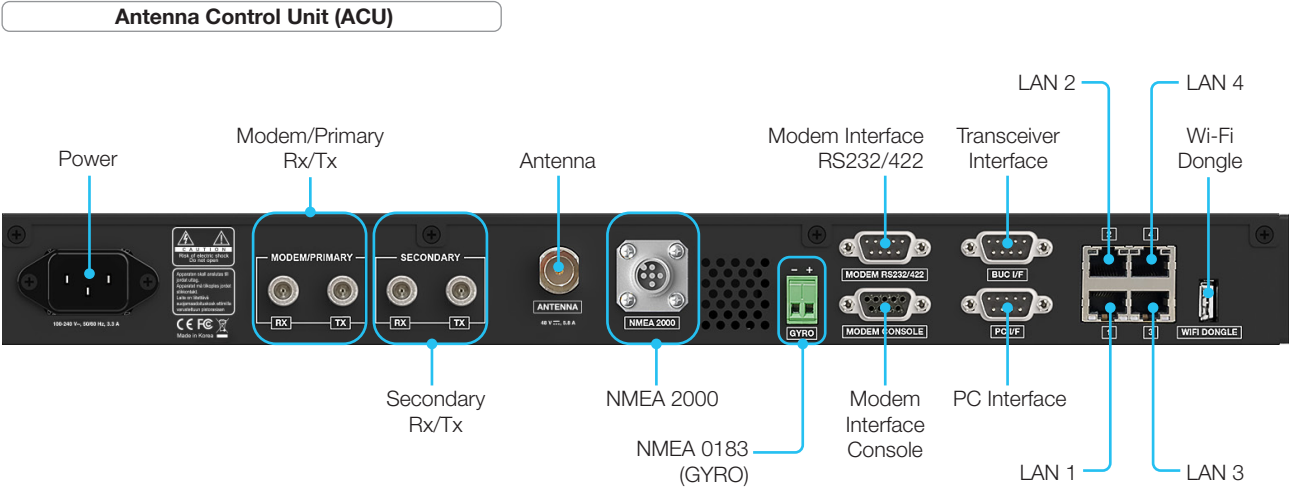
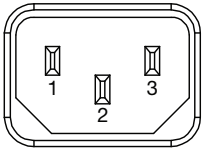


Figure 21: ACU Back Panel Connectors

6.5.2 ACU Connector Pinout Guide

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

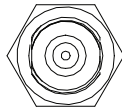
Power Connector



IEC 320 C14 Plug Male

Pin	Signal
1	NEUTRAL
2	GND
3	LIVE

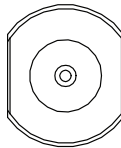
Modem / Primary / Secondary Tx and Rx Connectors



RF F Type Female

Conductor	Function
Inner	DATA
Outer	GND

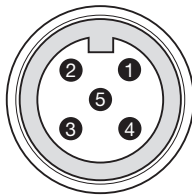
Antenna Connector



RF N Type Female

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

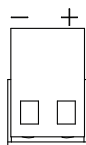
NMEA 2000 Input



Mini-C 5-Pin Male

Pin	Signal
1	N/C
2	N/C
3	N/C
4	NET-H (CAN-H)
5	NET-L (CAN-L)

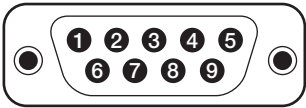
NMEA 0183 Input



2-Pin Terminal Block

Pin	Signal
-	HEADING GND
+	HEADING IN

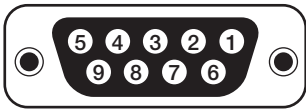
Modem Interface - RS232 & RS422 Connector



D-Sub 9-Pin Male

Pin	Signal
-	HEADING GND
+	HEADING IN

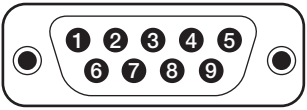
Modem Interface - Console Connector



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

Transceiver Interface - RS422 Connector



D-Sub 9-Pin Male

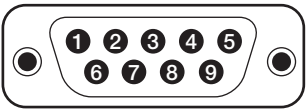
Pin	Signal
1	Transceiver RS422 RX+
2	Transceiver RS422 RX-
3	Transceiver RS422 TX+
4	GND
5	GND
6	Transceiver RS422 TX-
7	Transceiver KEYLINE RX+
8	Transceiver KEYLINE RX-
9	N/C



NOTE

Use the supplied Transceiver Interface Cable (D-Sub to RJ45) to connect between RS422 port of the ACU and Transceiver I/O port of the modem.

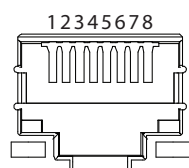
PC Interface - RS232 Connector



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

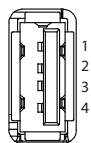
LAN Connectors (LAN 1~LAN 4)



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

Wi-Fi Dongle Connector



USB A Female

Pin	Signal
1	+5 V
2	DATA-
3	DATA+
4	GND

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 22: 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).

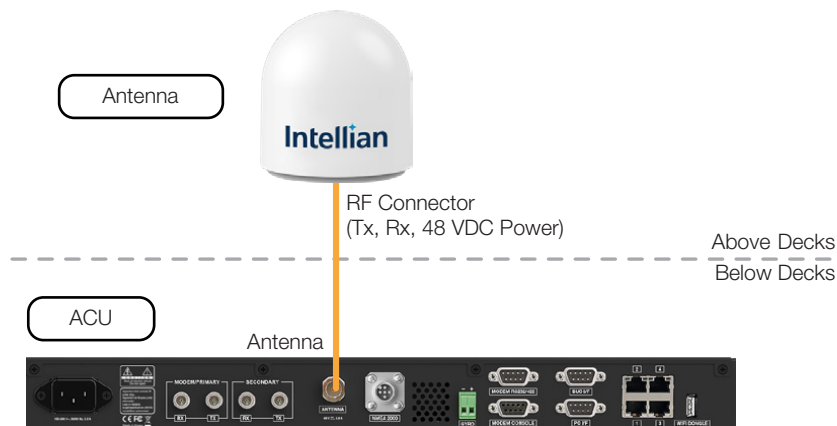


Figure 23: ACU to Antenna Cable Connection in Single Antenna System

6.5.5 Connecting ACU to Antenna in Dual Antenna System (Optional)

For the Dual Antenna System, the antenna system needs to be installed with two ACUs and two antennas.

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

1. Connect another **Antenna RF cable (N to N)** (customer supplied) from the **ANTENNA (N) port** of the Secondary ACU to the **RF (N) port** of Secondary Antenna.

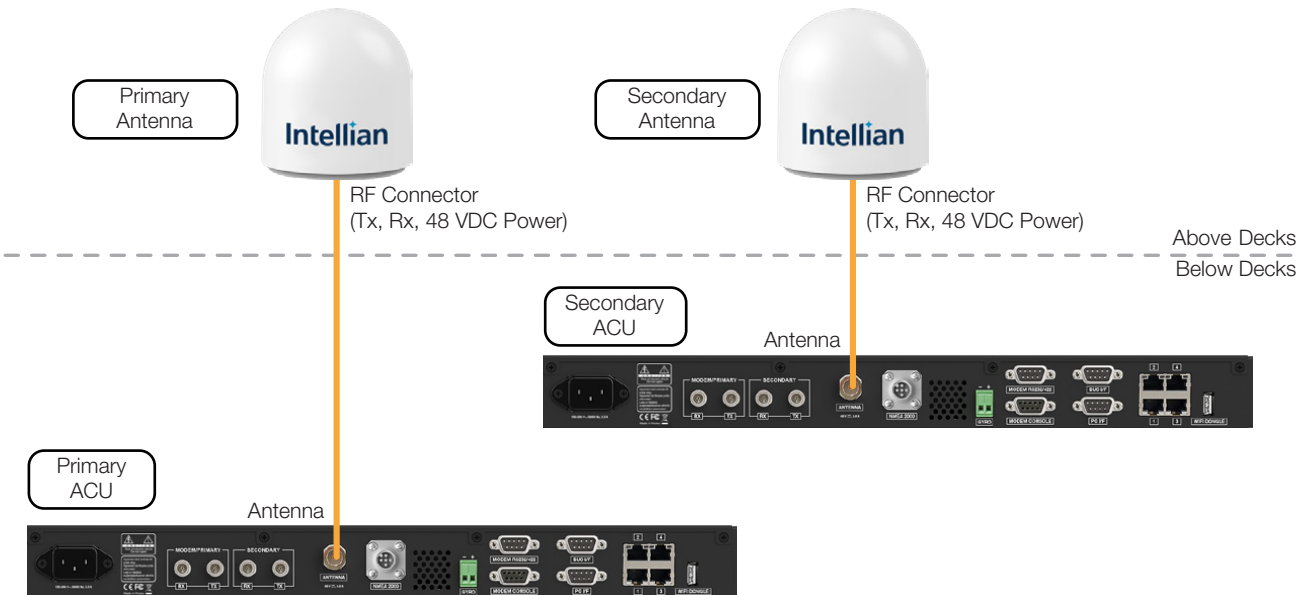


Figure 24: ACU to Antenna Cable Connection in Dual Antenna System

6.5.6 Connecting Primary/Secondary ACUs in Dual Antenna System (Optional)

For the Dual Antenna System, the antenna system needs to be installed with two ACUs and two antennas.

1. Connect a **RF cable (F to F)** from the **Secondary Rx (F) port** of the Primary ACU to the **Primary Rx (F) port** of Secondary ACU.
2. Connect another **RF cable (F to F)** from the **Secondary Tx (F) port** of the Primary ACU to the **Primary Tx (F) port** of Secondary ACU.
3. Connect an **Ethernet cable** between the **LAN 3 (RJ45) ports** of each Primary and Secondary ACUs.

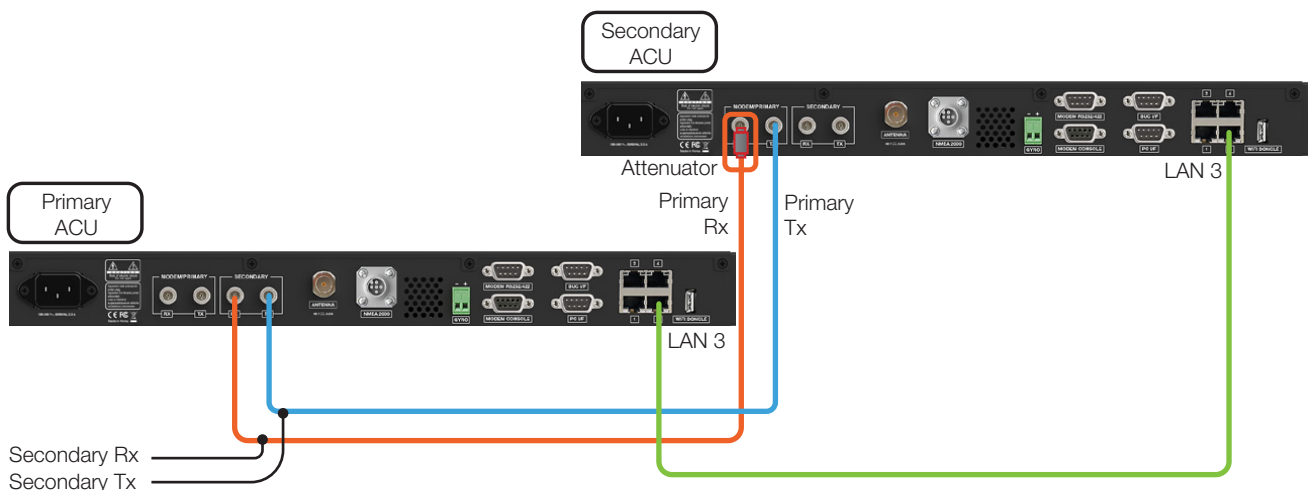


Figure 25: Primary and Secondary ACU Cable Connection in Dual Antenna System

6.5.7 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. Connect the **Transceiver Interface cable (DB-9 to RJ45)** from the **Transceiver I/F (DB-9) port** of the ACU to the **Transceiver I/O (RJ45) port** of the modem.
4. When using the OpenAMIP modem protocol, connect an **Ethernet cable** from the **LAN 1 (RJ45) port** of the ACU to a **LAN (RJ45) port** of the modem.

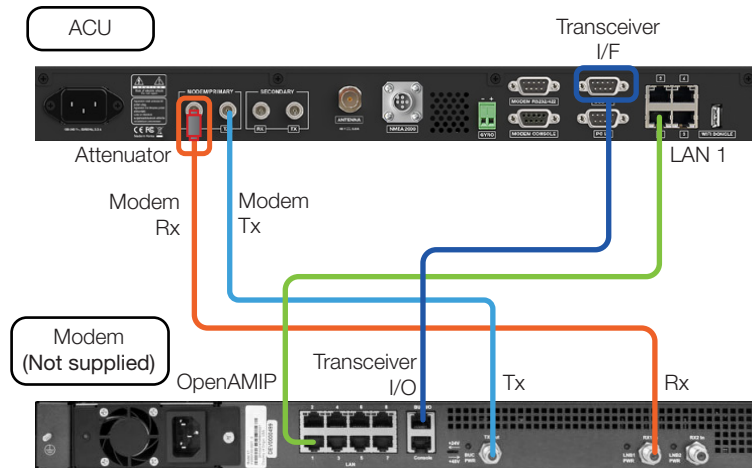


Figure 26: ACU to Modem Cable Connection

6.5.8 Connecting ACU to Switch Router

Connect an **Ethernet Cable** from the **LAN 2 (RJ45) port** of the ACU to a **LAN (RJ45) port** of the Switch Router.



Figure 27: ACU to Switch Router Cable Connection

6.5.9 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 and NMEA 2000 gyrocompass inputs. If the gyrocompass has a different output standard, a compass converter should be used to supply the required NMEA input. The NMEA 2000 gyrocompass needs to be purchased separately. Refer to "**6.5.2 ACU Connector Pinout Guide**" on page 41 for pin configuration.

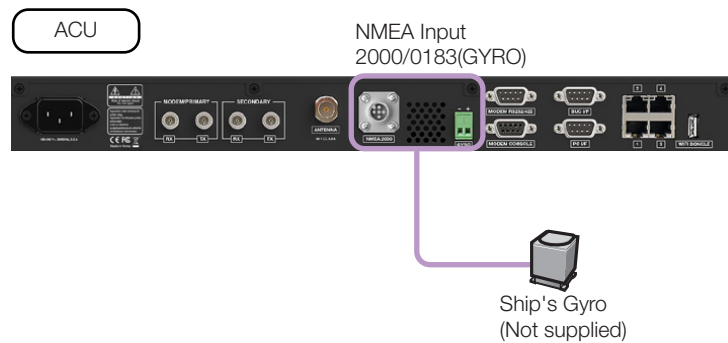
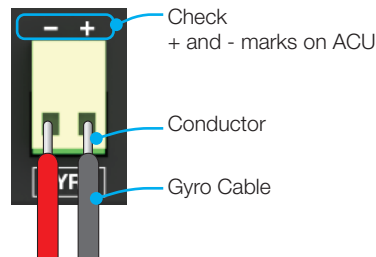


Figure 28: ACU to Ship Gyrocompass Cable Connection

How to Connect NMEA 0183 Gyrocompass Cable

1. Using a Phillips screwdriver, loosen the two screw terminals by rotating them counterclockwise.
2. Strip wires up to 5 mm (0.2"). Do not solder the cables.
3. Insert conductor of gyro cable to the terminal block. The polarity of the terminal is indicated on the ACU with + and - marks. After checking the polarity, connect the cables correctly.



4. Fully tighten the screws by rotating them clockwise to clamp the wires securely.
5. Insert the terminal block with gyro cables to the **NMEA 0183(GYRO)** port of ACU.

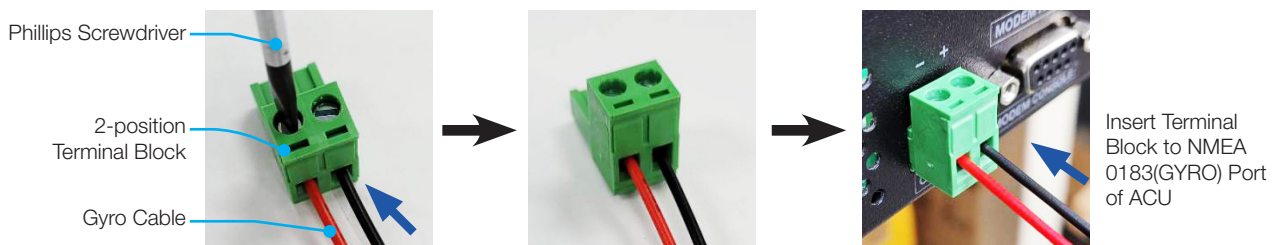


Figure 29: NMEA 0183 Gyrocompass Cable Connection

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 30: Front Panel Management LAN Port Connection

6.6.2 USB Connection

Using Right Side USB Port on ACU Front Panel

Connect a USB memory stick to the right side USB port on the front panel of ACU for the log download, backup/restore antenna settings, and firmware upgrade.

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

Connect the supplied USB Cable (A to A) 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.

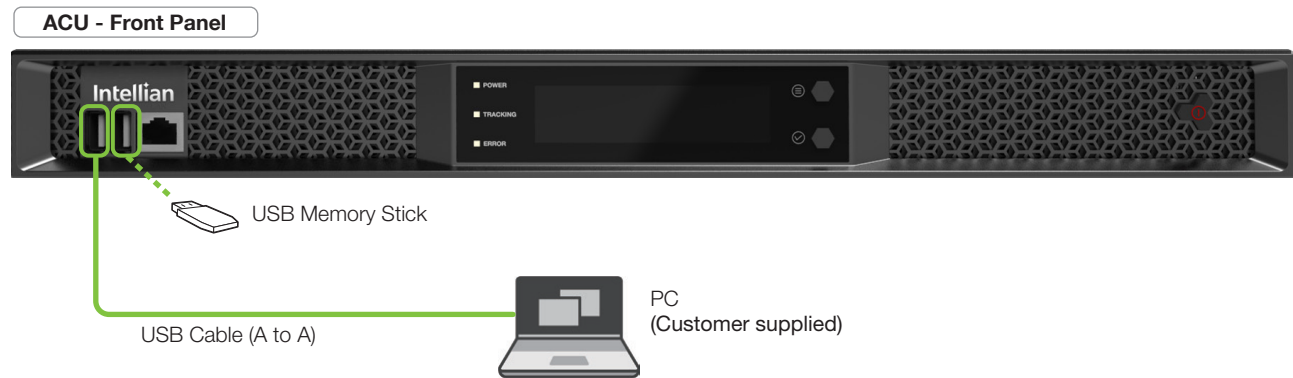


Figure 31: Front Panel USB Port Connection

6.6.3 Wi-Fi Connection

Connection through Wi-Fi Dongle

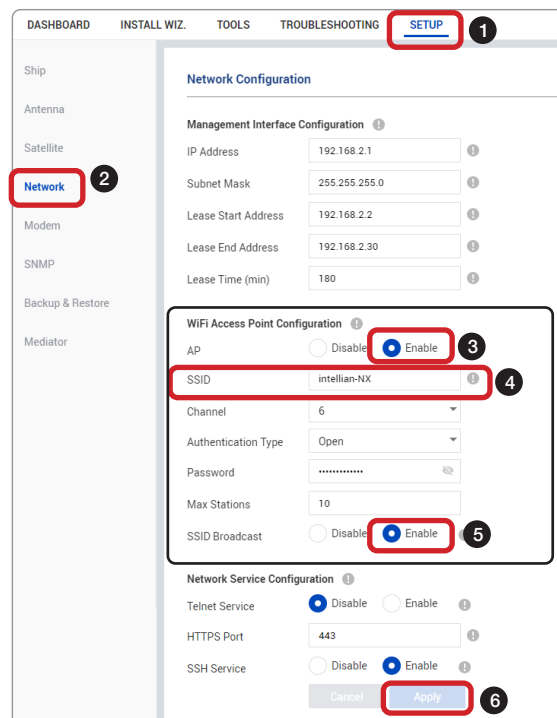
Intellian provides the Wi-Fi Dongle for Wi-Fi connection. You can connect PC to the ACU via Wi-Fi for easy management and control whenever you are on the vessel.

1. Connect an Ethernet cable from the Management LAN port on the front panel of ACU to a LAN port of PC. The network connection is established automatically.
2. Find the Wi-Fi Dongle from the ACU box. Plug the Wi-Fi Dongle into the USB port on the back panel of ACU.



Figure 32: Wi-Fi Dongle Connection

3. Use the following IP address to access Intellian AptusNX page.
 - **IP Address: 192.168.2.1 (Default)**
4. Log into the AptusNX by typing in User Name and Password. If this system has not been changed from the factory default:
 - **User Name: intellian**
 - **Password: 12345678**
5. Select the **SETUP** on the main menu, then select the **Network** menu. Under the **Wi-Fi Access Point Configuration**, choose **Enable** for the **AP**. If you don't want to use Wi-Fi connection, choose **Disable** for the **AP**.
6. Check the **SSID** (Wi-Fi AP Name) information.
7. Choose **Enable** for the **SSID Broadcast** to show the **SSID** (Wi-Fi AP Name) information.
8. Click the **Apply** button to apply the settings to the system. Then perform the "**9.8.2 iARM Save & Reboot**" on page 88.
9. After a reboot, connect to the Wi-Fi.



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 **TRACKING** 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)**

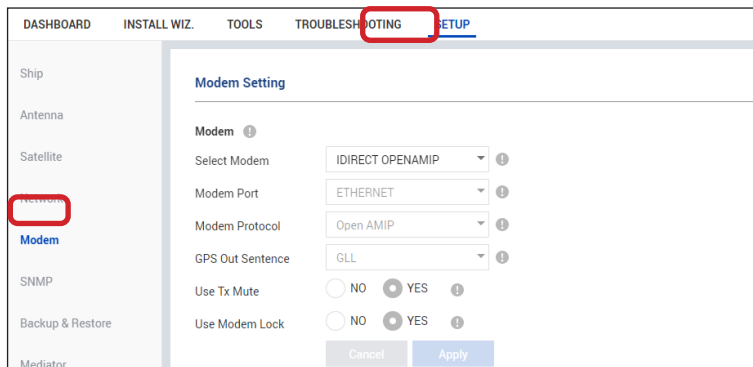


Figure 33: Front Panel Management LAN Port Connection

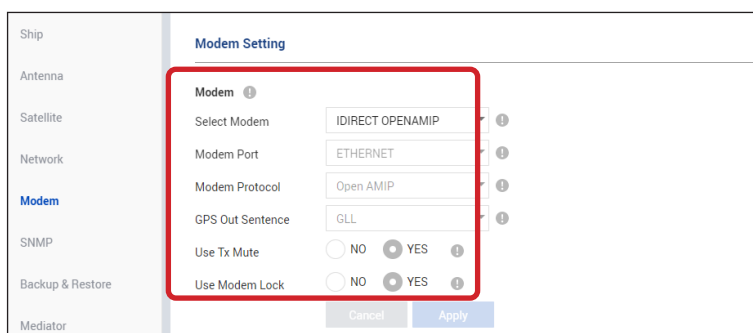
7.3 Modem Configuration

Before starting installation wizard, set up the modem configuration.

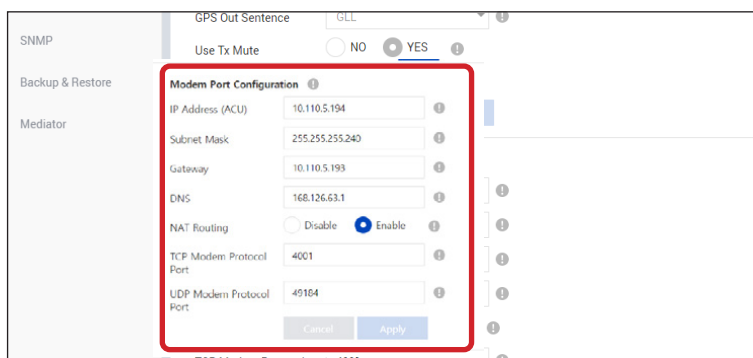
1. After accessing the **AptusNX** main page, go to the **SETUP → Modem** on the main menu then follow these steps.



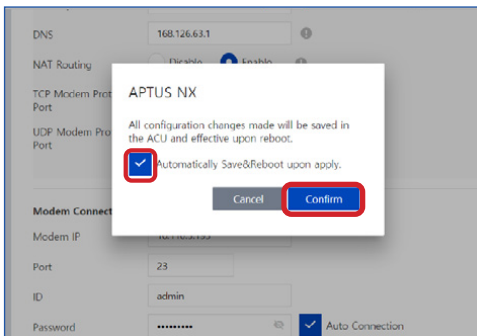
2. Select your modem type from the **Select Modem** drop-down list for loading a pre-configuration of modem. The setting parameters related to the modem interface will be set automatically once the modem type is selected. If you select **USER SETTING** from the **Select Modem** drop-down list, the settings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



- 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.



- Reboot the system.

7.4 Starting Install Wizard

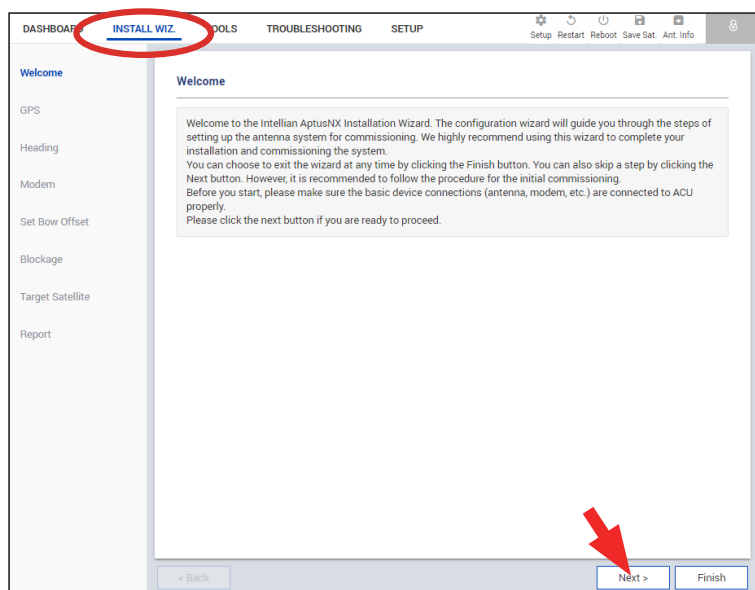
The Install Wizard will give you a guide by going through the steps of setup for the antenna system commissioning. We highly recommend using this wizard to complete the installation and commissioning of the system. You can exit the wizard at any time by clicking the **Finish** button. You can also skip 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 74 for detailed description of each function.

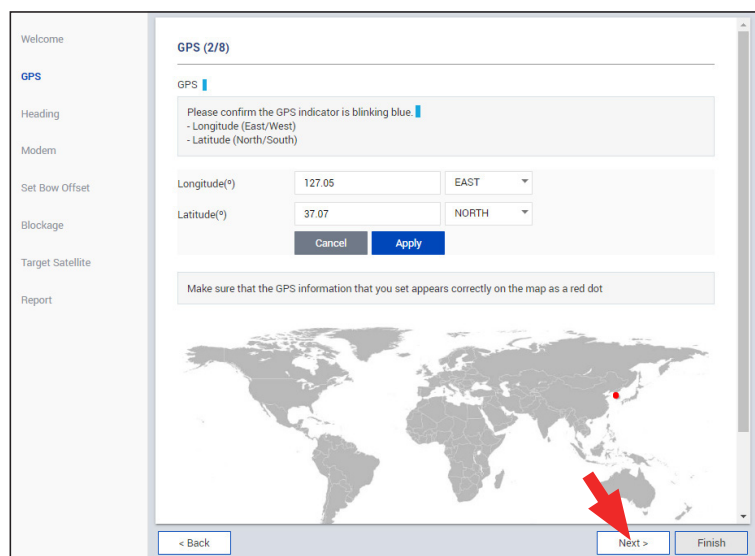
✓ Welcome Page



Welcome message is displayed.

Click the **Next** button.

✓ 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.

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

✓ Step 4: Set Bow Offset

For setting BOW offset, select one of two satellite tracking types and a trackable satellite.

(Option 1: Using Beam Switch Type)

Welcome

GPS

Heading

Modem

Set Bow Offset

Blockage

Target Satellite

Cable Compensation

Line-up Test

Report

Set Bow Offset (5/8)

Satellite Tracking ⓘ

Tracking Type ☒ Beam Switch ☐ Library

Beam Selector ⓘ

ID	Description
85	XXXXXXXXXX
27	XXXXXXXXXX

Apply **Lock** **Reboot** **Refresh**

Heading

Current Device NMEA 2000

Heading(°) 0

Bow Offset

The reference satellite has been successfully tracked.
When you press the 'Save Satellite' button, Bow offset is automatically calculated and displayed.

Save Satellite **Lock** ☒

Current Bow Offset 16°

< Back **Next >** Finish

- **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)

Welcome

GPS

Heading

Modem

Set Bow Offset

Blockage

Target Satellite

Cable Compensation

Line-up Test

Report

Set Bow Offset (5/8)

Satellite Tracking ⓘ

Tracking Type ☐ Beam Switch ☒ Library

Select Satellite

Satellite List COMS_3D (128.19/E)

Satellite Name COMS_3D Longitude 128.19 EAST

Rx Polarization LHCP Tx Polarization RHCP

Skew Offset 0 Local Frequency 18250

DVB Frequency 20124 Verify Type DVB Lock

Symbol(kSps) 10000

Start Searching

Heading

Current Device NMEA 2000

Heading(°) 0

Bow Offset

The reference satellite has been successfully tracked.
When you press the 'Save Satellite' button, Bow offset is automatically calculated and displayed.

Save Satellite **Lock** ☒

Current Bow Offset 16°

< Back **Next >** Finish

- **Step 1:** Choose the **Library** for 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:** 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.

✓ 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. After setting the modem connection in the "**Step 3: Modem**", 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)

Target Satellite (7/8)

Current Satellite: ☐ Controlled by Modem ☒ **Manual Setup**

Satellite Information

Display and set current tracking satellite settings.

Satellite Name: SAT_000W

Longitude(°): 0.7 WEST

Local Frequency(MHz):

RX Polarization: LHCP

TX Polarization: LHCP

Identify: ☒ Modem Lock ☐ DVB Lock

NBD Information

Display and set NBD tracking mode's tracking information.

Frequency(kHz_IF): 20059500

Reserved Parameter: 9520

< Back Next > Finish

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: 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.

Report (8/8)

Save Report Export View Last Report

Engineer Information

Name:

Company:

Certification ID:

Email:

Line-up Test

Test Result

Ticket Number:

Operator:

CPI Value(dB): 0

P1 dB Compression: 0

< Back Next > Finish

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** button 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.

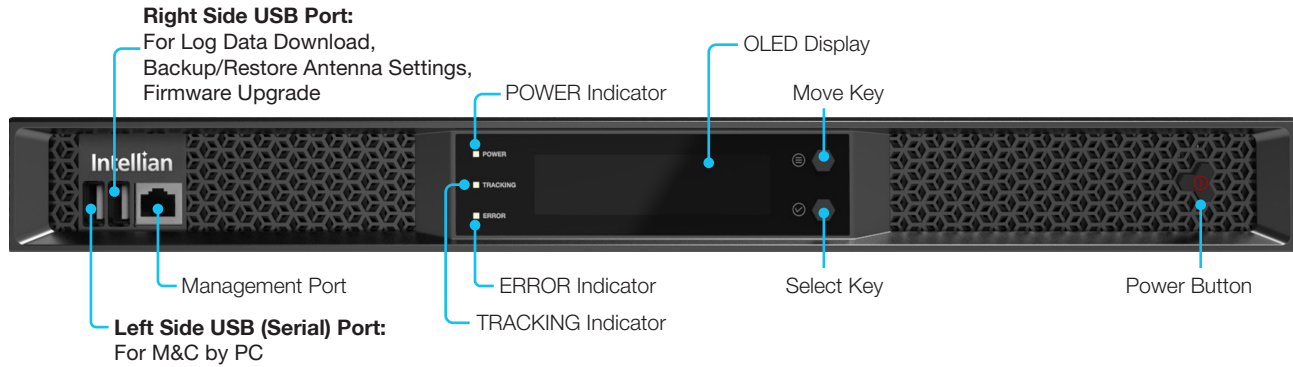


Figure 34: ACU Front Panel View

The following table shows the function of each touch key.

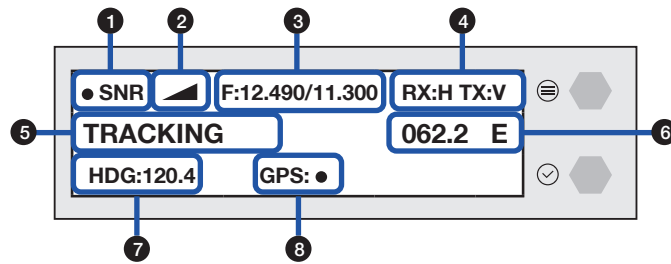
Touch key	Function
Power Button	Powers on/off the ACU.
Move Key	Moves to the desired screen.
Select Key	Selects the desired screen.

The following table shows status indicators on the ACU.

LED Display	Color	Description
POWER	Steady Green	The ACU is powered on.
	Off	The ACU is powered off.
ERROR	Steady Red	The antenna is in error.
TRACKING	Steady Green	The antenna is in tracking mode.

8.2 ACU Display Menu

The following figure shows the ACU display menu.

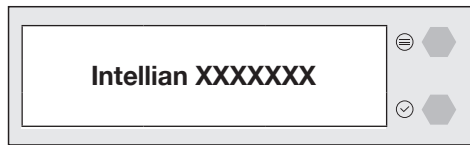


The following table shows the function of each touch key.

No.	Item	Description
①	Satellite Lock	Displays the satellite lock status.
②	Signal Level	Displays the antenna signal level.
③	Frequency Information (Target/LNB Local)	Displays the frequency information (Target, LNB Local).
④	Polarization	Displays the Rx, Tx polarization (L: LHCP, R: RHCP).
⑤	Antenna Status	Displays the antenna status (TRACKING, SEARCH 1, SEARCH 3, BEAM S/W, BLOCKING).
⑥	Target Satellite	Displays the target satellite (E: East, W: West).
⑦	Heading Information	Displays heading information (e.g. gyrocompass).
⑧	GPS Lock	Displays the GPS lock status.

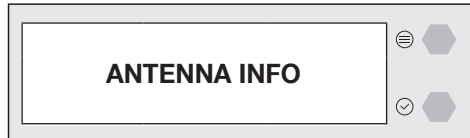
8.3 Startup

With the system is installed and power is applied, the ACU display will show the following sequence.

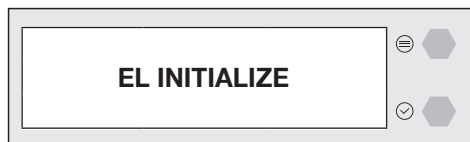


✓ Startup

Intellian's model name is displayed.



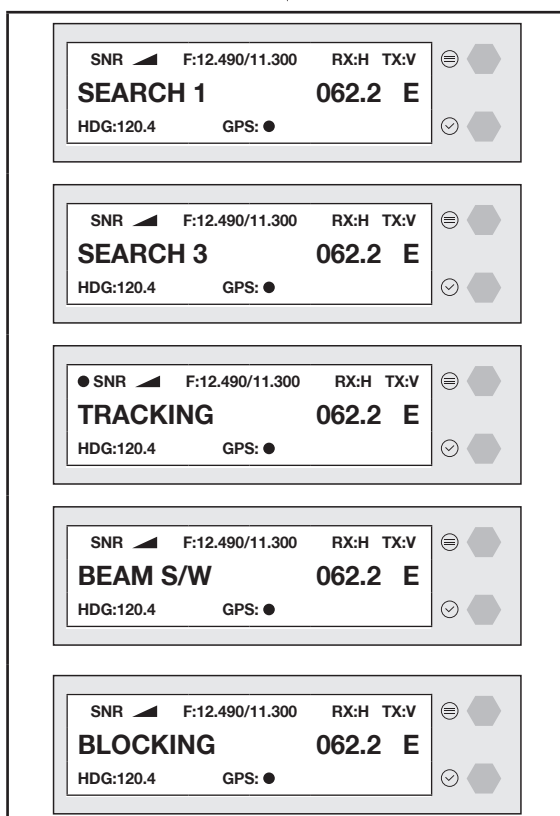
✓ Initialize Antenna Information



✓ Initialize Elevation Angle



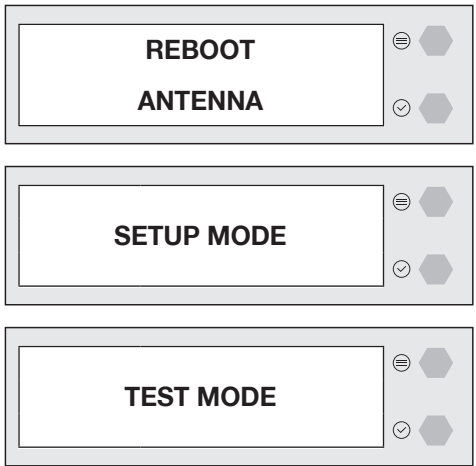
✓ Initialize Azimuth Angle



✓ Antenna's Status

Search 1 (Global Search), Search 3 (Local Search), Tracking, Beam Switching, Blocking

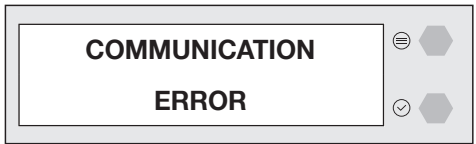
When the antenna is controlled by AptusNX, the ACU displays the control mode status.



✓ **Control Mode Status**

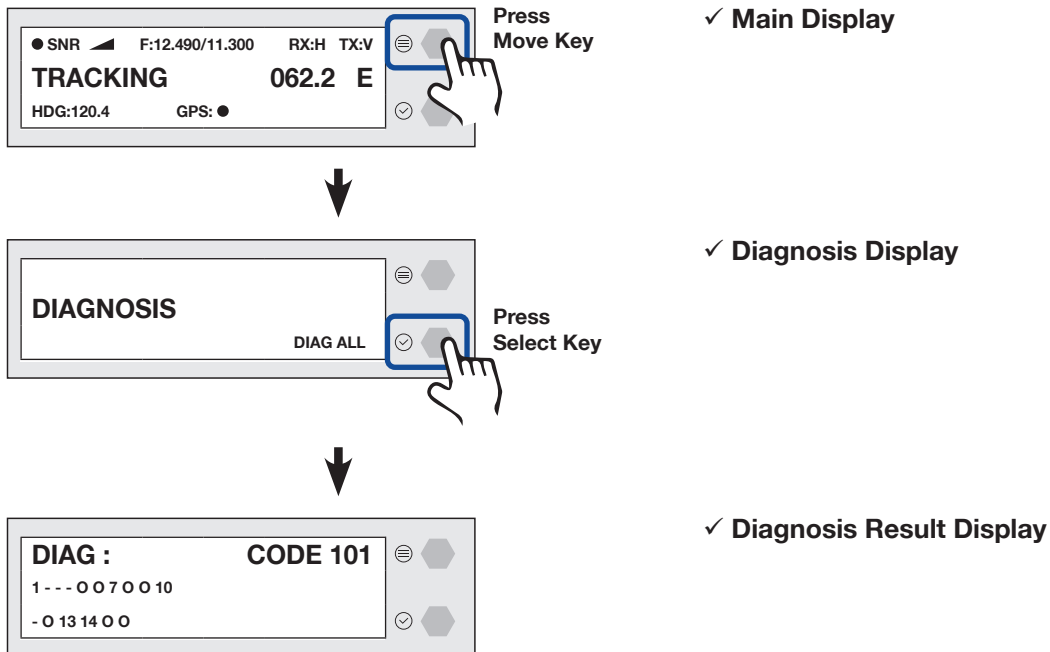
Reboot Mode, Setup Mode, Test Mode

If the antenna does not communicate with ACU, the **COMMUNICATION ERROR** is displayed.

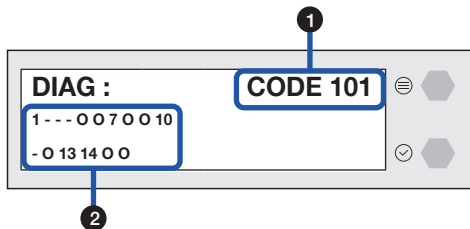


8.4 Diagnosis

Executes antenna Diagnosis test and shows the real-time diagnosis result.



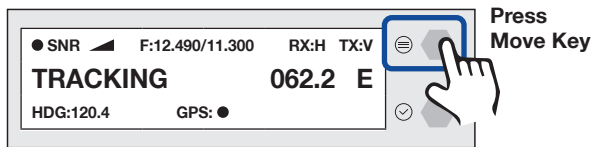
Refer to the diagnosis codes for the test results.



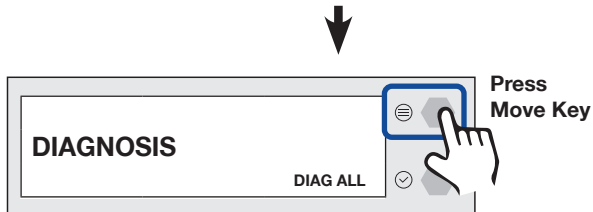
No.	Item	Description																																	
①	Diagnosis Code	Displays the diagnosis code.																																	
		Code	Test	101	The data communication between the antenna and the ACU is tested.	102	The azimuth axis is tested.	103	The elevation axis is tested.	104	The cross-level axis is tested.	105	Not Available	106	Not Available	107	The rate sensor is tested.	108	Not Available	109	Not Available	110	The LNB / NBD is tested.	111	The LNB pol motor is tested.	112	Not Available	113	The antenna power is tested.	114	The ACU power is tested.	115	Not Available	116	The home sensor is tested.
		Code	Test																																
		101	The data communication between the antenna and the ACU is tested.																																
		102	The azimuth axis is tested.																																
		103	The elevation axis is tested.																																
		104	The cross-level axis is tested.																																
		105	Not Available																																
		106	Not Available																																
		107	The rate sensor is tested.																																
		108	Not Available																																
		109	Not Available																																
		110	The LNB / NBD is tested.																																
		111	The LNB pol motor is tested.																																
		112	Not Available																																
		113	The antenna power is tested.																																
		114	The ACU power is tested.																																
115	Not Available																																		
116	The home sensor is tested.																																		
②	Diagnosis Result	• An example of diagnosis result: <table><tr><td>1 - - - 0 0 7 0 0 10</td><td>← Diagnosis Result of Code 101~110</td></tr><tr><td>0 13 14 0 0</td><td>← Diagnosis Result of Code 111~116</td></tr></table> - ' - ' : The test was passed. Code 102, 103, 104 and 111 were passed. - Last 1 or 2 digits of diagnosis code : The test was failed. Code 101, 107, 110, 113 and 114 were failed. - ' 0 ' : The test was not performed. Code 105, 106, 108, 109, 112, 115 and 116 were not performed.	1 - - - 0 0 7 0 0 10	← Diagnosis Result of Code 101~110	0 13 14 0 0	← Diagnosis Result of Code 111~116																													
1 - - - 0 0 7 0 0 10	← Diagnosis Result of Code 101~110																																		
0 13 14 0 0	← Diagnosis Result of Code 111~116																																		

8.5 Antenna Information

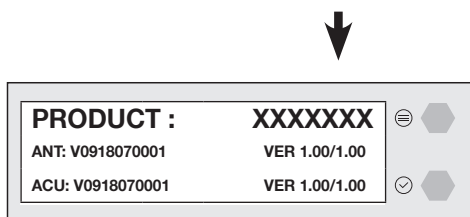
Displays the Antenna/ACU serial number, PCU/STAB/ACU/i-ARM Version of the product.



✓ **Main Display**



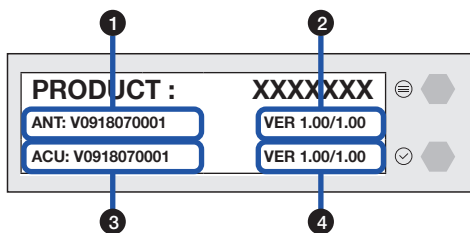
✓ **Diagnosis Display**



✓ **Antenna Information Display**

Product model name and antenna/ACU serial numbers are displayed.

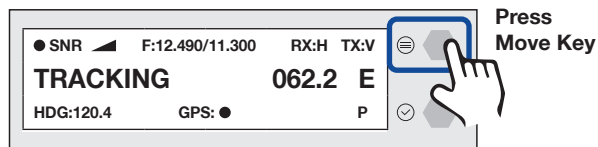
Refer to the Antenna Information display.



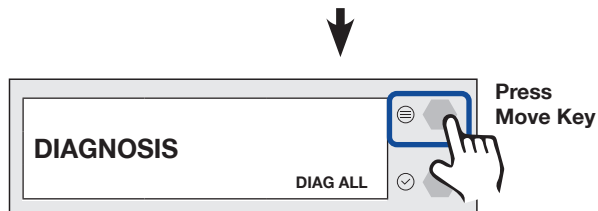
No.	Item	Description
①	Antenna Serial Number	Displays the Antenna serial number. The serial number is displayed depending on the product.
②	PCU Version/ STAB Version	Displays the PCU version / Stabilizer version.
③	ACU Serial Number	Displays the ACU serial number. The serial number is displayed depending on the product.
④	ACU Version/ i-ARM Version	Displays the ACU version / i-ARM version.

8.6 Interface Information

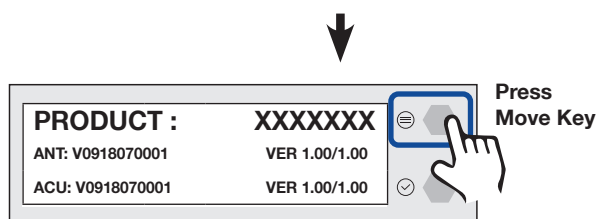
Displays the modem/heading type in use and the network connection status.



✓ Main Display

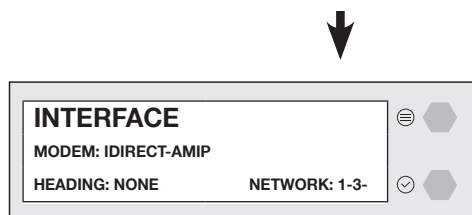


✓ Diagnosis Display



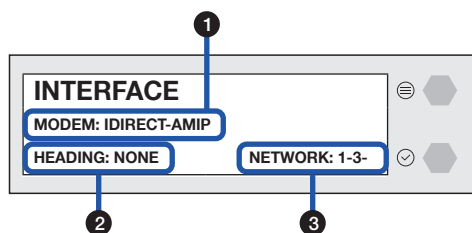
✓ Antenna Information Display

Product model name and antenna/ACU serial numbers are displayed.



✓ Interface Information Display

Refer to the Interface Information.



No.	Item	Description
①	MODEM	Displays the modem type in use. (IDIRECT-AMIP, SATLINK-SERIAL, IDIRECT I/O, SATLINK-VACP, NEWTEC AMIP, COMTECH I/O, ELEKTRIKOM AMIP, USER SETTING, COMTECH ROSS, GILAT-SE-II, HUGHES, IP STAR)
②	HEADING	Displays the heading type in use (NONE, NMEA0183, STATIC, NMEA2000).
③	NETWORK	Displays the network connection status with the ACU. - An example of network result: 1-3- ' - ' : the network is not connected. ' 1~4 ' : the number (1~4) of connected ACU port to network.

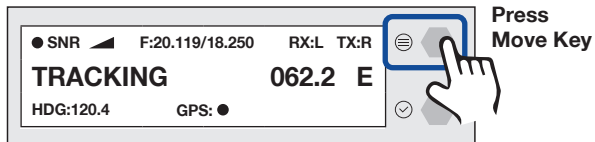
8.7 USB Function

To use this function, a USB Memory Stick must be connected to the USB port (the right side USB port on the front panel of the ACU). The USB Function supports the four menus (Log Download, Firmware Upload, Backup To USB, Restore From USB). For detailed information about each function, refer to the next page.

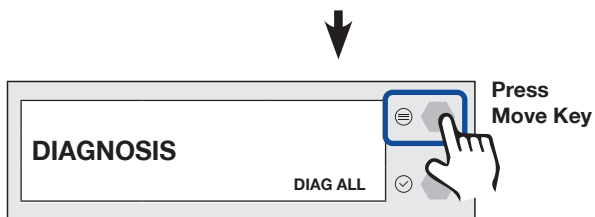


NOTE

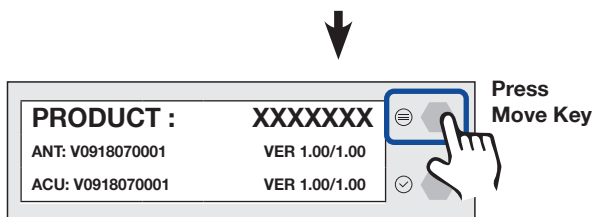
The USB function is activated only when a memory stick is detected on the front panel USB port (right side).



✓ Main Display

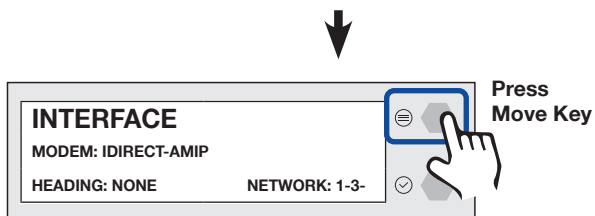


✓ Diagnosis Display

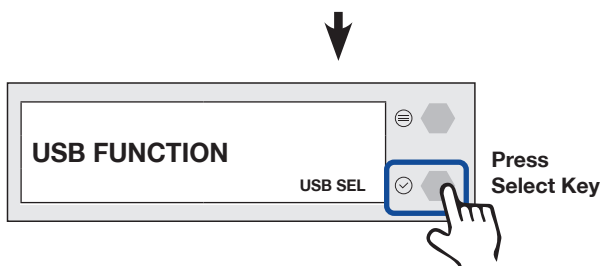


✓ Antenna Information Display

Product model name and antenna/ACU serial numbers are displayed.

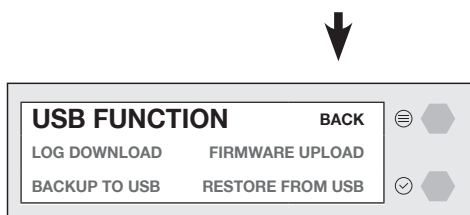


✓ Interface Information Display



✓ USB Function Display

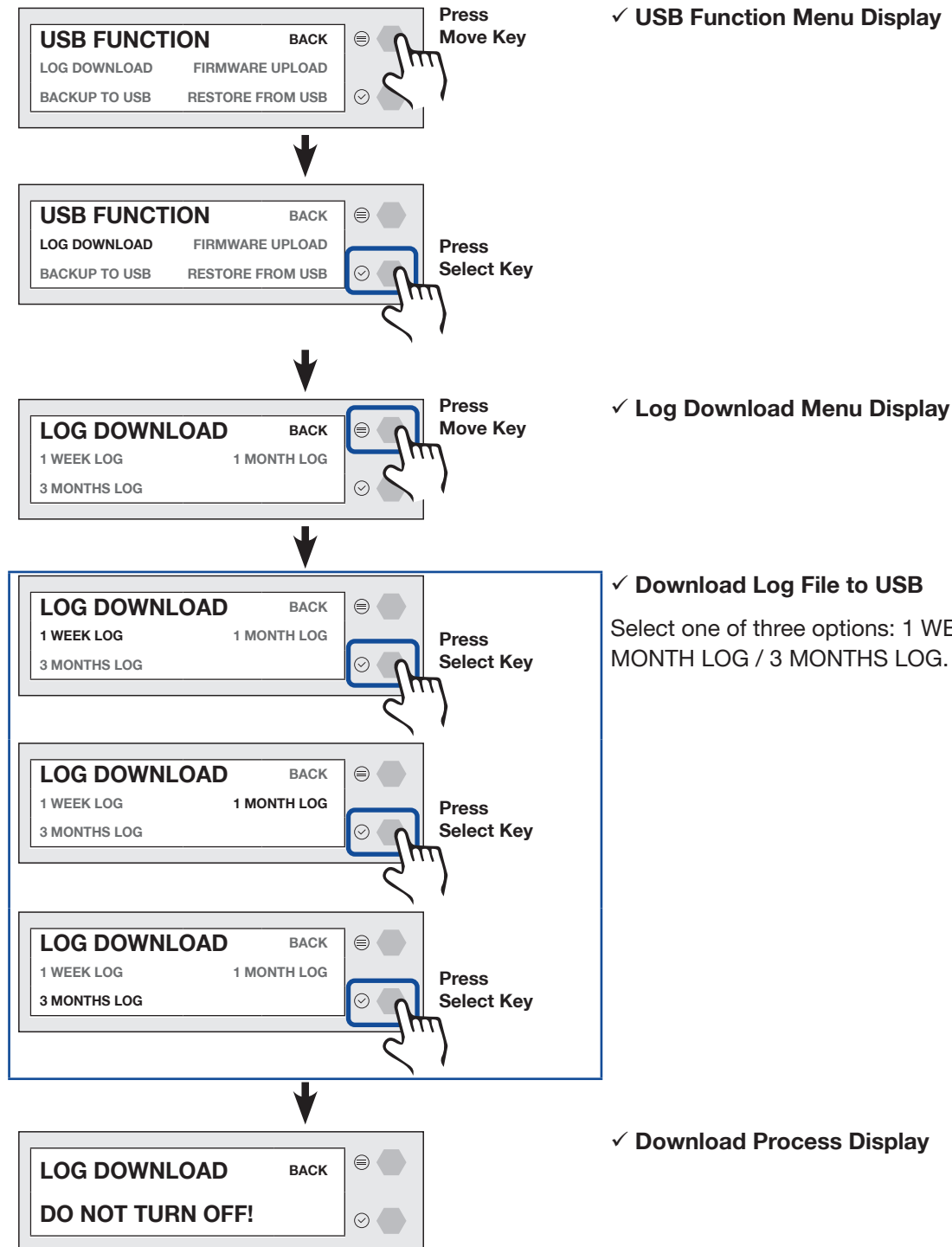
The USB function is activated only when a memory stick is detected on the front panel USB port (right side).



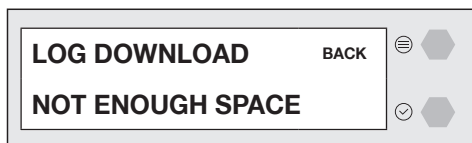
✓ USB Function Menu Display

8.7.1 Log Download

Downloads all data logs to the USB memory stick



If there is not enough free space on the USB drive, **NOT ENOUGH SPACE** message is displayed.

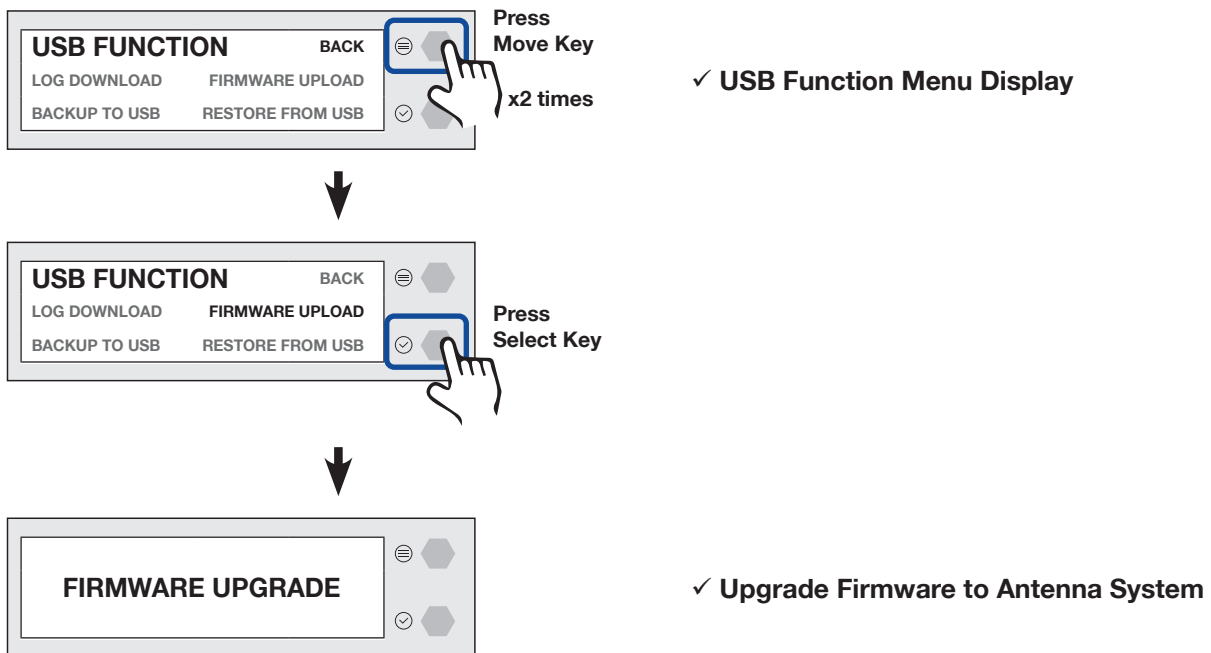
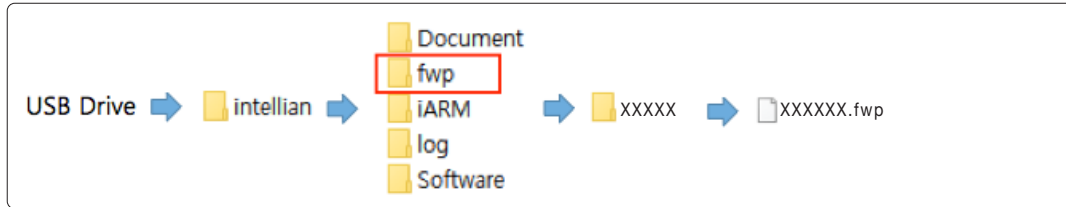


NOTE

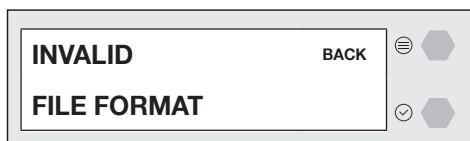
If you want to go back to the previous screen, select the **BACK** option then press the **Select** key.

8.7.2 Firmware Upload

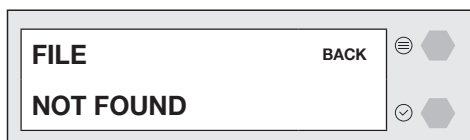
To use Firmware Upload function, you must follow the folder structure guide to configure the folders properly. It supports up to FAT32. The antenna system is upgraded with the FWP file in the designated folder of a USB memory stick.



If the firmware file in USB is in invalid format, **INVALID FILE FORMAT** message is displayed.



If any firmware file is not available on the USB drive, **FILE NOT FOUND** message is displayed.

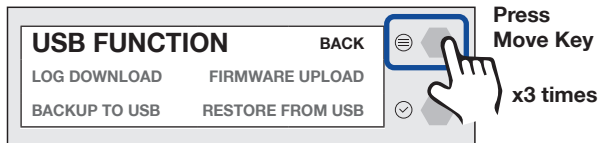


NOTE

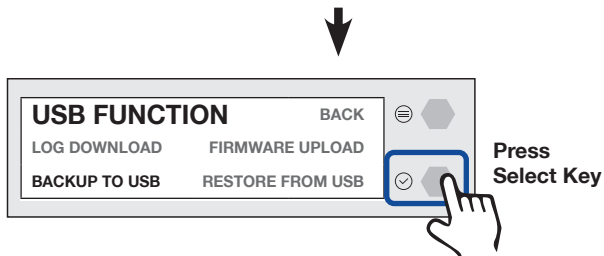
If you want to go back to the previous screen, select the BACK option then press the Select key.

8.7.3 Backup to USB

Backs up the antenna setting files to the USB.

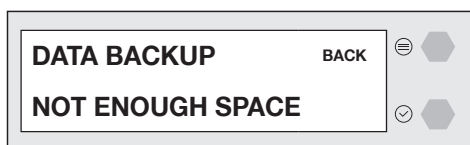


✓ USB Function Menu Display



✓ Back up Antenna Setting files to USB

If there is not enough free space on the USB drive, **NOT ENOUGH SPACE** message is displayed.

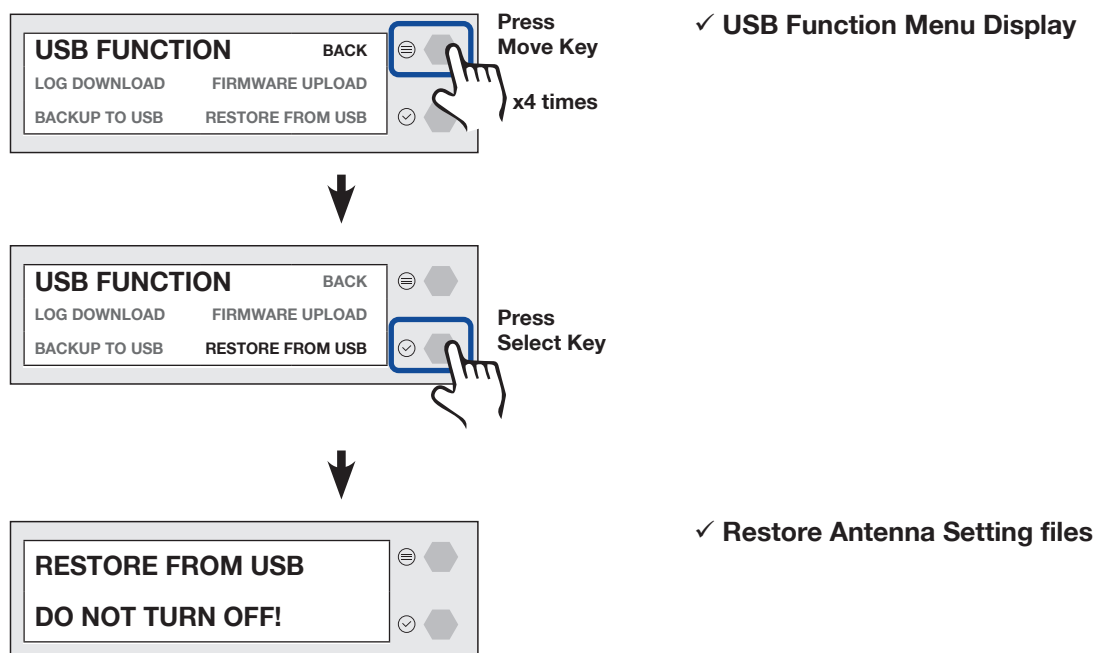


NOTE

If you want to go back to the previous screen, select the **BACK** option then press the **Select** key.

8.7.4 Restore From USB

Restores the antenna setting by using the setting files saved in USB.



NOTE

If you want to go back to the previous screen, select the **BACK** option then press the **Select** key.

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..

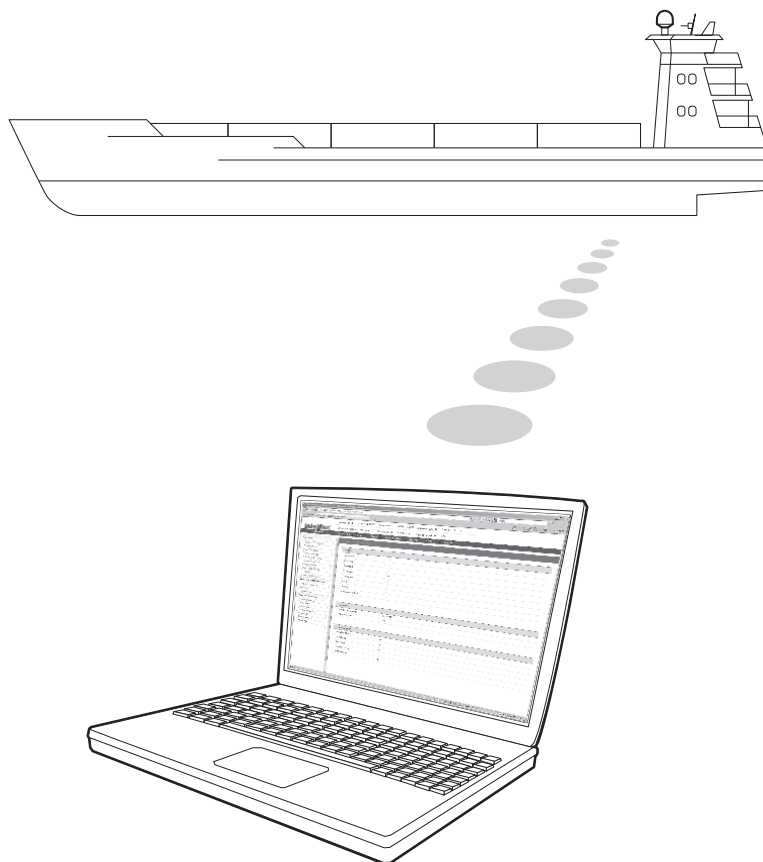
9.2 Accessing AptusNX for ACU

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.

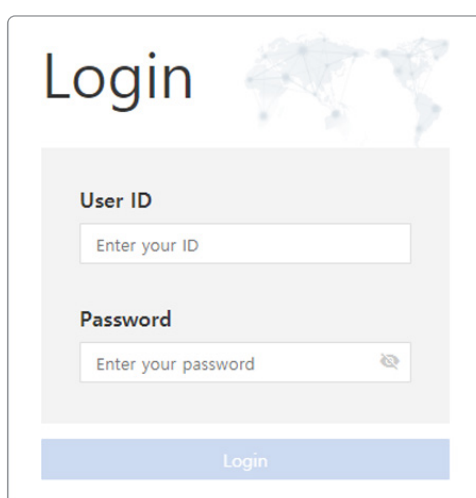


9.3 Main Page (Page Login)

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	<i>intellian</i>	<i>12345678</i>	All menus for monitoring and setting
	<i>captain</i>	<i>12345678</i>	All menus for monitoring and setting Assigns permissions to users
User	<i>guest</i>	<i>guest</i>	Limited menus for monitoring (Dashboard, Tools, Troubleshooting)

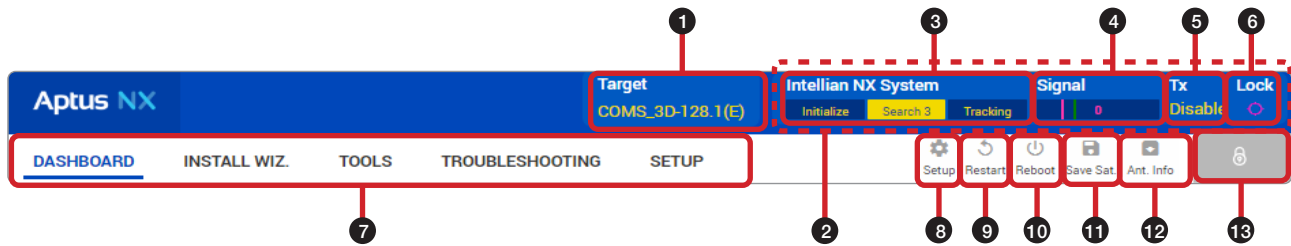


NOTE

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

9.4 Top Menus

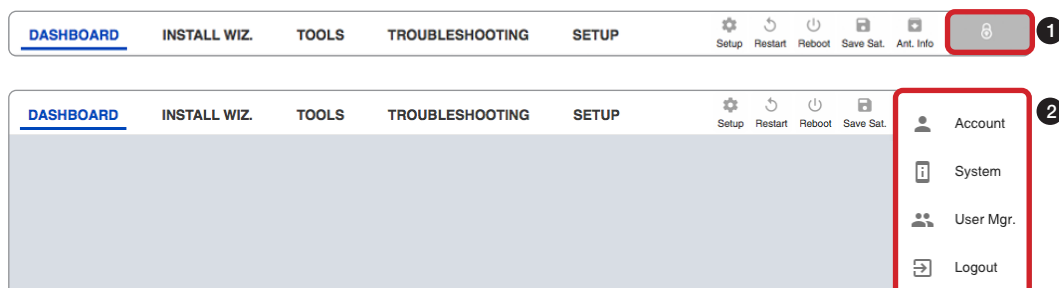
Once you log in, the following information and menus are displayed.



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 in the red dotted box), 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. <table border="1"> <thead> <tr> <th>Main Menu</th><th>Side Menu</th><th>Function</th></tr> </thead> <tbody> <tr> <td rowspan="5">SETUP</td><td rowspan="4">Antenna</td><td>Antenna Angle</td></tr> <tr> <td>Dish Scan Range Check</td></tr> <tr> <td>Sensor Calibration - Tilt Sensor Bias - Rate Sensor Bias </td></tr> <tr> <td>Antenna Mode - Set Idle Mode </td></tr> <tr> <td>Backup & Restore Setting</td><td>Antenna Restore</td></tr> </tbody> </table>	Main Menu	Side Menu	Function	SETUP	Antenna	Antenna Angle	Dish Scan Range Check	Sensor Calibration - Tilt Sensor Bias - Rate Sensor Bias	Antenna Mode Set Idle Mode	Backup & Restore Setting	Antenna Restore
Main Menu	Side Menu	Function											
SETUP	Antenna	Antenna Angle											
		Dish Scan Range Check											
		Sensor Calibration - Tilt Sensor Bias - Rate Sensor Bias											
		Antenna Mode Set Idle Mode											
	Backup & Restore Setting	Antenna Restore											
⑨	Restart	The antenna system exits the Setup mode and switches to the normal mode (Searching/Tracking mode).											
⑩	Reboot	The antenna system powers off and restarts. After system initialization, the antenna switches to normal mode (Searching/Tracking mode).											
⑪	Save Sat.	Saves current satellite settings. Bow offset will be adjusted and saved automatically.											
⑫	Ant. Info	Obtains current antenna information.											
⑬	Account Button	Click the  button to manage the user account. 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 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

Account

Registration ①

System

User Mgr.

Registration

For better customer service, please register your product information and customer information. Thank you.

② Product

Antenna

Serial Number

③ Vessel

Has IMO Number ☐ Yes ☒ No

Ship Name

Type

Owner

④ Service Provider

Service Provider 1

Service Provider 2

Service Provider 3

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. - Has IMO Number: Choose whether you have 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. - 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

Account
Registration
System ①
User Mgr.

System

Print

② Antenna Information

Antenna Size xx cm / xx inch
Antenna Voltage 48.3V
ACU Voltage 23.4V
Temperature 35.1°C
Antenna Product xx-xx-xxxx
ACU Product xx-xxxx
Antenna Serial Number xxxxxxxxxxxx
ACU Serial Number xxxxxxxxxxxx
System Polarization Circular Only
System Band Ka Band

③ S/W Version Information

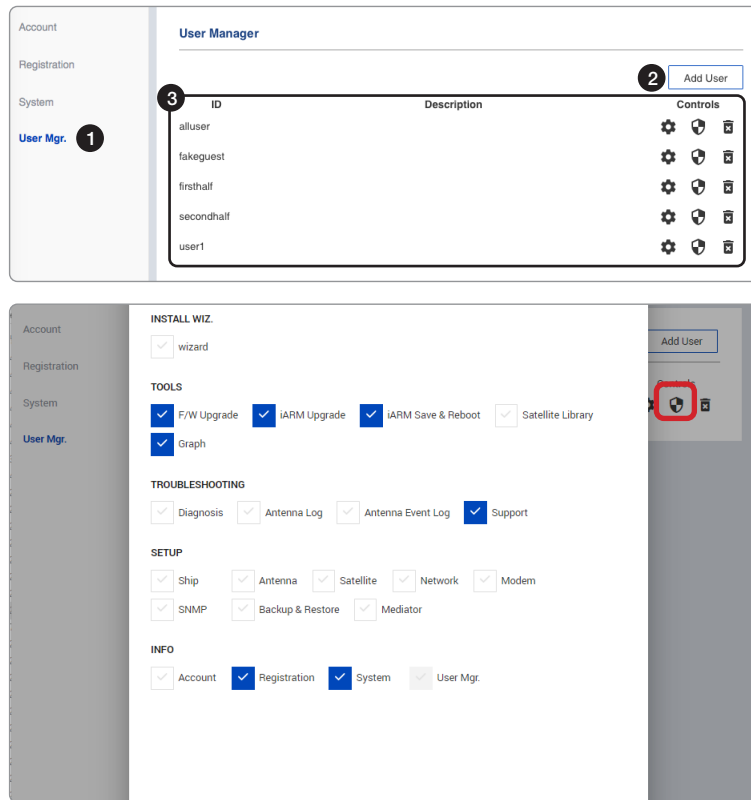
Antenna PCU v1.00
Antenna Stabilizer v1.00
Antenna Stacker v1.00
ACU Main v1.00
ACU Display v1.00
Antenna Destacker v1.00
Lib Ver v1.00

④ Network Information

Control IP 192.168.2.1
Current IP 192.168.2.1
Idle Session Timeout xxxxxx
Date xxxx-xx-xx
Time xxxxxx

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

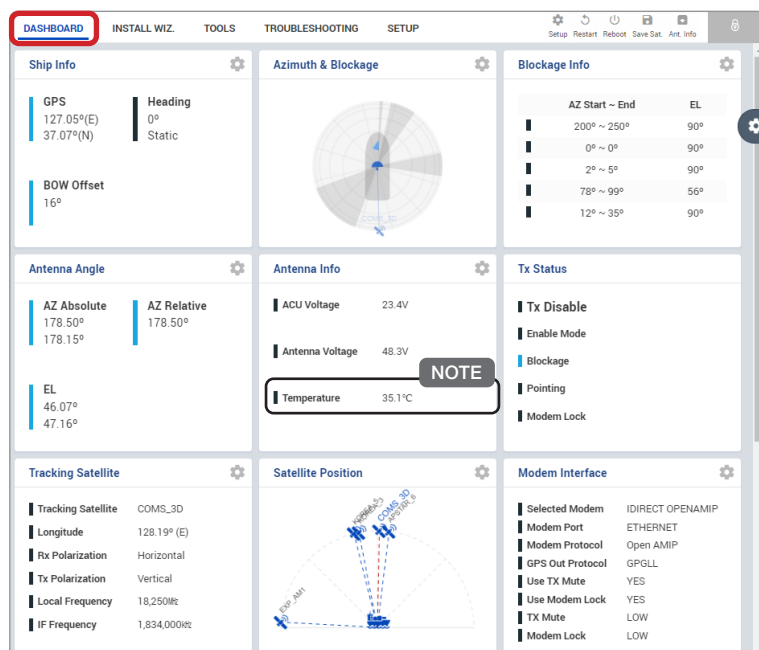


Editable User Permissions Menu

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 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.



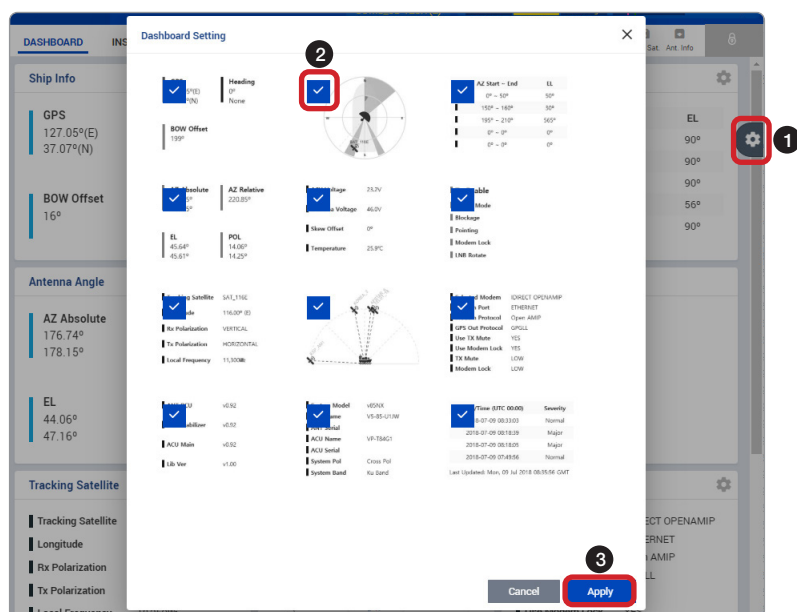
NOTE

The measured temperature can be different from the actual temperature.

9.6.1 How to Add & Remove Panels (Dashboard Setting)

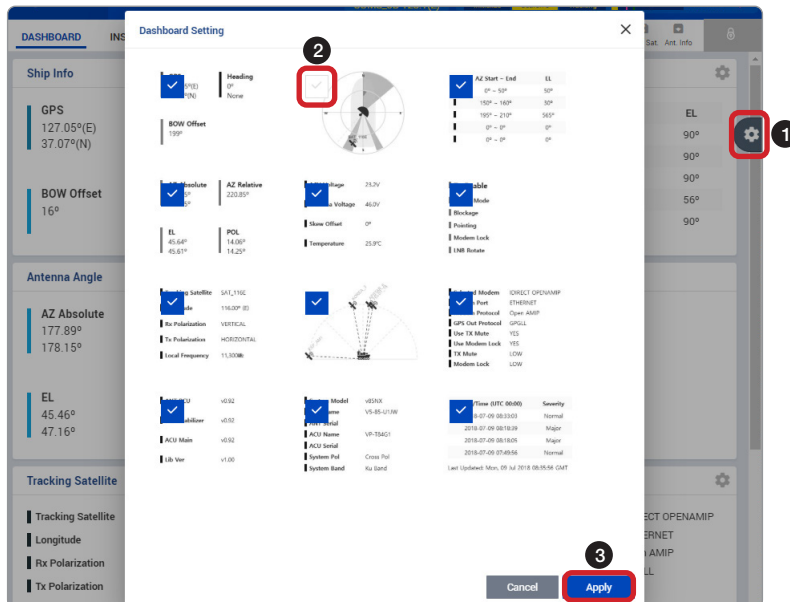
Adding Panels

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

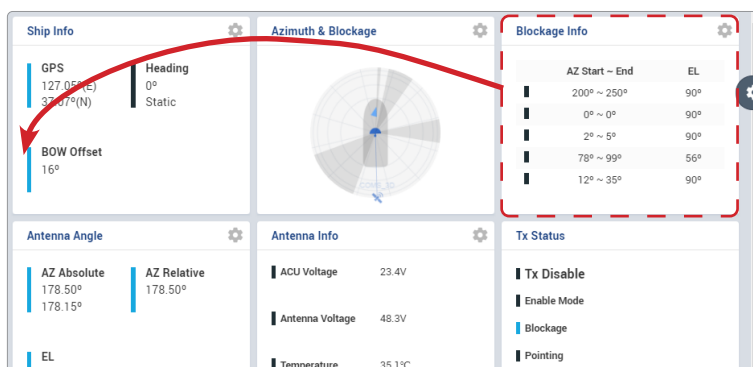
1. On the right side of the page, you will see the gear icon to edit your dashboard. To start editing, click on the gear icon indicated by the red mark.
2. Uncheck the box of the panel that you wish to remove from the dashboard.
3. Click the **Apply** button to apply the settings to the system.



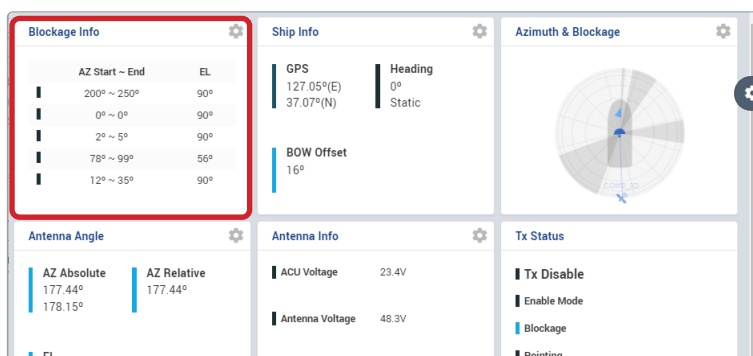
9.6.2 How to Arrange Dashboard Layout

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.



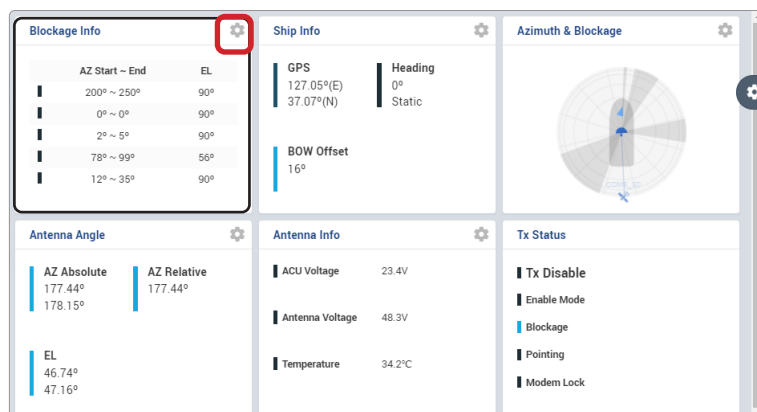
2. This time, the selected panel will be moved to the desired position. You can also move multiple panels into a customized layout in the same manner.



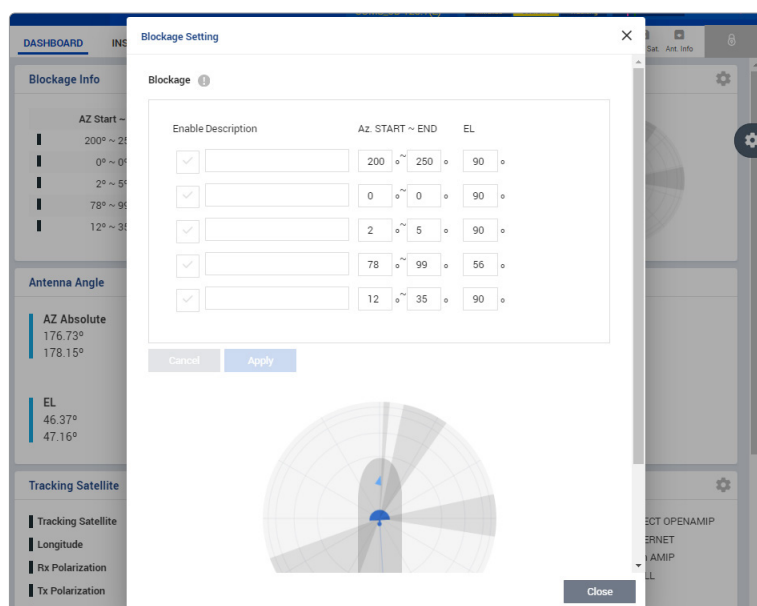
9.6.3 How to Use Shortcut Settings

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.

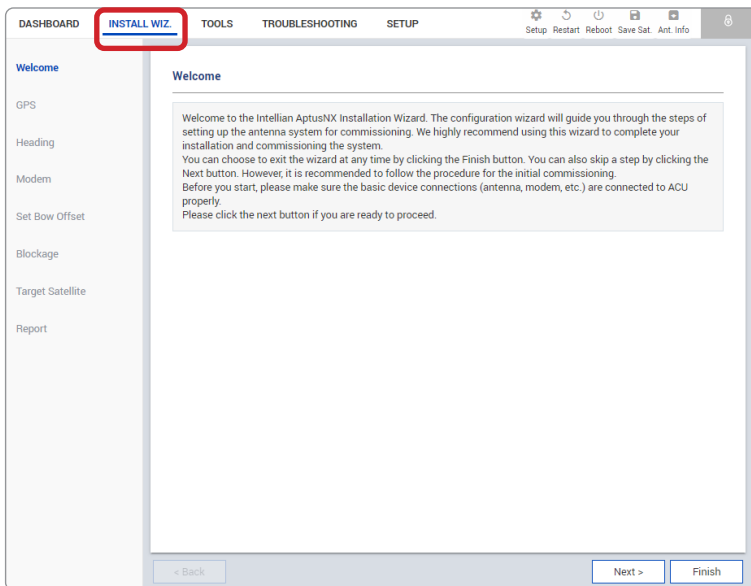


2. The setting page will appear on the individualized web page. You can check the detailed information and quickly apply settings that you wish.



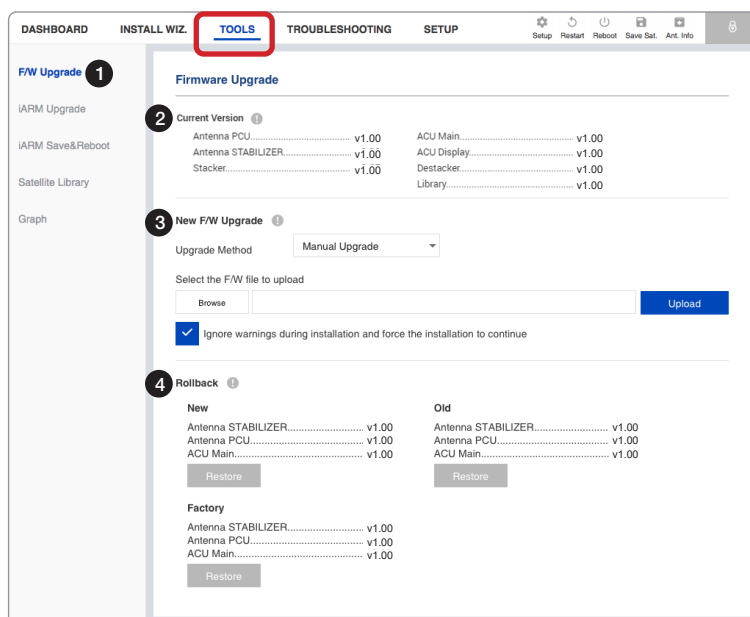
9.7 Install Wizard

The description of this menu is written on the previous page. Refer to the **"7.4 Starting Install Wizard"** on **page 56** for more details.



9.8 System Tools

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



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, Stacker, Destacker, ACU Display)
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: For the Manual Upgrade method, refer to the following "Antenna Firmware Upgrade (Manual Upgrade) Procedures" 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) 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-in.) to iARM module.

New F/W Upgrade ⓘ

Upgrade Method: Manual Upgrade

Select the F/W file to upload

Browse Upload

☒ Ignore warnings during installation and force the installation to continue

**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, then click the **Start Upgrade** button.

APTUS NX

Type	Current Ver.	New Ver.
STAB	כיתת חס ח"ט v1.00	כיתת חס ח"ט v1.01
PCU	מחשבת חס ח"ט v1.00	מחשבת חס ח"ט v1.01
ACU Main	דרי ח"ט v1.00	דרי ח"ט v1.01
STACKER	חסי ח"ט v1.00	חסי ח"ט v1.01
DESTACKER	חסי ח"ט v1.00	חסי ח"ט v1.01
ACU Display	חסי ח"ט v1.00	חסי ח"ט v1.01

☒ Skip the Same F/W Version

Cancel Start Upgrade

3. The upgrade process is displayed on the window.

APTUS NX

Please do not turn off the power during the upgrade.

Type	Current Ver.	New Ver.	Result
STAB	כיתת חס ח"ט v1.00	כיתת חס ח"ט v1.01	Success
PCU	מחשבת חס ח"ט v1.00	מחשבת חס ח"ט v1.01	Success
ACU Main	דרי ח"ט v1.00	דרי ח"ט v1.01	Success
STACKER	חסי ח"ט v1.00	חסי ח"ט v1.01	Skip
DESTACKER	חסי ח"ט v1.00	חסי ח"ט v1.01	51 %
ACU Display	חסי ח"ט v1.00	חסי ח"ט v1.01	Ready

Ok

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

APTUS NX

Please do not turn off the power during the upgrade.

Type	Current Ver.	New Ver.	Result
STAB	v1.00	v1.01	Success
PCU	v1.00	v1.01	Success
ACU Main	v1.00	v1.01	Success
STACKER	v1.00	v1.01	Success
DESTACKER	v1.00	v1.01	Success
ACU Display	v1.00	v1.01	Success

Ok

9.8.1 iARM Upgrade

The screenshot shows the 'iARM Upgrade' window with a sidebar on the left containing links: 'F/W Upgrade', 'iARM Upgrade' (highlighted), 'iARM Save&Reboot', 'Satellite Library', and 'Graph'. The main area is divided into four numbered sections:

- 1 iARM Upgrade**: A sidebar link.
- 2 New iARM Firmware**: A section titled 'Select the F/W file to upload' with a 'Browse' button and a 'Start Upgrade' button. Below it is a checkbox labeled 'Ignore warnings during installation and force the installation to continue.' which is checked.
- 3 Bootstrap/Bootloader**: A section showing version information for 'Bootstrap' and 'Bootloader'. Each has three entries: 'Main' (v1.00), 'Factory Default' (v1.00), and 'Active Bootloader' (Main).
- 4 Kernel/File System**: A section showing version information for 'Sys0', 'Sys1', 'Factory Default', and 'Current Active'. Each has 'Kernel' and 'File System' entries (all v1.00). Below each pair is an 'Activate' button. The 'Sys1' button is highlighted in light blue.

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 firmware version before uploading firmware. NOTE: Refer to the following "7.4 Starting Install Wizard" on page 56 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 "9.8.2 iARM Save & Reboot" on page 88 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 the **Start Update** button to update the iARM firmware. Wait until the page is loaded.

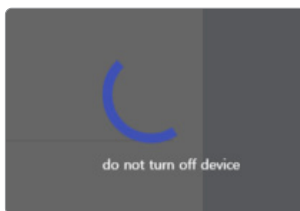
**NOTE**

When selecting the box "Ignore warnings during installation and force the installation to continue" before performing the upgrade, the warning messages do not appear during the upgrade.

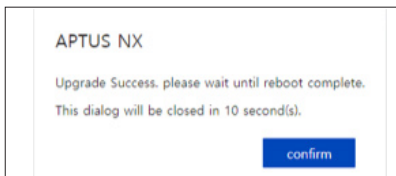
2. Once the update starts, the update process will be displayed on the screen. It will take about two minutes to complete the firmware upgrade.

**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.

**9.8.2 iARM Save & Reboot**

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

9.8.3 Satellite Library

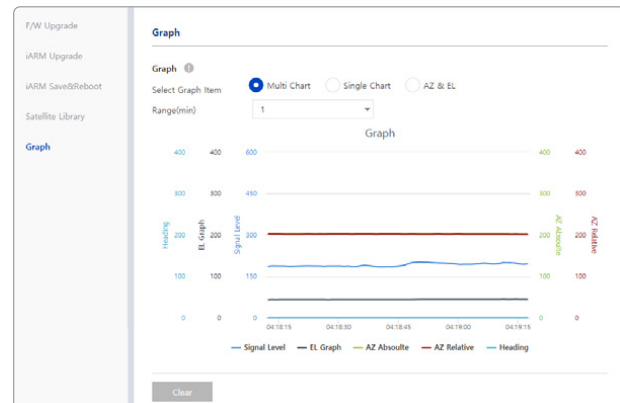
No.	Item	Description
①	Satellite Library	Sets the satellite library information.
②	Satellite List	Reads or manages satellite information from the library. - Get Library from ACU: Obtains satellite library file from the ACU. - Get Library from PC: Obtains the satellite library file from the PC. - Save 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.

No.	Item	Description
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.

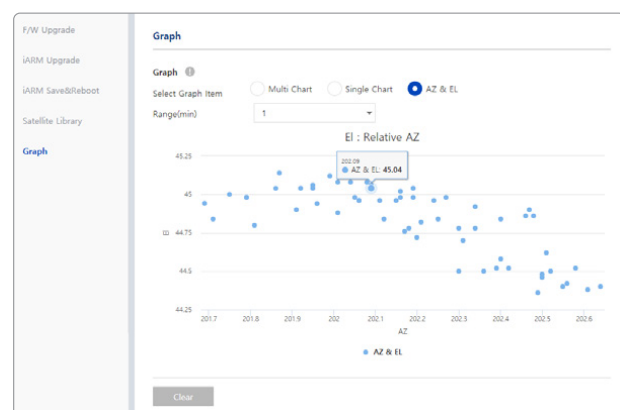
9.8.4 Graph



Single Chart View



Multi Chart View



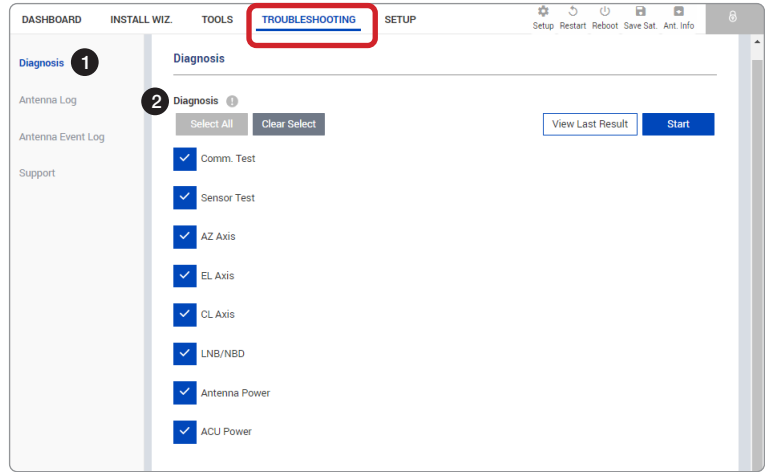
AZ & EL View

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.

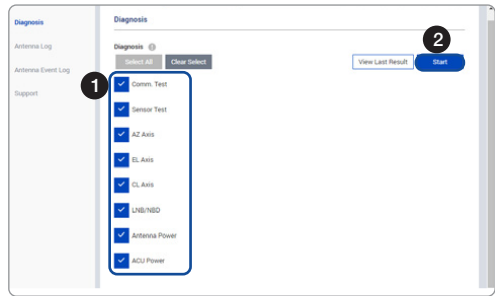
9.9.1 Diagnosis



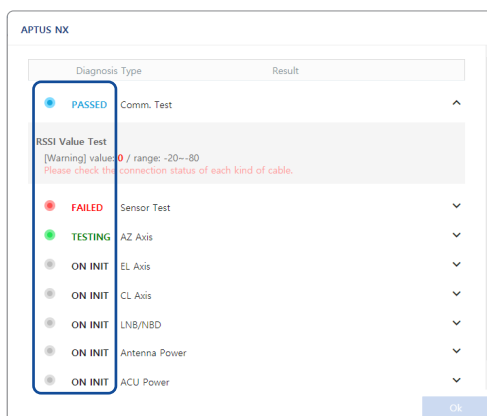
No.	Item	Description
①	Diagnosis	Executes antenna diagnosis test to check the antenna status.
②	Diagnosis	Select the checkbox (full diagnosis test or single diagnosis test) before modifying the settings. • Select All: Select to run a full diagnosis test. • Clear Select: Select to run a single diagnosis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

Diagnosis Procedures:

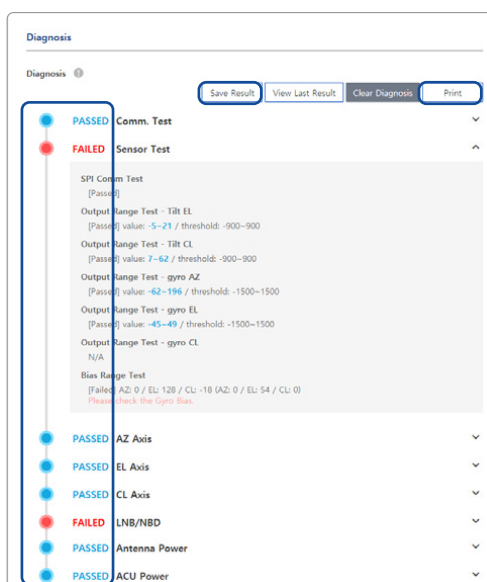
1. Select the checkbox (full diagnosis test or single diagnosis test) before modifying the settings. Click on the **Start** button to run the diagnostic test.



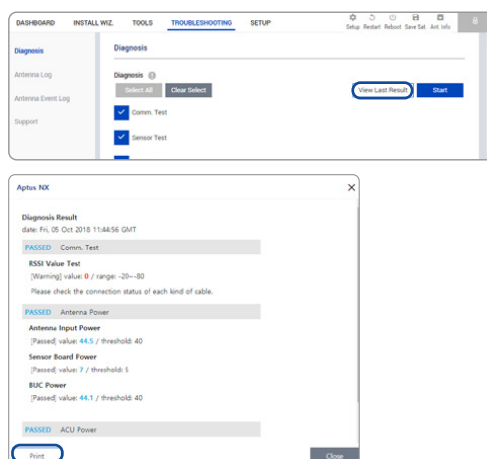
2. Once the diagnosis starts, the page will indicate test status. It should take a few minutes to complete the test.



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.



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

Antenna Log

2 GPS Log Option

Turn On ☐ Off ☒ On

3 Antenna Log Download

Duration

☒ Include Backup/Report File ☒ Compress

[Start Download](#)

4 Antenna F/W Log

Date/Time (UTC 00:00)	STAB	PCU	Main
Wed, 25 Jul 2018 06:16:13	0.94 Success	0.94 Success	0.94 Success

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 logged events of the antenna system filtered by the urgency level, category and time frame of the events.
②	Query Filter	Sets the filter options to show the logged events. - Severity: Choose the urgency level of event to show. - Category: Choose the event category to show. - Time Frame: Choose the time frame of event log to show. - Duration: Set the duration by selecting start and end dates in the calendar. - Tracking Method: Select the sorting method (Descending / Ascending). Click the Query Event Log button to show the logged events under the Event Log.
③	Event Log	Displays the list of logged events filtered by the Query Filter options in the previous step.

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 for frequently asked questions about the product.

9.10 System Setting

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

9.10.1 Ship Setting

The screenshot shows the 'SHIP' configuration page. The top navigation bar includes 'DASHBOARD', 'INSTALL WIZ.', 'TOOLS', 'TROUBLESHOOTING', and 'SETUP' (highlighted). The left sidebar lists 'Ship' (1), 'Antenna', 'Satellite', 'Network', 'Modem', 'SNMP', 'Backup & Restore', and 'Mediator'. The main content area is titled 'Ship' and contains the following sections:

- 2 GPS**: Includes 'Longitude(°)' (127.05), 'Latitude(°)' (37.07), and direction dropdowns (EAST, NORTH). Buttons: Cancel, Apply.
- 3 Heading Device**: Includes 'Current Device' (NMEA 2000) and 'Heading(°)' (185.1). Buttons: Cancel, Apply.
- 4 BOW Offset**: Includes 'Current Bow Offset(°)' (0). Buttons: Cancel, Apply.
- 5 Blockage**: Includes a table for 'Enable Description', 'Az. START ~ END', and 'EL'. Buttons: Cancel, Apply.

At the bottom is a radar diagram showing a ship's heading and blockage zones.

No.	Item	Description
①	Ship	Sets the ship information and block zone.
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. Confirm 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(°): Sets Longitude information (East / West). - Latitude(°): Sets Latitude information (North / South). Click the Apply button to apply the settings to the system.

No.	Item	Description
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, NMEA 2000, Static). • Baud Rate: Select the band rate (4800, 9600, 19200, 38400). When NMEA is selected on the Current Device list, this item appears. • Sentence: Displays the sentence information. When NMEA is selected on the Current Device list, this item appears. • Heading(°): 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(°): 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

Ship
Antenna 1
Satellite
Network
Modem
SNMP
Backup & Restore
Mediator

Antenna Setting

2
Antenna Angle
Relative Azimuth 125.76°
Absolute Azimuth 310.86° / 294.42°
Elevation 42.33° / -35.85°

3
Tracking / Searching Parameter

Thresholds Setting
Detect Level 40
Tracking Level 20
Tx Enable 50

4
Search Parameter
Wait Time(sec) 5
Search Step(°) 0.5
Azimuth(°) Search1 400 Search2 6 Search3 3
Elevation(°) Search1 8 Search2 6 Search3 4

5
Conical Range
Azimuth 80 80
Elevation 60 60

6
Conical Range Check
Switch Activation Off On

7
Sensor Calibration
El Adjust 2.5

8
Tilt Sensor Bias
Ready
EL -1 1
CL 0.6 1

9
Rate Sensor Bias
Azimuth -89
Elevation 44
Cross-level 158

10
Antenna Mode
Set Idle Mode Reboot

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.

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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.
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(°): 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 you 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.

No.	Item	Description
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.
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	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: Enter the satellite name. • Longitude(°): Enter the satellite orbit position. • Local Frequency (MHz): Select the local frequency. • Rx Polarization: Select the current Rx polarization. • Tx Polarization: Select the current Tx polarization. • Identify: Select the lock setting type (Modem Lock or 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): Set the tracking frequency. • Reserved Parameter (kHz): Set 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: Turn on or off the modem lock function (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 **"9.8.2 iARM Save & Reboot"** on page 88 .

The screenshot shows the 'Network Configuration' setup page. The left sidebar has a 'Network' tab selected, marked with a circled '1'. The main content area is titled 'Network Configuration' and contains several sections, each with a numbered icon:

- 2 Management Interface Configuration:** Includes fields for IP Address (192.168.2.1), Subnet Mask (255.255.255.0), Lease Start Address (192.168.2.2), Lease End Address (192.168.2.30), and Lease Time (min) (180).
- 3 WiFi Access Point Configuration:** Includes a radio button to Enable (selected), fields for SSID (intellian-NX), Channel (6), Authentication Type (Open), Password (masked), Max Stations (10), and a radio button for SSID Broadcast (selected).
- 4 Network Service Configuration:** Includes radio buttons for Telnet Service (Disable selected) and SSH Service (Enable selected), and a field for HTTPS Port (443).
- 5 Sys Log Configuration:** Includes a radio button for Management Server (No selected), fields for Server IP (192.168.1.1) and UDP Port (514), checkboxes for Message Type (Error, Major, Minor, Diagnosis, Periodic, Setting, Special, Notice), and a dropdown for Syslog Target Level (LOG NOTICE).
- 6 Radius Configuration:** Includes a radio button for Client (Disable selected), fields for Server IP (192.168.1.10), Timeout (5), and Server Secret (testing123).

Each section has 'Cancel' and 'Apply' buttons at the bottom.

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: Set the network IP address (Factory default: 192.168.2.1). • Subnet Mask: Set the subnet mask (Factory default: 255.255.255.0). • Lease Start Address: Set the lease IP address start range. • Lease End Address: Set the lease IP address end range. • Lease Time: Set the lease IP address update time. Click the Apply button to apply the settings to the system.

No.	Item	Description
③	Wi-Fi Access Point Configuration	Set up for the Wi-Fi access point function of ACU. • AP: Enable or disable the Access Point (AP) function. • SSID: The SSID is the network name shared among all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 alphanumeric characters, which may be any keyboard character. Make sure this setting is the same for all devices in your wireless network. • Channel: Select an appropriate channel from the list provided to correspond with your network settings. All devices in your wireless network must use the same channel in order to function correctly. Try to avoid conflicts with other wireless networks by choosing a channel where the upper and lower three channels are not in use. • Authentication Type: The module supports an authentication mode that the 802.11 device uses when it authenticates and associates with an access point or IBSS cell. • Password: Set the password for Wi-Fi access point. • Max Stations: Enter the maximum number of stations. • SSID Broadcast: Enable or disable the SSID broadcast function. Click the Apply button to apply the settings to the system.
④	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.
⑤	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.
⑥	Radius Configuration	<i>This menu is used when the network administrator needs to authorize user connections using Radius server.</i> • 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.



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.

APTUS NX

All configuration changes made will be saved in the ACU and effective upon reboot.

☒

Automatically Save&Reboot upon apply.

Cancel

Confirm

9.10.5 Modem Setting

No.	Item	Description
①	Modem Setting	Sets the modem interface.
②	Modem	Sets the interface between the ACU and the satellite modem. • Select Modem: Selects your modem type from the Select Modem drop-down list 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: Selects a proper data communication port for the ACU to interface with the satellite modem. • Modem Protocol: Selects a proper communication protocol for the ACU to interface with the modem. • GPS Out Sentence: Selects the GPS out sentence type. • Use Tx Mute: Select whether you use the Tx Mute function for the modem or not. • Use Modem Lock: Select whether you 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 5 V (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.

No.	Item	Description
③	Modem Port Configuration	This function is available after performing the "9.8.2 iARM Save & Reboot" on page 88. 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.

9.10.6 SNMP Setting

No.	Item	Description
①	SNMP Setting	Sets SNMP configuration.
②	SNMP Agent Configuration	Sets the SNMP configuration. • SNMP V1/V2 Status: Choose the SNMP mode. • V1/V2 Community Name: Enter the SNMP V2 community name. • V3 Authentication Type: Enter the SNMP V3 authentication mode. • V3 Authentication Encoding: Choose the SNMP V3 authentication encoding. • V3 Username: Enter the V3 username of the SNMP Agent. • V3 Password: Set the V3 password of the SNMP agent. The password must be at least eight character long. • V3 Private Encoding: Choose the SNMP V3 private encoding. • V3 Private Password: Set the V3 private password. The password is must be at least eight character long. • TRAP IP/Port: Enter the TRAP IP/Port. • TRAP Parameter: Enter the SNMP trap specific parameter. Click the Apply button to apply the settings to the system. Then, perform the "9.8.2 iARM Save & Reboot" on page 88.

9.10.7 Backup & Restore Setting

The screenshot displays the 'SETUP' interface of AptusNX. The sidebar on the left lists various configuration categories, with 'Modem' highlighted. The main panel shows two configuration sections. The 'Modem Setting' section (labeled 2) contains dropdown menus for 'Select Modem' (IDIRECT OPENAMIP), 'Modem Port' (ETHERNET), 'Modem Protocol' (Open AMIP), and 'GPS Out Sentence' (GLL). It also features radio buttons for 'Use Tx Mute' (YES) and 'Use Modem Lock' (YES). The 'Modem Port Configuration' section (labeled 3) includes input fields for IP Address (ACU), Subnet Mask, Gateway, and DNS, along with radio buttons for 'NAT Routing' (Enable) and input fields for 'TCP Modem Protocol Port' (4001) and 'UDP Modem Protocol Port' (49184). A callout box (labeled 2) provides a detailed view of the 'Modem Setting' fields, showing the 'Select Modem' dropdown set to 'USER SETTING', 'Modem Port' set to 'RS 232', 'Modem Protocol' set to 'IO Console', 'GPS Out Sentence' set to 'GLL', 'Use Tx Mute' set to 'YES', 'Use Modem Lock' set to 'YES', 'Tx Mute' set to 'HIGH', and 'Modem Lock' set to 'LOW'.

No.	Item	Description
①	Backup & Restore Setting	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. Then, the iARM will automatically reboot.

9.10.8 Mediator Setting for Dual Antenna System (Optional)

This function is available when using the Dual Antenna System.

Refer to "12.2 Appendix B. Starting Dual Antenna System (Optional)" on page 114 for more detail.

The screenshot shows the 'Mediator Setting' window for the Primary Antenna. The 'Mediator' tab is selected. The 'Use Mediator' dropdown is set to 'Yes'. The 'Antenna Active' section has 'Auto' selected. The 'Antenna Description' section shows 'Primary' as 'NX_MasterDash' and 'Secondary' as 'NX_Slave'. The 'Switching Threshold' section shows 'Signal Level' as 30 and 'Switching Time(sec)' as 5. The 'Role' section has 'Primary' selected. The 'Network to connect secondary antenna' section shows fields for 'Primary Server IP' (192.168.205.1), 'Primary Server PORT' (50205), 'IP' (192.168.205.1), and 'Netmask' (255.255.255.0).

Figure 35: Mediator Setting for Primary Antenna

The screenshot shows the 'Mediator Setting' window for the Secondary Antenna. The 'Antenna Description' section shows 'Primary' as 'NX_Slave'. The 'Role' section has 'Secondary' selected. The 'Switching Threshold' section shows 'Signal Level' as 30 and 'Switching Time(sec)' as 5. The 'Network to connect secondary antenna' section shows fields for 'Primary Server IP' (192.168.205.1), 'Primary Server PORT' (50205), 'IP' (192.168.205.2), and 'Netmask' (255.255.255.0).

Figure 36: Mediator Setting for Secondary Antenna

No.	Item	Description
①	Mediator Setting	Intellian's new ACU has embedded Dual Antenna Mediator function, which can be utilized to switch between two Intellian VSAT antenna systems simultaneously. When one antenna is blocked by obstacles or has sudden service loss, another antenna immediately provides fail-safe operation to maintain the high leveled system performance.
②	Mediator	Enable or disable the dual antenna mediator function. - Yes: Enables the mediator function to use the Dual Antenna System. The submenu is shown for detailed function settings. - No: Disables the mediator function. Click the Apply button to apply the settings to the system. Then, perform the "9.8.2 iARM Save & Reboot" on page 88.
③	Antenna Active	This function is available in the Primary Antenna's APTUSNX when both Primary Role's ACU and Secondary Role's ACU are connected to the system. Sets the method for selecting the active antenna. The active antenna (either primary or secondary antenna) is communicating (Tx/Rx) with a satellite. - Auto: This method is recommended. Automatically switch-over to the primary or secondary antenna which has no blockages and no errors. - Primary: Manually switches-over to the primary antenna which is connected to the modem and the gyrocompass. - Secondary: Manually switches-over to the secondary antenna. Click the Apply button to apply the settings to the system.

No.	Item	Description
④	Antenna Description	This menu is differently shown in the Primary Antenna's AptusNX and the Secondary Antenna's AptusNX. To clearly distinguish the primary antenna and the secondary antenna, enter a description to each antenna. - Primary: Enter the description for the primary antenna in AptusNX (Editable). This menu is not shown for the secondary antenna in AptusNX. - Secondary: Enter the description for the secondary antenna in AptusNX (Editable). This menu is displayed as Read-only for the primary antenna in AptusNX. Click the Apply button to apply the settings to the system. Then, perform the "9.8.2 iARM Save & Reboot" on page 88.
⑤	Switching Threshold	When two antennas are in Tracking mode and have no blockage, the allowable value will apply for the automatic switching. - Signal Level: If the signal level is less than the set value, the active antenna is automatically switched (Default: 30). - Switching Time (sec): If the signal value difference between the active antenna and inactive antenna is more than the set value which is set in the Signal Level menu and the difference is maintained for a set time, the active antenna is automatically switched. Set the switching time value (Default: 5). Click the Apply button to apply the settings to the system. Then, perform the "9.8.2 iARM Save & Reboot" on page 88.
⑥	Role	Assigns the antenna's role of the primary antenna or secondary antenna. - Primary: When running the primary ACU, which is connected to the modem and the gyrocompass, select the primary role. The primary ACU is assigned and operated as the primary antenna, which will communicate with the target satellite. - Secondary: When running the secondary ACU, select the secondary role. The secondary ACU is assigned and operated as the secondary antenna, which will be on standby and ready to assume primary antenna role to provide better service in the event of tracking failure or low signal level status. Click the Apply button to apply the settings to the system. Then, perform the "9.8.2 iARM Save & Reboot" on page 88.
⑦	Network to connect secondary antenna	Sets the primary antenna's network information to transmit to the secondary antenna. - Primary Server IP: Enter the server IP address (Default: 192.168.205.1). - Primary Server PORT: Set the server port number for the primary antenna and the secondary antenna, which must be the same number (Default: 50205). - IP: When the antenna role is primary, enter the same IP address with the Primary Server IP. When the antenna role is secondary, enter a different IP address from the Primary Server IP; however, it must be assigned to the same network class as the primary (Default: 192.168.205.1). - Netmask: The primary and secondary netmasks must be the same (Default: 255.255.255.0). Click the Apply button to apply the settings to the system. Then, perform the "9.8.2 iARM Save & Reboot" on page 88.

**CAUTION**

When using Dual Antenna System, the IP address under the Modem Port Configuration for the Primary ACU and the Secondary ACU must be assigned differently.

Chapter 10. Specification

10.1 Technical Specification

Antenna System		
Antenna Radome Height		1458 mm (57.4 in.)
Antenna Radome Diameter		Ø1379 mm (54.3 in.)
Antenna Reflector Diameter		Ø1050 mm (41.3 in.)
Antenna Unit Weight (With Radome)		110.0 Kg (242.5 lbs)
Platform		3-axis: Azimuth, Elevation, Cross-level
Positioning		3-axis Velocity Mode Servo Control: Azimuth, Elevation, Cross-Level
Azimuth Range		Unlimited
Elevation Range		-20° to +115°
Cross-Level Range		Up to ±37°
Stabilization Accuracy		0.2° peak mispointing @ max ship motion condition
Motor Brake System		Dynamic braking
Ship's Motion	Roll	±25° at 6 second
	Pitch	±15° at 6 second
	Yaw	±8° at 6 second
	Turning Rate	Up to 12°/sec & 5°/sec ²
Rx	Frequency	17.7 GHz ~ 20.2 GHz Ka-Band
	Gain	44.3 dBi @ 19.0GHz (Excl. radome)
Tx	Frequency	27.5 GHz ~ 30.0 GHz Ka-Band
	Gain	48.0 dBi @ 29.0GHz (Excl. radome)
Above Deck IFL Termination		1 x 50 Ω N-type female connector Tx, Rx: 10 MHz/50 MHz, 400 MHz, 433 MHz L-band (950 MHz ~ 2150 MHz) DC power to Transceiver & pedestal (and LNB)
G/T over Rx Range at elevation angle > 10 deg.		19.6 dB/K @ 19.0GHz (Incl. radome)
Polarization		Circular Dual Polarization (Rx: RHCP/LHCP, TX: RHCP/LHCP)
Transceiver		4.5W, 9W Transceiver
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 500 W) through a single RF cable
Antenna Control Unit (ACU)		
ACU Size		431 mm x 350 mm x 44.3 mm (16.97 in. x 13.78 in. x 1.74 in.)
ACU Weight		5.2 Kg (11.5 lbs)
Display		256 x 64 Graphic OLED
Key		Two Push Keys
LED Indicator		Three LEDs for Power, Tracking and Error
USB Port		2 ea (front panel), 1 ea (back panel, for Wi-Fi dongle)
Ship's Gyrocompass Interface		NMEA 2000, NMEA 0183 (GYRO)

GPS	NMEA Out
Serial Interface	RS-232C (57600 bps 8, N, 1)
BUC Interface	RS422/Keyline Port (LK0080_ D SUB to RJ45 Cable)
Ethernet port	RJ 45 (4 ea), TCP/IP connection
Input power	100 ~ 240 V AC, 50 ~ 60 Hz, 3 A

10.2 Environmental Specification

Test	Intellian Standard	
Temperature (ADE)	Operational	IEC-60945 (-25 °C to +55 °C, Power On)
	Survival	IEC-60945 (-40 °C to +80 °C, Powered On and a non-functional state)
	Storage	IEC-60945 (-40 °C to +85 °C, Power off)
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)
Wind	56 m/sec (125 mph)	
Humidity	IEC-60068-2-30 Upper test Temp.: +40 °C (-3), Humidity 98 % Lower test Temp.: +15 °C (+3), Humidity 71 % ~ 78 %	
Vibration	Operational	IEC-60945
	Survival	IEC-60721-3-6 Class 6M3 DNV Standard No. 2.4, Class C
Shock	Operational	IEC-60068-2-27 Method Ea 20 g, 7 ms
	Survival (Transient)	IEC-60721-3-6 Class 6M3 type II 30 g, 6 ms
	Survival (Bump)	IEC-60068-2-29 Method Eb 25 g, 6 ms
Salt mist	Saline solution: 5 ±1 % NaCl Storage period: 7 Days (IEC-60945)	
Waterproofing	IPX6 (IEC-60529)	
Solar	IEC 60945-Annex B. Operational +32 °C air temperature with the addition of 670 Watt/m ² solar radiation	

Chapter 11. Warranty

Warranty Policy

Intellian systems are warranted against defects in parts and workmanship, these warranties cover THREE (3) 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, or date of installation which is come sooner. Providing maximum 6 months Warranty additionally if submission of authorized form which is described installation occurs within 6 months from the shipment date.

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

12.2 Appendix B. Starting Dual Antenna System (Optional)

Intellian ACU has the embedded Dual Antenna Mediator function, which can be utilized to switch between two Intellian VSAT antenna systems simultaneously. When one antenna is blocked by obstacles or has suddenly lost service, another antenna will immediately provide a fail-safe operation to maintain the highest levels of system performance and reliability. It ensures always-on broadband service by reducing the out of service time.

12.2.1 Configuration of Dual Antenna System

To use the Dual Antenna System, make sure the antenna system components are properly installed. Refer to the **"6.4.2 Dual Antenna System Configuration (Optional)" on page 40** for more details.

12.2.2 Setting Up Dual Antenna System

To establish the Dual Antenna System communication between the primary and secondary antennas, follow the steps below.

Connecting Ethernet Cable

Connect an Ethernet cable from the Management LAN port on the front of the Primary/Secondary ACU to the LAN port of PC. The connection network is established.

Process to Set Up Dual Antenna System

The following flow chart shows the process of establishing the Dual Antenna System.

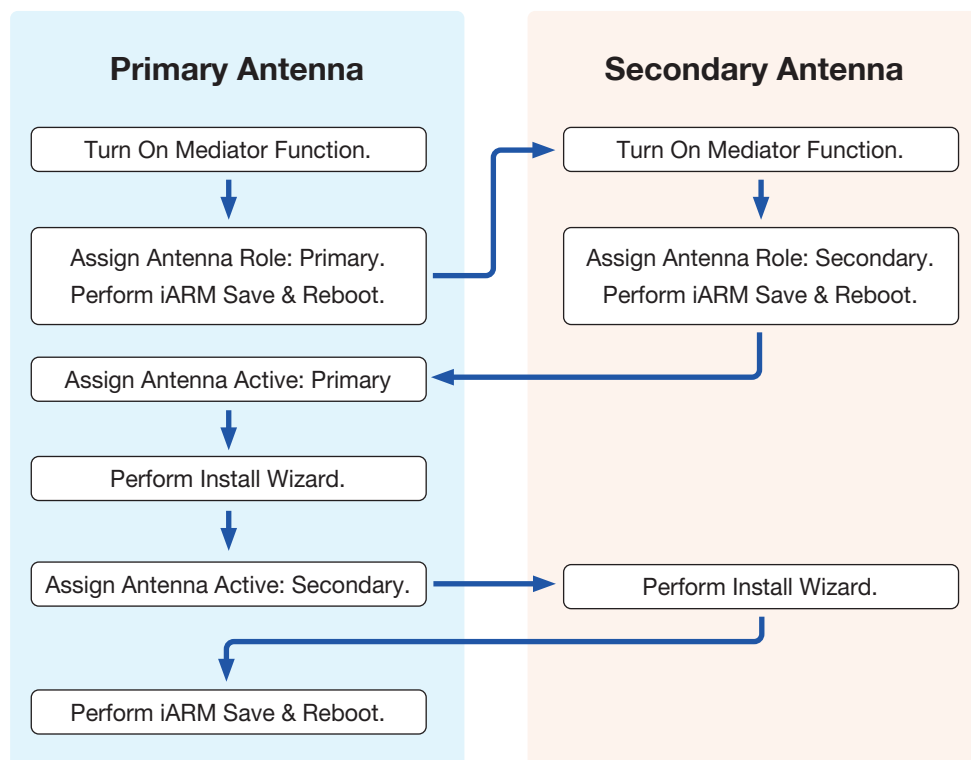
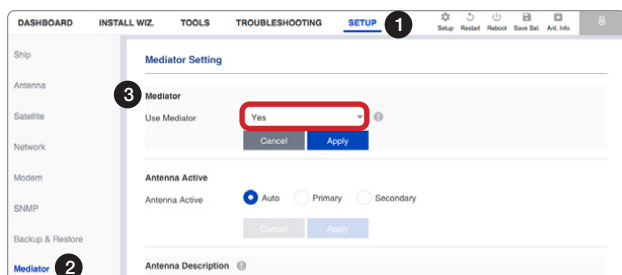


Figure 37: Flow Chart of Establishing Dual Antenna System

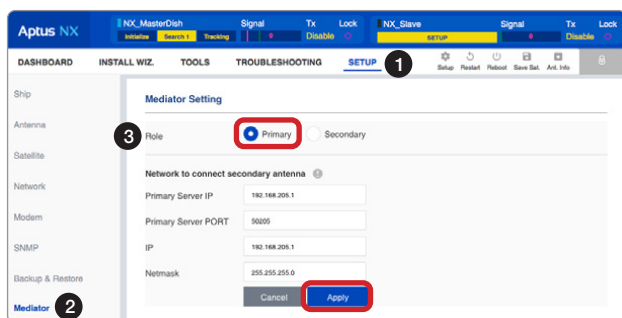
Assigning Antenna Role

Access the AptusNX (IP Address: 192.168.2.1) to manage and control the Dual Antenna System. Go to **SETUP > Mediator > Mediator Setting**. Select the **Yes** for the **Use Mediator** option.



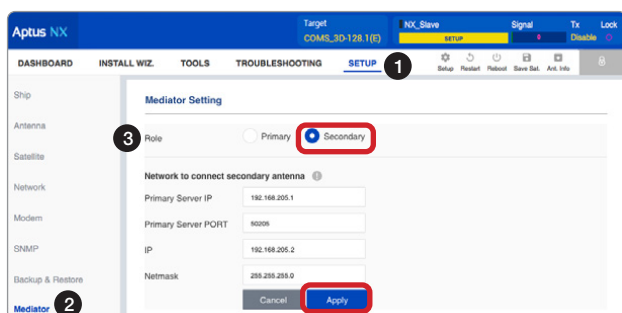
1. Assigning Primary Antenna Role

When connecting the primary ACU, which is connected to the modem and the gyrocompass, select **"Primary"** for the **Role** option. The primary ACU is assigned and operated as the primary antenna, which communicates with the target satellite. Click the **Apply** button to apply the settings to the system. Then perform **"9.8.2 iARM Save & Reboot"** on page 88.



2. Assigning Secondary Antenna Role

When connecting the secondary ACU, select **"Secondary"** for the **Role** option. The secondary ACU is assigned and operated as the secondary antenna, which will be on standby and ready to assume primary antenna role to provide better service in the event of tracking failure or low signal level status. Click the **Apply** button to apply the settings to the system. Then perform **"9.8.2 iARM Save & Reboot"** on page 88.



12.2.3 Performing Install Wizard

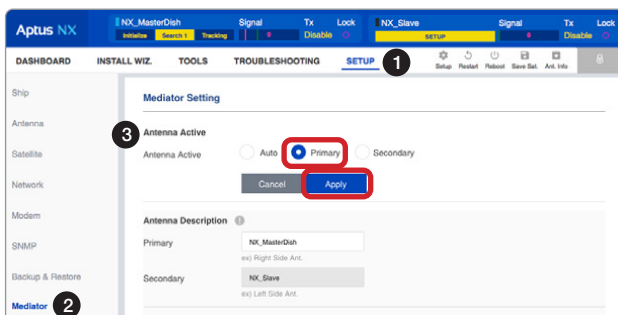
To control and manage both of the primary and secondary antenna systems, access the AptusNX with the Primary Antenna. Before starting the Dual Antenna System, perform the Install Wizard of the primary and secondary antenna system.

Performing Install Wizard for Primary Antenna System

To perform the Install Wizard of the primary antenna system, follow the steps below.

1. Assigning Active Antenna

Select "**Primary**" for the Antenna Active option. Click the **Apply** button to apply the settings to the system.



2. Performing Install Wizard

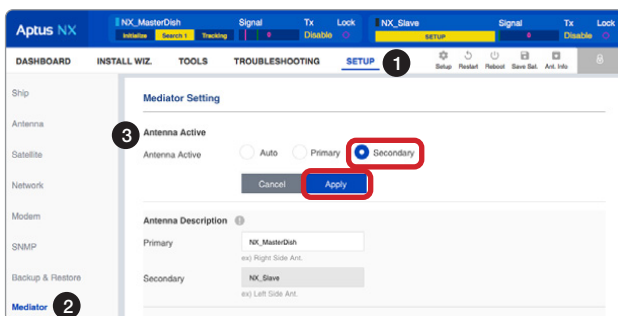
Perform the Install Wizard process. Refer to "**7.4 Starting Install Wizard**" on page 56 for more details.

Performing Install Wizard for Secondary Antenna System

To perform the Install Wizard of the secondary antenna system, follow the steps below.

1. Assigning Active Antenna

Select "**Secondary**" for the Antenna Active option. Click the **Apply** button to apply the settings to the system.



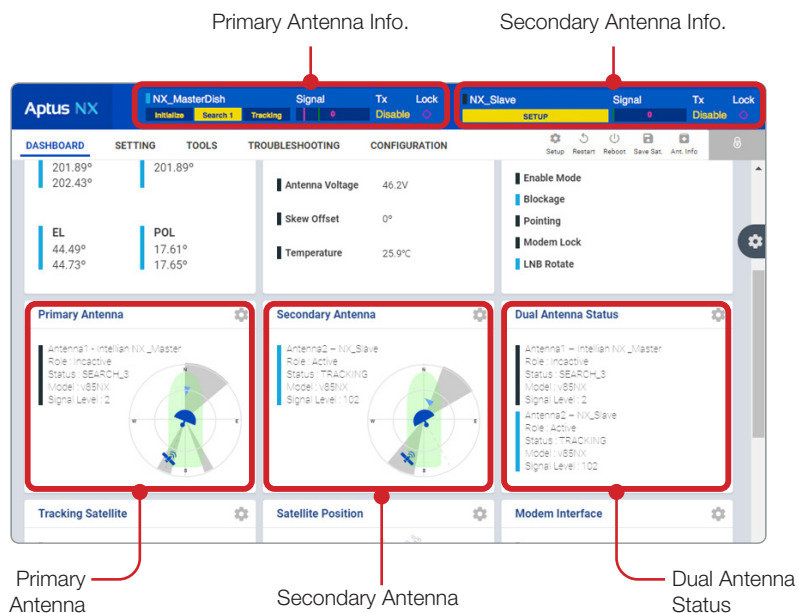
2. Performing Install Wizard

Perform the Install Wizard process. Refer to "**7.4 Starting Install Wizard**" on page 56 for more details.

Then, perform "**9.8.2 iARM Save & Reboot**" on page 88.

12.2.4 Monitoring Dual Antenna System

You can monitor the performance of the Dual Antenna System via AptusNX. The information of the primary and secondary antennas is shown on the Top Menu bar. On the Dashboard, the Dual Antenna Status, Primary Antenna, and Secondary Antenna panels are displayed for the monitoring.



12.3 Appendix C. Important notice of waterproofing connector

12.3.1 Introduction

During antenna installation, it is important to ensure that once the cable is connected to the antenna, proper waterproofing of the connector must be done with a self-amalgamating tape.

If you need any assistance, please contact Intellian Technical Support (support@intelliantech.com).

12.3.2 Outline of taping

Self-amalgamating tape comes with a protective, plastic peel-away layer that allows the tape to be rolled and shipped. To waterproof a connector, you need to begin by peeling away a portion of this protective plastic layer and then start wrapping the tape around it.



12.3.3 Procedure

1. Connect the cable to the connector to be fully secured.

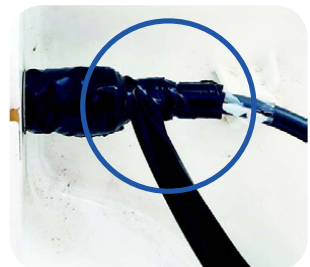


CAUTION

- DO NOT over-tighten the connector, nuts, or screws when mounting the antenna to prevent any damage.
- DO NOT leave any cables loose and non-fixed, especially for those installed outside of the antenna.

2. Apply tape over the connector.

It is important to wrap the cable onto itself and the best practice is to wrap the tape over itself by 50%, meaning that once you wrap your first layer your second layer should overlap over half of the first layer, and so on. This ensures that you get a strong bond between the different layers of tape that properly adhere to one another.



3. Ensure that the entire RF connector is taped up as shown in the picture right.



**WARNING**

- Note that you cannot use ordinary electrical tape to waterproof the RF connector. Only self-amalgamating tape is able to waterproof the connector properly.
- Failure to do so will result in rust and corrosion to the cable and its connector and this might end up damaging the antenna.