



X130D PM

1.25m Ku-Ka Dual-Band
Maritime VSAT Antenna System

Installation & Operation User Guide

Serial number of the product

--

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

Intellian

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Disclaimer

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Chapter 1. Precautions

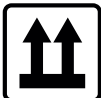
1.1 Warnings, Cautions, and Notes

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 that if not avoided, could result in death or serious injury.
	CAUTION CAUTION indicates a potentially hazardous situation that if not avoided, could result in minor or moderate injury. It may also be used to alert users about 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, OR 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

UK-CA Declaration of Conformity

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709, Korea declare under our sole responsibility that the product(s) described in the below to which this declaration relates is in conformity with the *essential requirements* and *other relevant requirements* according to UK legislation Electrical Equipment (Safety) Regulations 2016 (S.I. 2016/1101).

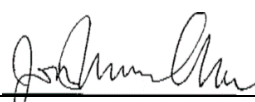
Product Information:

Product Name(s):	Intellian X130D PM
Model Number(s):	VX1-12B-1NXXX

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: James Cha
/ CTO, R&D

Signature: 

Date: January 6, 2022

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Chapter 3. Introduction

3.1 Intellian X130D PM Introduction

Intellian X130D PM is a 1.25 m military-grade, single feed Ku-Ka auto-switchable maritime VSAT. With its compliance to strict military specifications and operation on both Ku- and Ka-band services on multiple orbits, the X130D PM allows limitless choices in the selection of satellite communication. This makes it an ideal solution for use in military applications such as defense and intelligence operations.

The X130D PM's dual-band system design allows automatic band and polarization switching, supporting both Ku- and Ka-band frequency range. The 1.25 m reflector and its radome are optimized and tuned for Ku- and Ka-band, and the antenna mediator and modem mediator are built into its ACU. These capabilities support the GEO, MEO and LEO networks, which can provide economical, high-speed, and low latency Internet access to a wide customer base.

Hence, the 1.25 m dual-band terminal is designed to be deployed for a wide range of maritime and semi-fixed applications, such as on shipping vessels, oil and gas rigs, cruise liners, and military applications.

The X130D PM meets required specifications with its 3-axis stabilized platform and advanced shock-resistant and vibration damping pedestal design, which is fully optimized to withstand demanding maritime conditions, MIL-STD-810H. The EMI harnessed shields and cables of the X130D PM meet MIL-STD-461G, ensures control of electromagnetic interference. This Military grade terminal, guarantees reliable broadband communications during military operations and missions.

3.2 Intellian X130D PM Features

- Compact Ku-Ka dual-band solution with single center feed.
- Center feed antenna design to optimize sweep volume and antenna efficiency.
- Auto-switchable to any commercial Ku- or Ka-band service available.
- Wide Ka-band feed (2.5 GHz bandwidth) covering the MEO constellation available.
- GEO and MEO tracking system (program tracking and conical scanning).
- Simple and easy dual antenna installation support.
- Dual Antenna installation support for NGSO make-before-break HOs.
- Future Proof with NGSO tracking for HEO and LEO services.
- Embedded antenna mediator and modem mediator ACU for flexible operation and blockage mitigation.
- Simultaneous two modem connection available.
- Designed to meet Military electromagnetic and environmental standards.
- **AptusNX** software platform for accurate and comfortable antenna management.

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. To maximize the performance of the system, a thorough review of this installation guide is strongly recommended. In addition, you should execute the installation process as it is noted in this manual.

**CAUTION**

DO NOT OPERATE THE ANTENNA WITHOUT THE RADOME. THIS WILL RESULT IN DAMAGE TO THE ANTENNA AND ABNORMAL OPERATION.

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 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. Minimum distances between the antenna and other onboard devices must also be considered during installation. Install the antenna in accordance with the following procedures to ensure maximum performance.

4.1.1 Minimize Satellite Blockage

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 -15° to $+90^{\circ}$ from the center of the antenna. Obstacles can interrupt the satellite signal transmission and reception of the antenna.

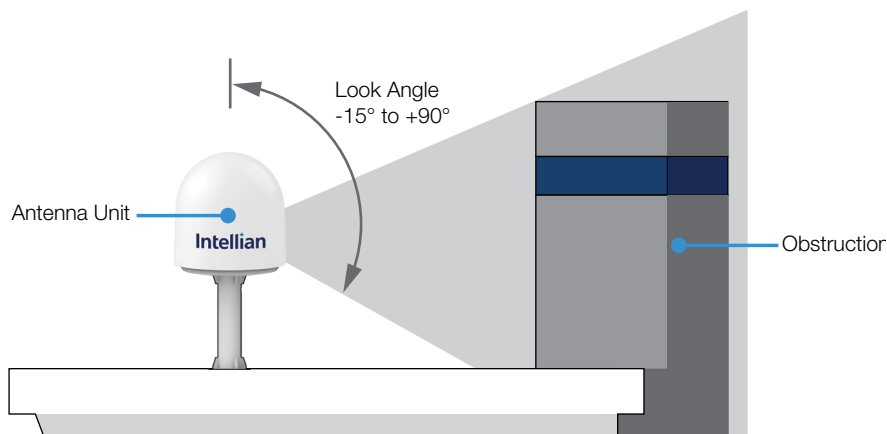


Figure 1: Elevation Limit of Obstacles

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, you should position the antenna at least 15 feet (4.6 m) away from the radar.

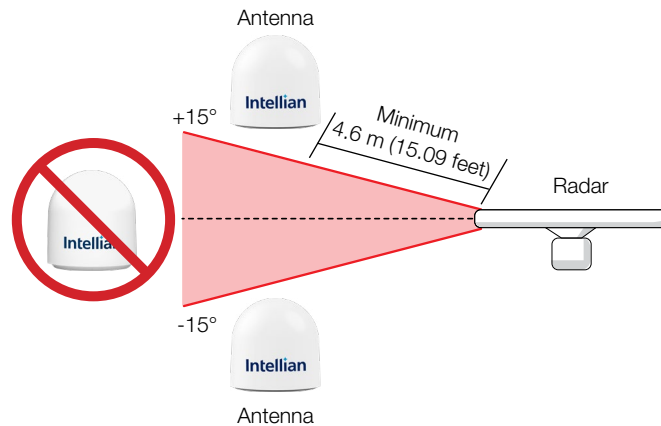


Figure 2: Potential RF Interference



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, make sure to keep the minimum safety distance. The recommended minimum safety distance to the reflector on the focal line is about 136 m (446 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.

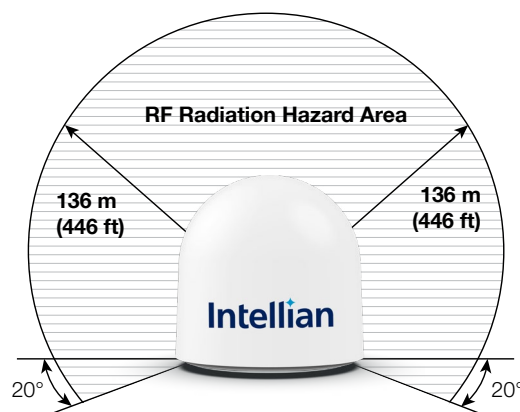


Figure 3: RF Radiation Hazard Area

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.

- Antenna M&C (monitoring and control)
- Connection for dual modems
- Connection for various modem interfaces via Ethernet or console
- Connection for ship's gyrocompass (NMEA 0183 and 2000)
- M&C via Ethernet and Wi-Fi
- Webserver embedded (AptusNX Web application)
- Dual antenna configuration via embedded mediator



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		Antenna Control Unit (ACU)
AC Power Cord (CEE7/7)	1	1.5 m	ACU power cord (220 V)
AC Power Cord (USA)	1	1.5 m	ACU power cord (110 V)
RF Cable_SMA(M) to SMA(M)	6	1.3 m	ACU to modem RX/TX & ACU to ACU
Ethernet Cable (RJ45 / LAN)	2	1 m	To connect ACU to PC network device
Console Cable	2		Modem interface cable - I/O console
AC Input Cable in Power Box	1		To connect AC power to antenna (Testing Purpose)
AC Power Cable (110V Plug_Braided hose)	1		Connector for AC Power Cable inside radome
Adaptor_SMA(F) to F(M)	4		Modem RX and TX
D-Sub 9 Pin Male Connector	2		Modem to ACU
MS-3 (F) Connector	1		Connector for Antenna Power Cable
Hexagon Head Bolt	5	M12 x 80L	Bolt kit for antenna-deck (mast) assembly (1 spare set included)
Flat Washer	5	M12	
Spring Washer	5	M12	
Hexagon Socket Head Cap Bolt	5	M6 x 40L	Bolt kit for radome assembly (1 Spare set included)
Flat Washer	5	M6, Ø18	
Spring Washer	5	M6	
Cable Tie	20	140 mm	For mounting cables
Quick Installation Guide (QIG)	1		Installation guide
RF Hazard Sticker	1		Radiation safety distance (100 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

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, use only 50 Ω coaxial cable types for standard system RF cable 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 (≤ 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	90 m



NOTE

- Optimal tightening torque for N type RF connector: 1.5 N-m
- Maximum RF loss at 2 GHz: 16 dB including connectors
- Max. cable length: IFL flatness guarantee length (IFL flatness $< 2.0\text{dB}@250\text{MHz}$ band)

4.3.2 Gyrocompass Cable (Customer Supplied)

The following general types of gyrocompass cables are recommended for compatible connection to Intellian antennas used in various vessel environments.

Standard	NMEA 2000	NMEA 0183
Connector Type	Micro-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

4.3.3 AC Power Cable (Customer Furnished)

AC Power Cable from Ship's Power (100 ~ 240V AC) to Antenna. Recommended maritime standard power cable for out door installation.

Cable Length	Up to 100 m	Up to 200 m
AWG (American Wire Gauge) Size	12	10
Cable Core Diameter	2.0 mm	2.5 mm
Cable Cross-Sectional Area	3.3 mm ²	5.3 mm ²



NOTE

MS-3 (Female) Connector supplied. Installer should terminate this connector on the end of power cable inside radome. Refer to **"11.2 Terminating the MS 3-pin (F) Connector on AC Power Cable"** on page 99 for detailed description

4.4 Unpacking System Package

The pallet should be lifted by a forklift. To unpack the wooden crate, follow the procedure below or refer to the **Wooden Crate Unpack Guide** attached on the crate.

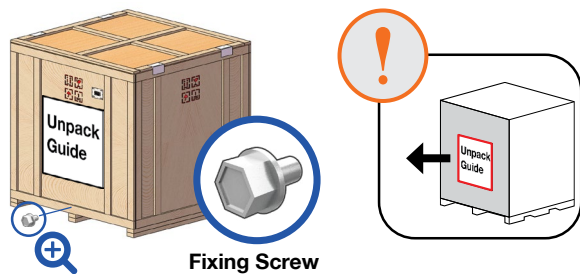
1. Open the side panel with an attached sticker paper (**Wooden Crate Unpack Guide**) by removing the fixing screw (1 ea) and clips (8 ea).



CAUTION

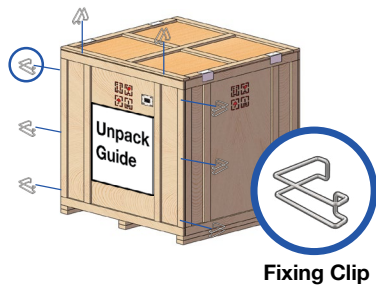
The side with the sticker paper attached must be opened first.

1-1  : 1 ea



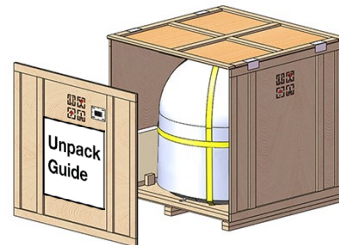
Fixing Screw

1-2  : 8 EA



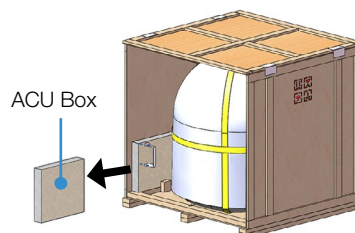
Fixing Clip

1-3



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

2-1



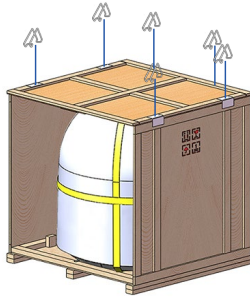
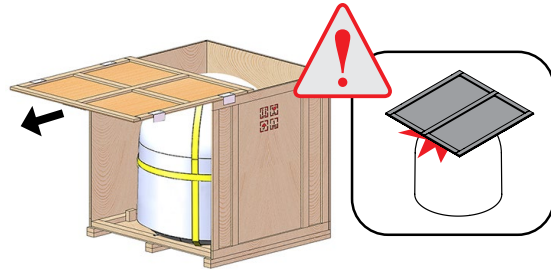
3. Remove the clips (6 ea) on the top panel, and then detach the top panel by carefully pulling it as shown in the figure below.

**WARNING**

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

3-1

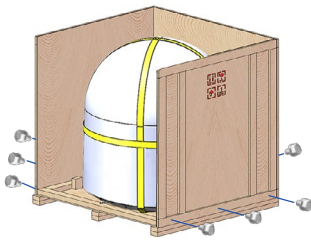
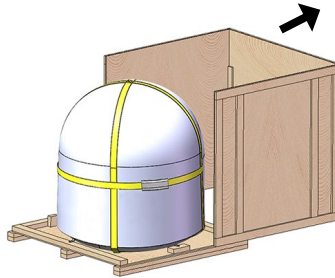
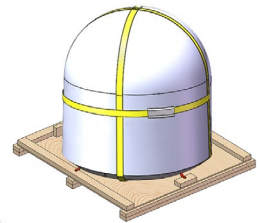
✎ : 6 ea

**3-2**

4. Remove the fixing screws (7 ea) that secure the three side panels, then detach the panels.

4-1

✎ : 7 ea

**4-2****4-3**

Chapter 5. Installing Above Deck Unit (ADU)

5.1 Antenna Dimensions

Before installing the antenna unit, confirm its height and diameter (see figure below). 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.



Figure 7: Antenna Side View



NOTE

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

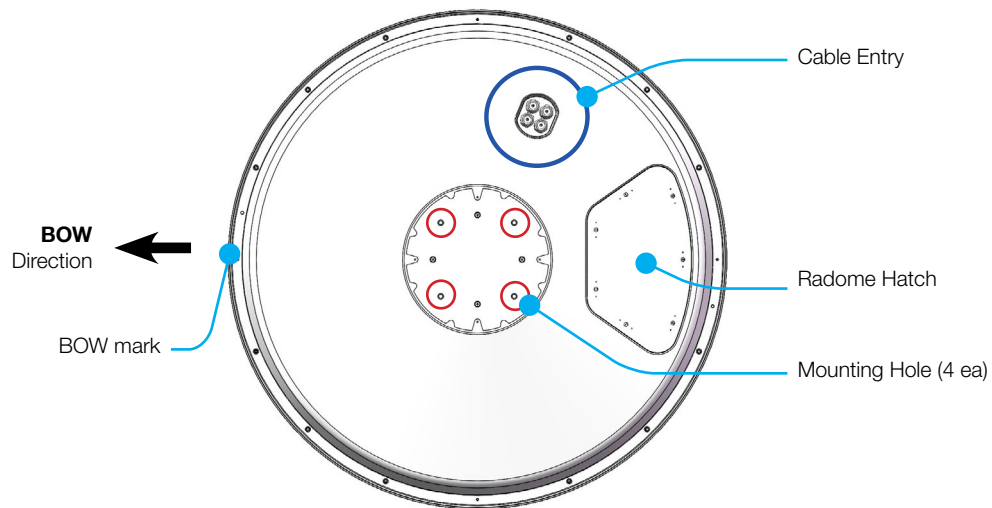


Figure 8: Antenna Bottom View

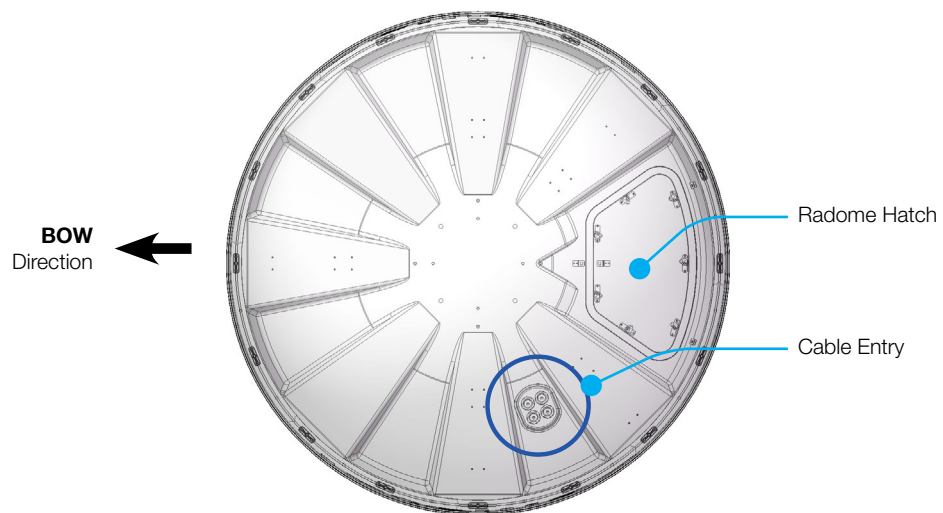


Figure 9: Antenna Top View (Inside Radome)

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, make sure the location of the holes on the mast correspond to the hole locations and sizes printed on the mounting template.

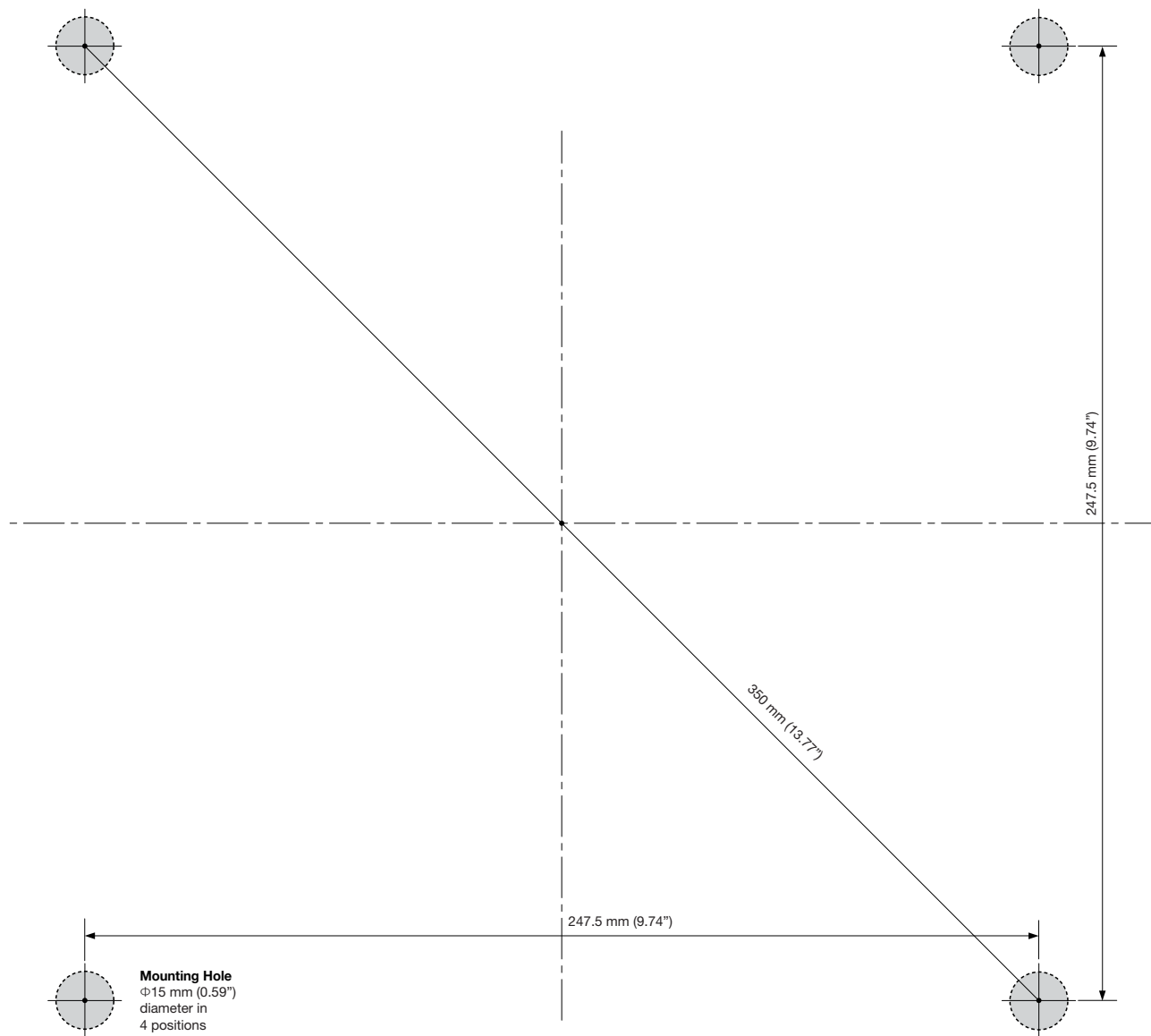


Figure 10: Antenna Mounting Hole Template

5.3 Designing Mast

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

**WARNING**

- When designing a mast, consider the minimum and maximum thickness of the mast plate marked on the diagram. If the thickness of the mast plate is different from the recommended size (Min. 10.0 mm/ Max. 20.0 mm), choose the bolt size for mounting the antenna on the mast according to the table below.

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

- To use the supplied bolts (M12 x 80L) for mounting the antenna on a mast, the thickness of the mast plate must be 10 ~ 20 mm. The minimum thickness of the mast plate is 10 mm. If the mast plate is thicker than 28 mm, the supplied antenna-mast mounting bolts may be too short to mount the antenna on the mast securely.

Unit: mm (inches)

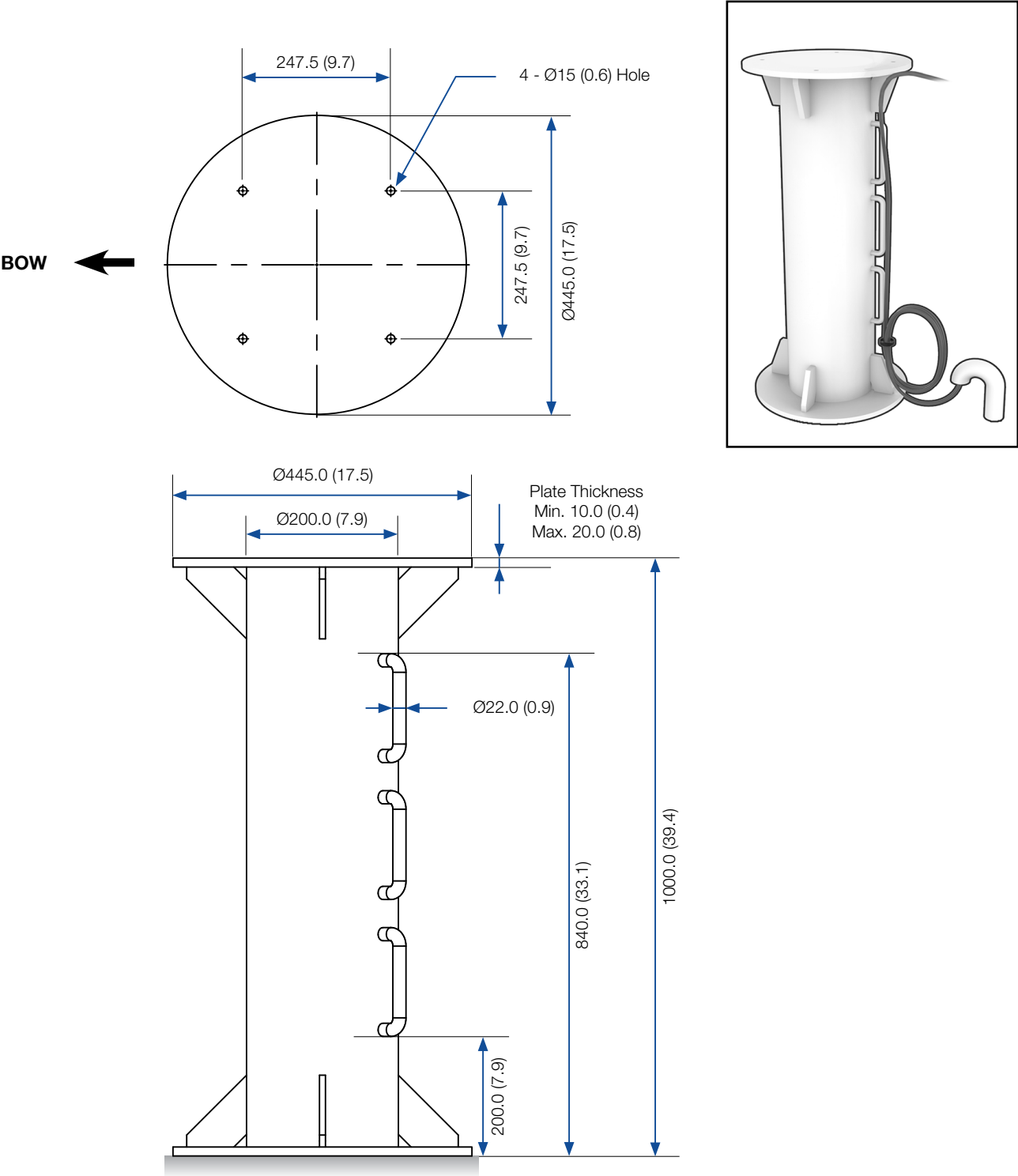


Figure 11: Recommended Size of Mast

5.4 Routing RF Cable on Mast

The cable must be routed from the antenna and through the ship to connect to the antenna control unit. When pulling the cable in place, avoid sharp bends, kinking, and excessive force. After placing cable, seal the deck penetration gland and tie the cable securely in place. Cable brackets must be installed on the mast to secure the cable. The gooseneck must be installed on the side of the mast to protect the cable from 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.

Routing Cable on Outside of Mast

This method is generally recommended.

1. Route the cable from the gooseneck 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 inside the radome, adjust the length and fix the cable on the cable brackets using cable ties.

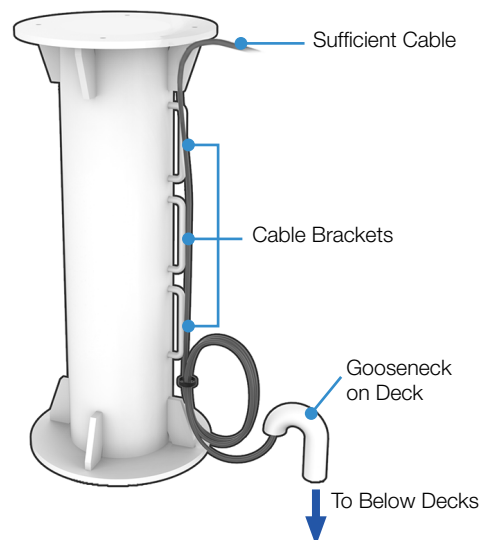
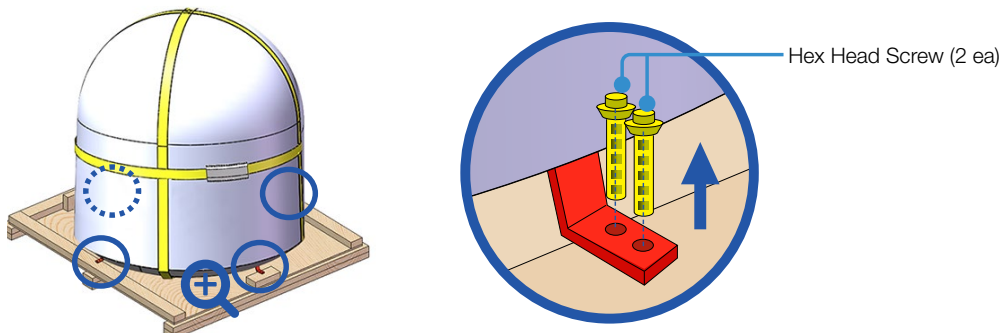


Figure 12: Routing Cable on Outside of Mast

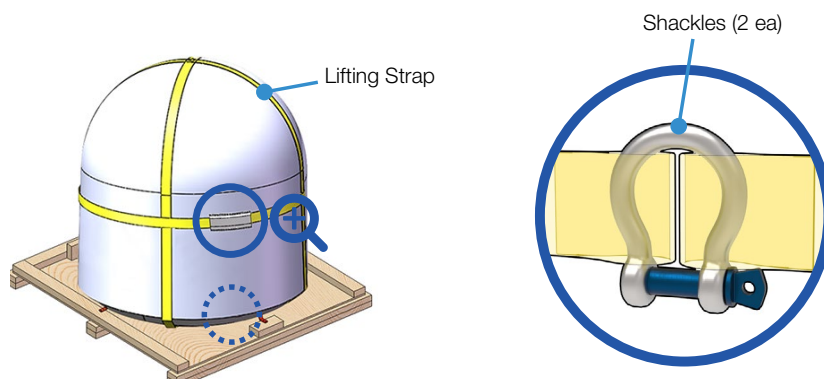
5.5 Removing Antenna from Wooden Pallet

Four radome brackets secure the antenna to the pallet. To remove the radome from the pallet and the brackets from the radome, use the following procedure.

1. Remove the Hex Head Screw (2 ea) from each of the radome brackets (4 ea) using a wrench.



2. Check the condition of lifting strap, and make sure the shackles (2 ea) are tightened. After checking the shackles, re-wrap them with the existing protection to avoid a radome damage.

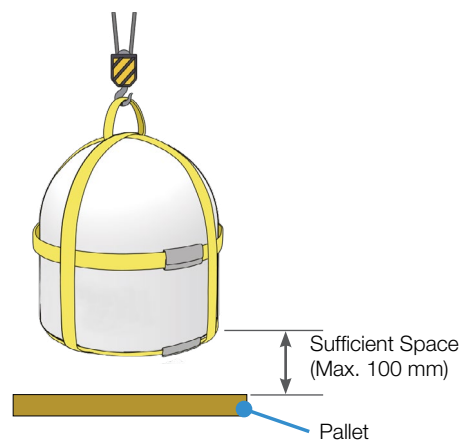


3. Lift the antenna above the pallet using a crane, and maintain a sufficient space (max. 100 mm) between the bottom of the antenna and the pallet to remove the shipping brackets.

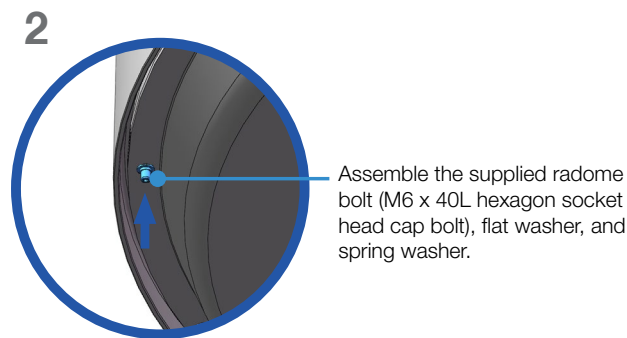
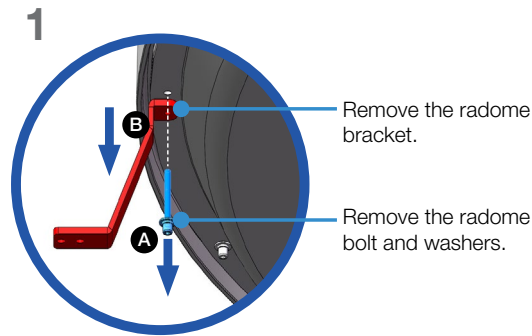
WARNING



- Before lifting the antenna, make sure that you have removed the bolts that secure the radome brackets to the pallet. Otherwise, the pallet will not separate from the antenna.
- 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, and then detach the radome bracket from the radome.
5. Find the supplied hexagon socket head cap bolt (M6 x 40L), spring washers and flat washers in the ACU box.
6. Apply Loctite #243 on the bolt, and then assemble the bolt and washers to the radome by turning the bolt clockwise using a wrench. DO NOT reuse the removed bolt and washers.
7. Repeat steps 4 through 6 for each remaining radome bracket.



5.6 Moving Antenna Above Mast

The Intellian antenna comes with the lifting strap pre-mounted.

1. Check the condition of the lifting strap and ensure the shackles are tightened up.
2. Lift the antenna above the mast using a crane, and then carefully lower the antenna toward the mast. Leave at least 150 mm of space between the bottom of the radome and the top of the mast.



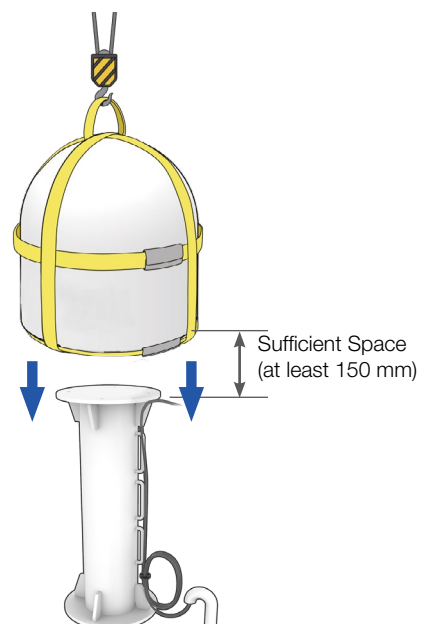
WARNING

The antenna may sway in the wind when suspended by a crane. Be careful when handling the antenna.



NOTE

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



5.7 Mounting Antenna on Mast

1. Bring the M12 x 80L hex head bolts (4 ea) for antenna-mast assembly from the ACU box.
2. Lower the antenna onto the mast using the crane, making sure the mounting holes of the antenna are aligned with those of the mast. Check the positions of the BOW mark, cable glands, and cable brackets (see Figure 14) when mounting the antenna on the mast. Make sure the cable from the mast is aligned with the cable entry on the bottom of the antenna for stable connection.
3. Apply Loctite #263 to the bolt threads, insert the bolts and washers from under the mast into the built-in nuts on the bottom of the radome (see Figure 14), and then lightly tighten them by hand. Use a crisscross sequence as shown in Figure 13.
4. After installing all 4 bolts, fully tighten the bolts using a torque wrench in the crisscross sequence. Refer to **"11.1 Tightening Torque Specification" on page 98** for the bolt tightening torque.
5. Remove the lifting strap from the antenna.

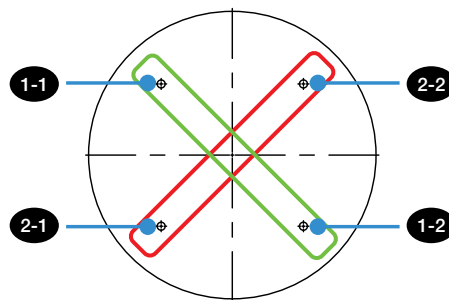


Figure 13: Installing Sequence of Bolts

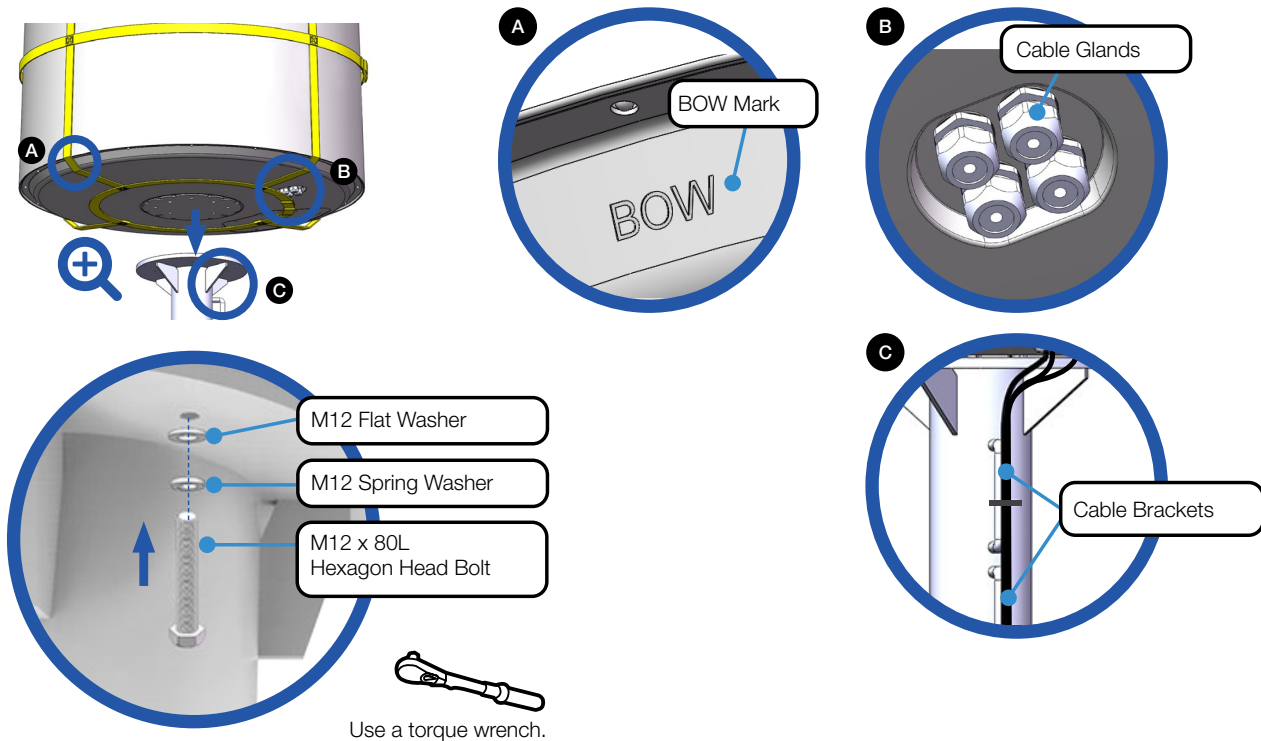


Figure 14: Installing Bolts for Antenna-Mast Assembly

NOTE



- Check the positions of **A** BOW mark, **B** cable glands, and **C** cable brackets when mounting antenna on the mast.
- Make sure the cable from the mast is aligned with the cable entry on the bottom of the antenna for stable connection.
- Refer to "**11.1 Tightening Torque Specification**" on **page 98** 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. Forceful tightening can damage the inner threads of the antenna mounting holes. This type of damage is not covered by the warranty.

5.8 Connecting RF Cable to Antenna

To connect the system cable, access the inside of the radome through the radome hatch. Make sure that there is sufficient space to open the hatch underneath the radome. For the cable connections, terminate cables at each end using proper tools. After connecting the cables inside the radome, adjust the cable lengths and use cable ties to securely fix the cables on the cable brackets of the mast.



NOTE

Make sure of the following before installing system cables.

1. All cables need to be well clamped and protected from 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 **"3.3 System Cables (Customer Supplied)" on page 15** for cable requirements.



WARNING

Keep the power turned off during cable installation. Turn on the power after you finish installing all the cables.

5.8.1 Opening Radome Hatch

Loosen the radome hatch locking screws (slotted) (7 ea) using a flat head screwdriver, and then open the radome hatch.

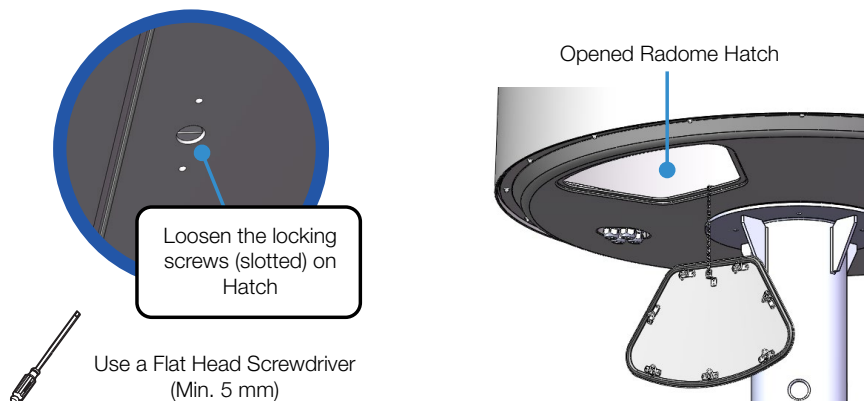


Figure 15: Opening Radome Hatch

5.8.2 Routing Rx, Tx and Power cables

When routing cables, loosely tie the cables on the cable bracket using cable ties. After connecting the cables to the connectors inside the radome, adjust the cable length and fix the cables on the brackets by fastening the cable ties securely. The Power cable is reached from ship to Antenna.

We recommend leaving a service loop (extra length) as shown in the figure.

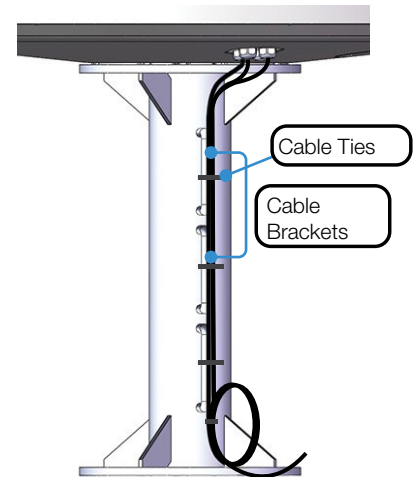


Figure 16: Routing Cables

5.8.3 Connecting Rx, Tx and Antenna Power Cables Inside Radome

* Dashed lines indicate pre-installed cables.

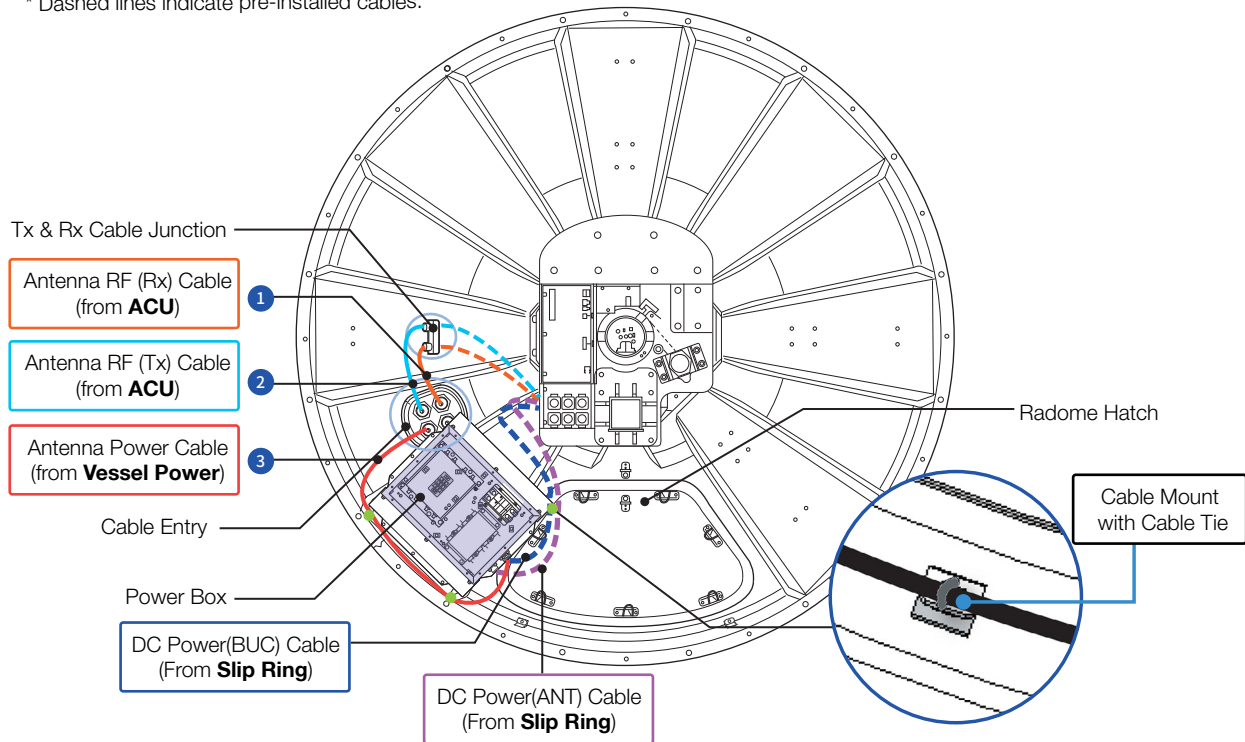


Figure 17: Cable Connection Inside Radome

1. Insert the cables into the radome through the pre-installed cable glands at the base of the radome. Tighten the compression nuts enough to hold the cables in position. Use the cable gland assembly sequence shown in the figure below, but do not tighten the cable glands completely yet.

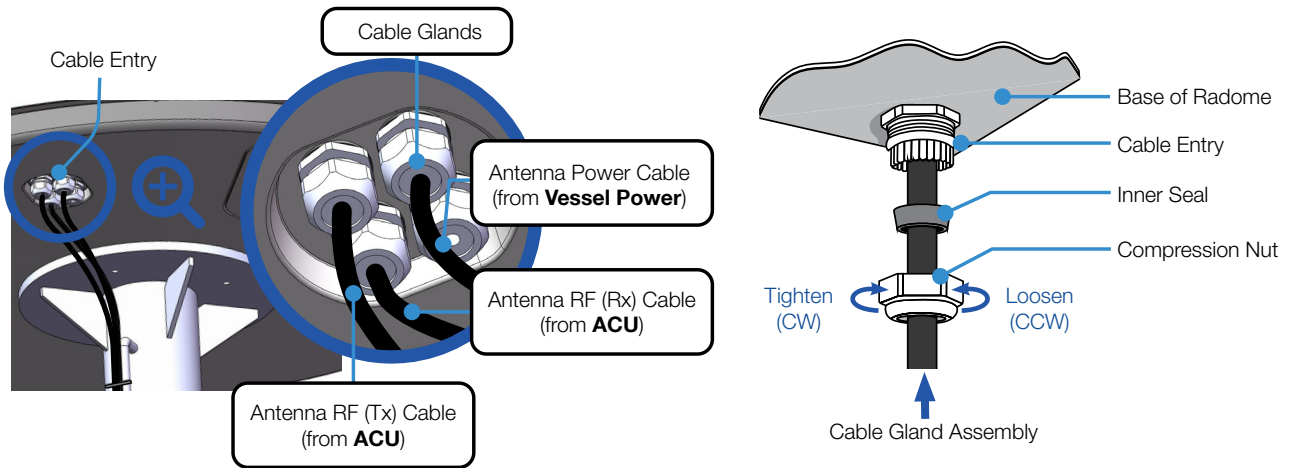


Figure 18: Inserting Cables Through Cable Glands



NOTE

To prevent cable damage, insert the AC Power Cable and RF Cables into the radome through the cable gland.

2. Terminate the Antenna RF cables with N (M) connectors and Antenna Power Cable with MS 3-pin (F) connector inside the radome. Intellian recommends using genuine cable connectors and tools. Refer to the cable termination instructions provided by the connector manufacturers.
3. Connect the N (M) connectors of Tx and Rx cables to the cable junction.

* Dashed lines indicate pre-installed cables

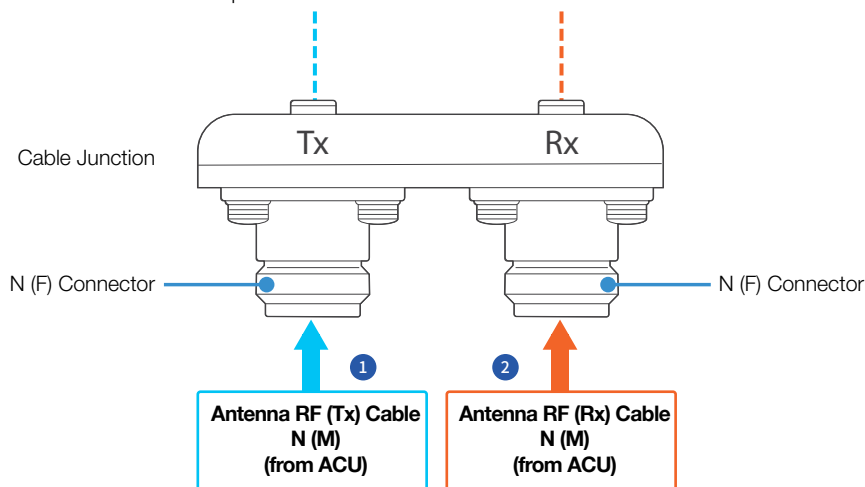
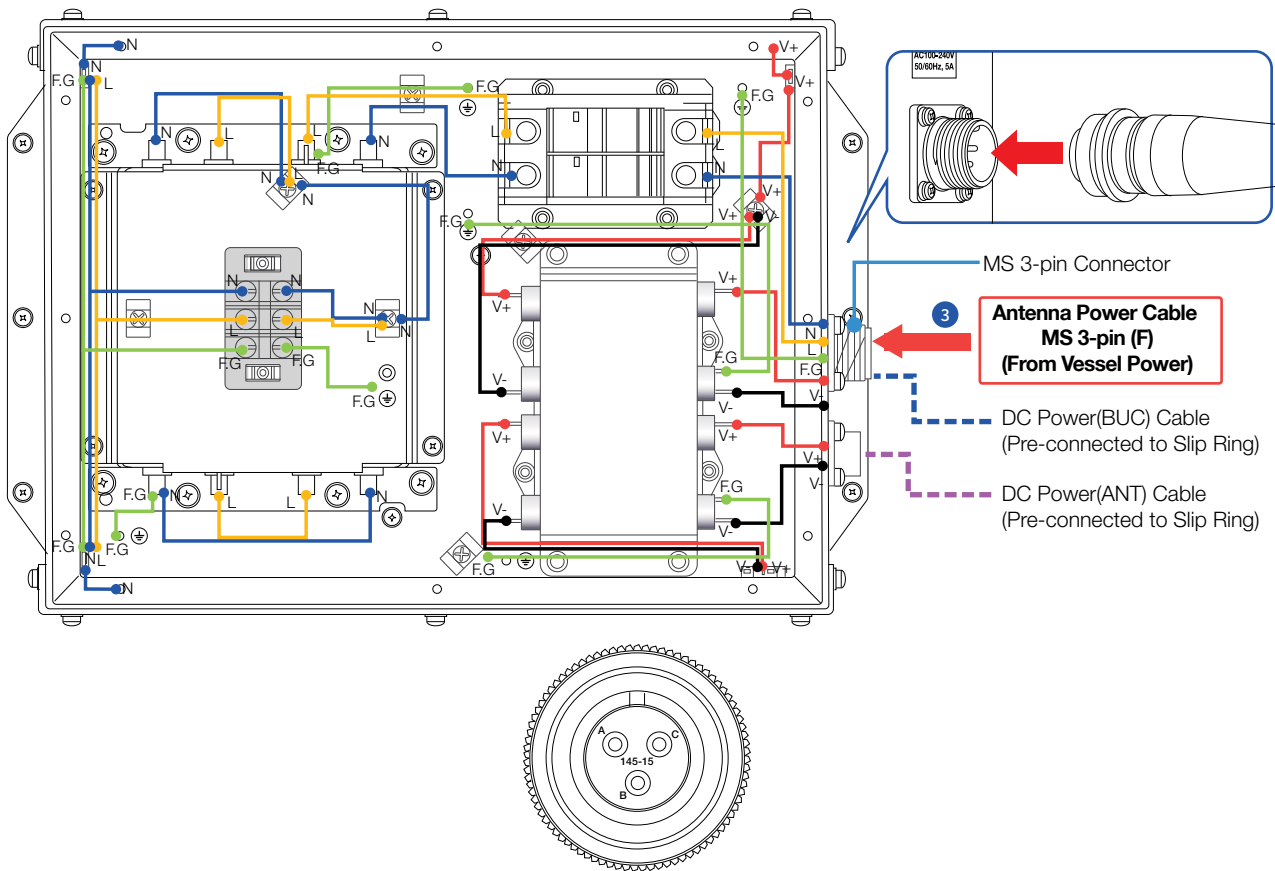


Figure 19: Connecting RF (Tx and Rx) Cables to Cable Junction

4. Terminate the supplied MS 3-pin (F) connector at the end of AC Power Cable and Plug into the MS 3-pin connector on the Power Box.



MS 3-pin connector

A	Neutral
B	Live
C	FG

Figure 20: Cable Connections to Power Box



NOTE

MS-3 (Female) Connector supplied. Installer should terminate this connector on the end of power cable inside radome. Refer to **"11.2 Terminating the MS 3-pin (F) Connector on AC Power Cable"** on page 99 for detailed description

5. You must secure the cable on the cable bracket in front of the power box using a cable tie after plugging the antenna power cable.

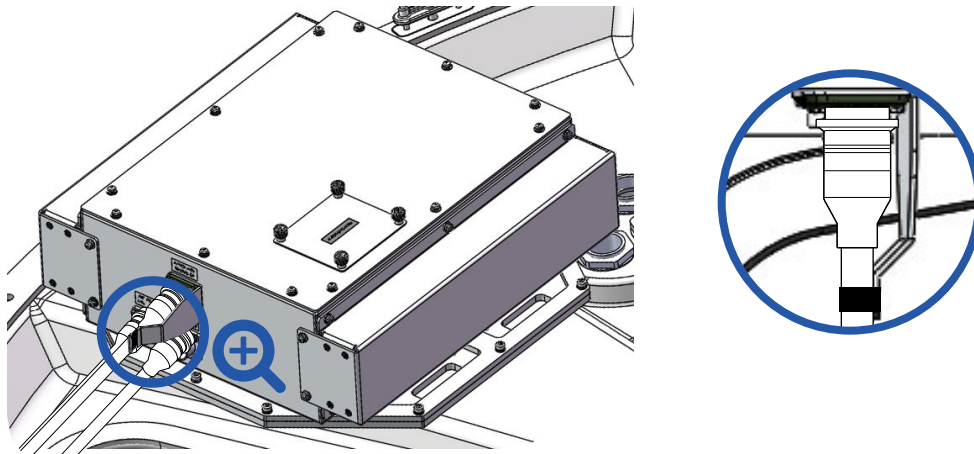


Figure 21: Securing the Antenna Power Cables on the Bracket

5.8.4 Closing Radome Hatch

1. Fully tighten the cable gland at the base of radome that you assembled temporarily in the previous step.
2. Position the radome hatch, and then close it by installing the locking screws (slotted) (7 ea) using a flat head screwdriver.
3. Adjust the cable lengths, and then securely fix the cables on the mast cable brackets using the cable ties.



NOTE

- Before closing the radome hatch, ensure that the cables are firmly fastened to the connectors.
- Fully tighten the cable glands at the base of the radome and fix the cables on the mast brackets by fastening the cable ties securely.

Chapter 6. Installing Below Deck Unit (BDU)

6.1 Selection of 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 dimensions of the ACU before installing it.

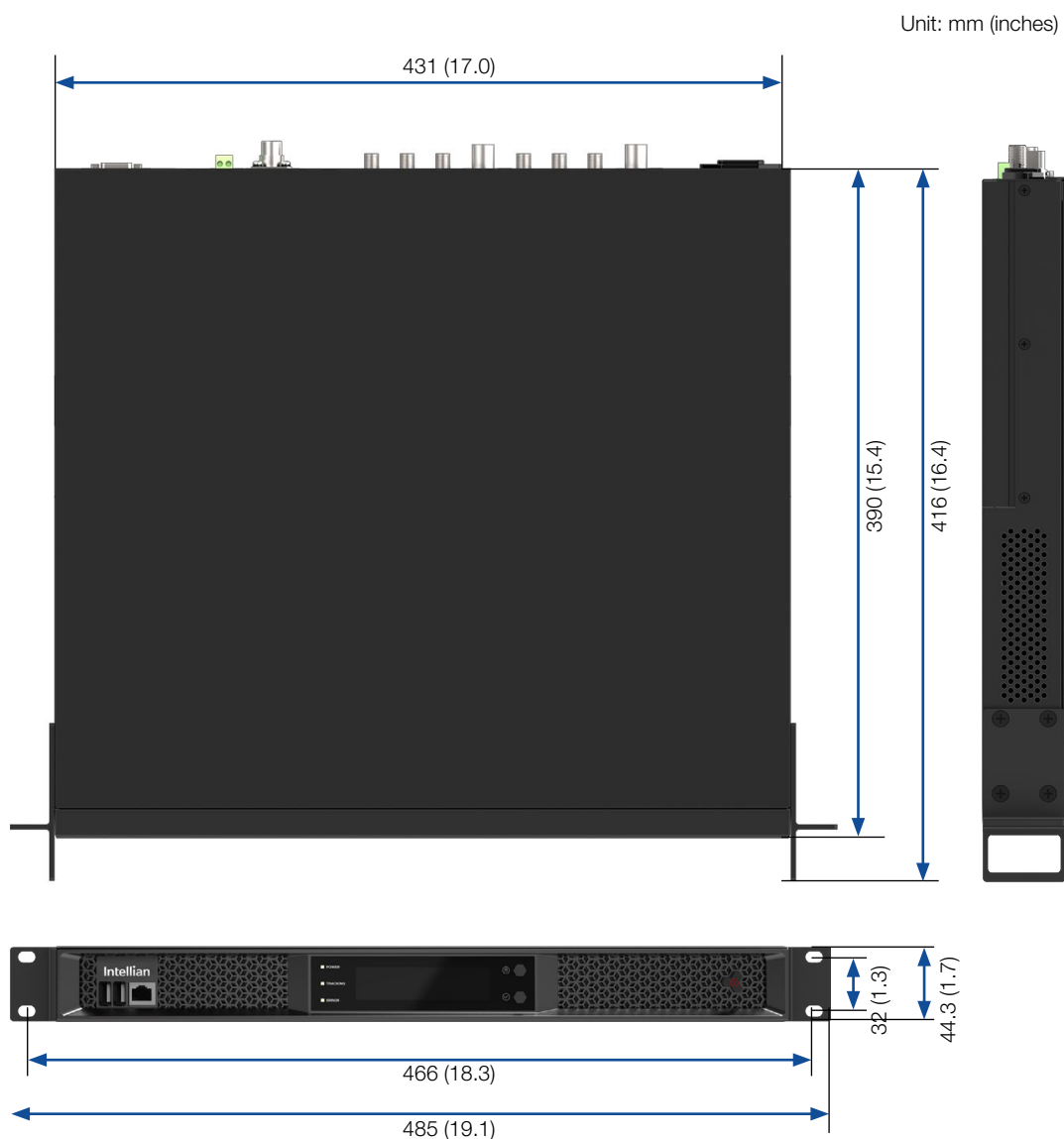


Figure 22: ACU Dimensions

6.3 Mounting ACU

Mounting ACU in a 19" Rack

The ACU can be installed in a 19" rack using the two rack mount brackets that are included in the ACU box. Attach the rack mount brackets to the sides of the ACU using the included M4 x 12L flat head screws (8 ea). Connect cables to the back side of the ACU.



Figure 23: 19" Rack Mounting 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 Configurations

The Intellian Dual-band Antenna system is versatile and supports several configurations. Refer to the following block diagrams to connect system cables. For the proper operation of the satellite communication system, the required components must be connected as shown in the figures below. Separate purchase of a satellite modem, switch router and ship's gyrocompass may be needed.

6.4.1 Single Antenna System Configuration

The basic system consists of one VSAT antenna and one ACU. This mode of operation can provide connection via GEO satellite constellations operating in commercial Ku- and Ka-band with the addition of the appropriate modems supported by the satellite network. Connect the cables as shown in the configuration below.

Single Antenna System Configuration with GEO Modem

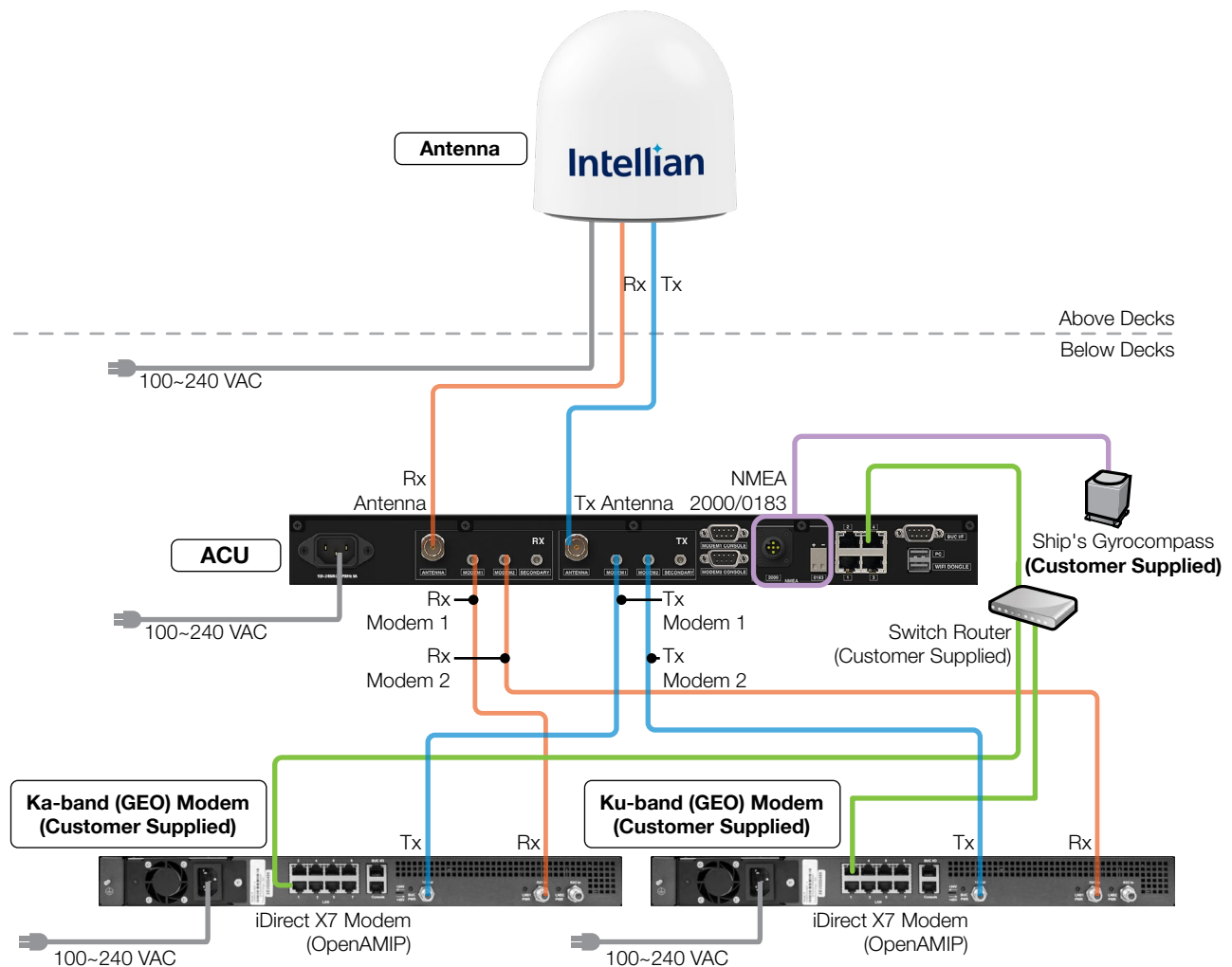


Figure 24: Single Antenna System Configuration with GEO Modem



NOTE

If the Modem RF connector is F-type, use the SMA(F) to F(M) adaptor that is provided additional.

6.4.2 Dual Antenna System Configuration (Optional)

The dual system consists of two VSAT antennas and two ACUs. The ACUs have 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.

Dual Antenna System Configuration with GEO Modem

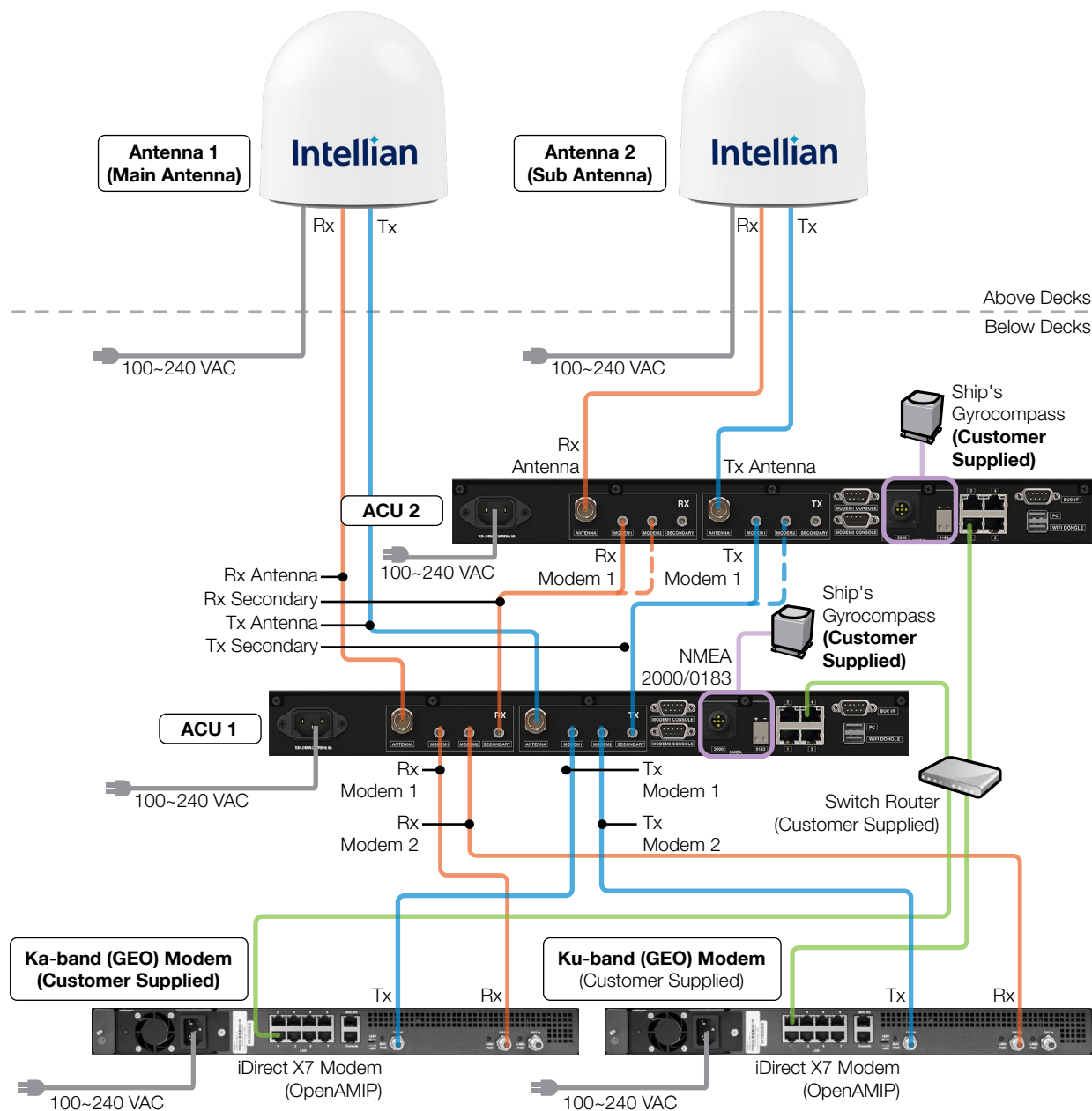


Figure 25: Dual Antenna System Configuration with GEO Modem

Dual Antenna System Configuration with NGSO Modem

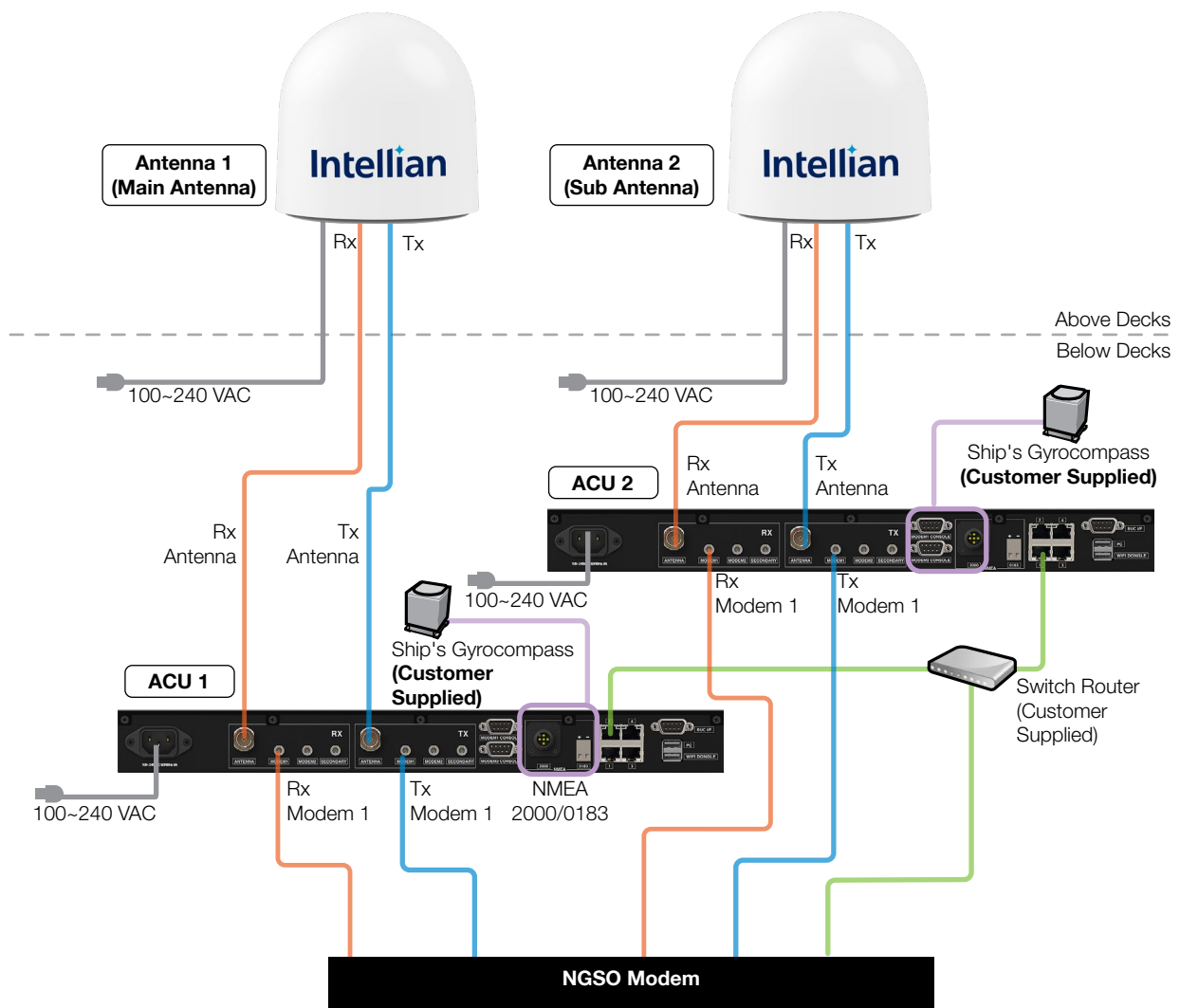


Figure 26: Dual Antenna System Configuration with NGSO Modem

Dual Antenna System Configuration with NGSO & GSO

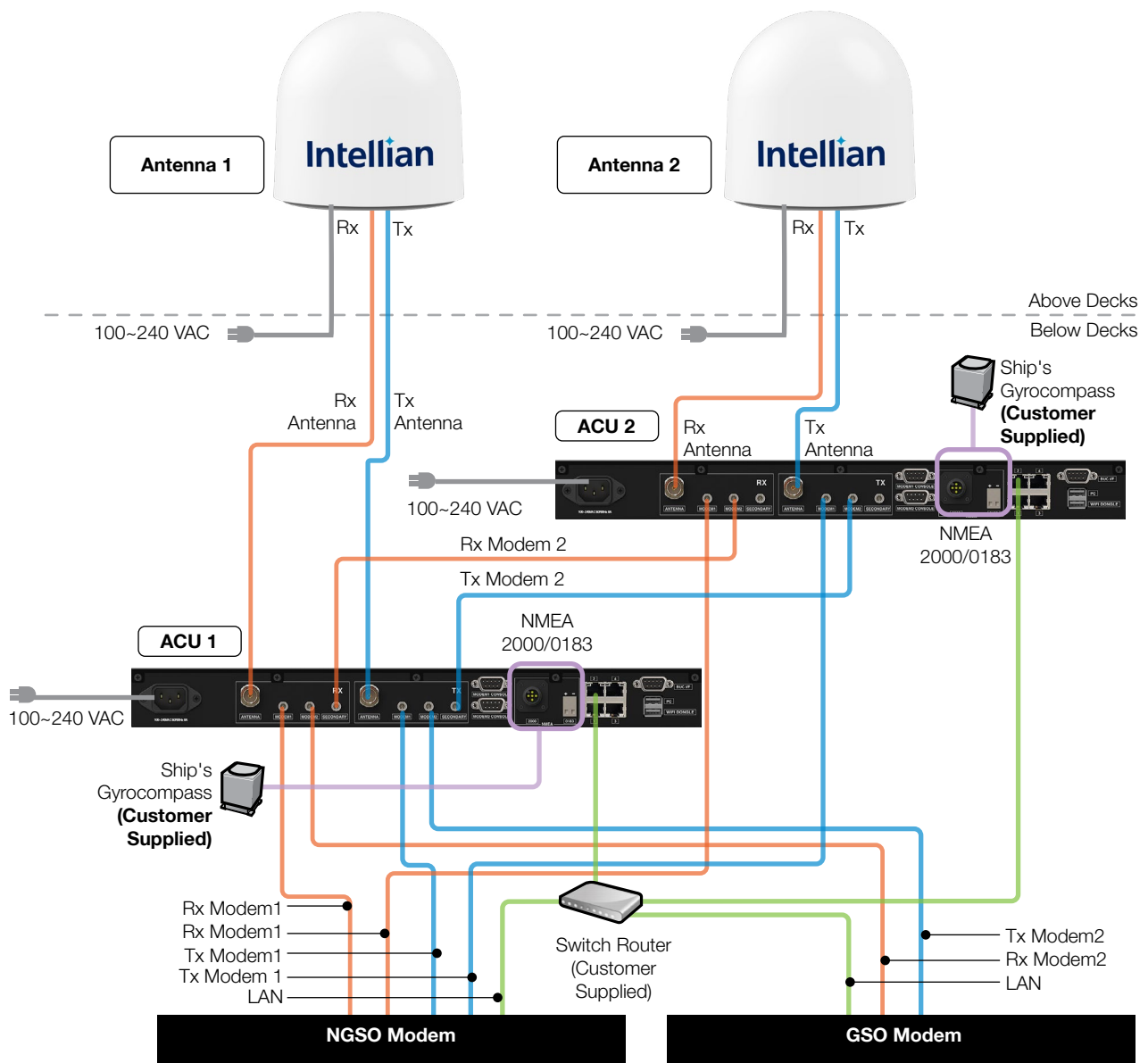


Figure 27: Dual Antenna System Configuration with NGSO and GSO Modem

Dual Antenna System and Intelligent Mediator Configuration with NGSO Modem

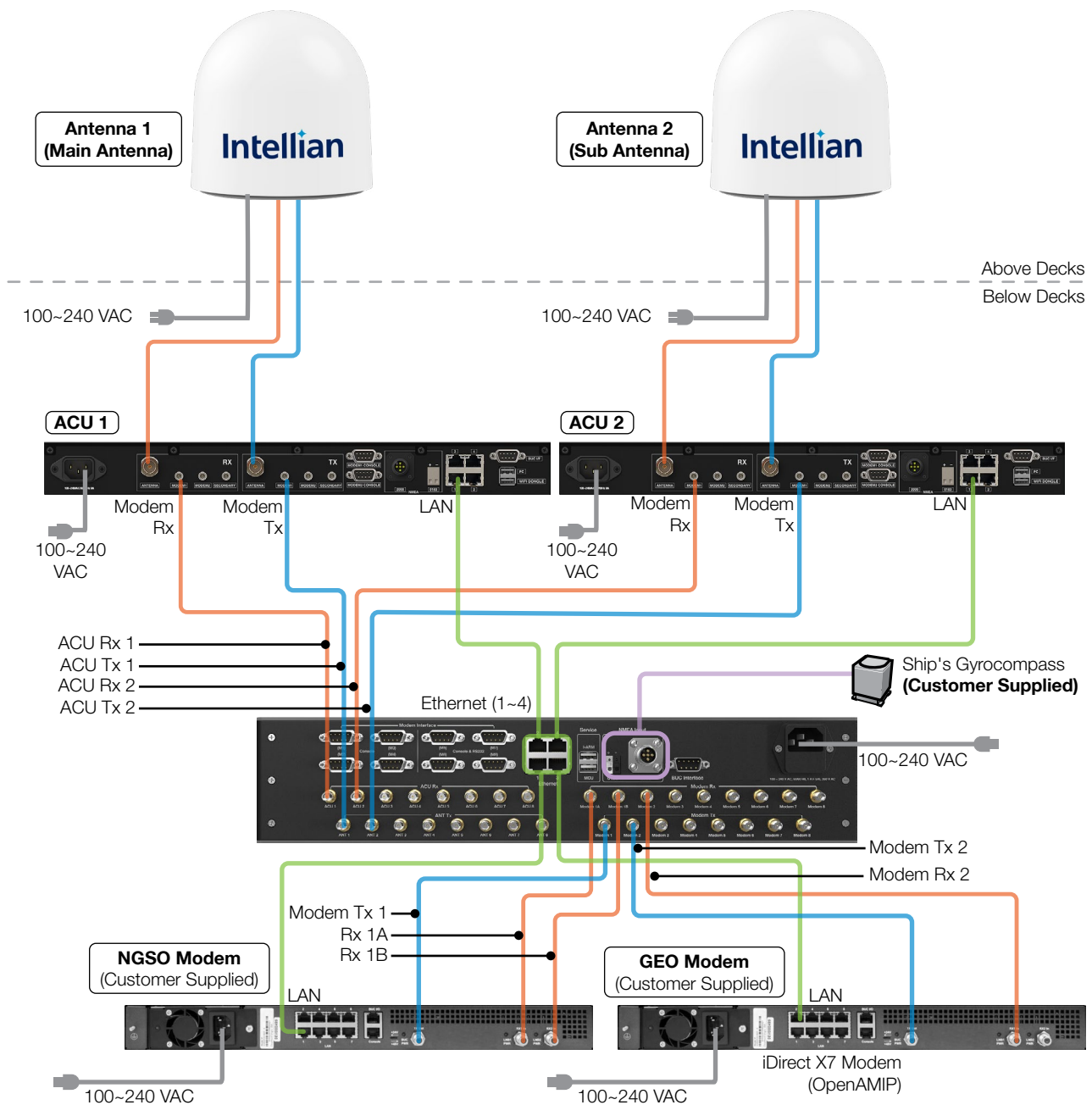


Figure 28: Dual Antenna System and Intelligent Mediator Configuration with NGSO Modem

6.5 ACU Cable Connection

6.5.1 ACU Back Panel Connectors

The following figure shows the ACU back panel connectors.

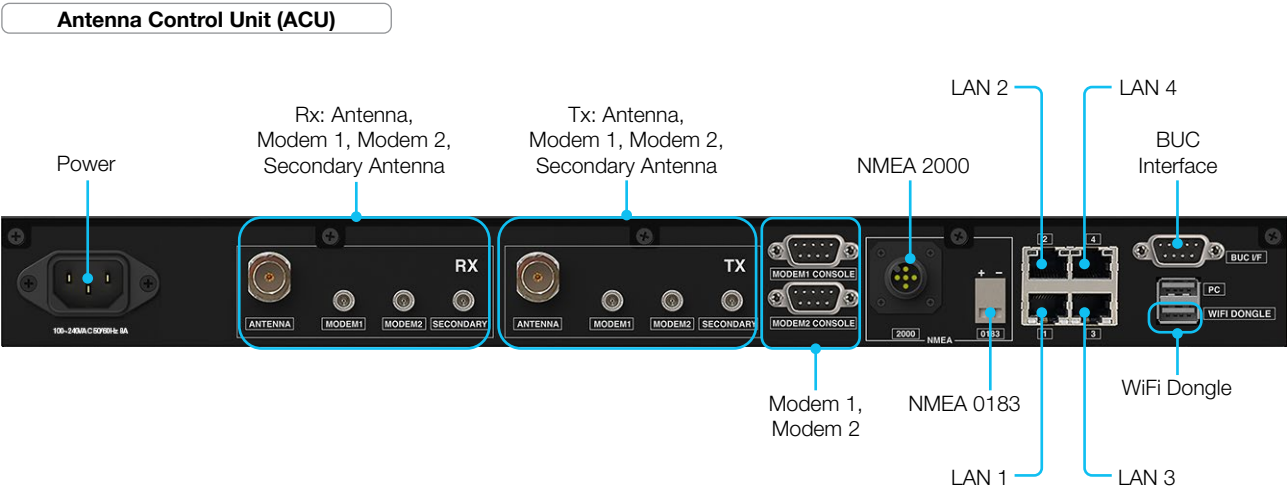
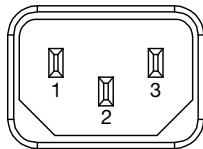


Figure 29: ACU Back Panel Connectors

6.5.2 ACU Connector Pinout Guide

Reference the following connector pinout information for the connection ports of the ACU.

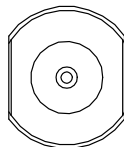
Power Connector



IEC 320 C14 Plug Male

Pin	Signal
1	NEUTRAL
2	GND
3	LIVE

Antenna Connector



RF N Type Female

• RX

Conductor	Function
Inner	Rx, Ethernet communication
Outer	GND

• TX

Conductor	Function
Inner	Tx, Reference Signal
Outer	GND

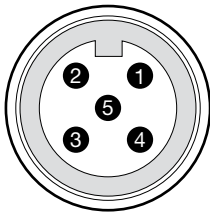
Modem Secondary TX and RX RF Connectors



RF SMA Type Female

Conductor	Function
Inner	Signal
Outer	GND

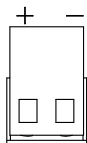
NMEA 2000 Input



Micro-C 5-Pin Male

Pin	Signal
1	Shield
2	NET-S
3	NET-C
4	NET -H
5	NET -L

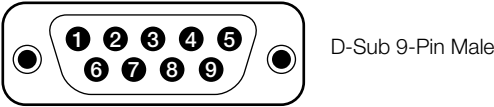
NMEA (NMEA 0183) Input



2-Pin Terminal Block

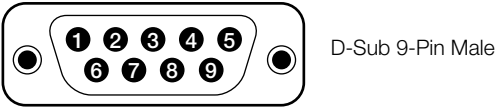
Pin	Signal
+	HEADING IN
-	HEADING GND

MODEM1/MODEM2 CONSOLE - GPS/Modem (Lock, Mute)



Pin	Signal
1	GND
2	GPS_OUTA
3	LOCK
4	MUTE0
5	N/C
6	GPS_OUTB
7	N/C
8	MUTE1
9	N/C

BUC Interface - RS232/RS422 Connector

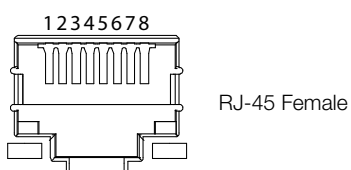


• For Ku-band - RS232

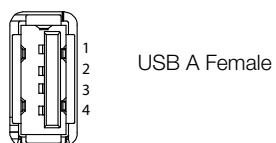
Pin	Signal
1	N/C
2	BUC RS232 RX
3	BUC RS232 TX
4	GND
5	GND
6	N/C
7	N/C
8	N/C
9	N/C

• For Ka-band (Optional) - RS422

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

ETHERNET (LAN) Connector (LAN 1~LAN 4)

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

WiFi Dongle USB Connector

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

6.5.3 Connecting ACU to Ship Gyrocompass

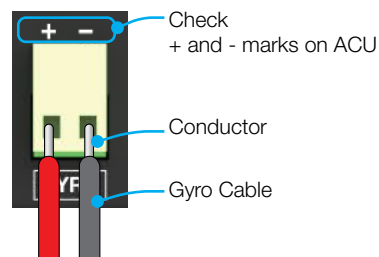
For satellite tracking, connect a ship gyrocompass to the antenna system through the gyrocompass interface of the ACU. The Intellian ACU supports NMEA 0183 and NMEA 2000 gyrocompass inputs. If the gyrocompass has a step-by-step or synchro output standard, a NMEA Converter should be used to convert the input to NMEA 0183.



Figure 30: Ship's Gyrocompass Cable Connection

How to Connect NMEA 0183 Gyrocompass Cable

1. Using a flat head 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 the conductor and gyro cable wires into the – (negative) and + (positive) terminals, respectively, of the terminal block. The polarity of the terminal is indicated on the ACU with + and - marks. Check the polarity to make sure the wires are inserted correctly.



4. Fully tighten the terminal block 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.

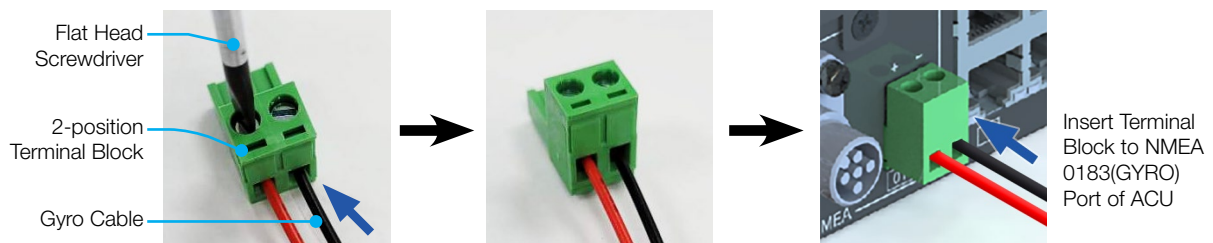


Figure 31: NMEA 0183 Gyrocompass Cable Connection

6.6 ACU to PC Communication Setup

You can establish the data communication between the ACU and a PC using a TCP/IP (Ethernet), USB, or Wi-Fi connection

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.

Connect an Ethernet cable from the management LAN port on the front panel of ACU to a LAN port of a PC for monitoring and controlling the antenna system.



Figure 32: Front Panel Management LAN Port Connection

6.6.2 Wi-Fi Connection

Connection through Wi-Fi Dongle

Intellian provides the Wi-Fi Dongle for Wi-Fi connection to AptusNX. You can connect a 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 a PC. The network connection is established automatically.
2. Find the Wi-Fi Dongle in the ACU box, and then insert the Wi-Fi Dongle into the USB port on the back panel of ACU.



Figure 33: Back Panel Wi-Fi Dongle Connection

3. Open a web browser, and then enter the following IP address to access Intellian AptusNX Login page.

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

4. Log in to AptusNX by typing the User Name and Password. If the system has not been changed from the factory default:

- **User Name: intellian**
- **Password: intellian1@1**

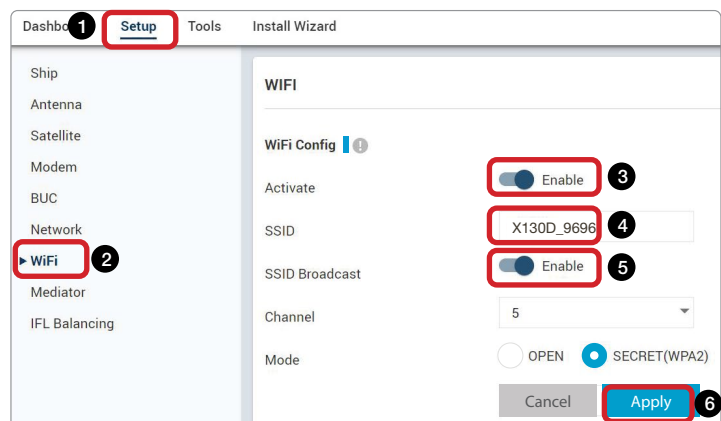
5. Select **Setup** on the main menu, and then select the **Wi-Fi** sub menu.

6. Choose **Enable** for the **Activate** option to edit the configuration.

7. Note the **SSID** (Wi-Fi access point/network name) information.

8. Choose **Enable** for the **SSID Broadcast** option to show the **SSID** (Wi-Fi access point/network name) information.

9. Click the **Apply** button to apply the settings to the system. For more information, see "8.7.7 WiFi Setting" on page 77.



Chapter 7. Operating Install Wizard

7.1 Turning On System

Make sure the antenna has a clear view of the sky.

1. Open the Radome Hatch and Power Switch Cover on top of Power box.
2. Change the Circuit Breaker lever to ON.
3. Assemble the Power Switch Cover and Radome Hatch.

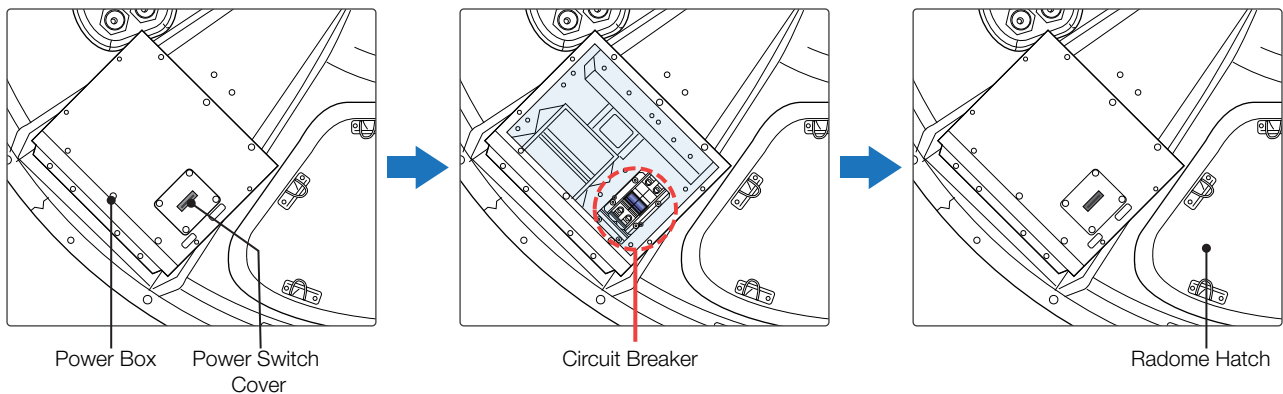


Figure 34: Turning on the Power switch of Antenna

4. Press the **POWER** button on the front panel of the Antenna Control Unit/ACU, and then wait a few minutes for system startup. Once the antenna finds the satellite, the **POWER** indicator light on the ACU display will turn green.



NOTE

Image is for illustration purpose. It may differ from actual product.

7.2 Accessing AptusNX

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

1. Connect an Ethernet cable from the management LAN port on the ACU front panel to a LAN port of a PC. The network connection is established automatically.
2. Open a web browser (Chrome, Firefox, etc.), and then enter the following IP address to access the Intellian **AptusNX** Login page.
 - **192.168.2.1 (Default)**



NOTE

After accessing the default IP Address, the user must change the default IP Address to a new IP Address for security. If you have forgotten your IP Address, you can access it via the modem port's secondary IP Address (10.10.10.1).

3. Log in to **AptusNX** by entering the User ID and Password.

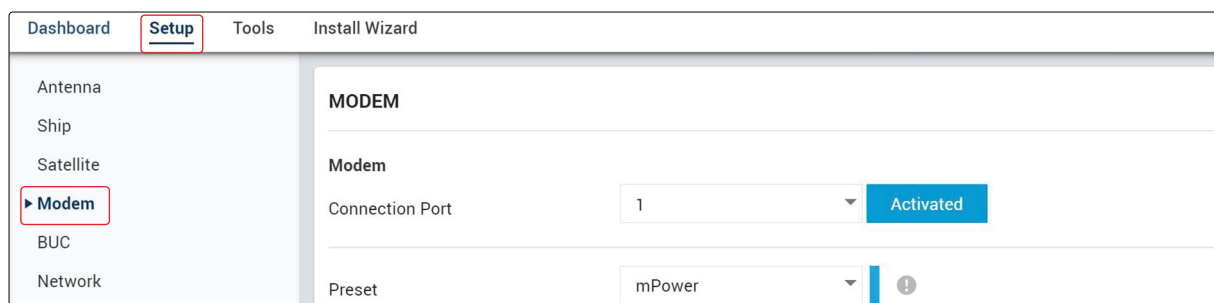
- **User ID: intellian (Default)**
- **Password: intellian1@1 (Default)**



Figure 35: Front Panel Management LAN Port Connection

7.3 Modem Configuration

1. After accessing the **AptusNX** main page, go to **Setup → Modem** on the main menu.



2. Select your modem type from the **Preset** drop-down list for loading a pre-configuration of modem. Enter the required parameters (marked with an asterisk *), and then click the **Apply** button.

Dashboard Setup Tools Install Wizard

Antenna
Ship
Satellite
► **Modem**
BUC
Network
IFL Balancing

MODEM

Modem

Connection Port 1 **Activated**

Preset mPower

NOTE ☒ View required value only

Name * name

TCP Port * 7001

Modem Protocol OpenAMIP v1.17

Cancel Apply

**NOTE**

The input parameters change depending on the modem selected. Parameters with an asterisk (*) are required.

3. For Modem Verify, turn on or off the modem lock function (On / Off)

- On: Regards as the target satellite.
- Off: Regards as the target satellite if the signal level is greater than the tracking level threshold regardless of modem lock.

4. Click the **Apply** button to apply the modem lock verification settings to the system.

Dashboard Setup Tools Install Wizard

Antenna
Ship
Satellite
► **Modem**
BUC
Network
IFL Balancing

MODEM

Modem

Connection Port 1 **Activated**

Preset mPower

☒ View required value only

Name * name

TCP Port * 7001

Modem Protocol OpenAMIP v1.17

Cancel Apply

Modem Lock use for verification

Modem Verify ☐ On ☒ Off

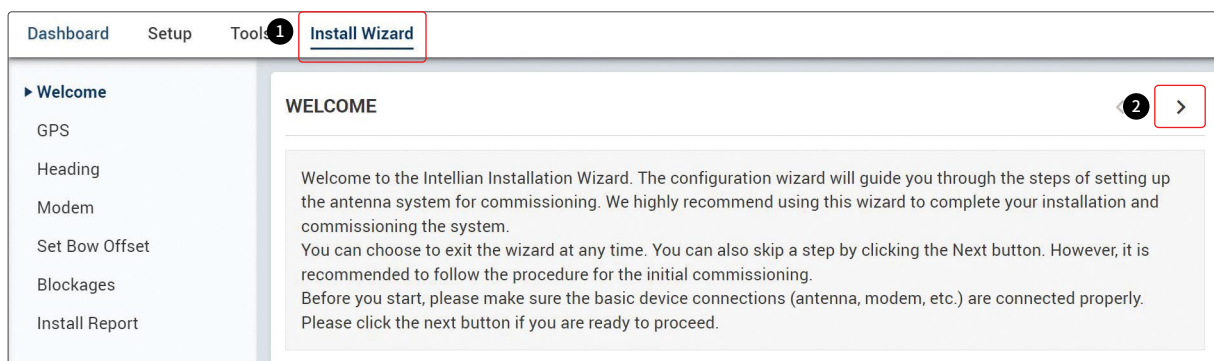
Cancel Apply

7.4 Starting Install Wizard

The Install Wizard will guide you 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. 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, click **Install Wizard** on the main menu then follow these steps.

✓ Welcome Page

Welcome message is displayed. Click the > (Next) button to go to the next step.



✓ Step 1: GPS

In this step you check the status of the GPS connected to the antenna system and, if necessary, set the GPS position of the antenna for satellite searching.

- GPS indicator: The colored indicator next to the title shows the GPS status. Make sure the GPS indicator is Blue.
 - Blue: The system received a correct GPS signal.
 - Black: The system has not received any GPS signal. You can enter the GPS value manually to set the GPS position. Click the **Apply** button to apply the settings to the system.
 - When the GPS signal is abnormal or the received value is incorrect (Error), the GPS error event will display on the dashboard.
- Longitude (°): Set Longitude information (East / West).
- Latitude (°): Set Latitude information (North / South).

The > (Next) button to go to the next step.

✓ Step 2: Heading

Set the ship's heading device.

- **Heading Device indicator:** 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.
- **Current Device:** If a gyrocompass is connected, choose the device type from the **Current Device** drop-down list. If no gyrocompass is connected, choose **NONE**.
- **Baud Rate:** Select the band rate (4800, 9600, 19200, 38400). Only applicable when **NMEA** is selected on the **Current Device** list.
- **Heading (°):** If Static is selected, you should enter the heading information manually. If NMEA or NMEA 2000 is selected, heading information will be displayed automatically.

Click the **Apply** button to apply the settings to the system and the > (Next) button to go to the next step.



NOTE

- **Skip "Step 4: Set Bow Offset" if no gyrocompass is connected.**
To receive NGSO (MEO, LEO) satellite signal you must connect a heading device and set the bow offset.
- When the antenna and Intelligent mediator are connected, Heading information received from the intelligent mediator is prioritized. If the **NONE/Static** is selected on the Current Device, the Intelligent mediator's heading information will not be applied.

✓ **Step 3: Modem**

- **Connection Port** : Select the port from the **Connection Port** drop-down list.
- **Preset**: Select the modem from the **Preset** drop-down list.
 - In case of connection to each port, it should be set to all ports.
 - In case of two connected GEO modems, it should be enabled currently available for the modem port.
- **Modem Verify**: To verify the modem lock status when tracking, turn on the modem lock function (On / Off)
 - On: Regards as the target satellite.
 - Off: Regards as the target satellite if the signal level is greater than the tracking level threshold regardless of modem lock.

Click the **Apply** button to apply the settings to the system and the > (Next) button to go to the next step.

**NOTE**

The input parameters change depending on the modem selected. Parameters with an asterisk (*) are required.

Welcome
GPS
Heading
► **Modem**
Set Bow Offset
Blockages
Install Report

MODEM

Modem

An active GEO modem is required to set BowOffset.

1 Connection Port
1
Activated

2 Preset
mPOWER

NOTE
☒ View required value only

Name *
idirect modem

TCP Port *
4001

Modem Protocol
OpenAMIP v1.17

Cancel
Apply

Modem Lock use for verification
Verifies the modem lock status when tracking.

3 Modem Verify
☐ On
☒ Off

Cancel
Apply

✓ Step 4: Set Bow Offset

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

- **Tracking Type:** Select **Control by Modem** or **Manual** for the Tracking Type.
 - **Control By Modem:** Sets the received satellite information automatically.
 - **Manual:** If a GEO modem is not connected, you need to set bow offset manually. Select the satellite from the library drop-down list or enter the satellite information.
- **Start Searching:** Begins tracking based on satellite information received from a preset modem or from your manual satellite settings.
- **Current Bow Offset:** Displays the Bow Offset (Range: 0 – 360°).
- **Lock:** Once the Lock is on, click the **Save Offset** button to save the BOW offset information to the ACU.

Click the > (Next) button to go to the next step.

Welcome
 GPS
 Heading
 Modem
 ▶ **Set Bow Offset**
 Blockages
 Install Report

SET BOW OFFSET

For setting bow offset, need to select satellite which is trackable in satellite library information.
 When antenna tracks to satellite selected, the bow offset will be set up automatically based on information of GPS.

1 Tracking Type
 ☒ Control By Modem
 ☐ Manual

Search

Choose a modem protocol or a modem type then click the "Start Searching" button. The modem will be connected. If this is not connected, please use the built-in library. Bow Offset can be detected when the antenna status is changed to Tracking Mode after pressing 'Start Searching' button.

2 Start Searching

Set Bow Offset

Please wait until antenna terminal is tracking to satellite. The bow offset will be set up automatically.

3 Current Bow Offset 193 °

4 Lock ☐ Unlock

Save Offset

✓ Step 5: Blockages

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 where transmission is muted. 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 **Apply** button to apply the settings to the system and the > (Next) button to go to the next step.

Enable	Description	AZ Start~End (°)	EL (°)
☒		0 ~ 0	90
☒		0 ~ 0	90
☒		0 ~ 0	90
☒		0 ~ 0	90
☒		0 ~ 0	90

✓ Step 6: Install Report

The configuration Install Report is displayed. If you enter a Name, Company, ID, and e-mail, they will be saved with the report.

- Save: Save the results to your PC.
- Export : Download the report file (.json format) to the PC or print the report to your system printer.
- View Last Report: Display a window containing the most recently saved report information, including the date and time saved.

This completes the steps of the wizard.

Engineer Information	
Name	
Company	
ID	
e-mail	

Chapter 8. Operating ACU

8.1 ACU Front Panel View

The following figure shows the features on the front panel of the ACU.

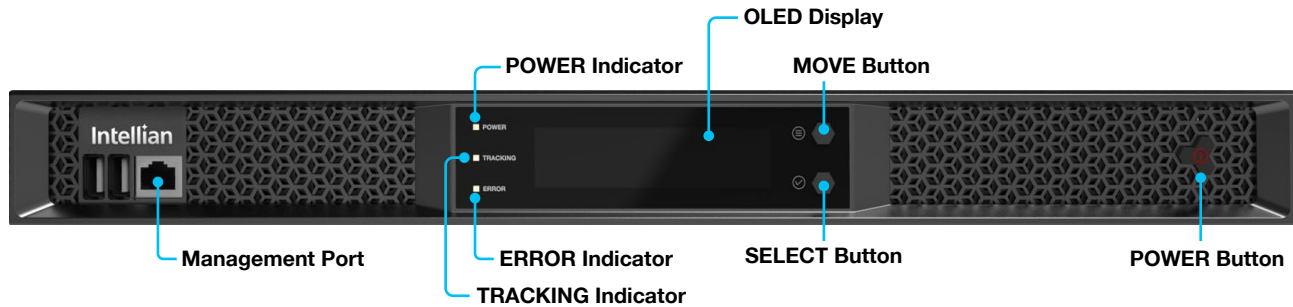


Figure 36: ACU Front Panel View

The following table describes the function of each button.

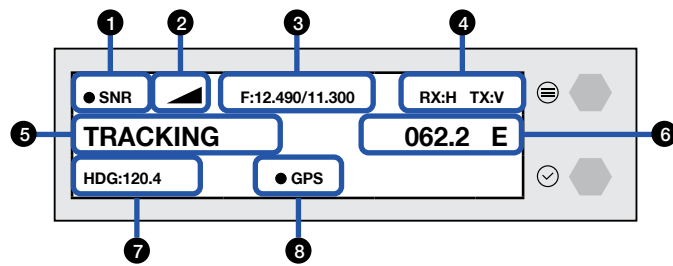
Button	Function
POWER Button	Powers on/off the ACU.
MOVE Button	Moves to the desired screen.
SELECT Button	Selects the desired screen.

The following table describes 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 an error state.
TRACKING	Steady Green	The antenna is in tracking mode.

8.2 ACU Display Menu

The following figure shows the ACU display menu.

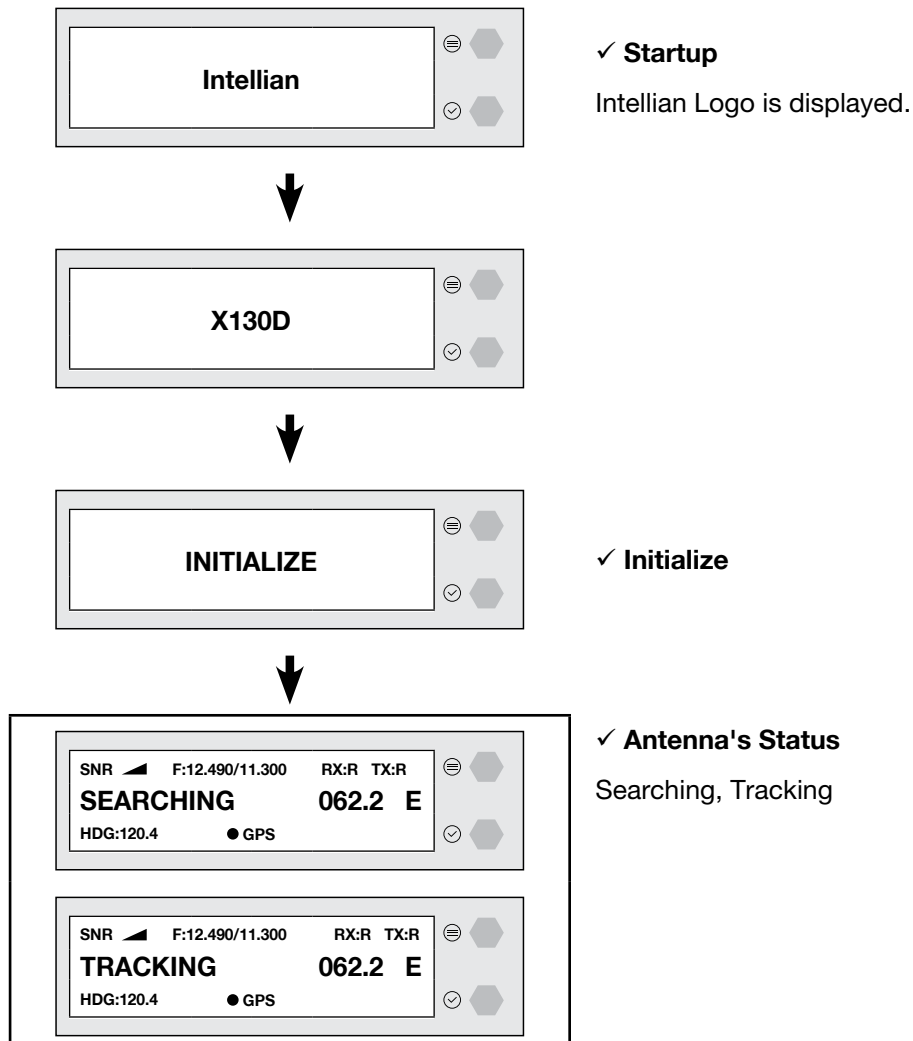


The following table shows the function of each button.

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 (H: Horizontal, V: Vertical, R: RHCP, L: LHCP).
⑤	Antenna Status	Displays the antenna status (TRACKING / SEARCHING / SETUP).
⑥	Target Satellite	Displays the target satellite (E: East / W: West).
⑦	Heading Information	Displays heading information.
⑧	GPS Lock	Displays the GPS lock status.

8.3 Startup

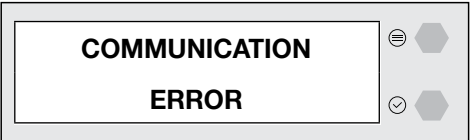
After the system is installed and power is applied, the ACU display will show the following sequence.



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

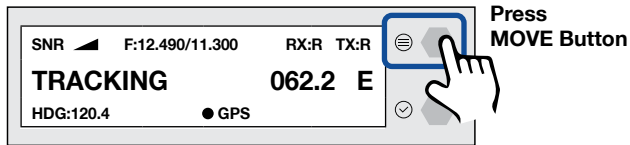


If the antenna does not communicate with ACU, the **COMMUNICATION ERROR** is displayed.

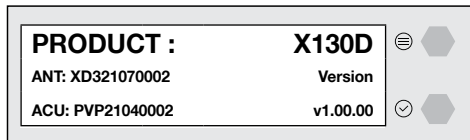


8.4 Antenna Information

Displays the Antenna/ACU serial number, Software Version of the product.



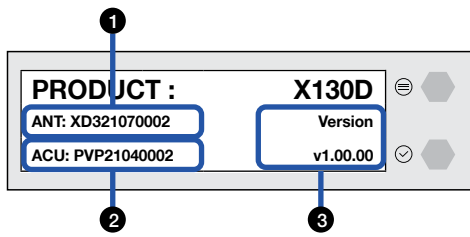
✓ **Main Display**



✓ **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	ACU Serial Number	Displays the ACU serial number. The serial number is displayed depending on the product.
③	Software version	Displays the Software Package version.

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. This saves you the time and cost generated by various maintenance activities, such as upgrading firmware, tracking parameter resets, and diagnosing system issues.

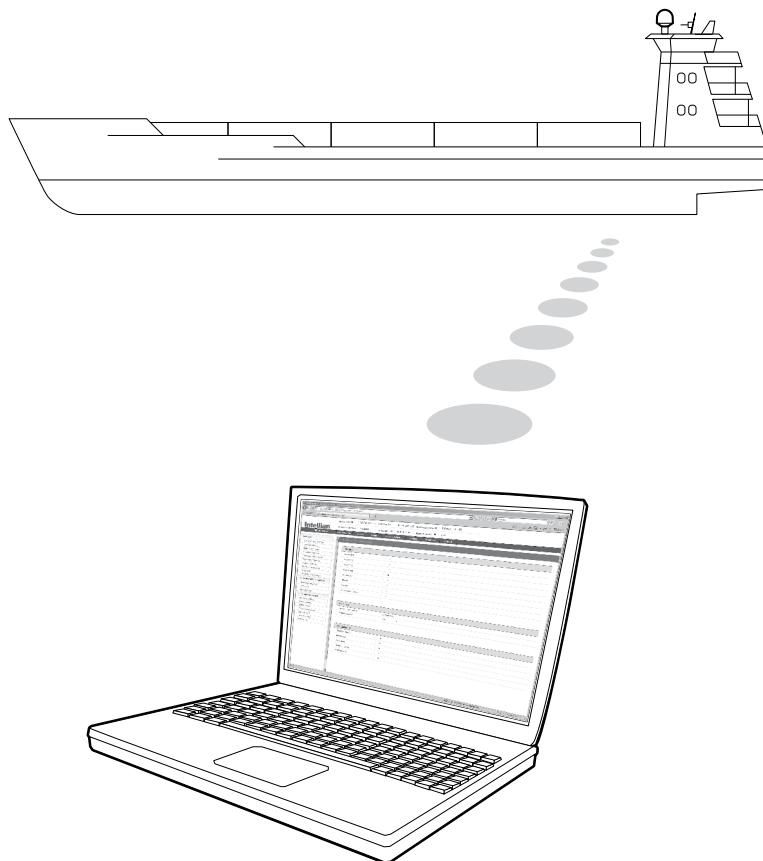
9.2 Accessing AptusNX for ACU

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 your web browser. The AptusNX Login page displays.



NOTE

- **AptusNX** works on Internet Explorer 11 or higher (Windows 7 or higher editions), Firefox, Microsoft Edge and Chrome web browsers.
- After accessing the default IP Address, the user must change the default IP Address to a new IP Address for security. If you have forgotten your IP Address, you can access it via the modem port's secondary IP Address (10.10.10.1).

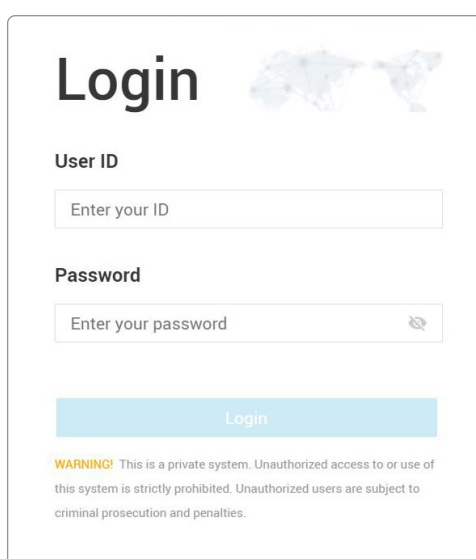


9.3 Main Page (Page Login)

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.

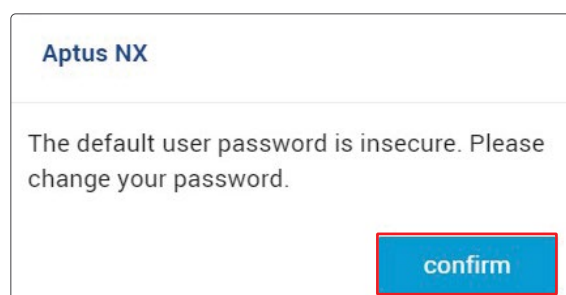
Log into the ACU by typing in User ID and Password. The following are the factory default values.

User Type	User ID	Password	Access Authority
Admin	sysadmin	sysadmin1@1	All menus for monitoring, setting up the system, as well as account management
Operator	intellian	intellian1@1	All menus for monitoring and setting up the system, but limited menus for account management
User	guest	guest	Dashboard only




NOTE

You must change the default password to a new password for security. When you access Aptus with a default password, the pop-up window for changing the password will appear. Click the **Confirm** button. The **Account** page displays, where you can change the user password.



9.4 Top Menus

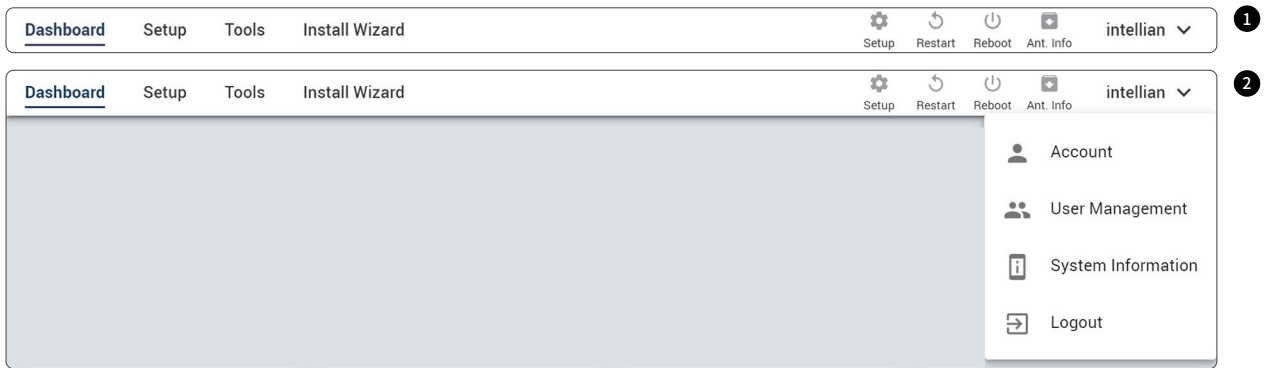
Once you log in, the following information and menus are displayed.



No.	Item	Description
①	Tx Status	Displays whether the antenna is able to transmit data or not. (Off/Standby/Transmit/) Refer to the "8.7.5 BUC Setting" on page 78 for more information.
②	Lock	Displays the satellite lock status. If the lock icon is lit green, the antenna has locked on the satellite.
③	Signal Level	Displays the current signal level using a yellow bar indicator. The length of the bar increases with signal strength.
④	Antenna Status Info	Displays the antenna status. • Initialize: The antenna system is initializing. • Searching: The antenna is searching for the target satellite. • Tracking: The antenna is tracking the target satellite.
⑤	Main Menu	Select a main menu item (Dashboard, Setup, Tools, Install Wizard). Each main menu item displays sub menus on the left of the screen.
⑥	Setup	Enter the setup mode to modify settings. Antenna manual movement and tilt sensor calibration are available only in setup mode.
⑦	Restart	Exits the Setup mode and switches to the normal mode (Searching/Tracking mode).
⑧	Reboot	Powers off and restarts the antenna system. After system initialization, the antenna switches to normal mode (Searching/Tracking mode).
⑨	Ant. Info	Updates AptusNX after reloading all information on the Antenna (Ship, Antenna Angle, Target satellite information, IFL balancing, Blockage setting, etc.).
⑩	Intellian	Click the Intellian button to manage the user account. The Account and System menus are for user management. Click the Logout button to log out of the AptusNX web page.

9.5 Account Menu

1. Click the **Intellian** button to manage the user account.
2. Select **Account**, **User Management** or **System Information** for user management. Select **Logout** to log out of **AptusNX**.



9.5.1 Account

No.	Item	Description
①	Account	Updates your password and sets timeout.
②	User Password Change	You can change your password. • ID: Displays the current user ID. • Old Password: Enter the current password. • New Password: Enter the new password. - 8-32 Characters - A mixture of letters, special characters and numbers. - Inclusion of at least one letter, one number and one special character. Click the Apply button to set the password to the new password. For the next login, the new password is required.
③	Session Timeout Change	Enter the session timeout (min.). Click the Apply button to apply the settings to the system.

9.5.2 User Management

The screenshot displays the 'USER MANAGEMENT' interface. On the left, a sidebar shows 'Account' and 'System Information' under the 'User Management' header (marked with a circled 1). The main area shows a 'User List' table (marked with a circled 2) with columns 'ID' and 'Description'. The table contains three entries: 'abcd' (guest), 'qwer' (guest#2), and 'rtey' (test#2). Each entry has a vertical ellipsis menu icon (marked with a circled 3). To the right, the 'User Account' dialog box is open, showing fields for 'ID', 'Password', and 'Description'. Below these fields is the 'Menu Authorization' section with checkboxes for various settings and tools. At the bottom of the dialog are 'Cancel' and 'Add' buttons.

Editable User Permissions Menu

No.	Item	Description
①	User Management	Sets the user ID and password information.
②	Add User	Creates new user accounts. To create a new user account, do the following: 1. Click the Add (+) button. The User Account window is displayed. 2. Enter the new user ID, Password, and Description (optional). 3. Under Menu Authorization, select the pages to which you want the user to have access. 4. Click the Add button.
③	User Management List	• ID: Displays the registered user ID. • Description: Displays the user's description. • ⋮ (Controls): Click the control, and then select one of the following commands to manage the selected user account. - Update User: Displays the User Account window. Change the user ID or choose user permissions by selecting the checkboxes, and then click the Apply button. The user can access only the selected permissions. - Change Password: Displays the Change Password dialog box. Enter the Old and New passwords, and then click the Apply button to set the new password. The next time the user logs in, the new password will be required. - Delete User Account: Displays a confirmation dialog box. Click OK to delete the user account.

9.5.3 System Information

Account
User Management
▶ System Information ①

SYSTEM INFORMATION

2 System Information ⓘ

Antenna Size	125 cm
Antenna Voltage	48.3 V
ACU Voltage	49.4 V
POL Main Voltage	24.0 V
Antenna Model Name	X130D
Antenna Model Number	VX1-12B-1N330
Antenna S/N	XD321070002
ACU Model Number	VP-T86X1
ACU S/N	PVP21040002
Antenna Temperature	27.7 °C
System Band	Ka
Uptime	1 Days, 15:38:35
Host controller	v1.2.0

3 Antenna Information

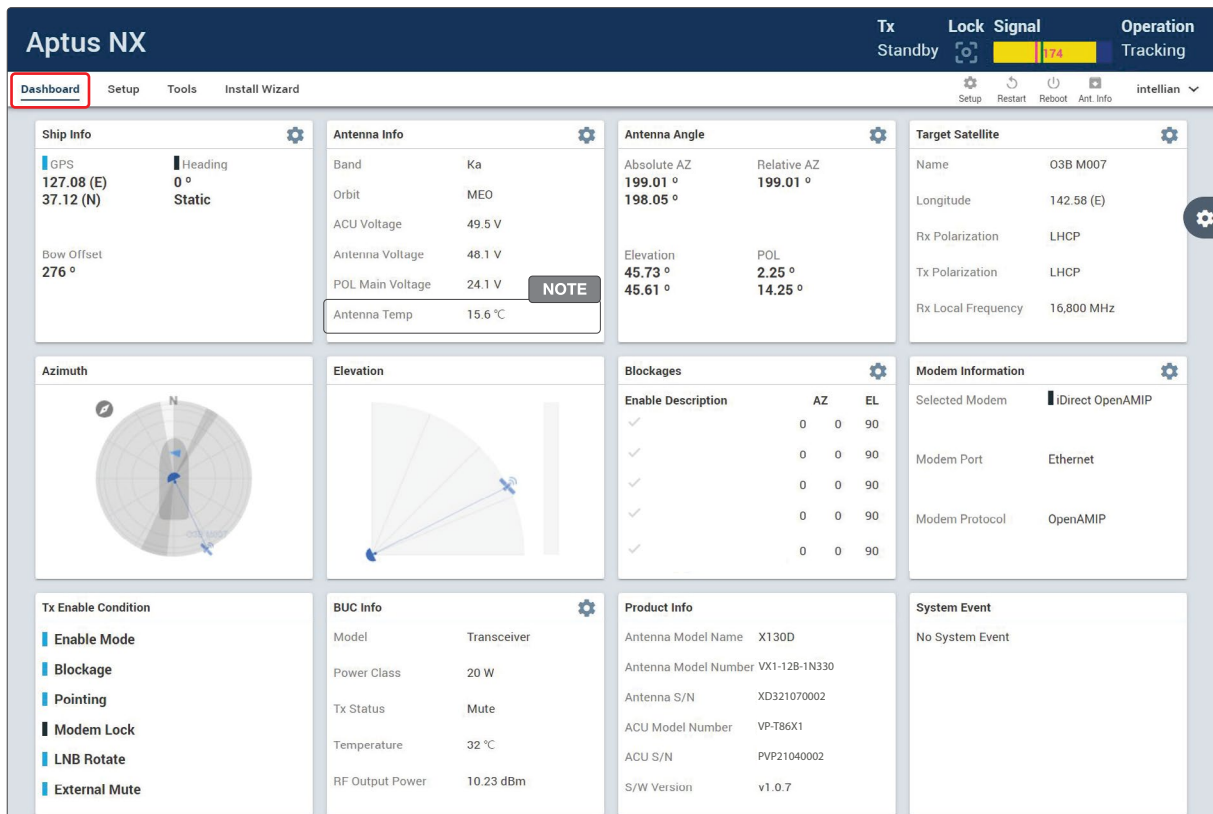
Antenna Name
 ⓘ

Cancel Apply

No.	Item	Description
①	System	Use this page to display system information and change the antenna name.
②	System Information	Displays antenna information.
③	Antenna Information	Enter the Antenna name. Click the Apply button to set the antenna name.

9.6 Dashboard

The Dashboard menu item provides access to quick monitoring of the antenna status. Once displayed, the Dashboard helps you arrange panels on a single screen, while providing you with a broad view of a variety of information at once. You can customize the dashboard by rearranging the panels to make them more readable and user-friendly.



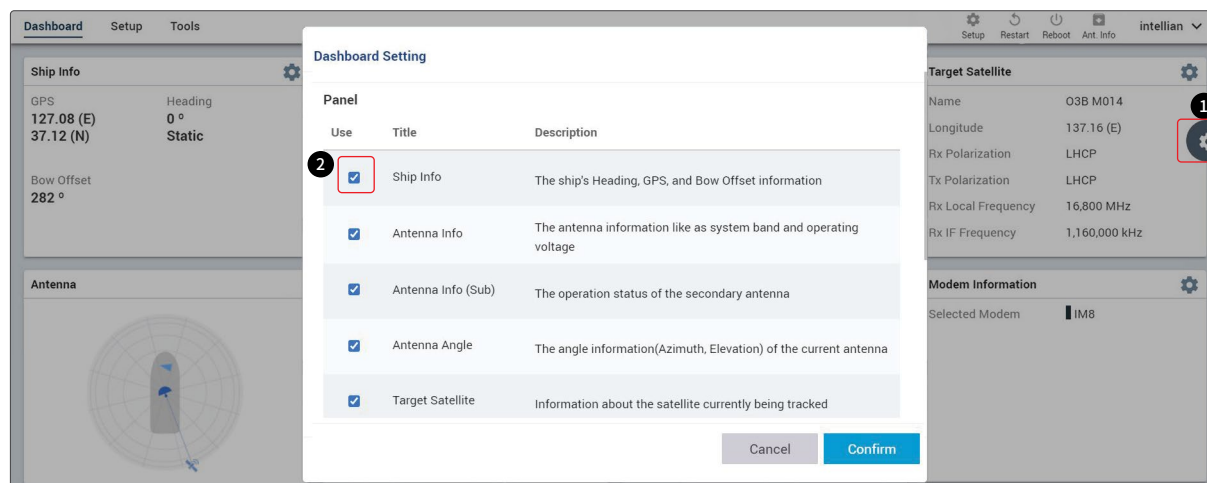
NOTE

In the BUC Info panel, the measured temperature can be different from the actual temperature.

9.6.1 How to Add & Remove Panels (Dashboard Setting)

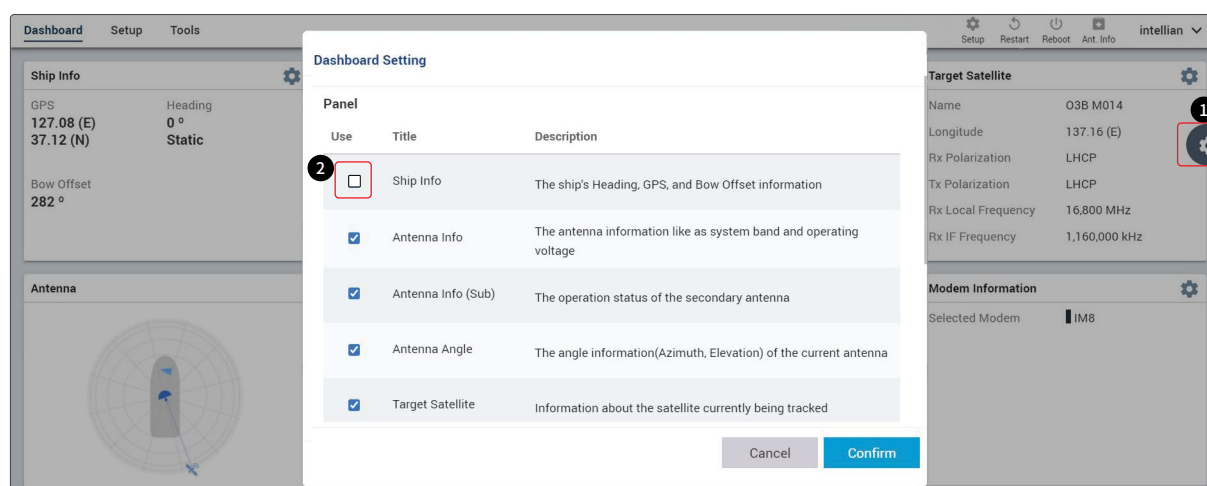
Adding Panels

1. Click the gear icon on the right side of the page (see figure below). The Dashboard Setting window displays.
2. Check the box of the panel that you wish to add to the dashboard.
3. Click the **Confirm** button to apply the settings to the system. Once the panel is added, it will be automatically placed at the bottom of the page.



Removing Panels

1. Click the gear icon on the right side of the page (see figure below). The Dashboard Setting window displays.
2. Uncheck the box of the panel that you wish to remove from the dashboard.
3. Click the **Confirm** button to apply the settings to the system.



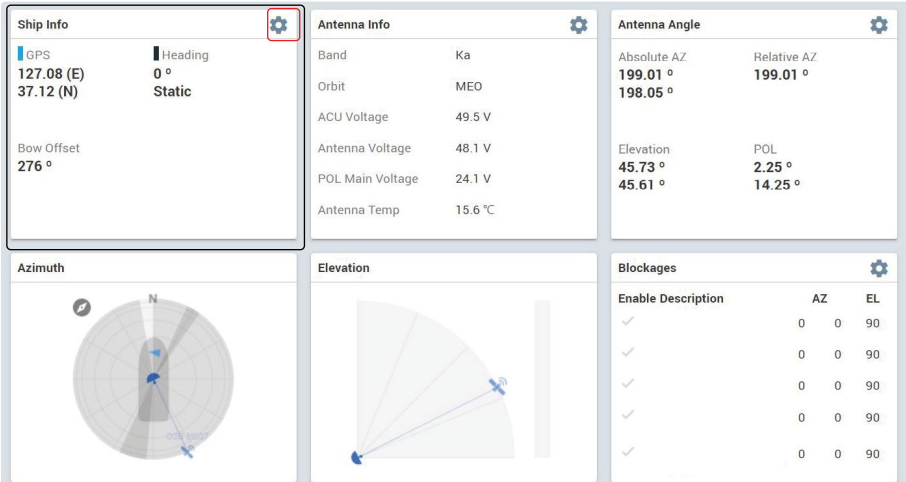
NOTE

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

9.6.2 How to Use Shortcut Settings

Many panels on the dashboard provides shortcut function. Using the **Shortcut** button on right side of the panel, you can easily access detailed information and manage settings.

1. Click the **Shortcut** button (⚙️) to open the setting page.



The setting page of the the selected panel will appear on a web page. On settings pages, you can check the detailed information and quickly apply the settings that you wish.

9.7 System Setting

This menu sets and displays the Ship, Antenna, Satellite, Modem, BUC, Network, WiFi, Mediator and IFL Balancing functions.

9.7.1 Ship Setting

SHIP

2 GPS

Longitude(°) EAST

Latitude(°) NORTH

3 Heading Device

Current Device

Baud Rate

Heading(°)

4 BOW Offset

Ka Ku

Current Bow Offset(°)

5 Blockage

Enable	Description	AZ Start~End (°)	EL (°)
☒		0 ~ 0	90
☒		0 ~ 0	90
☒		0 ~ 0	90
☒		0 ~ 0	90
☒		0 ~ 0	90

No.	Item	Description
①	Ship	Sets the ship information and blockage zones.

No.	Item	Description
②	GPS	Sets the GPS position of the vessel for searching for a satellite. Check the GPS status connected to the antenna system. The indicator to the left of the help button shows the GPS status. Make sure the GPS indicator is Blue. (Blue: 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 (°): Set Longitude information (East / West). • Latitude (°): Set Latitude information (North / South). Click the Apply button to apply the settings to the system.
③	Heading Device	Sets the ship's heading device. Choose the device type from the Current Device drop-down list. The indicator to the 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.) NOTE: When the antenna and Intelligent mediator are connected, the heading's priority information received from the Intelligent mediator will be used. If the NONE/Static is selected on the Current Device, the Intelligent mediator's heading information will not be applied. • Current Device: Select the heading device (None, NMEA (0183), Static). • Baud Rate: Select the band rate (4800, 9600, 19200, 38400). It must be set when NMEA is selected on the Current Device list. • Heading(°): Enter the heading information. Click the Apply button to apply the settings to the system.
④	BOW Offset	For setting the 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 Ka/Ku Bow Offset Range (0 – 360°). • Save Offset: Save current satellite setting. Bow offset will be adjusted and saved automatically. 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 where transmission is muted. 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.

9.7.2 Antenna Setting

Dashboard

Setup

Tools

Install Wizard

Ship

► Antenna 1

Satellite

Modem

BUC

Network

WiFi

Mediator

IFL Balancing

ANTENNA

2

Antenna Angle ⓘ

Relative Azimuth117.63 °

Absolute Azimuth117.63 °/ 115.21 °<5> ⓘ

Elevation45.26 °/ 21.46 °▼5▲ ⓘ

Pol. Angle0.00 °/ 0.00 °<5> ⓘ

3

Thresholds Setting ⓘ

KaKu

Tracking Level1010

Detect Level60100

Tx Enable5050

CancelApply

4

Search Parameter ⓘ

GEO MEO

Search Step(°)0.50.5

Search1 Azimuth(°)480480

Search1 Elevation(°)66

Search3 Azimuth(°)34

Search3 Elevation(°)41

CancelApply

5

Conical Range ⓘ

KaKu

Azimuth4555

Elevation5060

CancelApply

6

Conical Range Check

Switch ActivationOnOff

7

El Adjust

El Adjust(°)

-1

Cancel

Apply

8

Tilt Sensor Calibration

Ready

Roll

1.77

Pitch

-0.66

Roll Offset

0.00

▼

1

▲

Pitch Offset

0.00

▼

1

▲

9

Pol. Sensor Calibration (Skew)

Sat Skew Offset(°)

0

Mechanical Offset(°)

0

Consolidated Offset(°)

0

Mechanical Skew Offset reset

No.	Item	Description
①	Antenna	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.
②	Antenna Angle	The system must be in Setup Mode to modify these 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 relative azimuth angle. - Absolute Azimuth: Adjust the antenna's absolute azimuth angle. - Elevation: Adjust the elevation angle. - Pol. Angle: Adjust the LNB pol angle
③	Thresholds Setting	Sets current detect level threshold and tracking level threshold. - Tracking Level: Enter the current tracking level threshold. - Detect Level: Enter the current detect level threshold. - Tx Enable: Enter the Tx enable threshold. Click the Apply button to apply the settings to the system.
④	Search Parameter	Sets the search step and search range. - Search Step(°): Set increment step size. - Search1: Searches the target satellite with the azimuth full scan (360°). - Search3: Searches the satellite signal from around the target angle. Click the Apply button to apply the settings to the system.

No.	Item	Description
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	The system must be in Setup Mode to modify these settings. Monitors the Azimuth and the elevation values when the conical range is modified. Switch Activation: Choose whether to use the switch activation function (On / Off). Click the Apply button to apply the settings to the system.
⑦	El Adjust	Adjusts the elevation to offset the angle. El Adjust(°): Enter the EL value. Click the Apply button to apply the settings to the system.
⑧	Tilt Sensor Calibration	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 calibration. Refer to the replacement manual for detailed procedures. Enter Setup Mode to modify settings. Maintain the pitch and the roll in order to keep the pedestal parallel to the horizon. - Ready: Click the Ready button to bring the elevation and cross-level to 0. - Roll/Pitch: Displays the roll and pitch value. - Roll/Pitch Offset : Displays the roll and pitch sensor offset. Click the Restart button on the top menu to restart the antenna system.
⑨	Pol. Sensor Calibration (Skew)	- Sat Skew Offset (°): Displays the skew offset value. - Mechanical Offset (°): Displays the skew offset value. - Consolidated Offset: (°) Displays the consolidated offset value. - Mechanical Skew Offset reset: To reset the mechanical skew offset value to 0, click on the Mechanical Skew Offset reset button. The mechanical skew offset is pre-set with a factory default value (0, 1 or 2) depending on the assembly condition. You may need to reset the mechanical skew offset when the satellite skew offset is unknown (consolidated skew offset = satellite skew offset + mechanical skew offset). Mechanical skew offset is set automatically by moving the Pol Angle left or right in the tracking mode. NOTE: Each satellite has its own skew offset. Intellian recommends that you contact your service provider or satellite operator to get the satellite skew offset value. To set the satellite offset value, go to Setup → Satellite → Satellite Information → Skew Offset (°).

**NOTE**

The following table shows the default value of each antenna setting.

Item		Value	
Thresholds Setting		KU	KA
	Tracking level	30	20
	Detect Level	60	60
	Tx Enable	50	50
Search Parameter		GEO	MEO
	Search Step	0.5	0.5
	Search1 Azimuth	480	480
	Search1 Elevation	6	6
	Search3 Azimuth	3	6
	Search3 Elevation	4	1
Conical Range		KU	KA
	Azimuth	50	40
	Elevation	60	50
EL adjust		0	
Tilt Sensor Calibration	Roll offset	0	
	Pitch offset	0	

9.7.3 Satellite Setting

No.	Item	Description
①	Satellite	Sets the current tracking satellite settings.
②	Select Satellite	Library: Select the Satellite from the Library drop-down list. NOTE: Refer to "8.8.2 Library" on page 88 to get information and edit details.

No.	Item	Description
③	Satellite Information	Displays the selected library information and sets the current tracking satellite settings. • Satellite Name: Enter the satellite name. • Longitude (°): Enter the satellite orbit position. • Skew Offset (°): Enter the skew offset. NOTE: Each satellite has its own skew offset. You may contact your service provider or satellite operator to get the satellite skew offset value. • Tx Local Frequency (MHz): Select the Tx local frequency. • Rx Local Frequency (MHz): Select the Rx 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.
④	NBD Information	Displays NBD mode's tracking information when you select the Modem Lock on Identify. • Rx IF Frequency (kHz): Enter the tracking frequency. • Bandwidth (kHz): Enter the detection bandwidth. Click the Apply button to apply the settings to the system.
	DVB Information	Displays DVB mode's tracking information when you select the DVB Lock on Identify. • Verify Type: Select the verification type. • Frequency (MHz): Enter the tracking frequency. • Symbol (kSps): Enter the symbol rate. Click the Apply button to apply the settings to the system.

9.7.4 Modem Setting

No.	Item	Description
①	Modem	Sets the modem interface.
②	Modem	Sets the interface between the Antenna and the satellite modem. • Connection Port: Select the port from the Connection port drop-down list (1/2). In case of connection the each port, It should be set all port. • Preset: Select the modem from the Preset drop-down list. The settings related to the modem interface will be set automatically once the modem type is selected. NOTE: The input parameters change depending on the modem selection. Parameters with an asterisk (*) are required.
③	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.



NOTE

When using the Dual Antenna System, the Modem Configuration for the Secondary ACU cannot be set. Disable Mediator setting or select the Antenna mode's Main on the Mediator. Refer to the "**8.7.8 Mediator Setting (Optional: For Dual Antenna System)**" on page 82 for more details.

9.7.5 BUC Setting

Dashboard
Setup
Tools
Install Wizard

Ship
Antenna
Satellite
Modem
BUC
Network
WiFi
Mediator
IFL Balancing

BUC

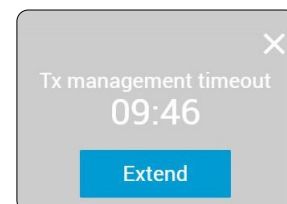
2 BUC Status
Refresh BUC information

Model	Transceiver
Power Class	20 W
Tx Status	Mute
Temperature	32 °C
RF Output Power	10.23 dBm
Tx Local Frequency	26550 MHz
Tx Polarity	LHCP
Tx PLL Lock	Unlock
Rx Local Frequency	18250 MHz
Rx Polarity	LHCP
Rx PLL Lock	Lock
Serial Number	A00017A17
Software Version	G-032-031

3 BUC Setting
Tx Status
☒ Mute
☐ Unmute
Cancel
Apply

4 BUC Network Setting
IP Address
172.22.1.30
Subnet Mask
255.255.255.0
Gateway
172.22.1.15
Cancel
Apply

No.	Item	Description
①	BUC	Sets the BUC interface.

No.	Item	Description
②	BUC Status	<i>This function is activated depending on the BUC type.</i> Displays current BUC status information (Model, Power Class, Tx Status, Temperature, RF Output Power, Tx Local Frequency, Tx Polarity, Tx PLL Lock, Rx Local Frequency, Rx Polarity, Rx PLL Lock, Serial Number, Software Version). Refresh BUC information: Click the Refresh BUC information button to update the BUC status information.
③	BUC Setting	<i>This function is activated depending on the BUC type.</i> Sets the BUC setting options. - Tx Status: Select the transmission status of the BUC signal. Click the Apply button to display the Manual Mode pop-up window. The Tx status automatically switches to the manual mode. Click the Extend button to extend the time. Click the X (Close) button to terminate the manual mode (Controlled by Modem).  <Manual Mode Pop-up Window> - Mute: Select Mute and click the Apply button. - Unmute: Select Unmute and click the Apply button. - Attenuator (dB): It is available only when the BUC is NJRC. The attenuator is applied automatically. Click the Apply button to apply the settings to the system.
④	BUC Network Setting	<i>This function is activated depending on the BUC type.</i> Sets the BUC network setting options. - IP Address: Enter the network IP address. - Subnet Mask: Enter the subnet mask. - Gateway: Enter the gateway. Click the Apply button to apply the settings to the system.

**NOTE**

The top menu's Tx status is different depending on the BUC setting options.

- Off : Mute in manual mode
- Standby : Mute in auto (not manual, controlled by modem) mode
- Transmit : Manual/auto unmute

9.7.6 Network Setting

Dashboard Setup Tools Install Wizard

Ship
Antenna
Satellite
Modem
BUC
► Network ①
WiFi
Mediator
IFL Balancing

NETWORK ⓘ

② Management Interface Configuration ⓘ

IP Address: 192.168.2.1

Subnet Mask: 255.255.255.0

Lease Start Address: 192.168.2.101

Lease End Address: 192.168.2.200

Lease Time (sec): 604800

Cancel Apply

③ Modem Port Configuration ⓘ

IP Address: 172.22.1.23

Subnet Mask: 255.255.255.0

Gateway: 172.22.1.1

Cancel Apply

No.	Item	Description
①	Network	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. DHCP will only assign IP addresses within the start and end range. • Lease End Address: Set the lease IP address end range. • Lease Time (sec): Set the lease IP address update time. This is the amount of time in seconds (default 604800 seconds or 7 days) that an IP address is reserved for a network device. Click the Apply button to apply the settings to the system.
③	Modem Port Configuration	Sets the ACU's internal IP address, routing, and ports. • IP Address: Enter the network IP address (Factory default: 192.168.0.223). CAUTION: when using Dual Antenna System, the "IP Address" of the "Modem Port Configuration" for the Primary ACU and the Secondary ACU must be specified differently. If you specified the same IP address, the system will not connect to a modem and cannot use a dual antenna system function. • Subnet Mask: Enter the subnet mask (Factory default: 255.255.255.0). • Gateway: Enter the gateway (Factory default: 192.168.0.1). Click the Apply button to apply the settings to the system.

9.7.7 WiFi Setting

No.	Item	Description
①	WiFi	Sets the WiFi access information.
②	WiFi Config	Sets the WiFi access point configuration. The indicator next to the title shows the WiFi dongle connection status. (Blue: The WiFi dongle is connected. Black: The WiFi dongle is not connected.) • Activate: Sets the WiFi function by toggling the activation button (Enable/Disable). • SSID: The SSID is the name that allows devices to identify and connect to the wireless network. The SSID is case-sensitive and must not exceed 32 alphanumeric characters, and it can be any keyboard character. The SSID is the same for all devices that connect to your wireless network. • SSID Broadcast: Sets the SSID broadcast function by toggling the activation button (Enable/Disable). • Channel: Selects an appropriate channel from the list provided to correspond with your network settings. All devices that connect to your wireless network will use the same channel automatically. Try to avoid conflicts with other wireless networks by choosing a channel where the upper and lower three channels are not in use. • Mode: Sets the security mode type (OPEN/SECRET(WPA2)). If you use the Secret (WPA2) mode, you must enter a Passphrase below. Each user will have to enter the passphrase to join the network before gaining access to the Login page of AptusNX. • Passphrase: Enter the password required to connect to WiFi. Click the Apply button to apply the settings to the system.

9.7.8 Mediator Setting (Optional: For Dual Antenna System)

This function is available when using a Dual Antenna System.

In Case of Main Antenna

- Main Antenna is connected to the ACU's Modem RX/TX port and to the modem.

The screenshot displays the 'MEDIATOR' configuration window. The left sidebar lists system components, with 'Mediator' highlighted. The main area is divided into five numbered sections:

- 1 Mediation:** A toggle switch for 'Use' is set to 'Enable'. 'Cancel' and 'Apply' buttons are at the bottom.
- 2 Antenna:** 'Antenna Mode' is set to 'Main'. A text field for 'Peer Antenna IP Address' is empty. 'Cancel' and 'Apply' buttons are at the bottom.
- 3 Operation:** 'Operation Mode' is set to 'Antenna Mediation'. 'Role' is set to 'Primary'. 'Cancel' and 'Apply' buttons are at the bottom.
- 4 Mediation Configuration:** Includes input fields for 'Timeout(sec)' (6) and 'Signal Threshold' (62). A 'Modem Lock Broadcast' section has a 'Use' toggle set to 'Disable'. 'Cancel' and 'Apply' buttons are at the bottom.

No.	Item	Description
①	Mediator	Intellian's new ACU has an embedded Dual Antenna Mediator function, which is used to instantly switch between two Intellian VSAT antenna systems. When one antenna is blocked by obstacles or has suddenly lost service, the other antenna will immediately provide fail-safe operation to maintain the highest levels of system performance and reliability.
②	Mediation	Enable or disable the dual antenna mediator function. • Enable: Enables the mediator function to use the Dual Antenna System. The mediator options is shown for detailed function settings. • Disable: Disables the mediator function. Click the Apply button to apply the settings to the system.

No.	Item	Description
③	Antenna	This function is available in the Main Antenna's AptusNX when both Main and Sub Roles' ACUs are connected to the system. Displays Main Antenna information when you select Main for the Antenna Mode. • Antenna Mode: If the ACU's Modem RX/TX port is connected to the modem, select the Main for the Antenna mode. • Peer Antenna IP Address: Sets the IP address of sub ACU from main ACU. Click the Apply button to apply the settings to the system.
④	Operation	Assigns the antenna's role as the Primary or Secondary antenna. The primary role's antenna (either main or sub antenna) communicates (Tx/Rx) with the satellite. • Operation Mode : <i>This function is only available in main antenna.</i> Sets the method for selecting the antenna role type. - Manual: Manually switch-over to the antenna role type. - Antenna Mediation: Automatically switch-over to the antenna role type. • Role : Select the antenna role type (Primary/Secondary) manually. This function is only available when Operation Mode is manual. Click the Apply button to apply the settings to the system.
⑤	Mediation Configuration	<i>This function is only available in main antenna.</i> If the signal of the secondary antenna is higher than the threshold within the set timeout, the Role switches automatically. • Change Role Option : Sets the timeout and signal threshold. - Timeout(sec) : Sets the Timeout (in seconds). - Signal Threshold : Sets the Signal Threshold. • Modem Lock Broadcast : Sets whether to send a Modem lock signal to all antennas. - Yes: Send a Modem lock signal to all antennas. - No: Send a Modem lock signal to primary antenna only.

In Case of Sub Antenna

- Sub Antenna is connected to the ACU's Modem RX/TX port to the Main Antenna's ACU.

The screenshot shows the 'MEDIATOR' configuration page. The left sidebar has 'Mediator' selected. The main content area has four sections:

- 2 Mediation**: 'Use' is set to 'Enable' (radio button selected). Buttons: 'Cancel', 'Apply'.
- 3 Antenna**: 'Antenna Mode' is set to 'Sub' (radio button selected). 'Connection Port' is a dropdown menu showing '1'. 'Peer Antenna IP Address' is a text input field. Buttons: 'Cancel', 'Apply', 'Connect'.
- 4 Operation**: 'Role' is set to 'Primary' (radio button selected). Buttons: 'Cancel', 'Apply'.

No.	Item	Description
①	Mediator	Intellian's new ACU has an embedded Dual Antenna Mediator function, which is used to switch instantly between two Intellian VSAT antenna systems. When one antenna is blocked by obstacles or has suddenly lost service, another antenna will immediately provide fail-safe operation to maintain the highest levels of system performance and reliability.
②	Mediation	Enable or disable the dual antenna mediator function. • Enable: Enables the mediator function to use the Dual Antenna System. The mediator options are shown for detailed function settings. • Disable: Disables the mediator function. Click the Apply button to apply the settings to the system.
③	Antenna	Displays Sub Antenna information when you select Sub for the Antenna Mode. • Antenna Mode: If the the ACU's Modem RX/TX port is connected to the Main Antenna's the ACU, select the Sub for the Antenna mode. • Connection Port: Select the modem port that connects to the main ACU. (Default: 1) • Peer Antenna IP Address: For the sub ACU, displays the IP address of the main ACU. Click the Apply button to apply the settings to the system.
④	Operation	The primary role's antenna (either main or sub antenna) is communicating (Tx/Rx) with a satellite. • Role : Displays the antenna role type (Primary/Secondary).

9.7.9 IFL Balancing

Dashboard
Setup
Tools
Install Wizard

Ship
Antenna
Satellite
Modem
BUC
Network
WiFi
Mediator
► IFL Balancing 1

IFL BALANCING

2 Cable ⓘ

Cable Type

LMR 400

Cable Length

30 m

Cable Loss

Rx: - 5.5 dB / Tx: - 5.5 dB

Cancel
Apply

3 IF Compensation ⓘ

Tx	Custom Adjust		Cable Loss Auto Adjust		Current Applied Gain
Ka	0	+	5.5 dB	=	5.5 dB
Ku	0	+	5.5 dB	=	5.5 dB

Rx	Custom Adjust		Cable Loss Auto Adjust		Current Applied Gain
PORT1	0	+	5.5 dB	=	5.5 dB
PORT2	0	+	5.5 dB	=	5.5 dB

Cancel
Apply

No.	Item	Description
①	IFL Balancing	Sets the cable length and IFL (inter-facility link) configuration.
②	Cable	Sets the Cable Length configuration. The gain is set according to the cable length. - Cable Type: Select the Cable type from the Cable Type drop-down list. - Cable Length: Select the Cable length from the Cable Length drop-down list. - Cable Loss: Displays the cable loss according to the cable type and length automatically. Click the Apply button to apply the settings to the system.
③	IF Compensation	Enter the fine-tuning value into Custom Adjust to apply the extra gain value. The gain is calculated and compensated according to the cable type and length automatically first. Then you can apply the extra gain value. Click the Apply button to apply the settings to the system.

9.8 System Tools

This menu sets and displays the S/W Upgrade, Library, Backup & Restore, Reset, Logs and Diagnostic system tools.

9.8.1 Software Upgrade

No.	Item	Description
①	S/W Upgrade	Upgrades the antenna software package.
②	File Upload	Browse and select the software package file to upload, and then click the Upload button. The update may take a few minutes to complete. The upload time may vary due to a variety of factors, such as your network speed. Uploading an incorrect software file may cause serious damage to your antenna and BDU. Refer to the following " Antenna Software Upgrade Procedure " page for more details.
③	System Partition	The ACU has three storage partitions: the Sys0, the Sys1 and the Factory Default. Select the desired storage partition and click the Activate button. The currently active partition is unavailable for selection. • Sys0: Displays the Sys0 host controller software version. • Sys1: Displays the Sys1 host controller software version. • Factory Default: Displays the Factory Default host controller software version. • Current Partition: Displays the activated storage partition name (Sys0, Sys1 or Factory Default).

Antenna Software Upgrade Procedure:

1. Click the **Browse** button and, in the Windows Open dialog box, select the upgrade package file to upload.
2. Click the **Upload** button to transfer the software package file (*.bin) to the antenna module. The antenna Software versions are displayed on the pop-up window.



NOTE

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

3. Check the current version installed and the new version available, and then click the **Update** button.

Name	Current	New
POL controller	0.14.0	1.0.1
ANT controller	0.14.0	1.0.1
ACU controller	0.14.0	1.0.1
Host controller	0.14.0	1.0.1

Cancel Update

During the upgrade process, the window will display progress and status.

Name	Progress	Status
POL controller	100%	Success
ANT controller	90%	Running
ACU controller	0%	Idle
Host controller	0%	Idle

Done

If the software is successfully upgraded, "Success" will be displayed in the Status column.

Name	Progress	Status
POL controller	100%	Success
ANT controller	100%	Success
ACU controller	100%	Success
Host controller	100%	Success

Done

4. Click the **Done** button to close the pop-up window.

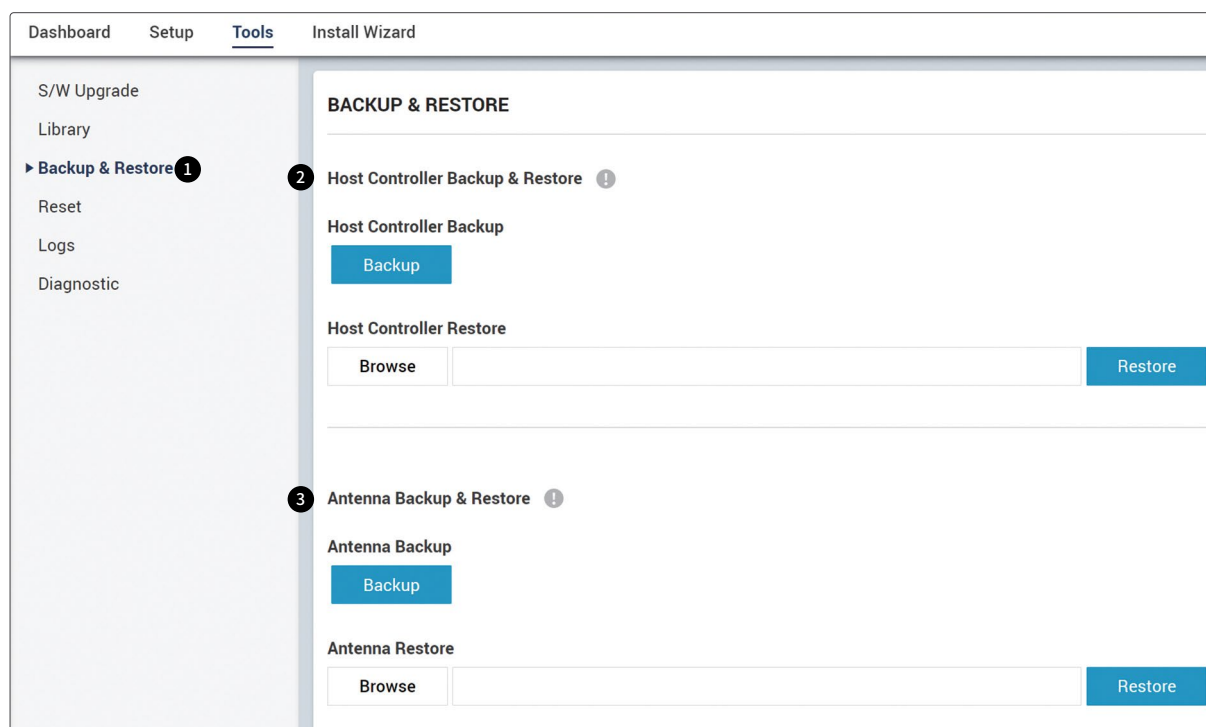
9.8.2 Library

The screenshot displays the 'Tools' menu with 'Library' selected. The 'LIBRARY' section includes options for uploading and downloading library files. The 'GEO Satellite List' section shows a table of satellites with columns for Name, Longitude, Band, Base Local, Skew Offset, Polarity(RX/TX), and Identify. The 'Satellite Library' pop-up window on the right allows for editing satellite information, including Name, Band, Longitude, Skew Offset, Local Frequencies, Polarization, and Lock settings.

Name	Longitude	Band	Base Local	Skew Offset	Polarity(RX/TX)	Identify
KR6_KU_H	116	Ku	11300	-12	Horizontal/Vertical	DVB Lock
KR5_KU_V	113	Ku	11300	0	Vertical/Horizontal	Modem Lock

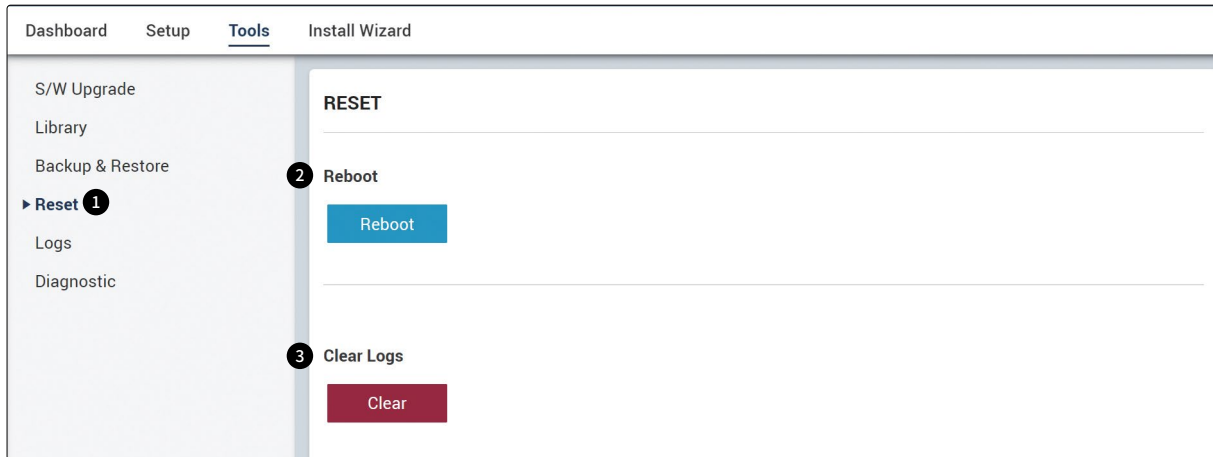
No.	Item	Description
①	Library	Sets the satellite library information.
②	Library File	Upload or download the GEO satellite library. • Select Library file to upload: Click Browse to select the library file to upload, and then click the Upload button. The update may take a few minutes to complete. • Download Library File : Library data (.isl) can be downloaded. Click the Download button.
③	GEO Satellite List	Displays the GEO satellite list and information. • Filter: Select the filter option (All/Ka) from the drop-down list. • Edit (✎) button: To edit the registered GEO satellite, click the Edit (✎) button. The Satellite Library pop-up window is displayed. You can edit the following details. - Satellite Information: Sets the current tracking satellite settings. • Satellite Name: Enter the satellite name. • Band: Select the band from the drop-down list. • Longitude(°): Enter the satellite orbit position. • Skew Offset(°): Enter the skew offset. • Tx Local Frequency(MHz): Enter the Tx local frequency. • Rx Local Frequency(MHz): Enter the local frequency. • RX Polarization: Select the current Rx polarization from the drop-down list. • TX Polarization: Select the current Tx polarization from the drop-down list. • Identify: Displays the lock setting type (Modem Lock / DVB Lock) for satellite tracking. • NBD Information: Displays NBD mode's tracking information. • Rx IF Frequency(kHz): Enter the IF Frequency • Bandwidth: Enter the detection bandwidth.

9.8.3 Backup and Restore



No.	Item	Description
①	Backup and Restore	Backs up user configuration files to a PC and restores the host/antenna settings.
②	Host Controller Backup & Restore	Backup or restore Host Controller setting. - Host Controller Backup: Stores user host configuration files on your PC. Click the Backup button to store the antenna configuration on your PC. - Host Controller Restore: Restores the host settings using the setting files saved on your PC. Click the Browse button to select the saved backup file from your PC, and then click the Restore button to restore the host controller settings.
③	Antenna Backup & Restore	Backup or restore antenna setting. - Antenna Backup: Stores user antenna configuration files on your PC. Click the Backup button to store the antenna configuration on your PC. - Antenna Restore: Restores the antenna settings using the setting files saved on your PC. Click the Browse button to select the saved backup file from your PC, and then click the Restore button to restore the backup antenna settings to the system.

9.8.4 Reset



No.	Item	Description
①	Reset	Resets the antenna system, settings and logs.
②	Reboot	Click the Reboot button to reboot the host controller.
③	Clear Logs	Click the Clear button to clear all host controller logs.

9.8.5 Logs

The screenshot shows the AptusNX web interface. At the top, there are tabs: Dashboard, Setup, Tools (selected), and Install Wizard. On the left sidebar, under the 'Tools' section, there are links for S/W Upgrade, Library, Backup & Restore, Reset, Logs (highlighted with a circled 1), and Diagnostic. The main content area is titled 'LOGS'. Below this, there is a 'Log Download' section (highlighted with a circled 2) which includes a date range selector with 'From' and 'To' fields both set to '9/15/2022', a checked checkbox for 'Include Antenna Backup', and a blue button labeled 'Download Log File'.

No.	Item	Description
①	Logs	Downloads the antenna log data.
②	Log Download	Allows you to download ACU and antenna log files for a specified date range. • From/To: Sets the date range for which you want to download files. Any log data up to a month old can be downloaded. • Include Antenna Backup: Downloads antenna log files along with the ACU log files. If you do not select this option, only ACU log files will be downloaded. • Download Log File: Downloads the specified log files in a compressed archive file (.tgz).

9.8.6 Diagnostic

Dashboard

Setup

Tools

Install Wizard

S/W Upgrade

Library

Backup & Restore

Reset

Logs

► Diagnostic 1

2 Diagnostic !

☐

Test

Result

Reason

☒

Ant. Communication

Idle

☒

Sensor (Tilt/Gyro)

Idle

☒

AZ Motor

Idle

☒

EL Motor

Idle

☒

CL Motor

Idle

☒

LNB/BUC

Idle

☒

Skew

Idle

Start

No.	Item	Description
①	Diagnostic	Executes antenna Diagnostic test to check the antenna status.
②	Diagnostic	Select the checkbox for each test that you want to run on the system. You can select all the tests quickly by selecting the top checkbox. Click the Start button to run the test.

Diagnostic Procedures:

1. Select the checkbox for each test that you want to run on the system. Click the **Start** button to run the Diagnostic test.

DIAGNOSTIC

Diagnostic

☒	Test	Result	Reason
☒	Ant. Communication	Idle	
☒	Sensor (Tilt/Gyro)	Idle	
☒	AZ Motor	Idle	
☒	EL Motor	Idle	
☒	CL Motor	Idle	
☒	LNB/BUC	Idle	
☒	Skew	Idle	

Start

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

DIAGNOSTIC

Diagnostic

☐	Test	Result	Reason
☐	Ant. Communication	Success	
☐	Sensor (Tilt/Gyro)	Idle	
☐	AZ Motor	Idle	
☐	EL Motor	Idle	
☐	CL Motor	Idle	
☐	LNB/BUC	Idle	
☐	Skew	Idle	

Stop

After the Diagnostic test is completed the system shows the Diagnostic test results of each item.

DIAGNOSTIC

Diagnostic

☒	Test	Result	Reason
☒	Ant. Communication	Success	
☒	Sensor (Tilt/Gyro)	Success	
☒	AZ Motor	Success	
☒	EL Motor	Success	
☒	CL Motor	Success	
☒	LNB/BUC	Success	
☒	Skew	Success	

Start

Chapter 10. Specification

10.1 Antenna Specification

Item		Specification
Platform		Three Axis: Azimuth, Elevation, Cross-level
Pedestal Motion Range	Azimuth	Unlimited
	Elevation	-20° to +115°
	Cross-Level	Up to $\pm 37^\circ$
Ship's Motion	Roll	$\pm 20^\circ$ at 6 second
	Pitch	$\pm 15^\circ$ at 6 second
	Yaw	$\pm 8^\circ$ at 6 second
	Turning rate	Up to 12°/sec & 5°/sec ²
Tracking Error		0.2° max in presence of specified ship motions
Power Source		AC 100-240V, 50/60Hz
Radome Height		1724.0 mm (67.9")
Radome Diameter		Ø1681.0 mm (66.2")
Reflector Size		Ø1250 mm (49.2")
Antenna Weight		180 kg (396.8 lbs) with Radome

10.2 RF Specification

Item	Ku-band	Ka-band
Rx Frequency	10.7 GHz ~ 12.75 GHz	17.7 GHz ~ 20.2 GHz
Rx Gain (Without Radome)	> 41.7 dBi @11.85 GHz	> 45.5 dBi @19.0 GHz
G/T	20.4 dB/K (@12.75 GHz, 30° EL)	21.0 dB/K (@19.0 GHz, 20° EL)
Tx Frequency	13.75 GHz ~ 14.5 GHz	27.5 GHz ~ 30.0 GHz
Tx Gain (Without Radome)	> 42.7 dBi @ 14.0 GHz	> 48.5 dBi @ 29.0 GHz
TX EIRP	55.8 dBW (@14.25 GHz, 25 Watt)	60.5 dBW (@29.0 GHz, 20 Watt)
Cross pol Isolation	Rx/ Tx : 30 dBc	Rx : 21 dBc / Tx : 25 dBc
BUC Power	8W/16W/25W/40W (BUC)	20W (Transceiver)
LNB	Intellian PLL LNB	Intellian Transceiver
Pattern Conformity	FCC 25. 209	FCC 25. 209
Regulatory Compliance	FCC 25. 218	FCC 25. 218
Polarization	Linear Pol. V/H	Circular Pol. RHCP/LHCP

10.3 Antenna Control Unit (ACU) Specification

Item	Specification
Size (W x D x H)	431 mm x 390 mm x 44.3 mm (17.0" x 15.4" x 1.7")
Weight	6.0 kg (13.2 lbs)
USB Port	1 Not used (front) 1 Firmware Upgrade and Logs Download (front) 1 WiFi (rear, for Wi-Fi dongle)
Ship's Gyrocompass Interface	NMEA2000 / NMEA0183
GPS	NMEA Out
Modem Interface	Ethernet port, I/O Console
BUC Interface	RS-232C
Ethernet port	RJ45, TCP/ IP connection
RF Interface	ACU to Antenna : N-type x 2EA ACU to Modem : SMA x 4EA ACU to ACU(for Antenna Mediation) : SMA x 2EA
Power Source	AC 100-240 V, 50/60 Hz
Power Consumption	Max. 50 W

10.4 Packing Specification

Item	Specification
Package	Size 201 cm x 192 cm x 200 cm (L x W x H, 79.13" x 75.59" x 78.74")
	Weight 380 kg (837.8 lbs)

10.5 Environmental Specification

Test	Intellian Standard	
Temperature (Antenna)	Operational	IEC-60945 (-25 °C to +55°C / Power On) MIL-STD-810H
	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) MIL-STD-810H
Temperature (ACU)	Operational	-15 °C to +55 °C (IEC-60945) MIL-STD-810H
	Survival	-25 °C to +70 °C (IEC-60945)
	Storage	-40 °C to +85 °C (IEC-60945) MIL-STD-810H
Wind	Operational	56 m/sec (125 mph)
	Survival	120 km/h
Humidity	IEC-60068-2-30, MIL-STD-810H Upper Test Temp.: +40 °C (-3), Humidity 98% Lower Test Temp.: +15 °C (+3), Humidity 71% ~ 78%	
Vibration	Operational	IEC-60945, MIL-STD-810H
	Survival	IEC-60721-3-6 Class 6M3

Test	Intellian Standard	
Shock	Operational	IEC-60068-2-27 Method Ea 20 g/7 ms MIL-STD-810H
	Survival (Transient)	IEC-60721-3-6 Class 6M3 type II 30 g/6 ms
	Survival (Bump)	IEC60721-3-6 Class 6M3 25 g/6 ms
Salt Mist	Saline Solution: 5 ±1% NaCl, PH 6.5 to 7.2 Storage Period: 7 Days (IEC-60945) MIL-STD-810H: 5% SAT 35°C, 48Hr Salt mist, 48Hr dry(1Cycle)	
Waterproofing	IPX6 (IEC-60529)	

Chapter 11. Warranty

Warranty Policy

Intellian systems are warranted against defects in parts and workmanship. These warranties cover THREE (3) YEAR of parts and ONE (1) 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, whichever is sooner. The warranty provides a maximum of 6 months additional coverage if you submit an authorized form describing the installation within 6 months of the shipment date.

Intellian Technologies warranty does not apply to a 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 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 Terminating the MS 3-pin (F) Connector on AC Power Cable

To terminate the supplied MS 3-pin (F) connector on the end of AC Power Cable, follow the steps below.

1. Prepare the MS-3 (F) Connector, AC Power Cable and Heat Shrinkable Tube.
(Supplied MS-3 (F) Connector)



2. Twist and loosen the MS-3 (F) Connector to separate.



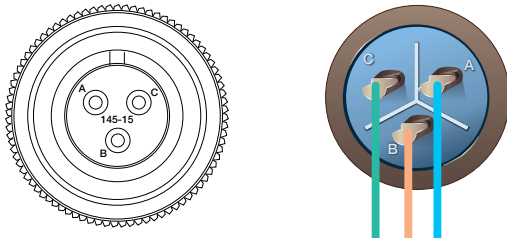
3. Pass the AC cable through the separated connector(step 2) and Heat Shrinkable Tube.



4. Cut off the Heat Shrinkable Tube to length by the N, L, FG line and Insert the it on each lines.



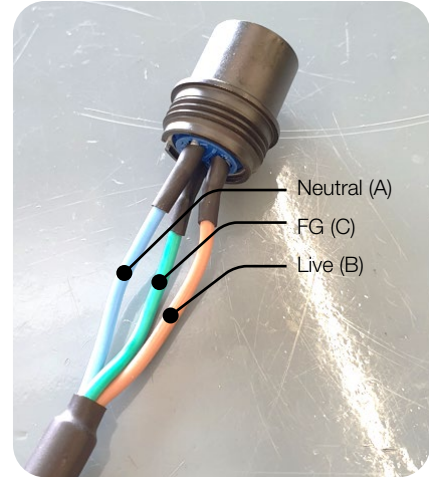
5. Tread the line into the MS-3 (F) Connector groove by referring to pinmap. Heat shrink the tube after soldering the cable and connector.



MS 3-pin connector

A	Neutral (Blue)
B	Live (Brown)
C	FG (Green)

6. Twist and tighten the previous passed MS-3 (F) Connector to assemble.



7. Heat shrink the tube as shown the image after wrapping the previous passed tube (step 3) over connector and cable.



12.3 Starting Dual Antenna System (Optional)

Intellian ACU has the embedded Dual Antenna Mediator function, which is used to instantly switch between two Intellian VSAT antenna systems. 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. This ensures always-on broadband service by reducing the out of service time.

12.3.1 Configuration of Dual Antenna System

To use the Dual Antenna System, make sure the antenna system components are properly installed. Refer to "5.4.2 Dual Antenna System Configuration (Optional)" on page 36 for more details.

12.3.2 Setting Up Dual Antenna System

To establish Dual Antenna System communication between the Main and Sub antennas, follow the steps below. The following flow chart shows the process of establishing the Dual Antenna System.

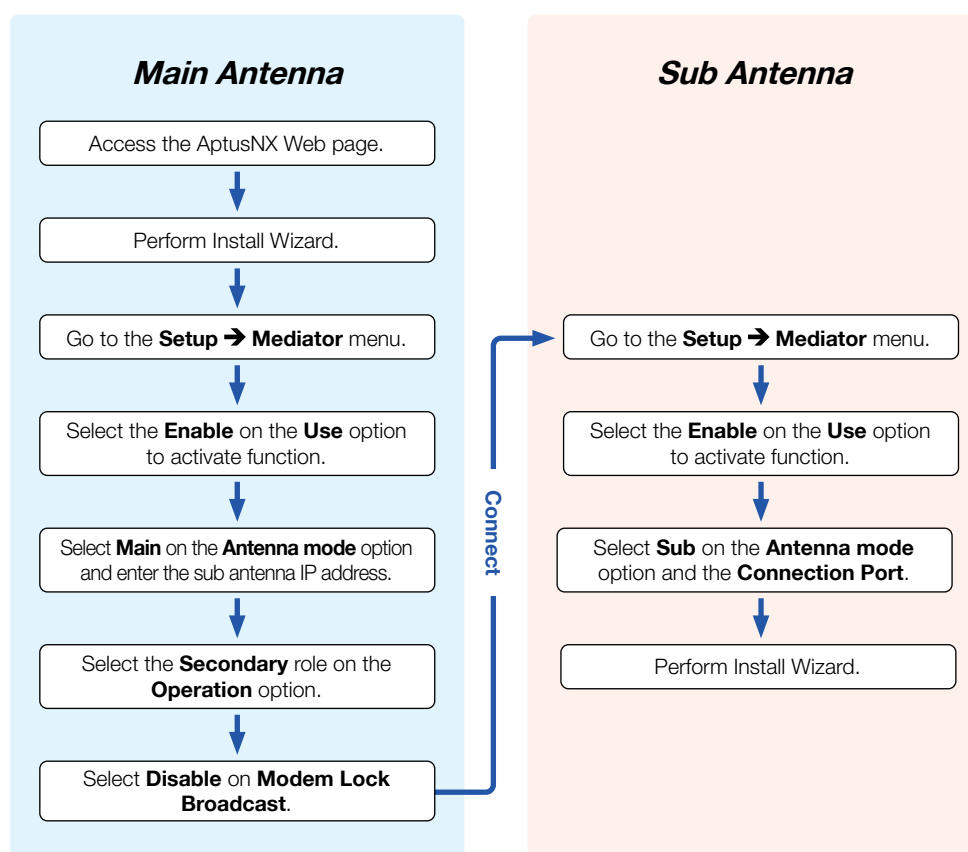


Figure 37: Flow Chart of Establishing Dual Antenna System

Setting the Main Antenna

The Main Antenna is connected to the ACU's Modem RX/TX port and to the modem.

1. Connect an Ethernet cable from the Management LAN port on the front of the Main ACU to the LAN port of a PC. The connection network is automatically established.
2. To manage and control the Dual Antenna System, access the AptusNX with the Main Antenna.
 - **IP Address: 192.168.0.1 (Default)**
3. Log in by typing in a user name and password information. If this system has not been changed from the factory default:
 - **User Name: intellian**
 - **Password: intellian1@1**
4. Perform the Install Wizard process. Refer to "**6.4 Starting Install Wizard**" on **page 46** for more details.
5. Select **Setup** on the main menu, and then go to the **Mediator**.
6. Select **Enable** on the **Use** of Mediation option to activate the function. Then click the **Apply** button to apply the settings to the system.
7. Select **Main** on the **Antenna mode** option. Enter the Sub Antenna IP address on the **Peer Antenna IP address**.
8. Select the **Secondary** role on the **Operation** option and click the **Apply** button to apply the settings to the system.
9. Select **Disable** on **Modem Lock Broadcast** and click the **Apply** button to apply the settings to the system.



NOTE

Refer to "**In Case of Main Antenna**" on **page 82** for more details.

Dashboard

Setup

Tools

Install Wizard

Ship

Antenna

Satellite

Modem

BUC

Network

WiFi

► Mediator

IFL Balancing

MEDIATOR

Mediation

Use

☒ Enable

☐ Disable

Cancel

Apply

Antenna

Antenna Mode

☒ Main

☐ Sub

Peer Antenna IP Address

Connect

Cancel

Apply

Operation

Operation Mode

☐ Manual

☒ Antenna Mediation

Role

☐ Primary

☒ Secondary

Cancel

Apply

Mediation Configuration

Change Role Option

Timeout(sec)

Signal Threshold

Modem Lock Broadcast

Use

☐ Enable

☒ Disable

Cancel

Apply

Setting the Sub Antenna

Sub Antenna is connected the ACU's Modem RX/TX port to the Main Antenna's ACU. **You must connect the Main Antenna before you can set the Sub Antenna.** To connect the Main Antenna, follow the steps of "Setting the Main Antenna" on page 102.

1. Connect an Ethernet cable from the Management LAN port on the front of the Main ACU to the LAN port of a PC, and then log in to AptusNX using a web browser.
2. Select the **Setup** on the main menu then go to the **Mediator**.
3. Select the **Enable** on the **Use of Mediation** option to activate function. Then click the **Apply** button to apply the settings to the system.
4. Select the **Sub** on the **Antenna mode** option and **Connection Port** from the drop-down list. Then click the **Apply** button to apply the settings to the system.
5. Perform the Install Wizard process. Refer to "**6.4 Starting Install Wizard**" on page 50 for more details.



NOTE

Refer to "**In Case of Sub Antenna**" on page 84 for more details.

Dashboard **Setup** Tools Install Wizard

Ship
Antenna
Satellite
Modem
BUC
Network
WiFi
► Mediator
IFL Balancing

MEDIATOR

Mediation

Use ☒ Enable ☐ Disable

Cancel Apply

Antenna

Antenna Mode ☐ Main ☒ Sub

Connection Port 1

Peer Antenna IP Address Connect

Cancel Apply

Operation

Role ☒ Primary ☐ Secondary

Cancel Apply

12.3.3 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 monitoring.

