



t360CK

3.6 m C-band and Ku-band Marine
Satellite TV Antenna System

Installation & Operation User Guide

Serial Number of Product

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



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Chapter 1. Precautions

1.1 Warnings, Cautions, and Notes

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

	WARNING WARNING indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.
	CAUTION CAUTION indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate personal injury, or damage to equipment. It may also be used to alert against unsafe practices.
	NOTE A NOTE statement is used to notify people of installation, operation, programming, or maintenance information that is important, but not hazard-related.
	IMPORTANT An IMPORTANT indicates an emphasis on notable characteristics in working procedures or information on working procedures and technology for convenient use.

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, which can cause surface cracking or other damage.
	DO NOT STACK Do not stack boxes/crates; if stacked boxes or crates fall, equipment inside of the containers can 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.
	Moving parts! There are moving parts inside the radome. Therefore, only skilled or certified persons should work with the unit. Adhere to the following guidelines when working. - Keep body parts away from moving parts. - Disconnect the power source prior to defeating or bypassing the equipment safeguard (Enclosure). - Restore the equipment safeguard (Enclosure) before restoring power.

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

* **DO NOT STORE THE ANTENNA WRAPPED IN A TARP, TENT, VINYL, AND OTHERS:**

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

Chapter 2. Certifications

FCC Part 15 Subpart B Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon (Chungho-ri), Pyeongtaek-si, Gyeonggi-do 17709 Korea declare under our sole responsibility that the product(s) described in the below to which this declaration relates is in conformity with the requirement of the FCC Part 15 Subpart B.

Product Information:

Model Name(s):	t360CK, 3.6m C- & Ku-band Maritime TVRO Antenna System
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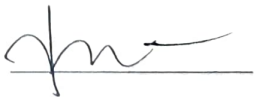
Test Result

Standard	Requirement	Test Report Number	Result
FCC Part 15, Subpart B	Conducted Emission	OT-24N-RED-121	Pass
	Radiated Emissions	OT-24N-RED-121	Pass

Supplementary Information:

Testing Organization	ONETECH Corp. 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-di, Gyeonggi-do 17709 Korea
Place and Date of issue:	Gyeonggi-do, Korea on 29 th November, 2024

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Product Information:

Product Name(s):	t360CK, 3.6m C- & Ku-band Maritime TVRO Antenna System
Model Number(s)	T4-366BWXXX

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

2014/53/EU Article	Standard(s) Applied in Full	Test Report Number	Result
SAFETY (Art 3.1.a)	EN IEC 62368-1:2020+A11:2020 EN 62368-1:2014+A11:2017	OT-251-RSD-009	Pass
EMC (Art. 3.1.b)	EN 301 843-1 V2.2.1 EN IEC 61000-3-2:2019 EN 61000-3-3:2013+A1:2019	OT-24N-RED-121	Pass
RF	EN 301 443 V2.1.1 EN 303 372-1 V1.2.1	OT-251-RWD-035 OT-251-RWD-036	Pass

Supplementary Information:

Notified Body Involved: (Testing Organization)	ONETECH Corp.– Safety, EMC, RF 43-14 Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do, 12735, Korea
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Chapter 3. Introduction

3.1 Intellian t360CK Introduction

The Intellian t360CK is a 3-axis satellite TV system featuring a 3.6-meter reflector. It is designed for large vessels requiring both C-band and Ku-band service. With exceptional RF performance and a groundbreaking design, the t360CK is built to exceed expectations in the maritime industry.

The t360CK automatically switches between C-band and Ku-band, while supporting both linear and circular polarization in a single feed, ensuring seamless service worldwide. Powered by Intellian's WorldView™ Ku LNB, it allows easy access to different satellite services with just a button press, eliminating manual adjustments. The C-band side is also equipped with a 5G mitigation solution, ensuring reliable operation in areas with high 5G interference.

User-friendly by design, the t360CK comes pre-configured with a global satellite library that can be easily updated via Intellian's Aptus NTV GUI. Firmware updates are also streamlined through the GUI and ACU Ethernet port.

Built for durability and versatility, the t360CK sets a new standard for global satellite TV on large vessels, providing reliable, high-quality entertainment wherever you are.

3.2 Intellian t360CK Features

Seamless TV Coverage

The t360CK has been designed with a central feed capable of accommodating both C-band and Ku-band LNBs, functioning across all polarizations. The Five-Port Quattro Ku WorldView LNB is fully programmable and flexible, designed to meet the specific needs of the cruise market. The C-band LNB, with 5G mitigation, includes various built-in filters that can be adjusted through our GUI, allowing it to receive C-band services even in areas affected by 5G interference.

Automatically Switches Between C & Ku Band

The t360CK joins a family of proven Intellian TVRO terminals and offers the first-and-only electronically switchable feed in the 3.6 m size class. The system is capable to electronically switch between C-Band and Ku-Band, while supporting C and Ku Band linear and circular polarization in the same feed. The fully switchable feed eliminates the need for cumbersome hardware modifications and ensures access to entertainment services and at the same time minimizing blockage mitigation.

DVB-S2 Digital TV Receptions

Some HD TV services have moved to DVB-S2 transmission formats and there will be more in the future. Thanks to Intellian's groundbreaking DVB-S2 digital TV technology, boaters can now enjoy their favorite Satellite TV entertainment at sea—just like at home.

Fiber Optic Solution and Coax Solution Available

The t360CK one-cable fiber solution is ideal for the cruise and super yacht markets. Designed and supported by Intellian, minimizes signal loss on long cable runs between above-deck and below-deck equipment. No external calibration or additional equipment is required.

The coax variants consist of a five-cable configuration: four independent RF cables that connect directly to the multi-switch and one Management and Control cable that is connects to the ACU.

Simplified Installation & Setup

Thanks to its optimized structure and design, the t360CK is designed for easy installation. The installation process is simplified with a common bolt pattern and fiber optic option or 5 cable coax cables, Using Intellian's seven-step Installation Wizard, the ship TV systems will be ready in no time.

Intuitive Aptus NTV

Aptus NTV is Intellian's latest GUI for the entire TVRO product line. Customers can configure and make all the required changes to the system without leaving the GUI interface. This includes switching between broadcast satellite presets, creating different groups of satellites to meet the needs of changing regions, and adding or changing satellite information using the improved library system.

Chapter 4. Planning Installation

The t360CK installation requires precautionary and safety measures to be taken due to the unit size and weight. Failure to follow the correct installation process may lead to injury of the installer and/or cause damage to the ship and system. To maximize the performance of the system, strongly recommended that you thoroughly review this installation guide and follow the installation process as it is written 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 Selection of Installation Site

The system should be placed on board the vessel in an area with little to no RF signal blockage. A safe mounting place and a restricted access location should be selected.

Obstacles in the way of the antenna look angle will decrease satellite signal strength. The antenna should have direct line-of-sight with the desired satellite without any obstacles. Certain minimum distances between the antenna and other onboard devices must also be considered during installation.

4.2 RF Interference and Recommended Distance

The Antenna should be mounted at least 2.5 meters away from any of the following devices: L-band satellite terminals, magnetic compass, and GPS receiver antennas.



WARNING

See Figure below, in which safe distances and mounting planes are shown for the t360CK in relation to any on-board radar assembly. A minimum safe distance of 10 m is recommended. The antenna should also be mounted 15 degrees above or below the radar plane, as shown.

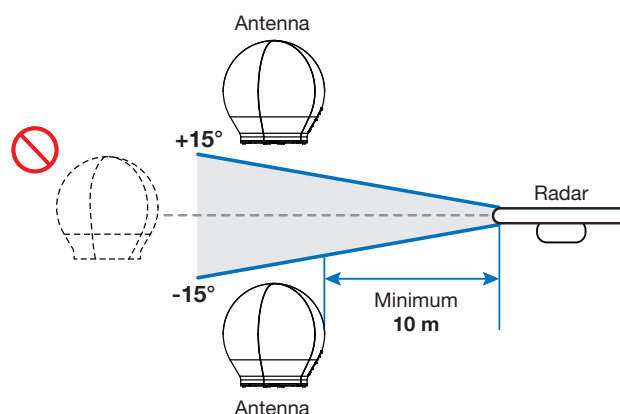


Figure 1: RF Interference and Recommended Distance from Radar

Recommended Distances	Other Antenna Affecting the ADE
10 meters *It depends on the power of the radar.	All Radar antenna
5 meters	Any high power shortwave antenna
4 meters	Any short range antenna

4.3 System Package

4.3.1 Antenna Unit

The antenna includes an antenna system inside a radome assembly. The assembly consists of the satellite antenna's main dish and sub-reflector module with a WorldView™ Ku-band LNB and C-band LNB mounted on a stabilized pedestal. The radome protects the antenna assembly from the severe marine environments.



Figure 2: Antenna Units

4.3.2 Antenna Control Unit (ACU)

The ACU controls the various settings of the antenna. ACU features include the following:

- OLED display
- USB port to download logs and upgrade firmware (no PC required)
- Wi-Fi access
- **Aptus NTV** web application

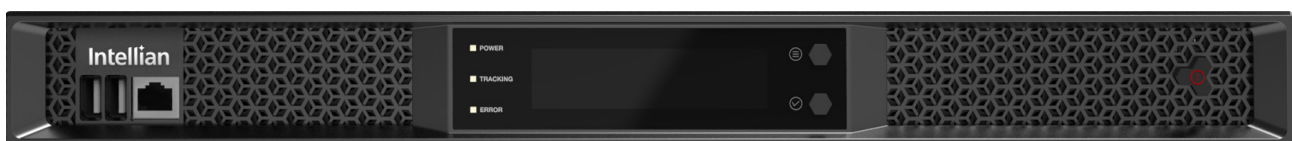


Figure 3: Front Panel of ACU



Figure 4: Back Panel of ACU

4.3.3 Fiber Link Module

Fiber Optic Systems provide a lossless connection between the antenna and the ACU using a Single-Mode fiber optic cable that can be run up to a distance of 2 km.:

- A single tread of a single-mode fiber optic cable connects the TVRO antenna to the BDU (Below deck unit)
- A simple connection using high-speed fiber is used for control and signal
- No cable run limitations
- Reduced signal loss compared to coaxial cable



Figure 5: Front Panel of Fiber Link Module



Figure 6: Back Panel of Fiber Link Module

4.3.4 Packing List

Before beginning installation, make sure all components are included in the kit. The components are packaged in four (4) crates as listed in the tables below.

Antenna Package (Crate 1)			
Size (W x D x H) : 2185 mm x 2195 mm x 2230 mm			
Pedestal Post			
Description	Q'ty	Size	Remarks
3.6 m Pedestal	1		
Feeder Module	1		
Lifting Strap	1	2.5m	Lifting strap for feeder module
Shackle(3/8")	2		
ACU Box			
Description	Q'ty	Size	Remarks
Antenna Control Unit (ACU)	1	431 x 350 x 443 mm	Antenna Control Unit
QIG	1		Quick Installation Guide
ACU Rack Mount Bracket	2		For installing ACU to 19 inch Rack
Flat Head Screw	10	M4 x 12L	For mounting ACU Rack Mount Bracket on ACU
AC Power Cord (EEEE7/7)	1	1.5 m	ACU power cord (220 V)
AC Power Cable (110V Plug)	1	1.8m	ACU Power (110V)
Ethernet Cable (RJ45 to RJ45)	1	1 m	To connect ACU to PC
Wi-Fi Dongle	1		For Wi-Fi connection
Cable Tie	20	140 mm	For mounting cables
Fiber Link Box			
Description	Q'ty	Size	Remarks
TVRO Fiber Link BDE	1		TVRO Fiber Link BDE
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
RG6 Cable_1m	1	1m	RG6 Cable
Fiber Optic Cable SC-APC to SC-APC	1	3 m	To connect Fiber Link Module to ACU
Fiber Optic Cable FC-APC to SC-APC	1	3 m	
Fiber Optic Cable LC to SC-APC	1	3 m	
Adaptor FC-APC to FC-APC	1		To connect two FC-APC connector cables
AC Power Cable (110V Plug)	1	1.8m	ACU Power (110V)
AC Power Cord (EEEE7/7)	1	1.5m	ACU Power (220V)
Antenna Installation Kit			
Description	Q'ty	Size	Remarks
Hex Bolt (BUMAX)	10	M12 x 65L	Bolt for Antenna Mounting 10EA
Lock Washer	20	M12	
Nut (BUMAX)	10	M12	
Hex Bolt (BUMAX)	14	M12 x 65L	Bolt for Extension Frame Mounting 12EA
Lock Washer	28	M12	
Nut (BUMAX)	14	M12	
Loctite 263	1	10 ml	

Feeder Installation Kit			
Description	Q'ty	Size	Remarks
Hex-S Bolt_M10x45_STS304_Pa	8	M10X45L	Bolt for Feeder Mounting 6EA
Flat Washer	8	M10	
Spring Washer	8	M10	
Hex-S Bolt_M10x80_STS304_Pa	4	M10X80L	Bolt for Support Pipe Mounting 3EA
Flat Washer	8	M10	
Spring Washer	4	M10	
Hex Nut_M10_STS304	4	M10	
Lifting strap	3	4 m	Reflector , Antenna Lift
Hex-S Bolt_M8x35_STS316L_Pa	30	M8x35L	Bolt for Reflector Mounting 24EA
Flat Washer_M8(Ø25)_STS304	60	M8(Ø25)	
Spring Washer	30	M8	
Hex Nut_M8_STS304	30	M8	
Horn Guide Pin_t360CK	2	18x58	Panel No. 2, Panel No. 5
Hex-S Bolt_M12x80_STS304_Pa	3	M12x80L	Reflector Mounting (Top)
Flat Washer	3	M12	
Spring Washer	3	M12	
Hex-S Bolt_M12x90_STS304_Pa	3	M12x90L	Reflector Mounting (Middle)
Flat Washer	3	M12	
Spring Washer	3	M12	
Hex-S Bolt_M12x40_STS304_Pa	3	M12x40L	Reflector Mounting (Bottom)
Flat Washer	3	M12	
Spring Washer	3	M12	
Hex Bolt_M12x80 BUMAX88_Pa	10	M12x80L	Bolt for Radome Frame(ADU) Mounting 8EA
Lock Washer	20	M12	
Hex Nut_M12 BUMAX88	10	M12	
Hex-S Bolt_M12x40_STS304_Pa	7	M12x40L	Reflector Support Pipe Block Mounting
Flat Washer	7	M12	
Spring Washer	7	M12	
Hex-S Bolt_M12x30_STS304_Pa	7	M12x20L	Reflector Assembly Plate Mounting
Flat Washer	7	M12	
Spring Washer	7	M12	
Ref. Assembly Plate_t360CK	3	130x30x8t	
Eye Bolt_M16_STS316L	3	M16	
Support Pipe_Block_t360CK	3	130x95x30	
Top Radome Package (Crate 2)			
Size (W x D x H) : 2805 mm x 2295 mm x 2230 mm			
Radome			
Description	Q'ty	Size	Remarks
Top Radome_168 inch	5		
Top Radome Cap_168 inch	1		
Radome Base Frame Outside BKT_168 inch	2		
Radome Base Frame Inside BKT_168 inch	2		
Extension Frame	1		
Lifting Strap_168 inch (14m)_Juli Sling	1	14 m	

168" Radome Installation Kit #1			
Description	Q'ty	Size	Remarks
Silicon	10		
Silicon Gun	1		
Cable tie 140	30		For mounting cables
Top Radome_Lift Bracket_168inch	3		
Top Radome_Lift Bracket Plate_168inch	3		
Hex Bolt_SF(Ø18)_M6x35L_STS304_Pa	10	M6x35L	Bolt Kit for Upper Radome Lift Bracket
168" Radome Installation Kit #2			
Description	Q'ty	Size	Remarks
Hex Bolt_SF(Ø18)_STS304_Pa	220	M6x30L	Bolt for Radome Assembly
Washer Nut_STS304	220	M6	
Hex Bolt_SF(Ø18)_STS304_Pa	55	M6x35L	Bolt for Radome Base Assembly
Washer Nut_STS304	55	M6	
Hex Nut_M6_STS304	55	M6	
Bolt Cap	55	M6	
Hex Bolt_M12x40_STS316L_Pa	22	M12x40L	Bolt for Radome Base Frame Assembly
Flat Washer_M12_BUMAX88	44	M12	
Spring Washer_M12_BUMAX88	22	M12	
Hex Nut_M12_BUMAX88	22	M12	
Hex Bolt_M12x65_BUMAX88	10	M12x65L	Bolt kit for Base Plate Assembly
Flat Washer_M12(Ø38)_STS304	10	M12	
Flat Washer_M12_BUMAX88	10	M12	
Spring Washer_M12_BUMAX88	10	M12	
Hex Nut_M12_BUMAX88	10	M12	
Loctite 263	1	10 ml	
Bottom Radome Package (Crate 3)			
Size (W x D x H) : 3075 mm x 2295 mm x 2230 mm			
Radome			
Description	Q'ty	Size	Remarks
Bottom Radome_168inch	5		
Bottom Radome_Side Hatch_168inch	1		
Radome Base Plate_Front_168inch	1		
Radome Base Plate_Back_168inch	1		
Radome Base Hatch Assembly	2		
Radome Base Bent Hole Cover	1		
Radome Base Frame_Half	2		
Radome Base Plate_Back_168inch	1		
Radome Base Hatch Assembly	2		
Radome Base Frame_Half	2		
Reflector Package (Crate 4)			
Size (W x D x H) : 2185 mm x 2095 mm x 2230 mm			
Radome			
Description	Q'ty	Size	Remarks
Reflector_t360ck	6		Reflector Panels

4.4 Preparing System Cables

Refer to “7.10 System Configurations” on page 88.

Before installing the System Cables, consider the following points:

- All cables must be securely clamped and protected from physical damage and exposure to heat and humidity.
- Ensure that the System Cables do not exceed the recommended bend radius.
- Where a cable passes through an exposed bulkhead or deckhead, a watertight gland or swan neck tube should be used.



NOTE

For cables that are longer than the recommended length, consult Intellian technical support.

4.4.1 RF Cables (Customer Supplied)

Because of signal loss along the length of RF coaxial cables in the L-band, only 75 Ω coaxial RF cables should be used for standard system installations. Using different cable types, such as 50 Ω coaxial cables, may result in issues. If you require RF cables that exceed the recommended maximum length, please reach out to Intellian Technical Support assistance.

Cable Requirements (Antenna Cable/ RF1 ~ RF4 Cable)

Coaxial Cable Type	Connector	Max. DC Resistance	Attenuation @ 2 GHz	Max. Cable Length (≤ 16 dB loss @ 2 GHz)
LMR300-75	F (M) to F (M)	0.8 Ω (Antenna cable only)	0.279 dB/m	50 meters
LMR400-75			0.187 dB/m	80 meters

4.4.2 Fiber Optic Cable

A single Fiber Optic Cable (Single mode type OS/2) links the antenna to the Fiber Module, simplifying installation by minimizing the number of cables needed from the antenna to the BDU. To prevent signal loss, avoid using a cable that runs longer than 2,000 meters.

4.4.3 Power Cable (Customer Furnished)

The cable sizes recommended in the following table are the input power cable size for standard system installation. The three core electric cable types are required.

Cable Length	Up to 100 m	Up to 200 m
AWG (American Wire Gauge) Size	13	11
Cable Core Diameter	1.8 mm	2.3 mm
Cable Cross-Sectional Area	2.6 mm ²	4.2 mm ²

4.4.4 Gyrocompass Cable (Customer Furnished)

See Table for recommended Gyrocompass Interface Cable types that are compatible with the antenna system

	NMEA 2000	NMEA 0183
Connector Type	Micro-C 5 pins connector	2 pins terminal block connector
Cable Type	5 wires within a single cable	2-wires constructed with one enclosed shield cable
Heading Information	Supports PGN, 127250: Vessel Heading	Supports \$HEHDT , baud rate 4800, format 8N1 as standard.

4.4.5 Power Requirements

The Intellian t360CK has been designed to work on the vessel's 220 VAC supply. Intellian recommends that all above-deck equipment (ADE) and below-deck equipment (BDE) use a suitable universal power supply (UPS) for all power applications.

Chapter 6. Installing Antenna

6.1 Heading Alignment

The radome assembly is recommended to be positioned with the BOW marker parallel to the ship's centerline and pointing toward the BOW of the ship.

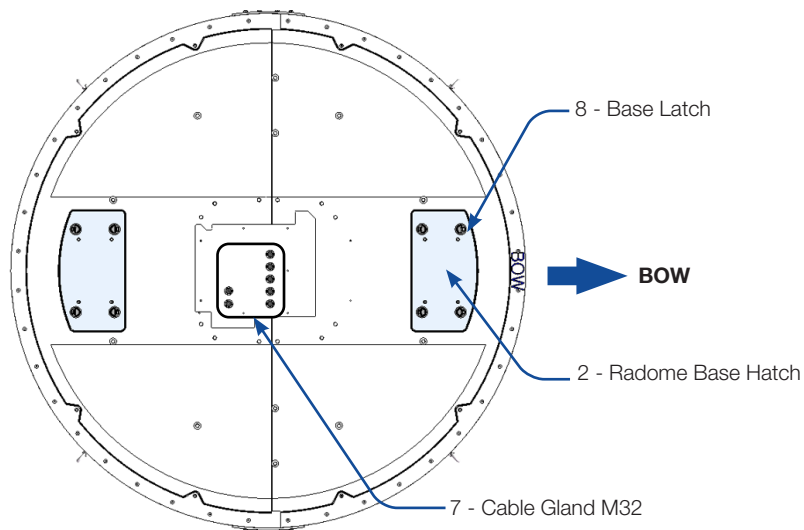


Figure 7: 168-in. Radome Antenna Heading Alignment (Plan view)



WARNING

ANTENNA PACKAGING AND EQUIPMENT CAN BE HEAVY. A HOIST OR CRANE IS RECOMMENDED TO LIFT AND MOVE HEAVY COMPONENTS. PERSONAL INJURY AND/OR DAMAGE TO THE EQUIPMENT CAN OCCUR UNLESS CARE IS TAKEN.

6.3 Unpacking System Package

6.4 Package Composition

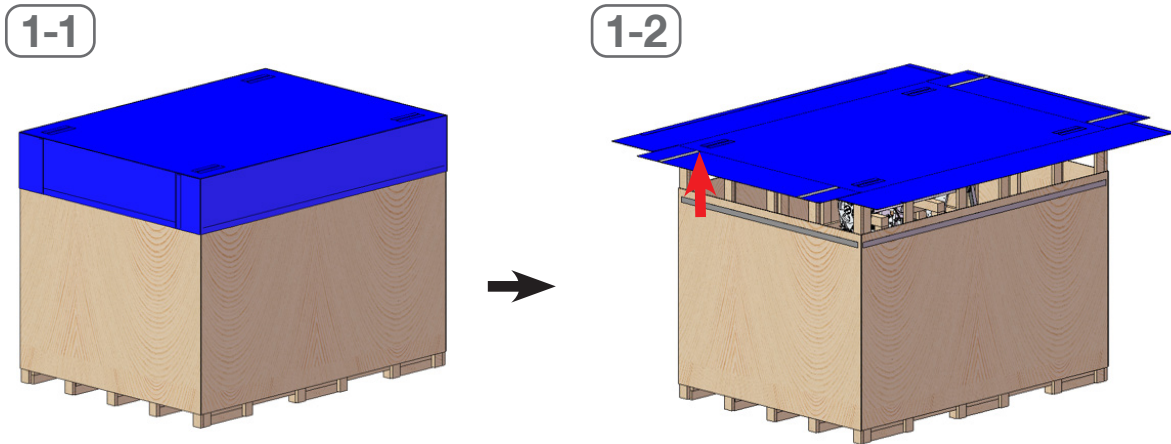


WARNING

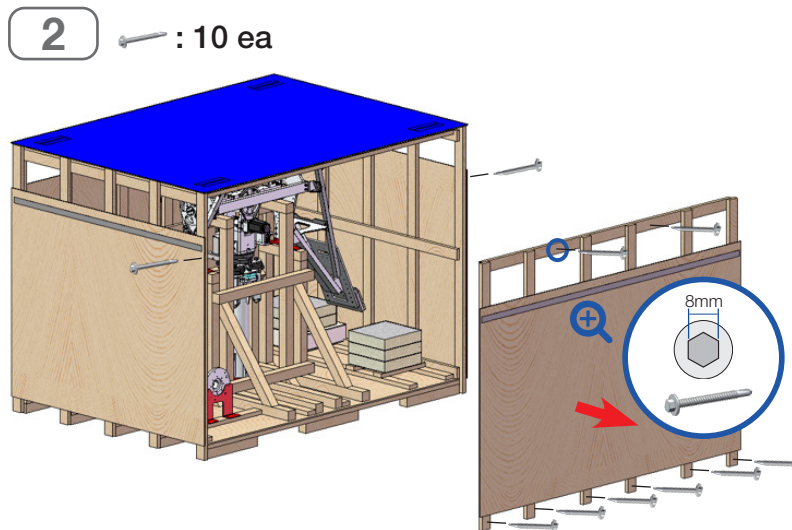
ANTENNA PACKAGING AND EQUIPMENT CAN BE HEAVY. A HOIST OR CRANE IS RECOMMENDED TO LIFT AND MOVE HEAVY COMPONENTS. PERSONAL INJURY AND/OR DAMAGE TO THE EQUIPMENT CAN OCCUR UNLESS CARE IS TAKEN.

6.4.1 Pedestal & Feed Horn package

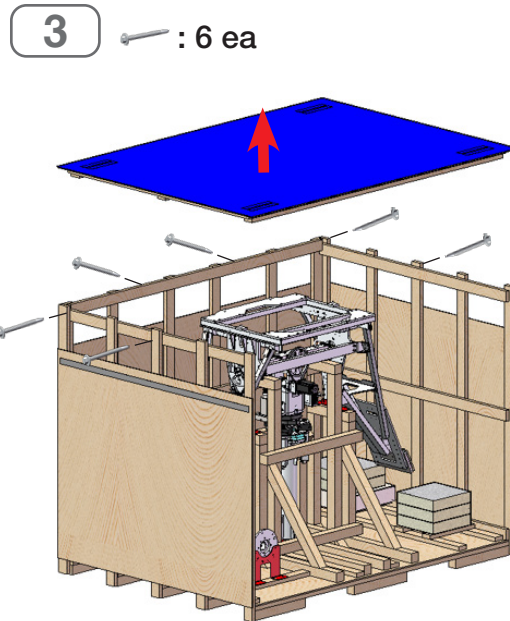
1. Roll up the side tarp on the top panel of the Segment Reflector crate.



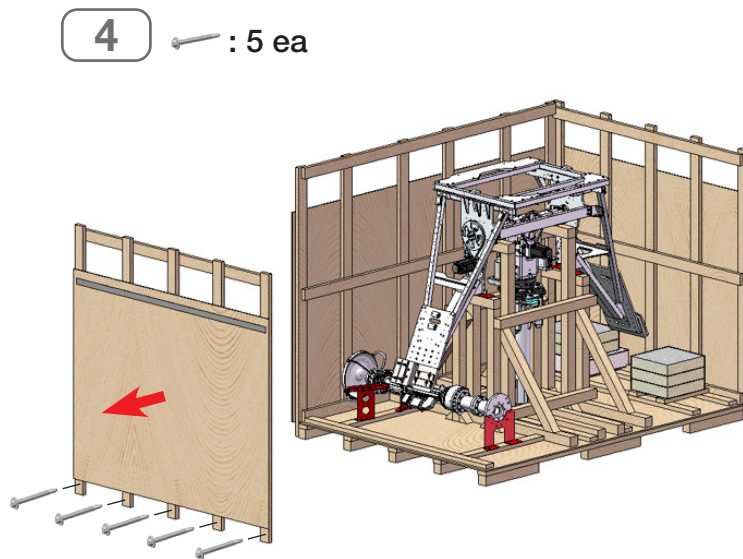
2. Open the front panel with an attached sticker paper (Wooden Crate Unpack Guide) by removing the crating screw (10 EA).



3. Remove the crating screws on the top panel, and then detach the panel by carefully lifting it as shown in the figure. Using a forklift to remove the top panel is recommended.

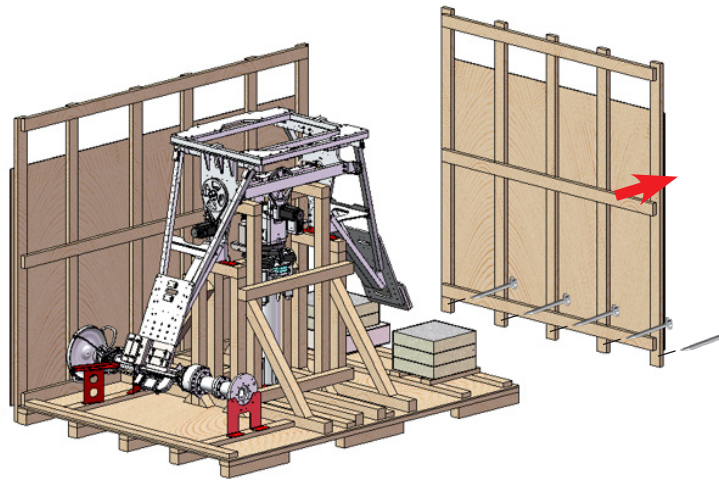


4. Remove the crating screws on the side panels (left), and then detach the panels by carefully pulling them, as shown in the figure.



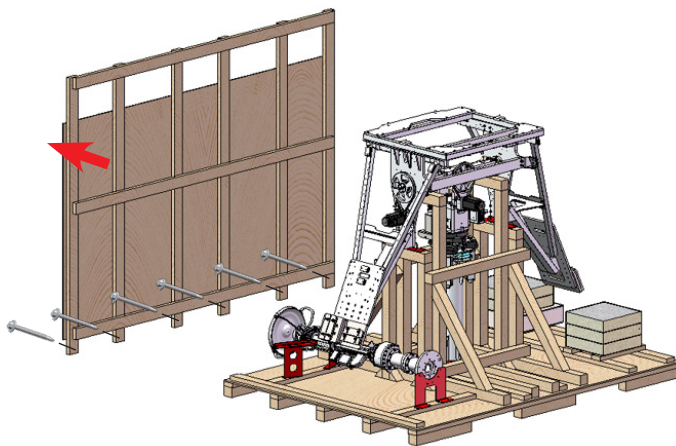
5. Remove the crating screws on the side panels (Right), and then detach the panels by carefully pulling it as shown in the figure.

5 : 5 ea

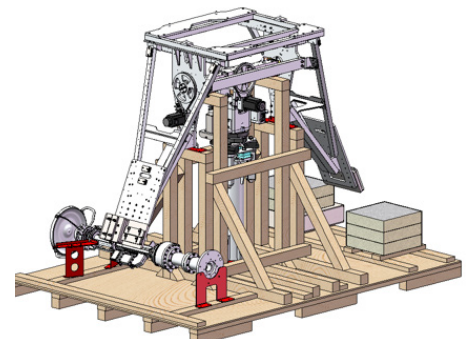


6. Remove the crating screws on the side panels (Rear), and then detach the panels by carefully pulling it as shown in the figure.

6-1 : 6 ea

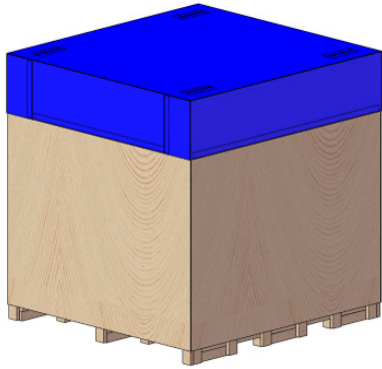
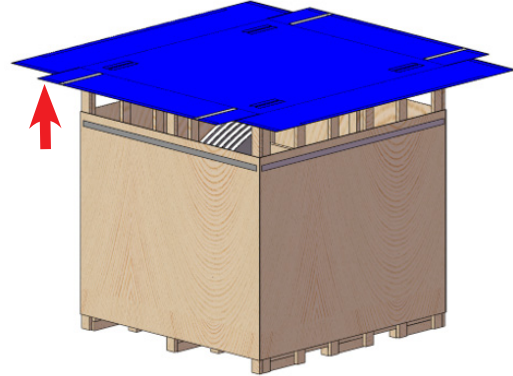


6-2

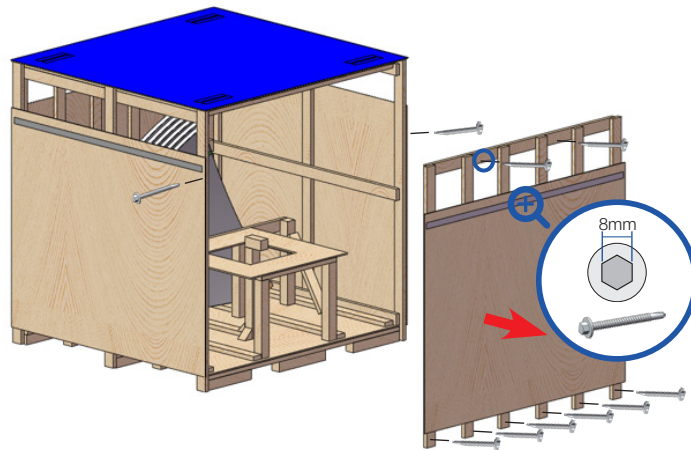


6.4.2 Reflector package

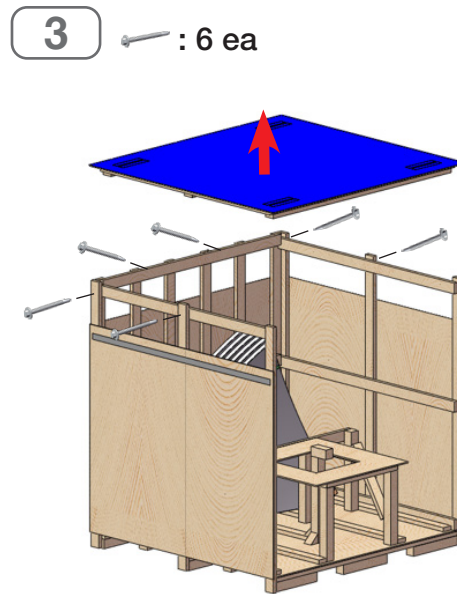
1. Roll up the side tarp on the top panel of the Segment Reflector crate.

1-1**1-2**

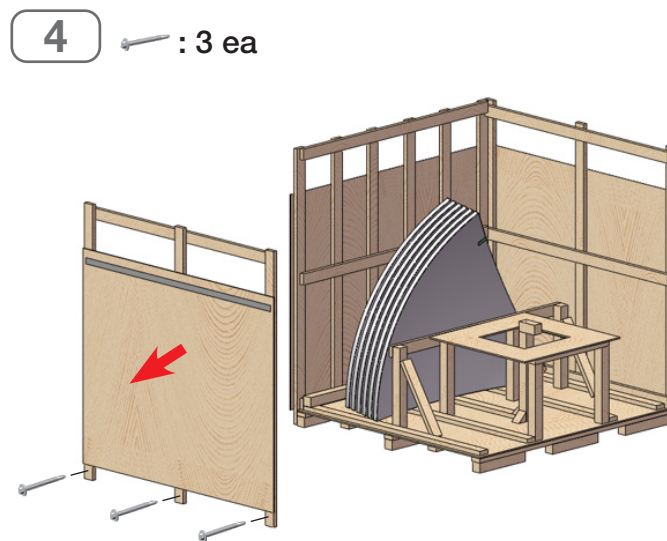
2. Open the front panel with an attached sticker paper (Wooden Crate Unpack Guide) by removing the crating screw (12 EA).

2  : 10 ea

3. Remove the crating screws on the top panel, and then detach the panel by carefully lifting it as shown in the figure. Using a forklift to remove the top panel is recommended.



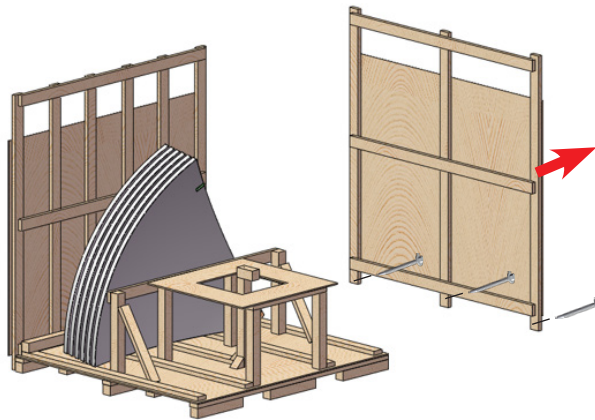
4. Remove the crating screws on the side panels (left), and then detach the panels by carefully pulling it as shown in the figure.



5. Remove the crating screws on the side panels (Right), and then detach the panels by carefully pulling it as shown in the figure.

5

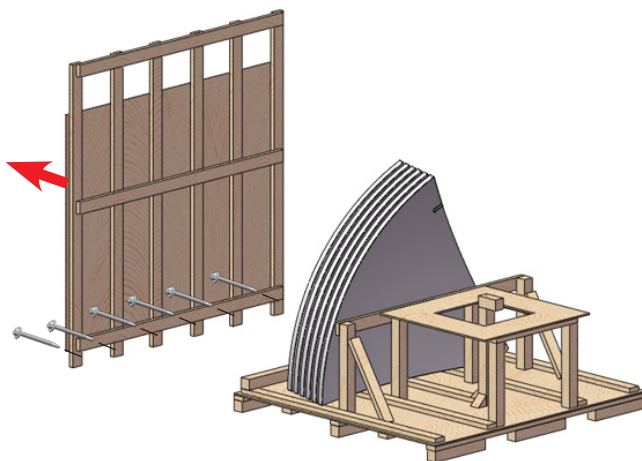
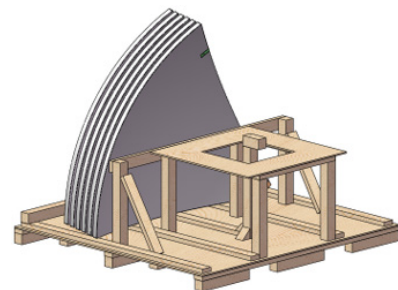
: 3 ea



6. Remove the crating screws on the side panels (Rear), and then detach the panels by carefully pulling it as shown in the figure.

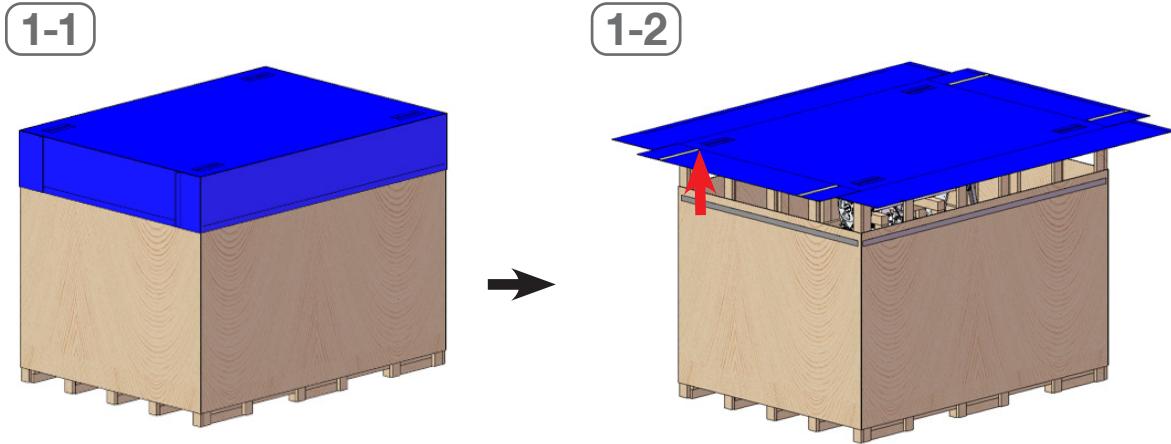
6-1

: 6 ea

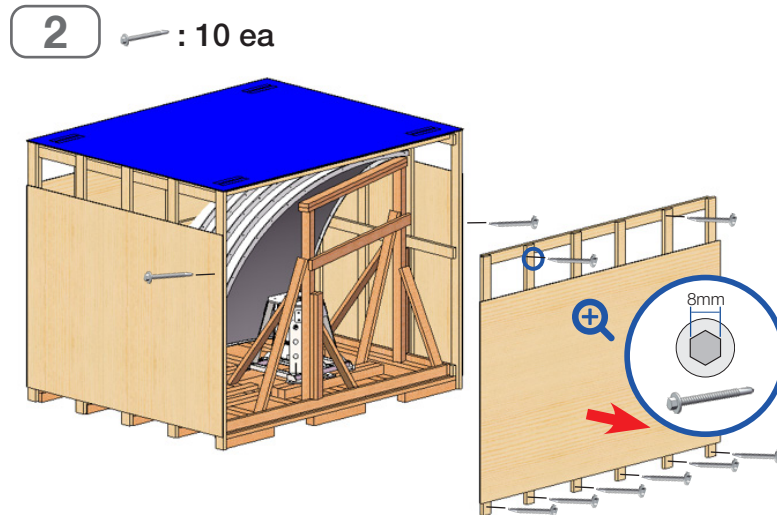
**6-2**

6.4.3 Top Radome package

1. Roll up the side tarp on the top panel of the Segment Reflector crate.

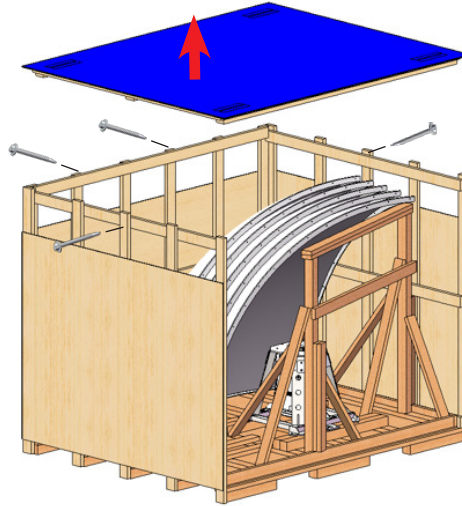


2. Open the front panel with an attached sticker paper (Wooden Crate Unpack Guide) by removing the crating screw.



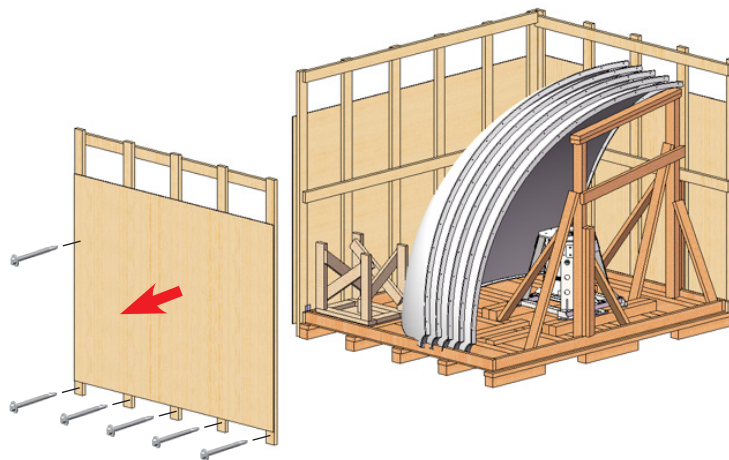
3. Remove the crating screws on the top panel, and then detach the panel by carefully lifting it as shown in the figure. Using a forklift to remove the top panel is recommended.

3 : 4 ea



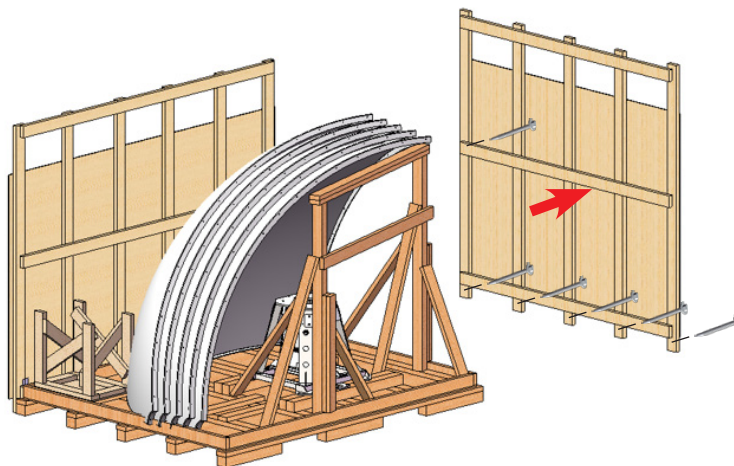
4. Remove the crating screws on the side panels (left), and then detach the panels by carefully pulling it as shown in the figure.

4 : 6 ea



5. Remove the crating screws on the side panels (Right), and then detach the panels by carefully pulling it as shown in the figure.

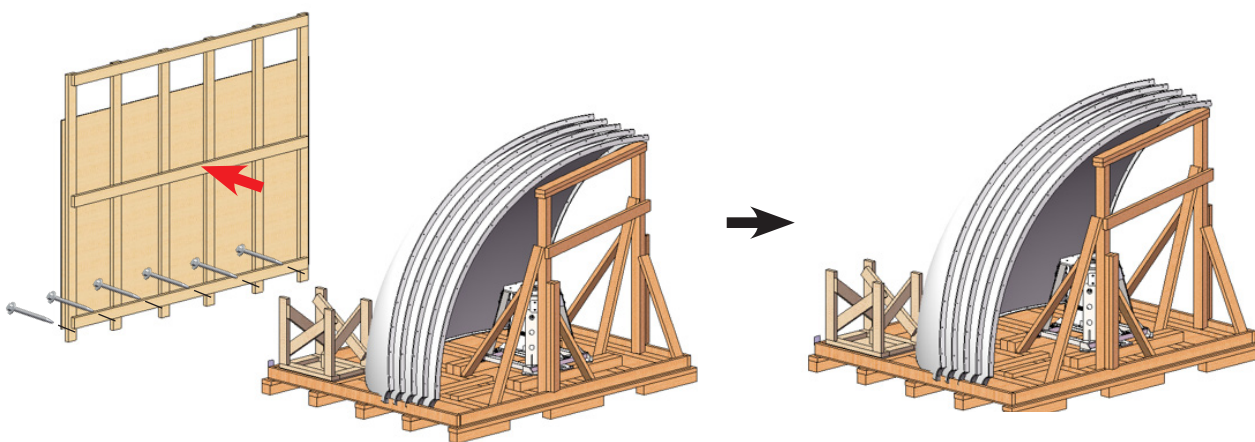
5  : 6 ea



6. Remove the crating screws on the side panels (Rear), and then detach the panels by carefully pulling it as shown in the figure.

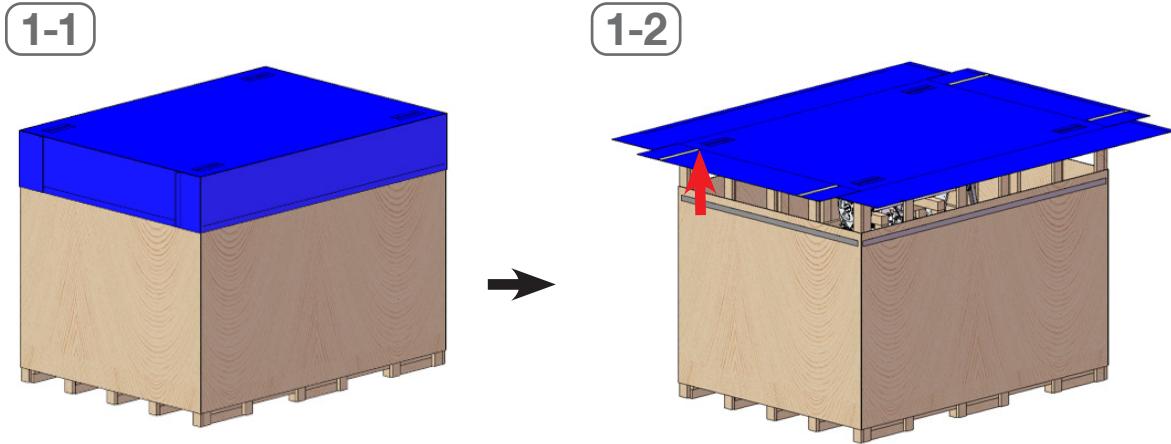
6-1  : 6 ea

6-2

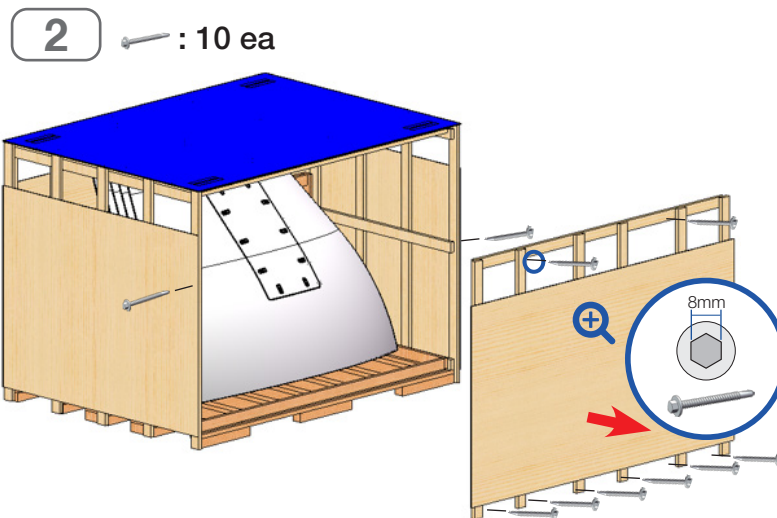


6.4.4 Bottom Radome package

1. Roll up the side tarp on the top panel of the Segment Reflector crate.

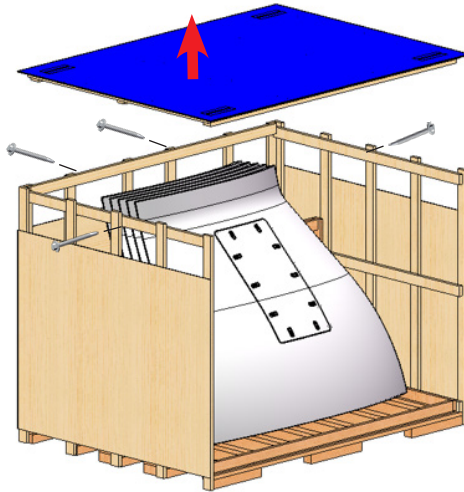


2. Open the front panel with an attached sticker paper (Wooden Crate Unpack Guide) by removing the crating screw.



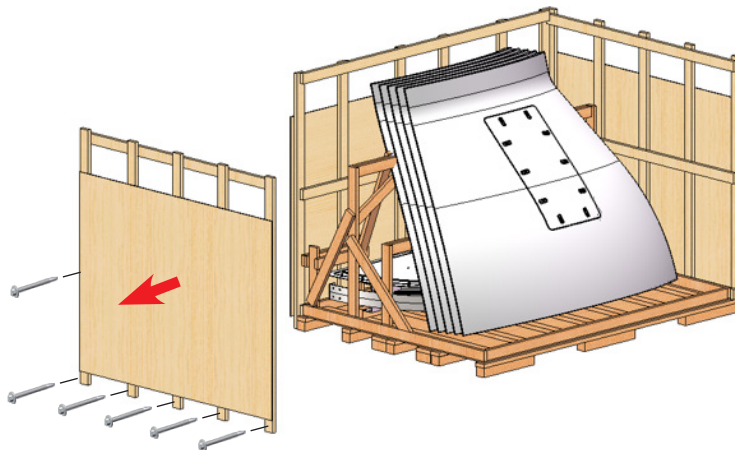
3. Remove the crating screws on the top panel, and then detach the panel by carefully lifting it as shown in the figure. Using a forklift to remove the top panel is recommended.

3 : 4 ea



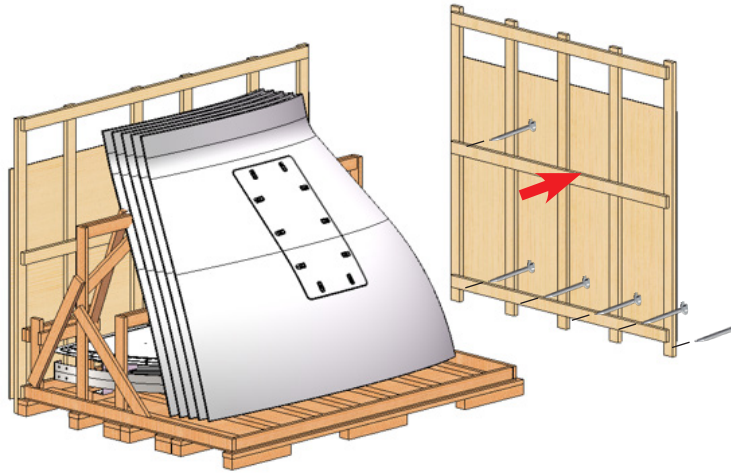
4. Remove the crating screws on the side panels (left), and then detach the panels by carefully pulling it as shown in the figure.

4 : 6 ea



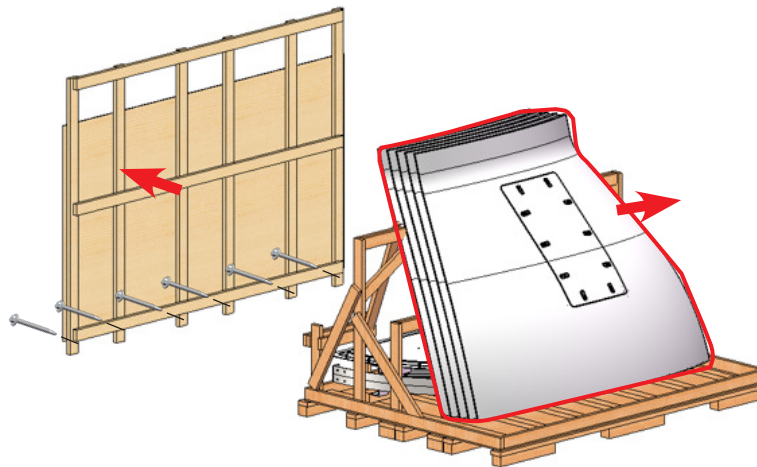
5. Remove the crating screws on the side panels (Right), and then detach the panels by carefully pulling it as shown in the figure.

5  : 6 ea



6. Remove the Bottom Radome panels to a safe place, then remove the crating screws on the side panels (rear) and remove the panels by gently pulling as shown in the diagram.

6  : 6 ea



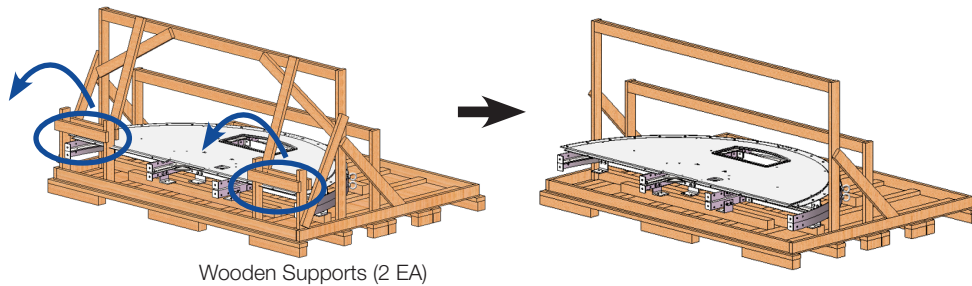
6.5 Base Frame Assembly

6.5.1 Bottom Radome Package



WARNING

FOLLOW THE UNCRATING INSTRUCTIONS CAREFULLY. PERSONAL INJURY AND DAMAGE TO EQUIPMENT CAN OCCUR FROM FALLING COMPONENTS.



Wooden Supports (2 EA)

Figure 9: Removing Wooden Supports

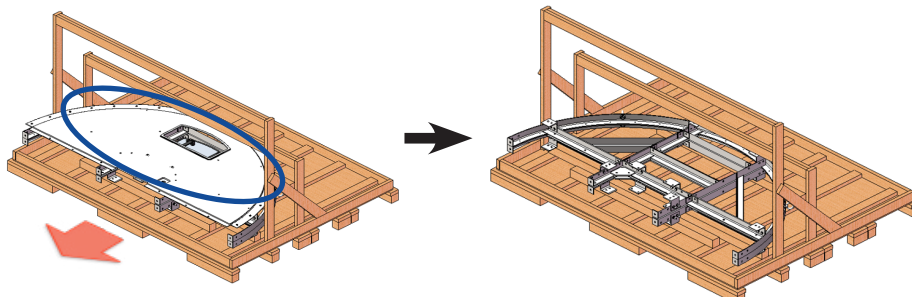


Figure 10: Moving Base Plate from Crate



NOTE

Notice the direction of the Base Plate.

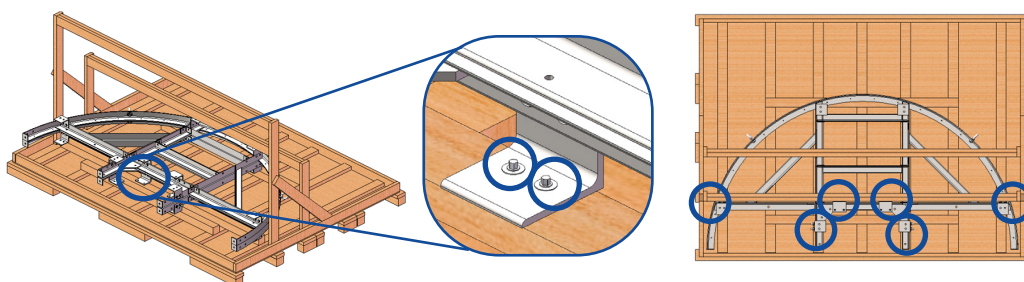


Figure 11: Removing Bolts Securing Frame Leg

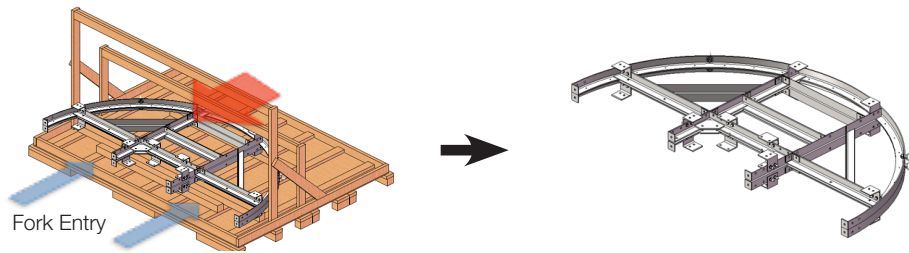


Figure 12: Moving Base Frame by Using Forklift



NOTE

Notice the direction of the Base Frame.

6.5.2 Assembling Base Frame

To assemble the Base frame, follow the procedures below.

1. Remove the Bolts (4 EA) securing Base Frame.

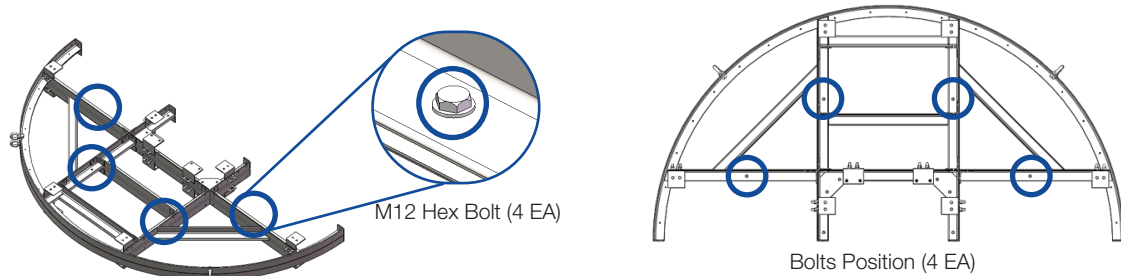


Figure 13: Removing Bolts Securing Base Frame

2. Get the 4m Lifting Strap from the Top Radome Package (Crate 2). Connect Lifting Strap to Eye-bolts (2 EA) on the Base Frame. Lift the Base Frame using a crane and unfold one side of Base Frame to make a circle.

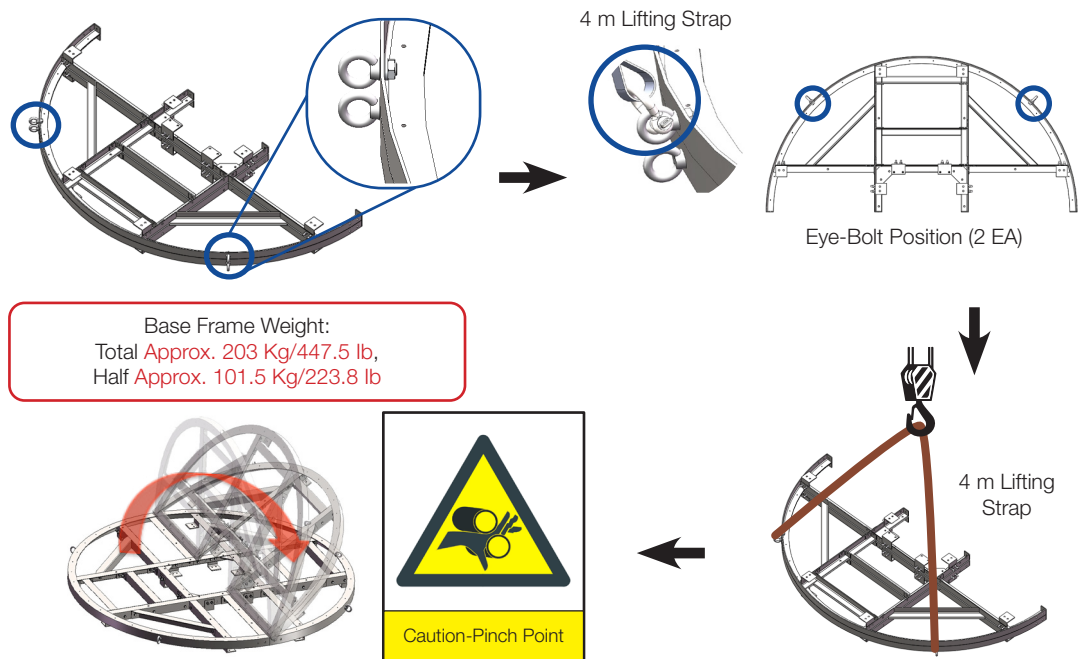


Figure 14: Lifting and Unfolding Base Frame



WARNING

- Be careful when lifting the Base Frame. Incorrect handling of the heavy object may lead to injury to the installers and/or cause significant damage to the unit. Use of a hoist or a crane is highly recommended.
- When unfolding the Base Frame, avoid Pinch Points. Keep hands and fingers clear.

3. Bring the brackets (three types) from the Top Radome Package (Crate 2). First, loosely assemble bolts on frames to enable the bolt tightening balance in step 4. Over-tightening the bolts at this point will prevent the proper tightening balance in step 4. After all of the frames are temporarily assembled (in Step 1, Step 2, Step 3), tighten the bolts fully (in Step 4). If this sequence is not followed, the frame assembly will not be correct.

4. Assemble the bolts as below. (See 1, Step 2 and Step 3) Before temporarily tightening bolts, apply Loctite #263 to the bolt's threads.

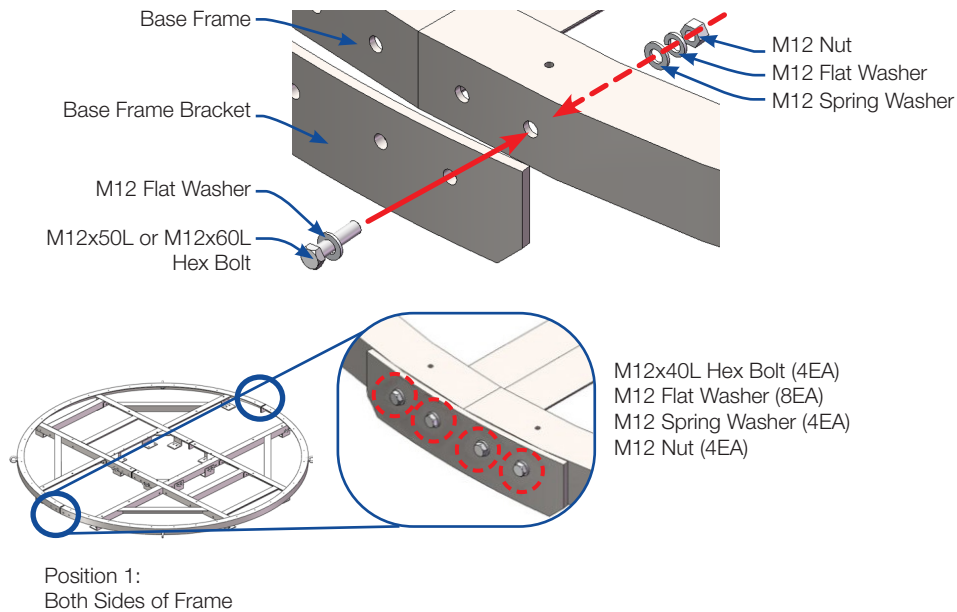


Figure 15: Loosely Assembling Brackets to Base Frame (Step 1)

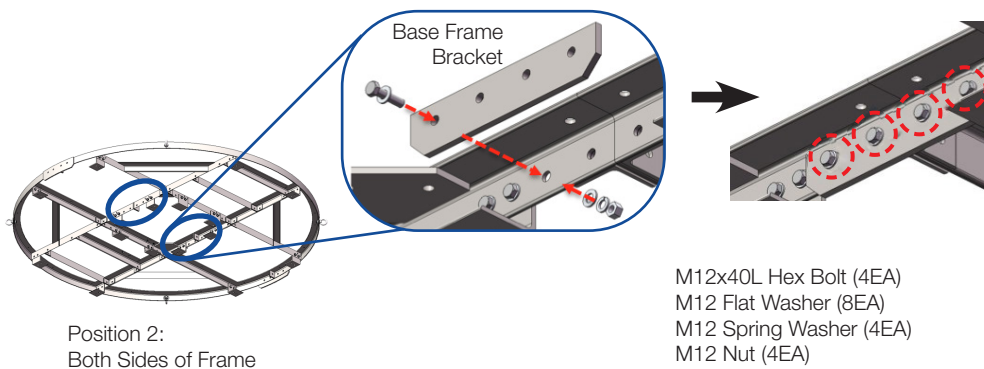


Figure 16: Loosely Assembling Brackets to Base Frame (Step 2)

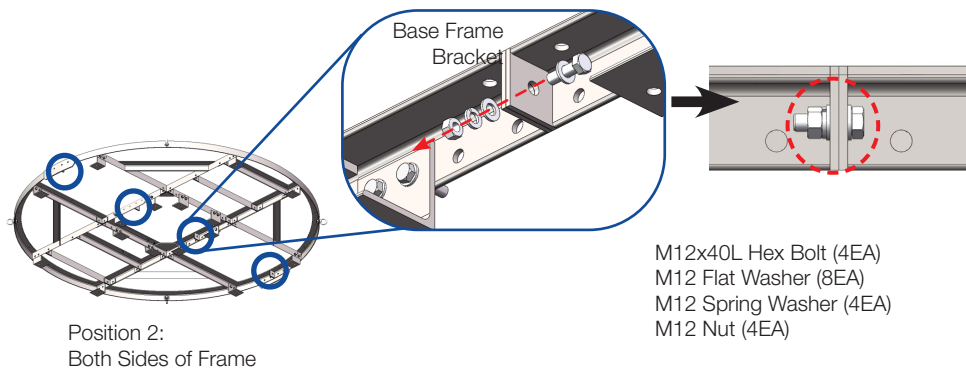


Figure 17: Loosely Assembling Brackets to Base Frame (Step 3)

5. After all of the frames are assembled, fully tighten bolts which were loosely assembled in an earlier step.



NOTE

Refer to "14.1 Appendix A. Tightening Torque Specification" on page 154 for the bolt tightening torque.

6. Assemble bolts on the edge of the base frame.

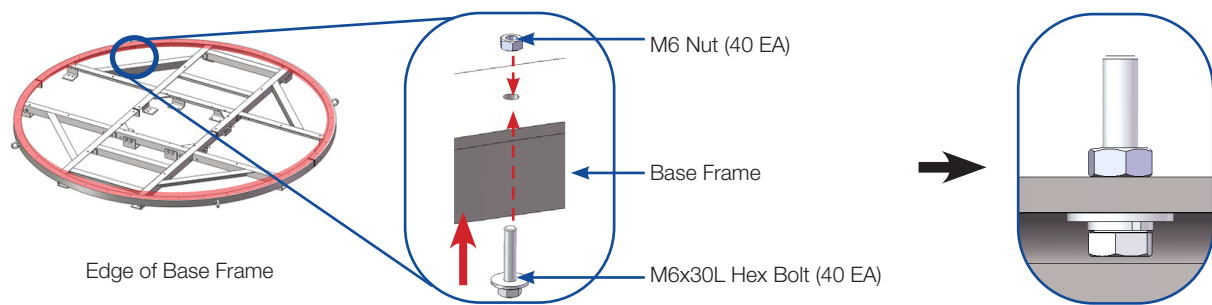


Figure 18: Tightening Bolts on Edge of Base Frame



CAUTION

Notice the assembling direction of the bolts. Assemble bolts from the bottom to top.



NOTE

Refer to "14.1 Appendix A. Tightening Torque Specification" on page 154 for the bolt tightening torque.

7. Place the holes of the base plate over the fixing bolts of the base frame in order.

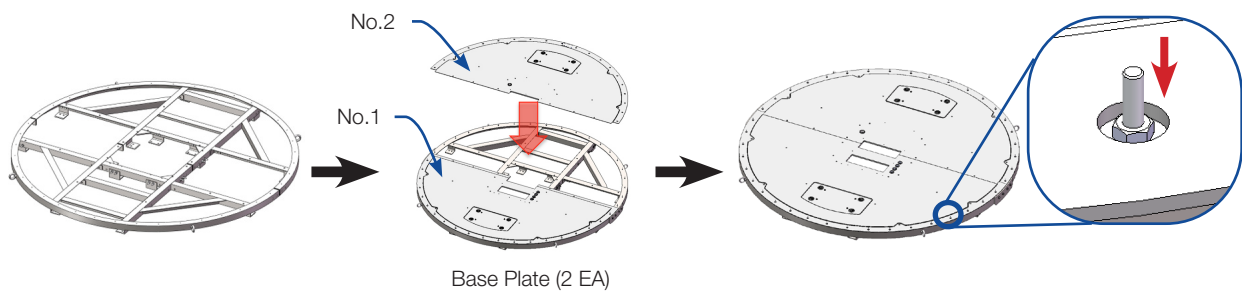


Figure 19: Placing Base Plates on Base Frame



NOTE

Notice the proper order (Base Plate 1 → Base Plate 2).

8. Place the vent hole cover on the base plate and secure the cover.

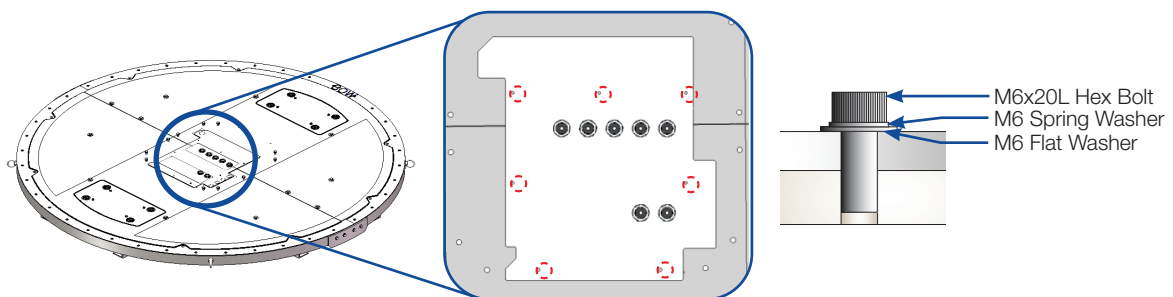


Figure 20: Placing vent hole cover on base plate

9. After securing the cover, apply silicone between the cover and the base plate. After applying the silicone, remove any excess silicone from the cover and clean the surface of the base plate.

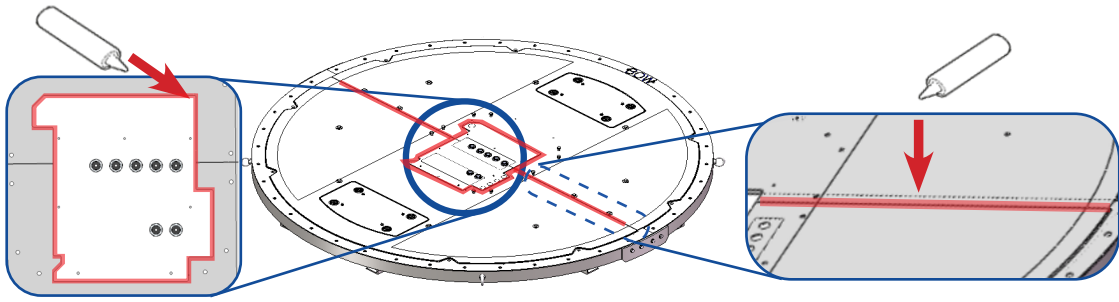


Figure 21: Applying silicone to the vent hole cover

6.5.3 Assembling Extension Frame

1. Bring the Extension Frame from the Top Radome Package (Crate 2) using a forklift. Place the Extension Frame on the Base Frame and insert bolts (12 EA) and washers into the Base Frame. Apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly. The nuts and washers under the Base Frame are tightened in the next step.

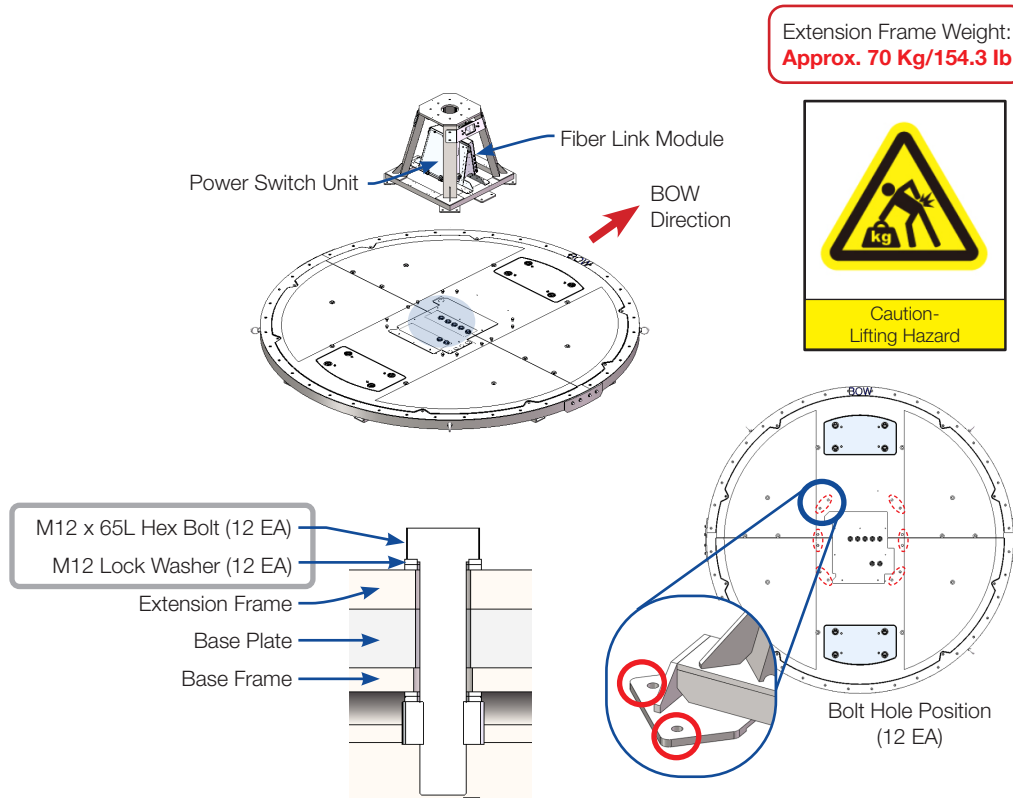
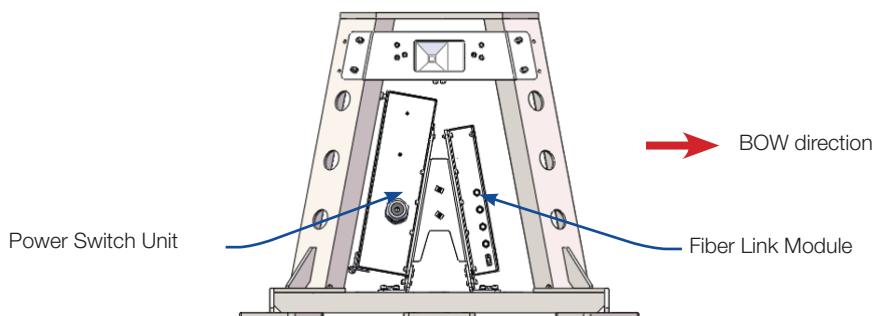


Figure 22: Assembling Extension Frame on Base Frame



CAUTION

Notice the Fiber Link Module positions the BOW direction.



2. Connect the Lifting Strap (2 EA) to the eye-bolts (4 EA) on the Base Frame. Gently lift the Lifting Strap from the center of the Base Frame using the crane and stabilize it.

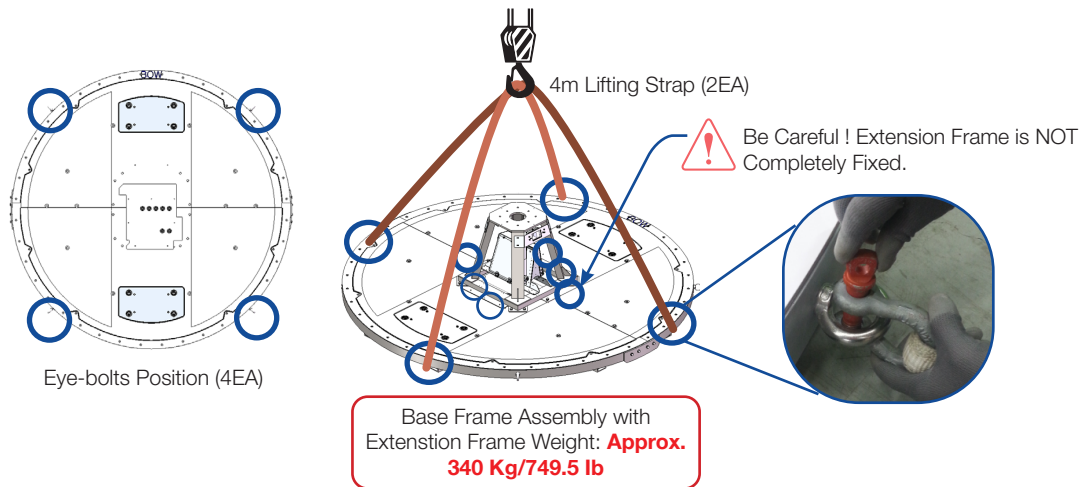


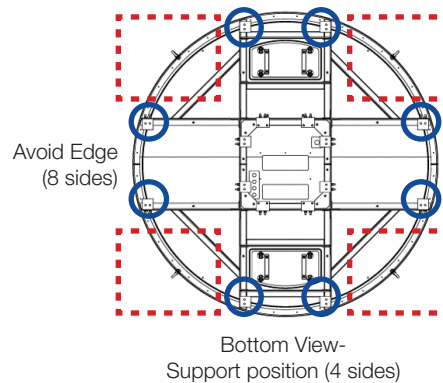
Figure 23: Lifting Base Frame

3. Bring strong supports (4 EA), such as a wood pallet, to support the base frame's weight. The supports must be more than 600 mm tall to safely work on the bolts underneath the base frame. Place the supports as shown in the Figure, then set the base frame on the supports and install the bolts while the Base Plate is elevated.



CAUTION

When placing the base frame on the supports, avoid the edge of the base frame (marked as ) otherwise, the base frame may not be positioned securely.



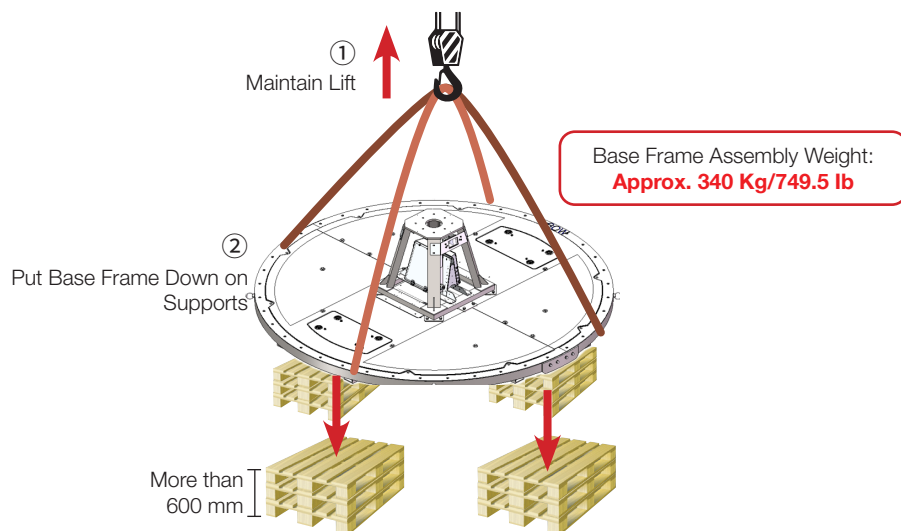


Figure 24: Placing Base Frame on Supports



WARNING

MAKE SURE THAT THE BASE FRAME IS ONLY POSITIONED ON SUPPORTS THAT CAN HOLD THE WEIGHT OF THE UNIT. THE BOLTS MUST BE TIGHTENED UNDER THE BASE FRAME BY THE INSTALLER; PERSONAL INJURY AND/OR DAMAGE TO THE EQUIPMENT CAN OCCUR UNLESS CARE IS TAKEN.

4. Tighten the Washers and Nuts under the Base Frame to fasten the Extension Frame.

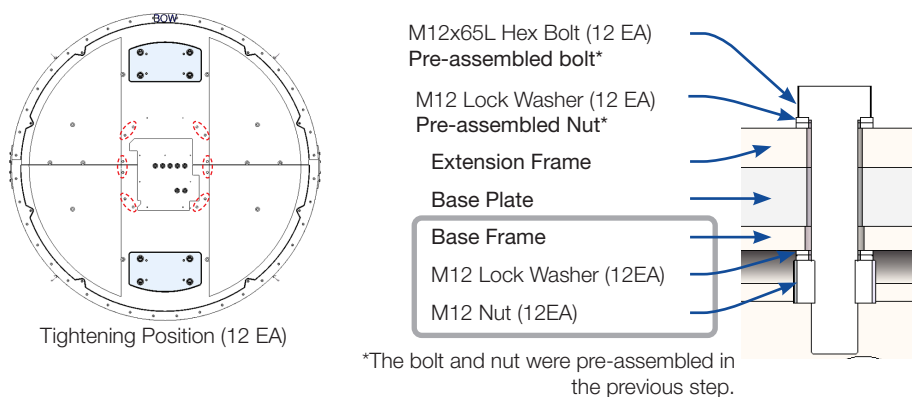


Figure 25: Assembling Extension Frame on Base Frame



WARNING

Be careful when assembling the Extension Frame because the unit is heavy. Incorrect handling of the UNIT may lead to injury to the installers and/or cause significant damage to the unit.



NOTE

Refer to "14.1 Appendix A. Tightening Torque Specification" on page 154 for the bolt tightening torque.

5. ① Insert bolts (12 EA) into the bolt hole of the base frame. ② Tighten the Washers and Nuts under the Base Frame to fasten the Base Plate.

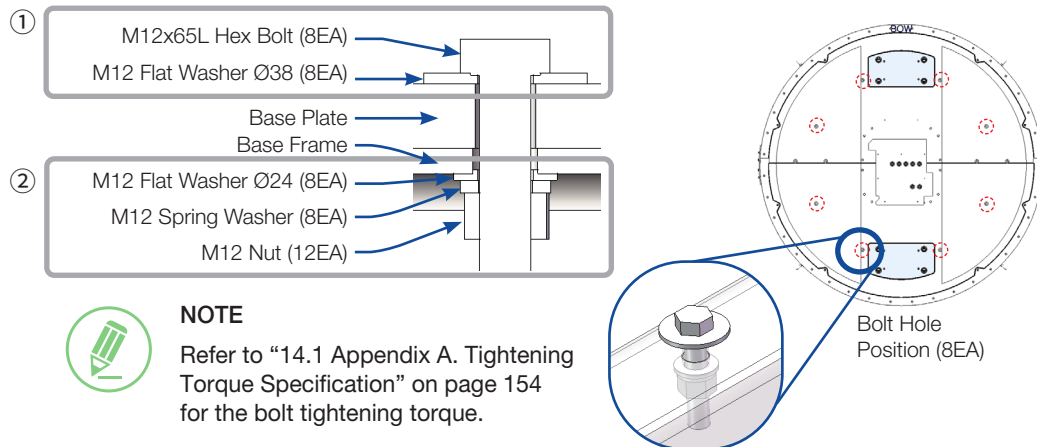


Figure 26: Fixing Base Plate to Base Frame



WARNING

Be careful when assembling the Base Frame because the unit is very heavy. Incorrect handling of the Unit may lead to injury to the installers and/or cause significant damage to the unit.

6.5.4 Placing Base Frame

Place the Base Frame on a sturdy floor using a crane and remove lifting straps.

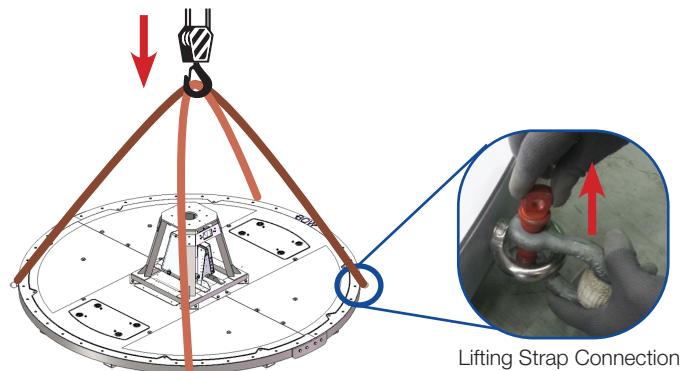


Figure 27: Placing Base Frame on Sturdy Floor

6.6 Pedestal Assembly

6.6.1 Removing Dampening Blocks



WARNING

The Dampening Blocks must be removed before taking off the Shipping Brackets for safety installation.

Follow the steps below for the Three (3) Sets of Dampening Blocks.

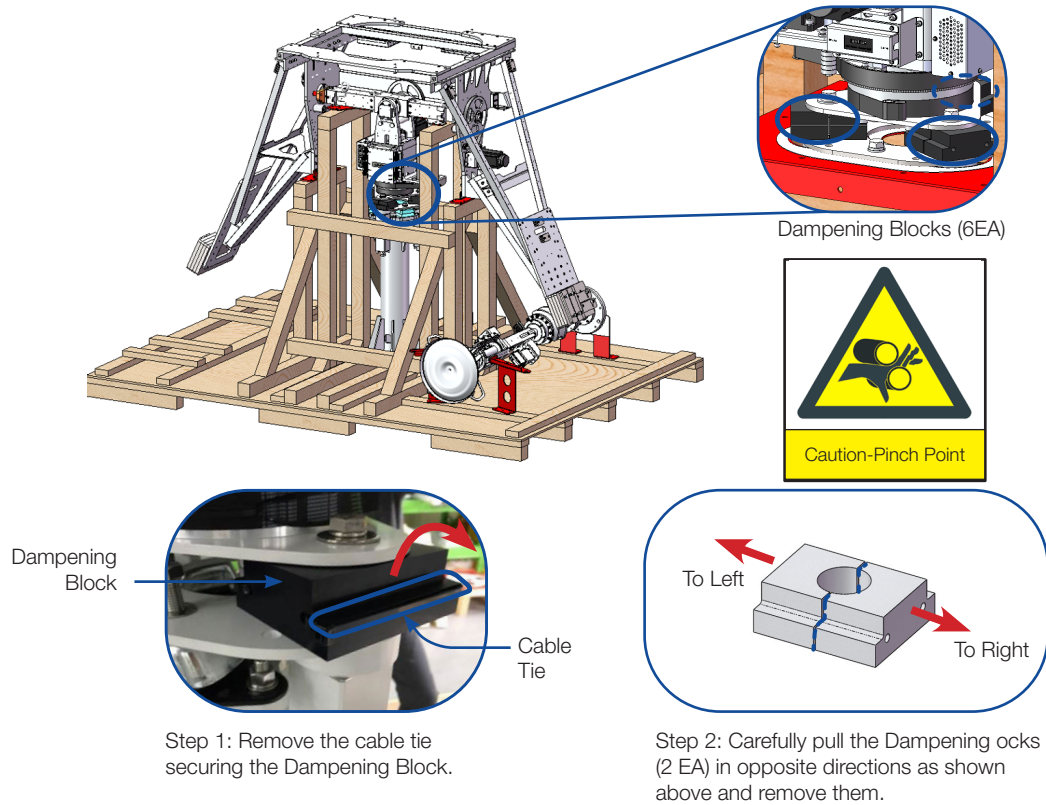


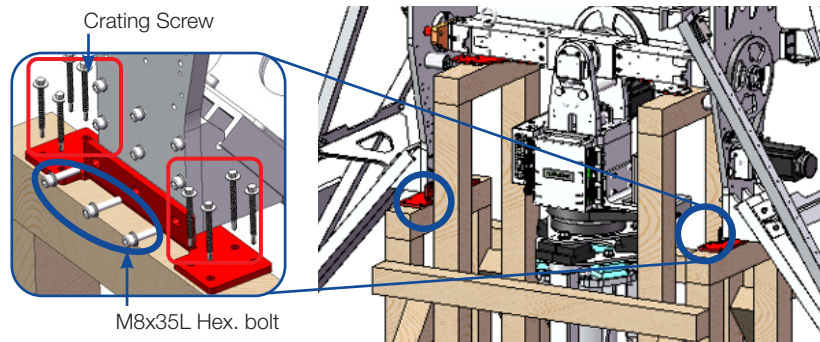
Figure 28: Removing Three Sets of Dampening Blocks

6.6.2 Removing Shipping Brackets on CL/EL Arm and Post

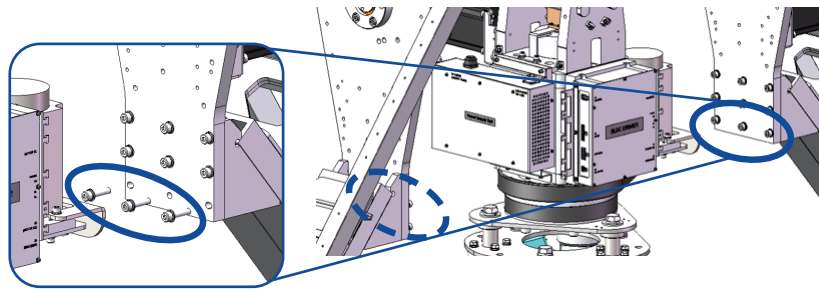
Release the cross-level arm by removing bolts. Remove the four (4EA) brackets on the elevation-level arm. Follow the steps below for both sides.

Step 1: Remove 8 mm crating screws (8 EA, each side) from wooden supports.

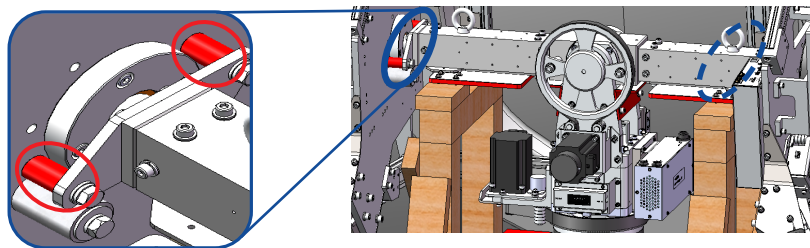
Step 2: Remove M8x35L Hex. wrench bolts (3 EA, each side) from the EL Arms and detach shipping brackets. Do not discard the M8x35 bolts.



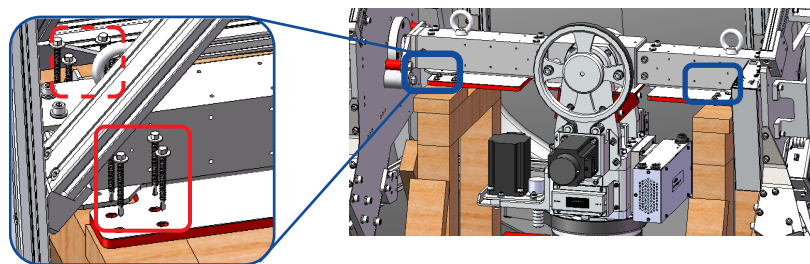
Step 3: Tighten the M8x35L Hex. wrench bolts (3 EA, each side) to the EL Arms after detaching the shipping bracket.



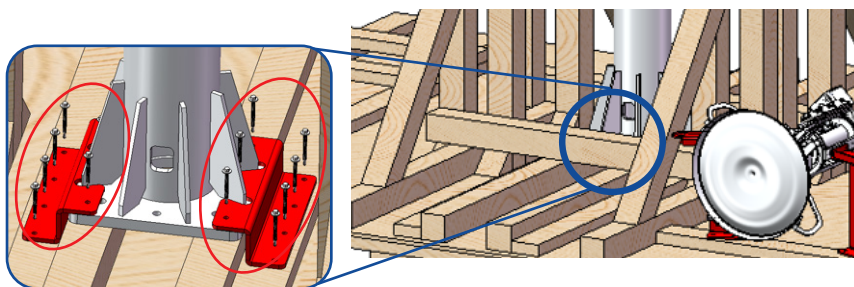
Step 4: Remove bolts (2 EA, each side) securing the counterweight plate using an 6 mm hex wrench.



Step 5: Remove 8 mm crating screws (8 EA, each side) from wooden supports.



Step 6: Remove 8 mm crating screws (7 EA, each side) from wooden supports.



6.6.3 Assembling Pedestal to Base Frame



CAUTION

When using a forklift, be careful not to damage the peripheral module and cables while inserting the fork. **Intellian is not responsible or liable for any damage incurred due to improper handling.**



WARNING

Be careful when lifting the heavy object. Incorrect handling of the heavy object may lead to injury to the installers and/or cause significant damage to the unit.

1. Connect the lifting strap (5m, 1EA) to the eye-bolts of the EL arm. Lift the reflector assembly using a crane, and move it above the post.

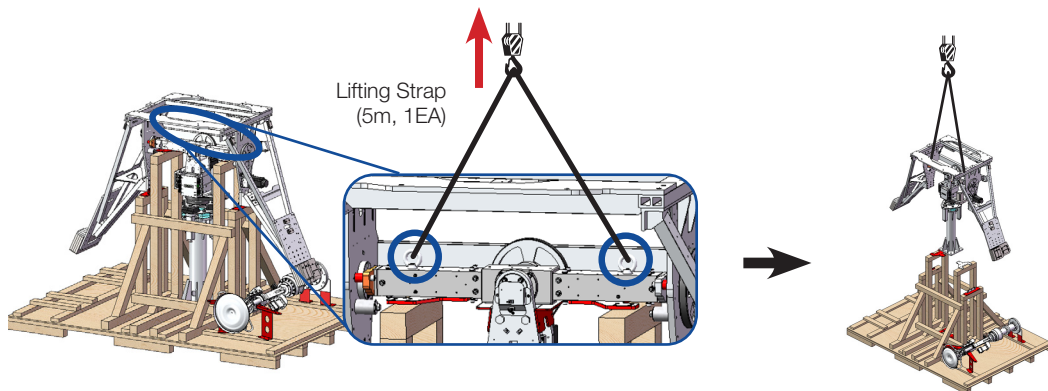
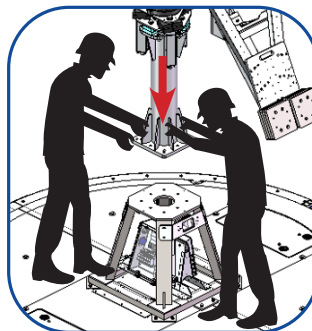
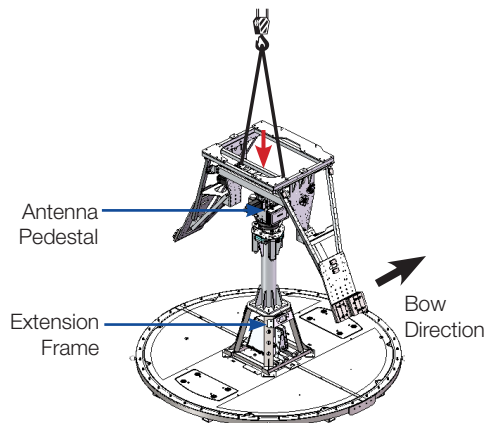


Figure 29: Lifting Reflector Assembly

2. Attach the Pedestal with the post to the extension frame. Before placing the base on the post, ensure that the BOW marker on the base plate and the post points in the direction of the BOW.



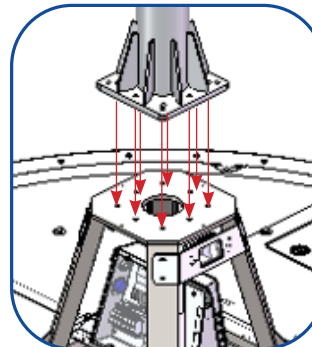
Step 1

Place the pedestal to the extension frame. Make sure the BOW marker is facing on the BOW direction.



WARNING

Be careful when lowering the pedestal down onto the Extension Frame because the unit is heavy. Incorrect handling of the Unit may lead to injury to the installers and/or cause significant damage to the unit.



Step 2

Align the bolt holes between the Pedestal and the Extension Frame.

Figure 30: Placing Pedestal on the Extension Frame

3. Fasten the Pedestal with the post and Extension Frame. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.

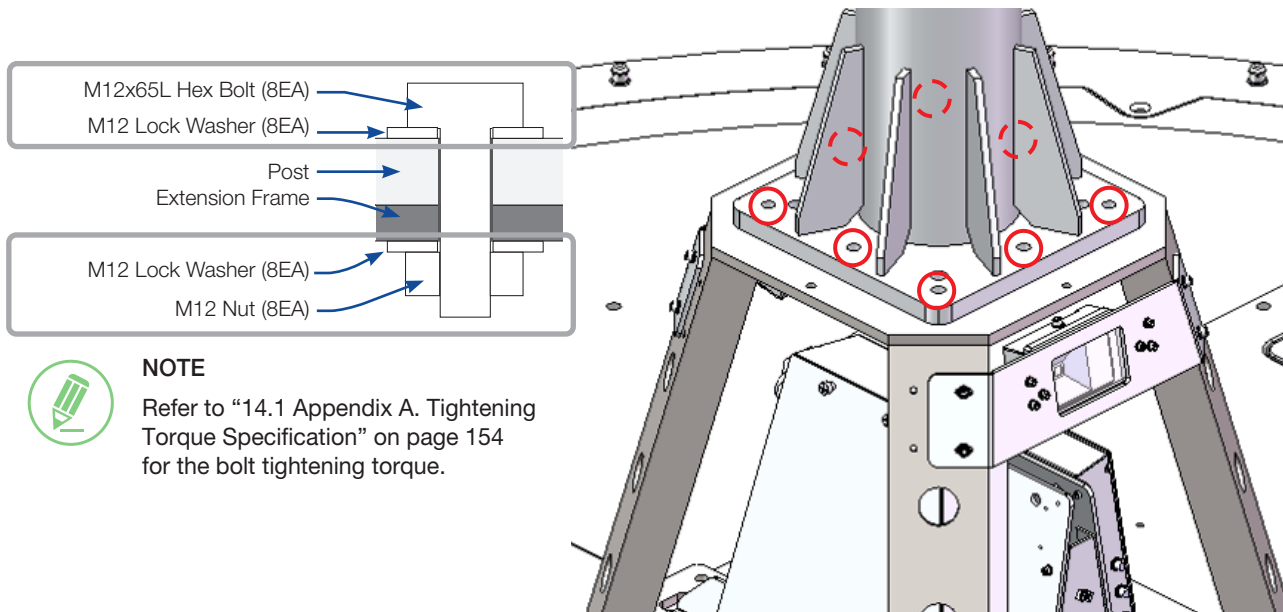


Figure 31: Fastening Pedestal with Post and Extension Frame

4. Remove the lifting strap (5 m, 1 EA) connected to the eye-bolts of the EL arm.

6.7 Reflector Assembly

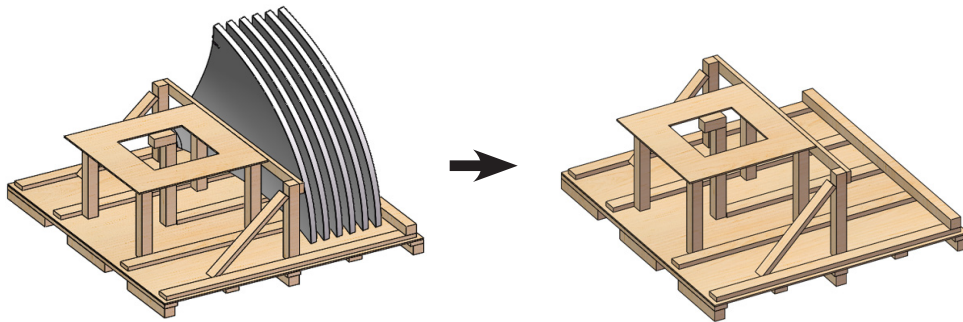


NOTE

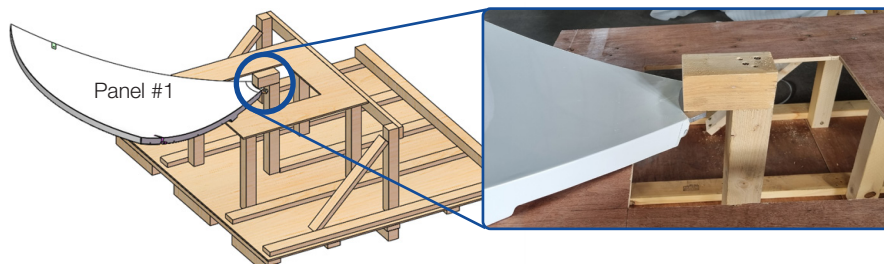
The bottom of the reflector panels are marked with numbers. Refer to them during assembly.



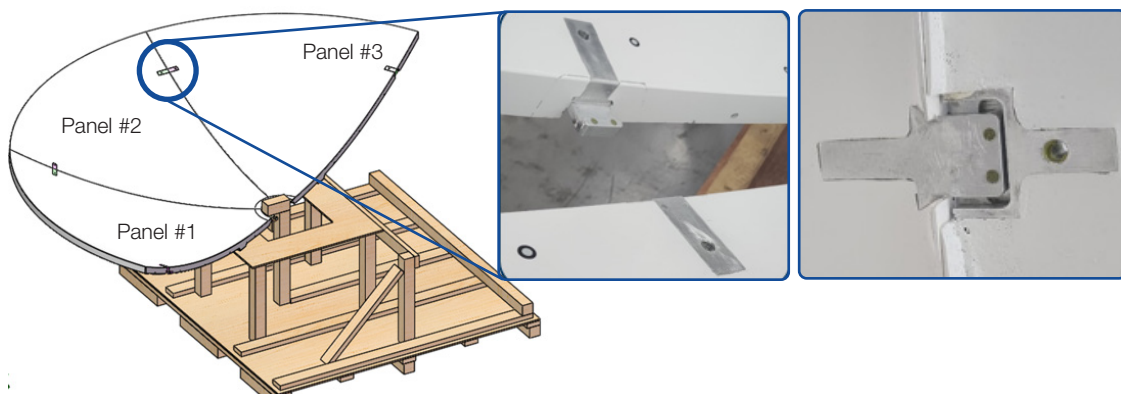
1. Place the reflector create in an unobstructed area.
2. Remove the segmented reflectors from the crate. The wooden crate is used as an assembly JIG.



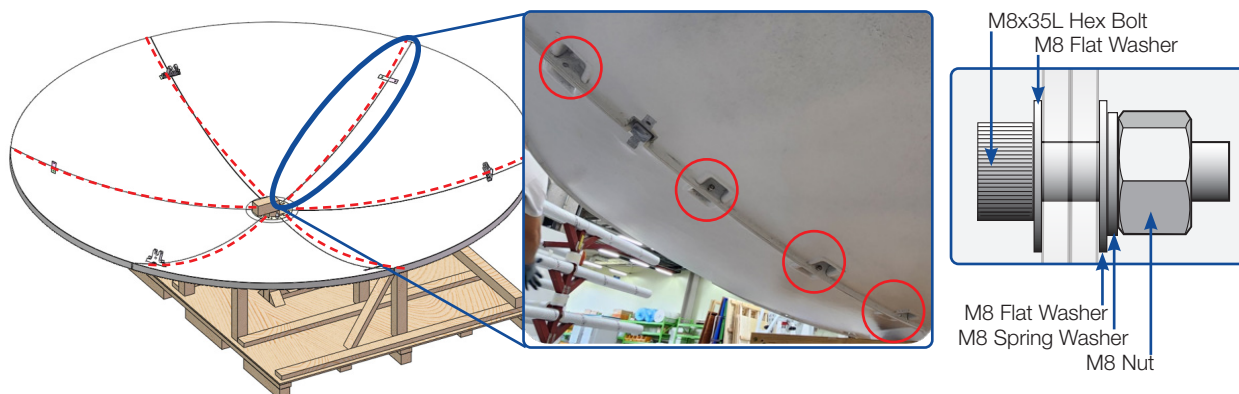
3. Locate the reflector panel #1 to the crate and hold the end of the reflector to the hook on the crate.



4. Assemble the segmented reflector panels (#1~#6) sequentially. Match the insert each reflector.



5. There are four screw holes for each joint on the back of the reflector.



NOTE

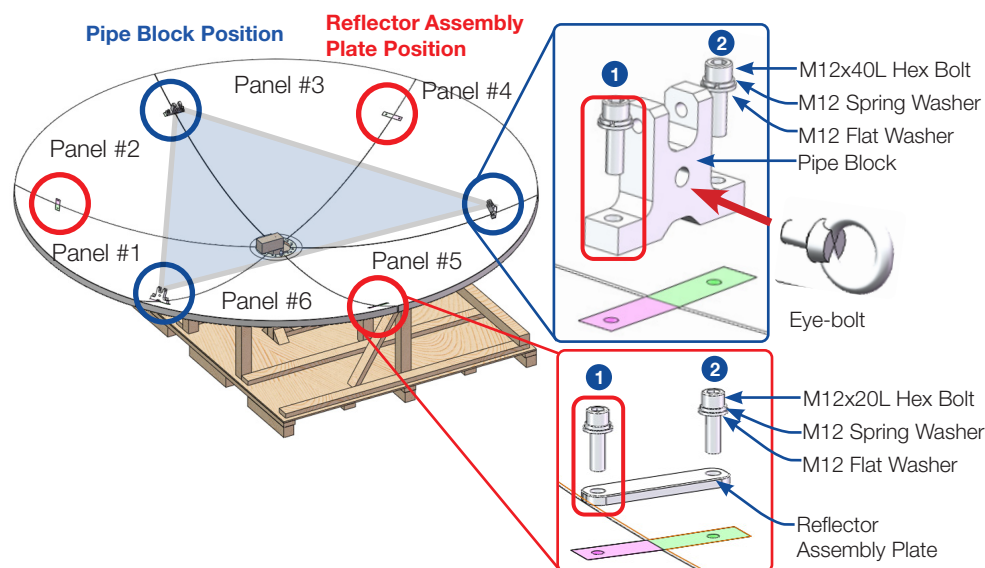
Tighten the bolts slightly at this step.

6. Take out the Pipe Blocks and position them (Panel #1/#6, Panel #2/#3, Panel #4/#5) Panel to form the sides of an equilateral triangle.
7. Take out the 3 Reflector Assembly Plate and position them (Panel #1/#2, Panel #3/#4, Panel #5/#6) Panel to form the sides of an equilateral triangle.
8. Tighten bolts to secure the Pipe Block and Reflector Assembly Plate. The ❶ (left) bolt should be tightened first and then, tighten the ❷ (right) bolt.

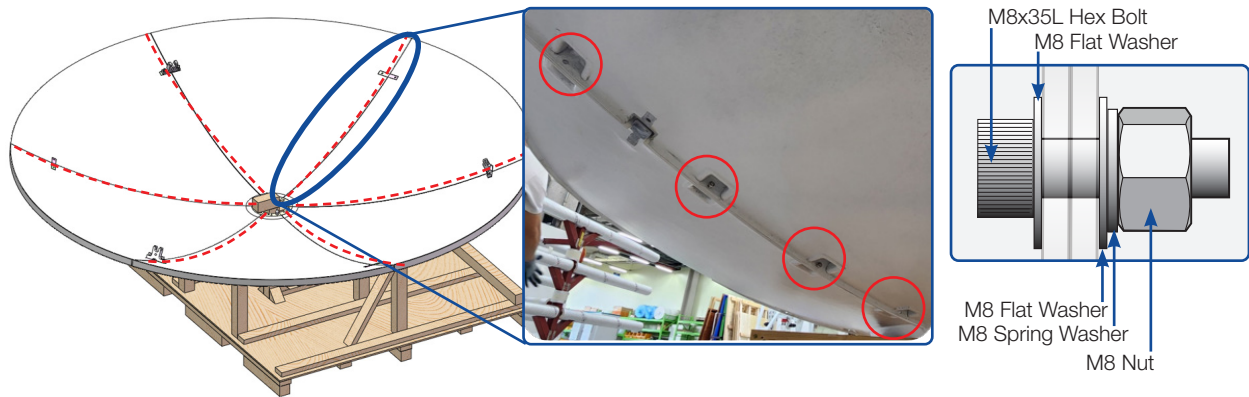


CAUTION

When tightening the bolts on the Pipe Block and Reflector Assembly Plate, the bolts on the left side must be tightened first to adjust the flatness of the reflector.



9. After installing the Pipe Block and the Reflector Assembly Plate, fully tighten the bolts on the back of the reflector.

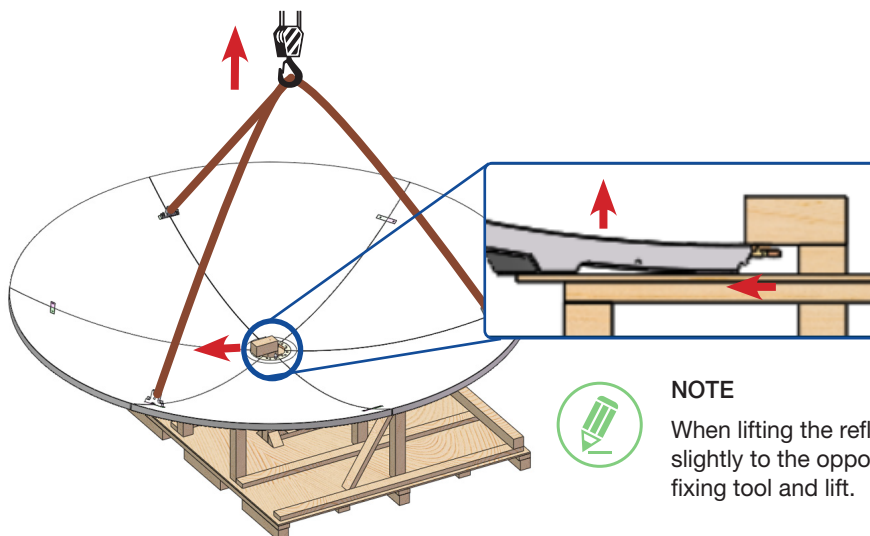


10. Check the panel joints by hand to ensure that the reflector is evenly assembled.



11. Bring lifting strap and connect the strap to the eye-bolt on the pipe block.

12. Move the assembled reflector to the flat and clean surface.

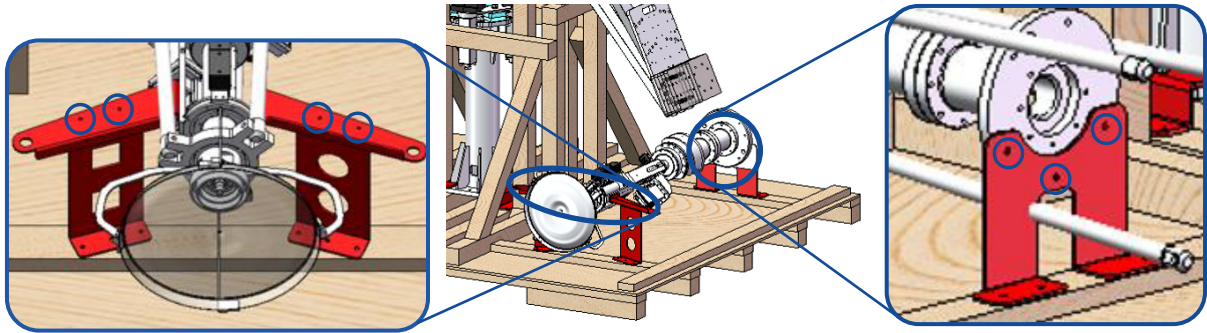


NOTE

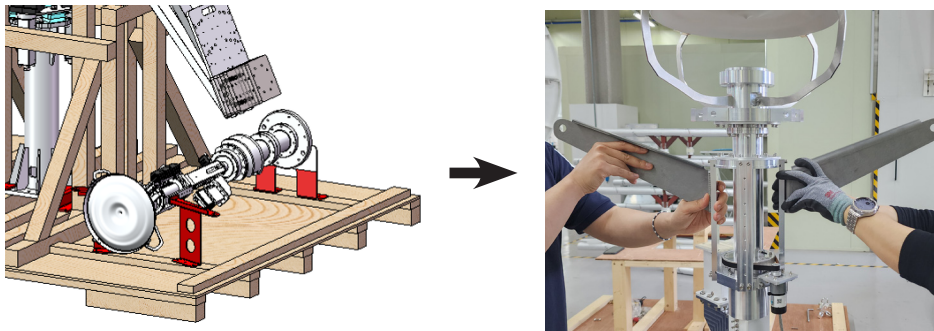
Do not remove lifting straps until reflector is mounted to the pedestal.

6.8 Feed Horn Installation

1. Remove M5x20L Hex. wench bolts (7 EA) securing shipping brackets using an 4 mm Hex. wrench.



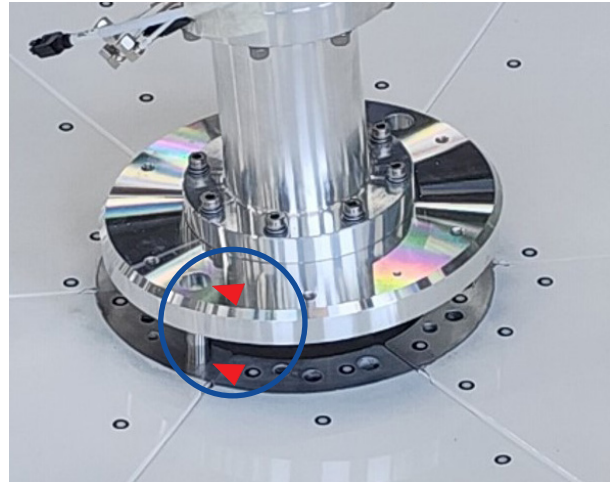
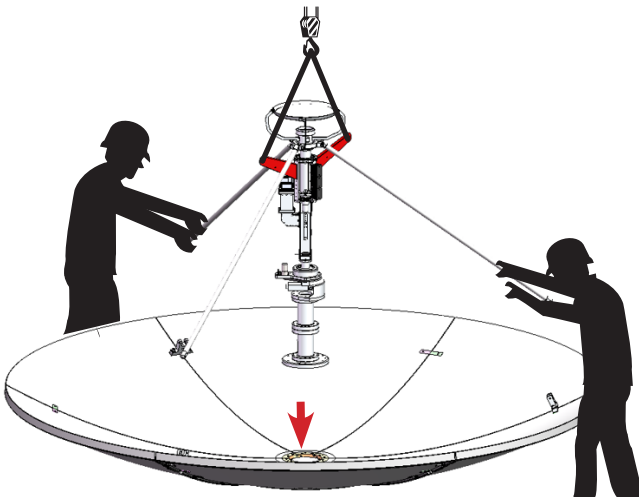
2. Stand up the feed horn that is anchored to the crate.



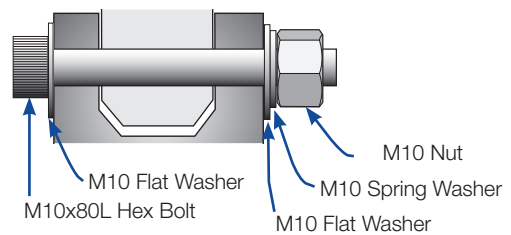
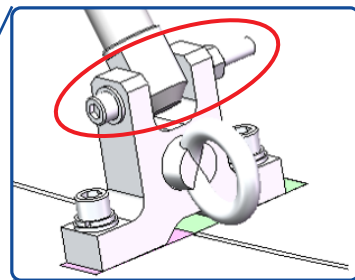
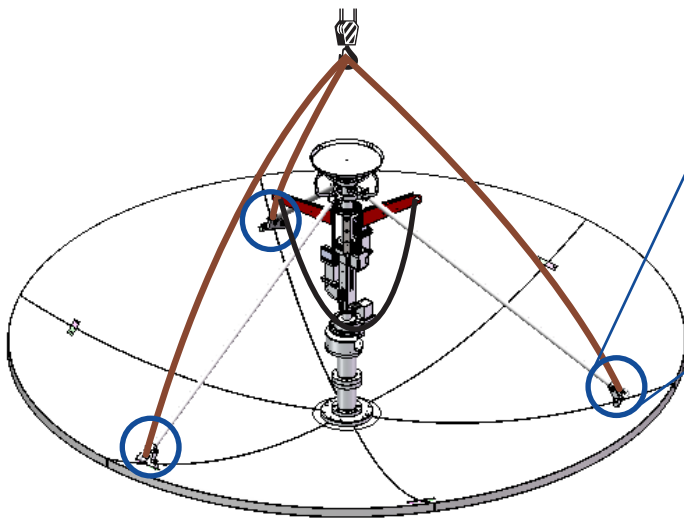
3. Adjust the angle of the feedhorn's support pipe to match the reflector's pipe block position.
4. Check that the lifting strap is fixed to the feed horn's brackets.



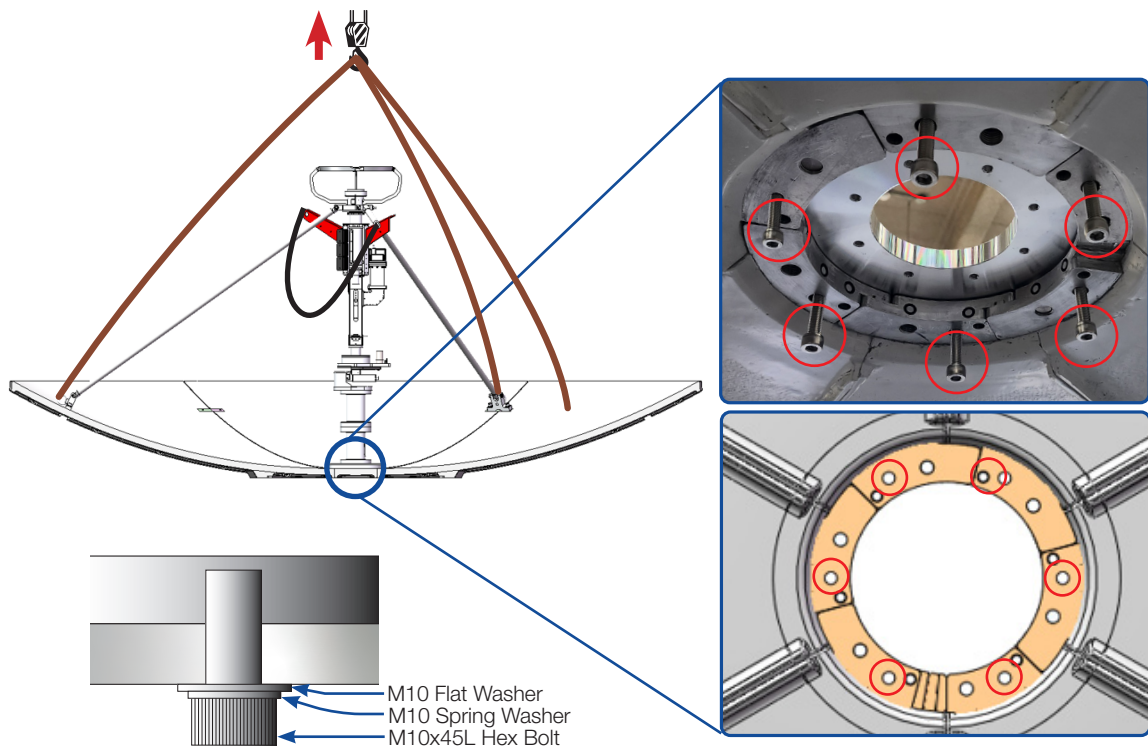
5. Lift the feed horn and place it on the reflector.
6. Position the feed horn along the two guide pins on the reflector. Match the pins to the holes by checking the red triangle stickers.



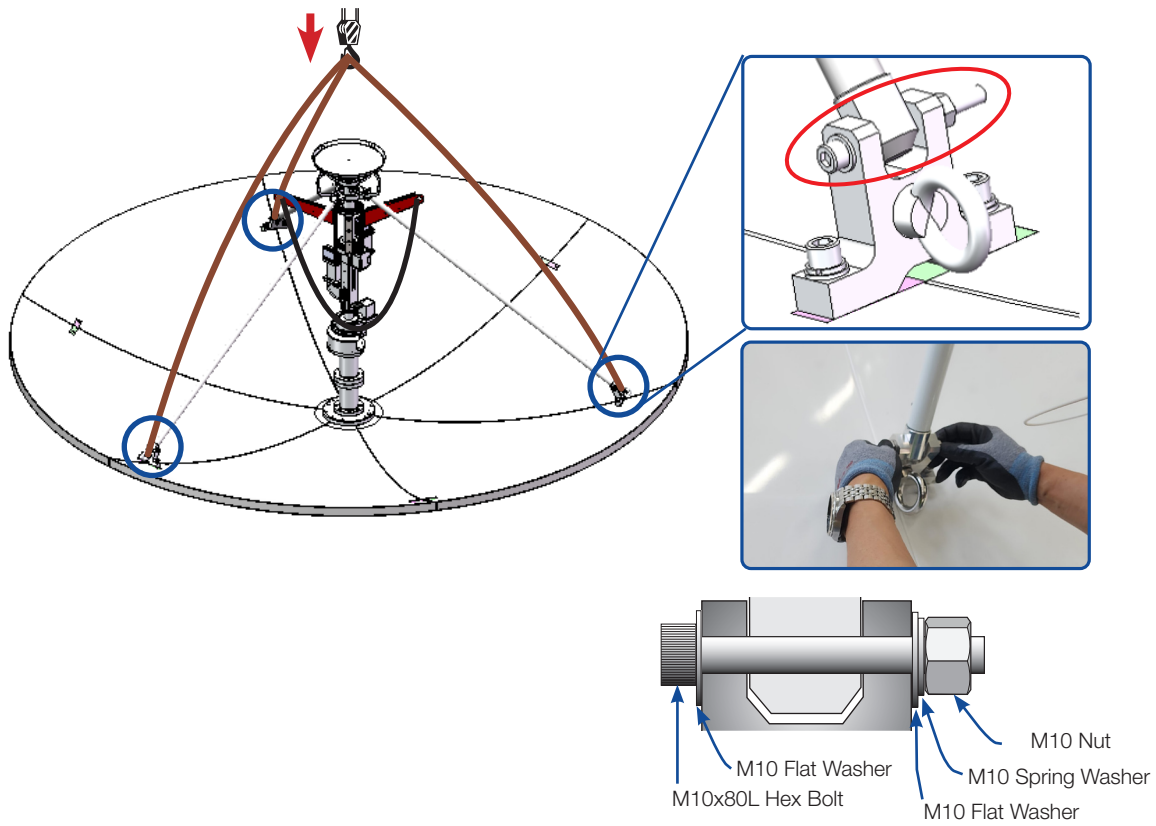
7. Secure the 3 support pipe and pipe blocks.



8. Gently lift the reflector and feed horn assembly and secure the feed horn from the reflector bottom side.



9. Lift down the reflector and secure the 3 support pipe and pipe blocks.

**NOTE**

Do not remove lifting straps until reflector is mounted to the pedestal.

6.9 Reflector Assembly



WARNING

Be careful when lifting the heavy object. Incorrect handling of the heavy object may lead to injury to the installers and/or cause significant damage to the unit.

1. Lift the reflector with the feedhorn assembled onto the antenna pedestal.
2. Adjust the reflector panels #3 and #4 to point towards the BOW direction.
3. Align bolt holes between reflector and pedestal and gently lift down the reflector assembly.



CAUTION

The assembled reflector is directional. Make sure to check the numbers on the bottom of the reflector.

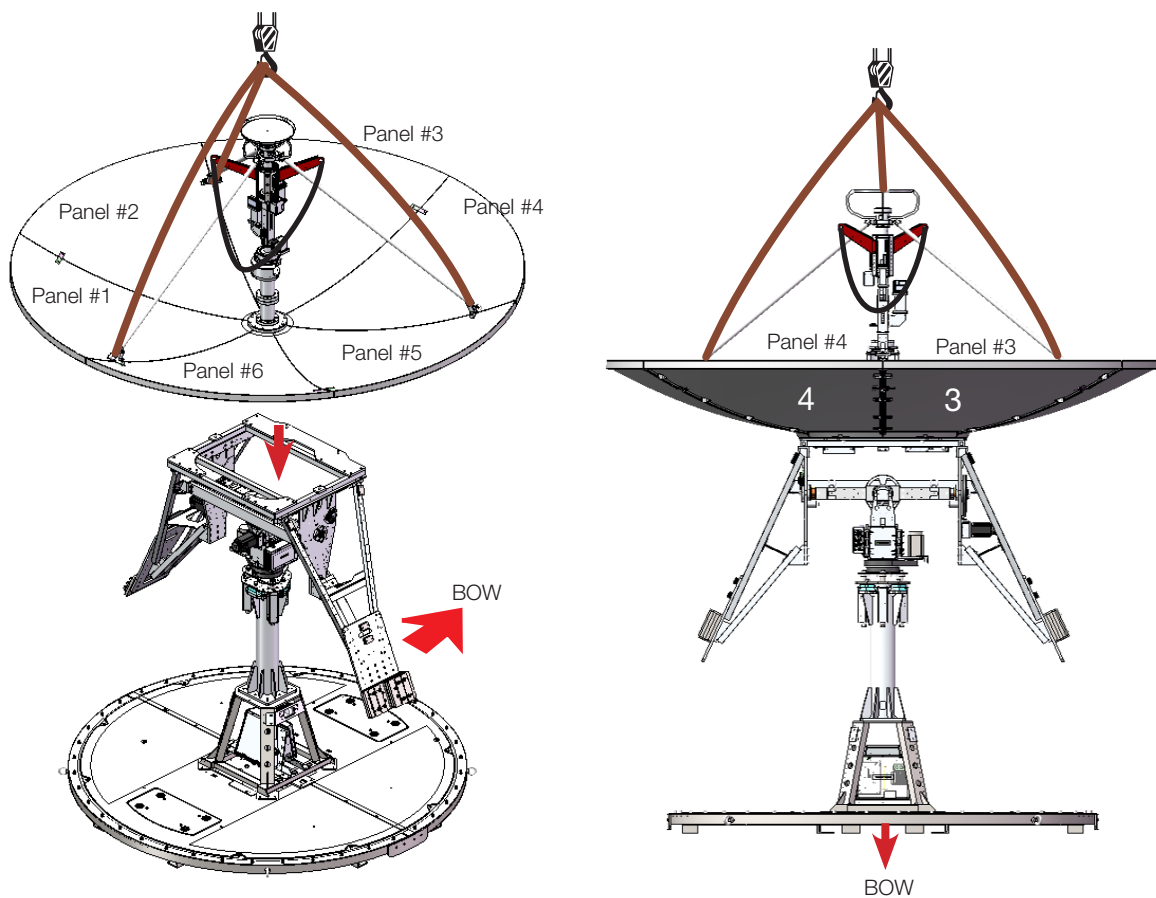


Figure 32: Mounting the Reflector Assembly

4. Tighten bolts to secure the reflector as shown.

⦿ : M12x80L Hex Bolt (2EA)
M12 Flat Washer (2EA)
M12 Spring Washer (2EA)

⦿ : M12x90L Hex Bolt (2EA)
M12 Flat Washer (2EA)
M12 Spring Washer (2EA)

⦿ : M12x40L Hex Bolt (2EA)
M12 Flat Washer (2EA)
M12 Spring Washer (2EA)

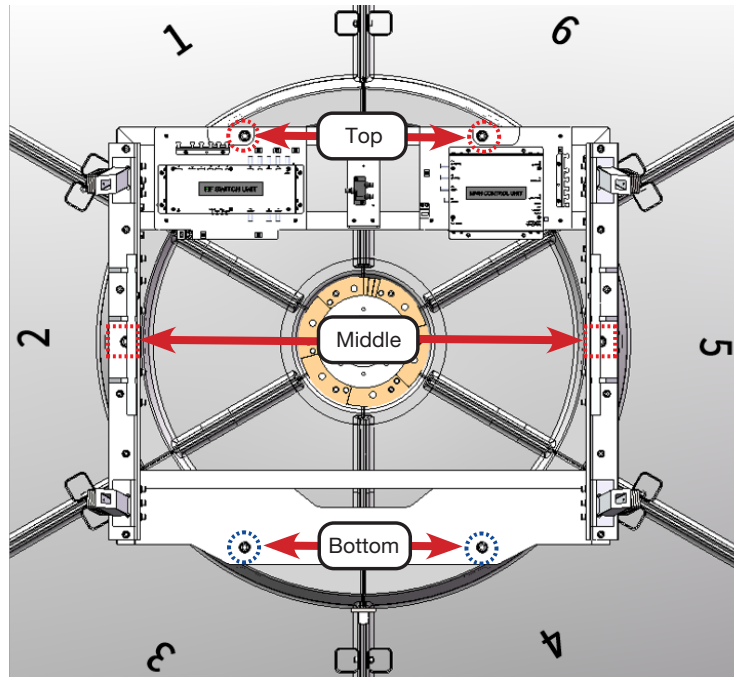


Figure 33: Securing bolts onto the pedestal

5. Adjust the antenna angle and remove reflector lifting strap on the 3 pipe blocks.
6. Remove lifting brackets from the feed horn using a 4 mm Hex. wrench.

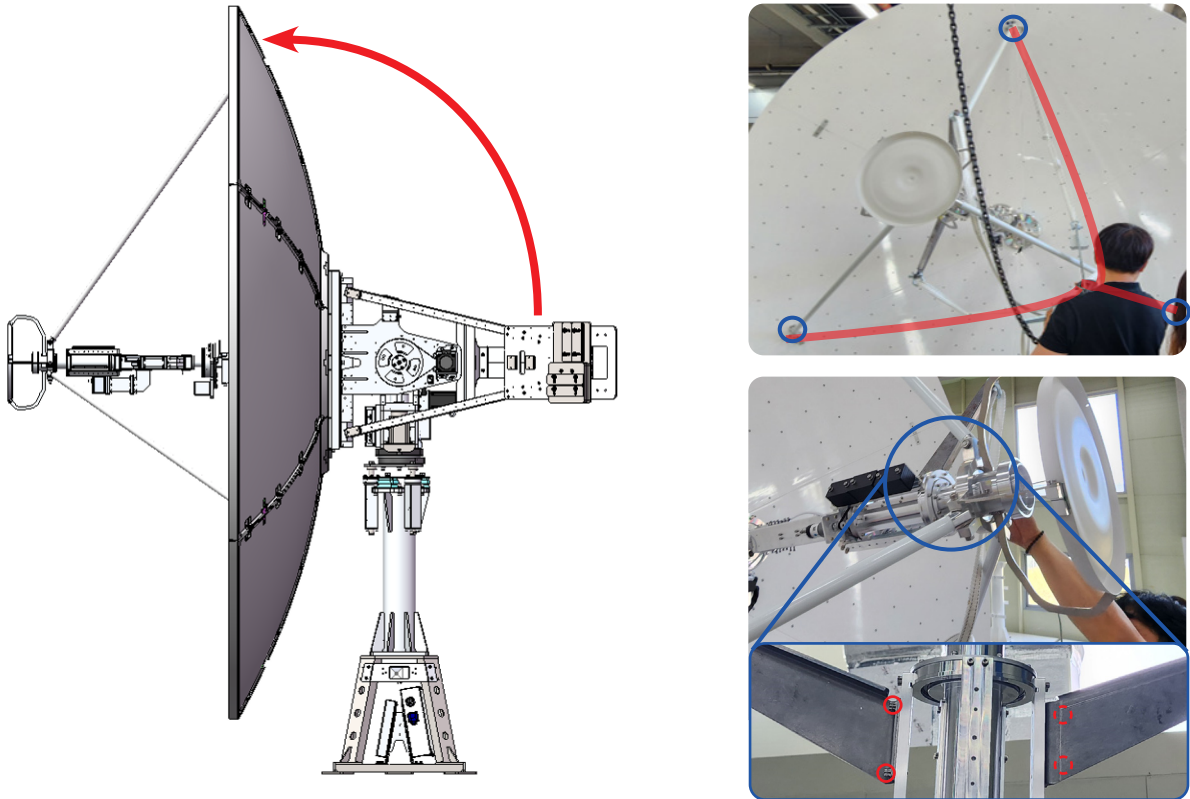


Figure 34: Removing straps from the reflector and feedhorn

7. After assembling the reflector and feedhorn assembly, route the feedhorn cable through the center hole to the rear of the reflector.

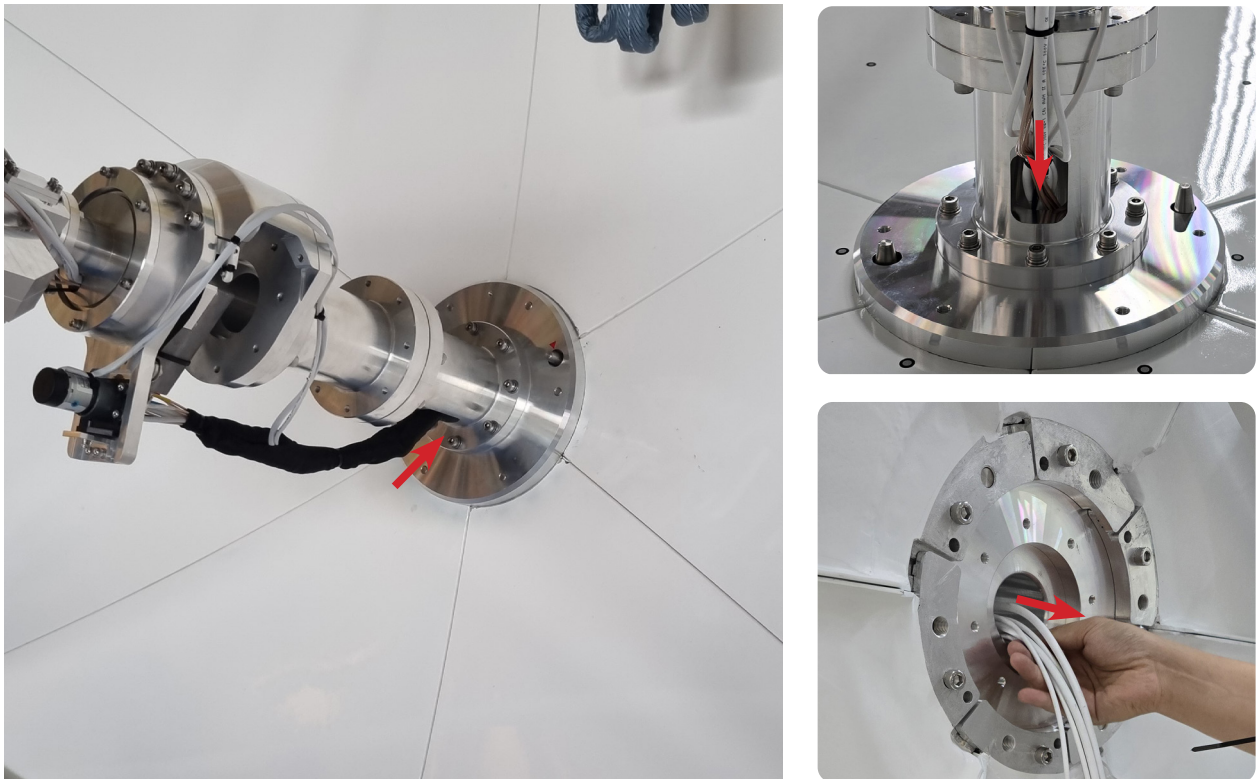


Figure 35: Feedhorn Cable routing

6.10 Cable Connection of Above Deck Unit

RF Switch Unit Cables should be connected following the procedure as shown in the figure. After connecting all cables, ensure all connectors are tightened.

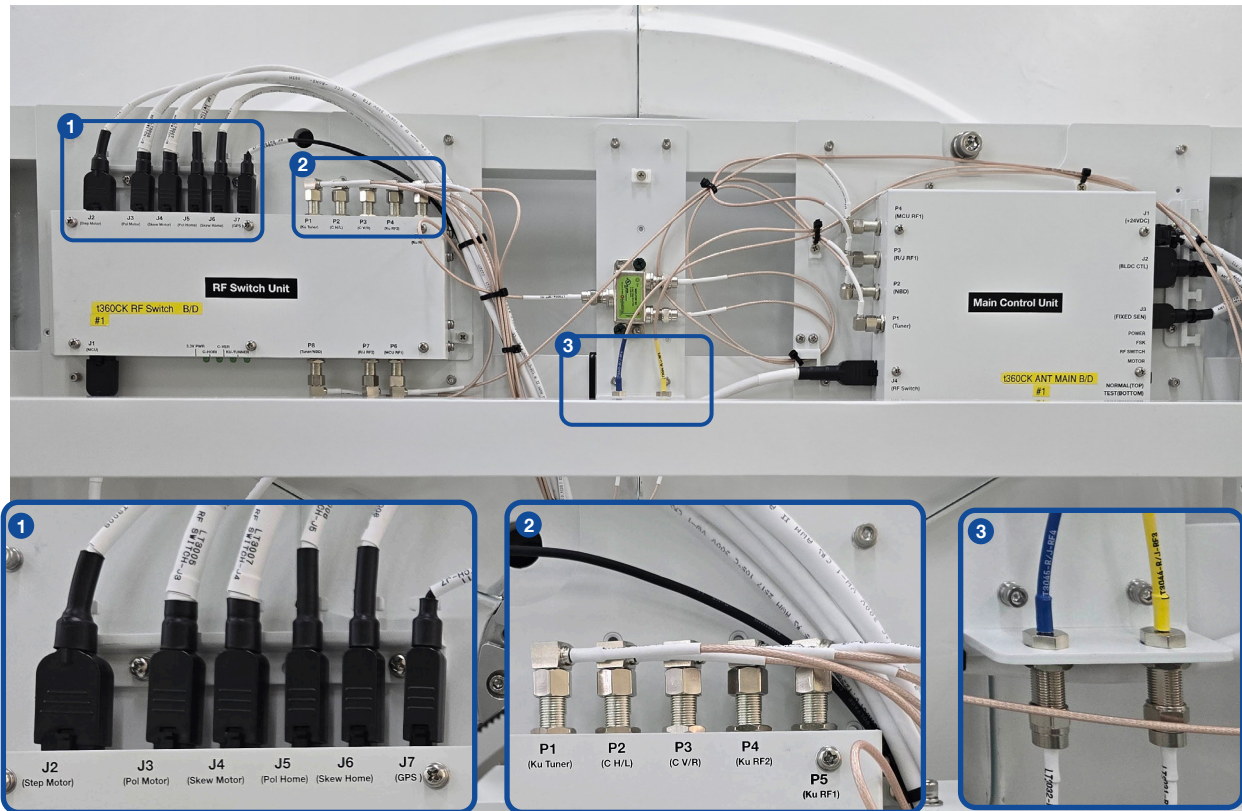


Figure 36: Connecting RF Switch Unit

Step 1

1. Connect the **J2 cable** to the **J2 (Step Motor) port** of the RF Switch Unit.
2. Connect the **J3 cable** to the **J3 (Pol Motor) port** of the RF Switch Unit.
3. Connect the **J4 cable** to the **J4 (Skew Motor) port** of the RF Switch Unit.
4. Connect the **J5 cable** to the **J5 (Pol Home) port** of the RF Switch Unit.
5. Connect the **J6 cable** to the **J6 (Skew Home) port** of the RF Switch Unit.
6. Connect the **J7 cable** to the **J7 (GPS) port** of the RF Switch Unit.

Step 2

1. Connect the **P1 cable** to the **P1 (Ku Tuner) port** of the RF Switch Unit.
2. Connect the **P2 cable** to the **P2 (C H/L) port** of the RF Switch Unit.
3. Connect the **P3 cable** to the **P3 (C V/R) port** of the RF Switch Unit.
4. Connect the **P4 cable** to the **P4 (Ku RF2) port** of the RF Switch Unit.
5. Connect the **P5 cable** to the **P5 (Ku RF1) port** of the RF Switch Unit.

Step 3

1. Connect the **LT3031 cable** to the **LT3044-R/J RF3 connector** of the cable junction.
2. Connect the **LT3232 cable** to the **LT3045-R/J RF4 connector** of the cable junction.

To connect the Fiber Link Unit and Power Switch Unit: Refer to the Figure to connect the Fiber Link Unit and the Power Switch Unit.

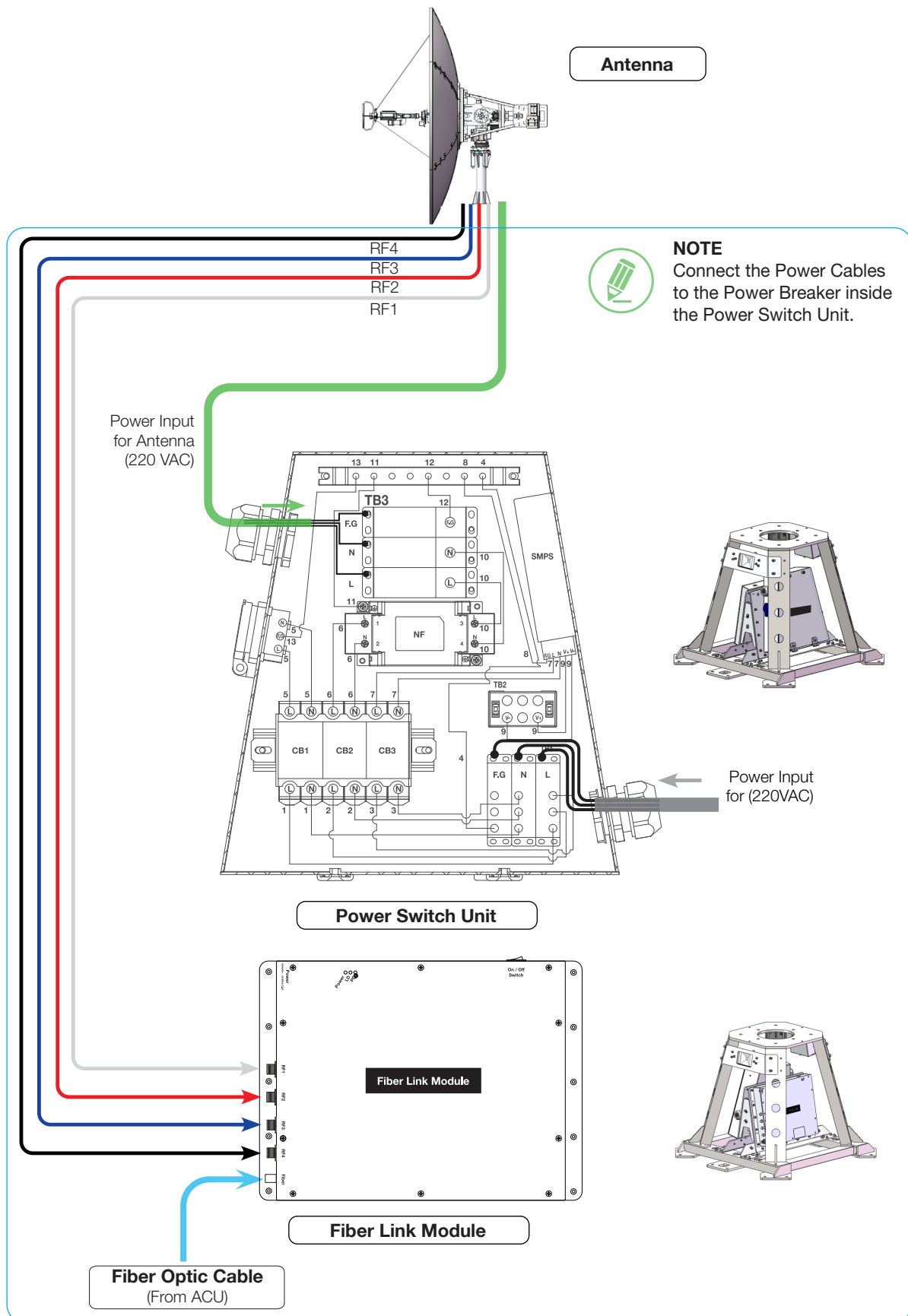


Figure 37: Antenna Cable Connection to the Power Switch Unit and Fiber Link Module

6.11 Radome Assembly

6.11.1 Assembling Top Radome

The Top Radome consists of 5 panels. To assemble the Top Radome, follow the procedures below:

- ***Two panels are assembled to make the first set.***
 - ***Place the Cap on top of the Radome.***
 - ***The other panels are assembled to make the Top Radome.***
1. Spread a thin line of silicone on the binding surface of the panels, connect the panels using bolts. Keep the bolts loosened temporarily until the panels are aligned.

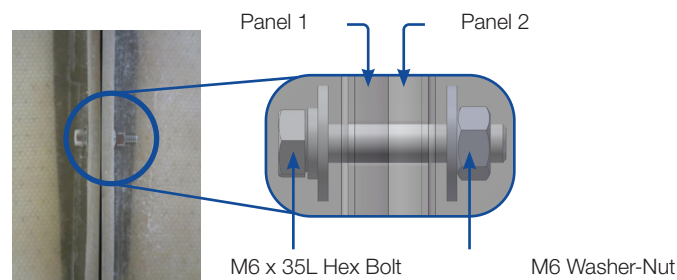


Figure 38: Top Radome Assembly



NOTE

- Refer to “14.1 Appendix A. Tightening Torque Specification” on page 154 for the bolt tightening torque.
- Refer to the information below for proper silicone use to protect the surface.
 - Tack-free Time (TFT): 60 min.
 - Setting speed: 3mm / 24hr
 - Applicable temperature: +10 to +35 deg.
 - Applicable temperature range: -40 to +90 deg.

2. After joining the panels together, apply a bead of silicone to the panels joint from the outside as shown in the figure below. After applying the silicone, remove excess silicone from each bead and clean the surface of the Radome.



Figure 39: Spreading Silicone between Radome Panels

6.11.2 Assembling Bottom Radome

1. The Bottom Radome consists of 5 panels. Before assembling it, check that the Side Hatch ((a)) is located opposite the Bow Mark ((b)) as in the example shown below. Then proceed with the assembly, ensuring that the panels are secured in place. Finally, firmly assemble the rest of the Bottom Radome.

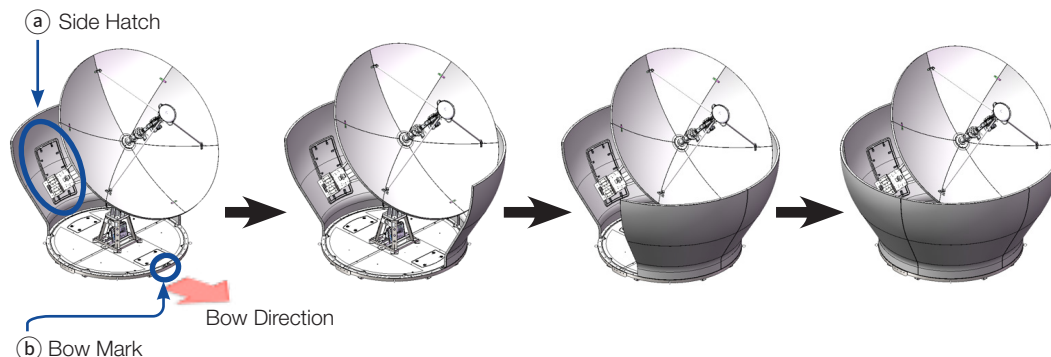


Figure 40: Assembly Sequence of Bottom Radome

2. As shown in the figure below, spread silicone on the binding surface of each panel, and fasten them together using the bolts provided.
 - ① Spread silicone on the Base Frame wedge and on the Side Panels bounding surface.
 - ② Tighten bolts to secure the panels as shown in the figure below.

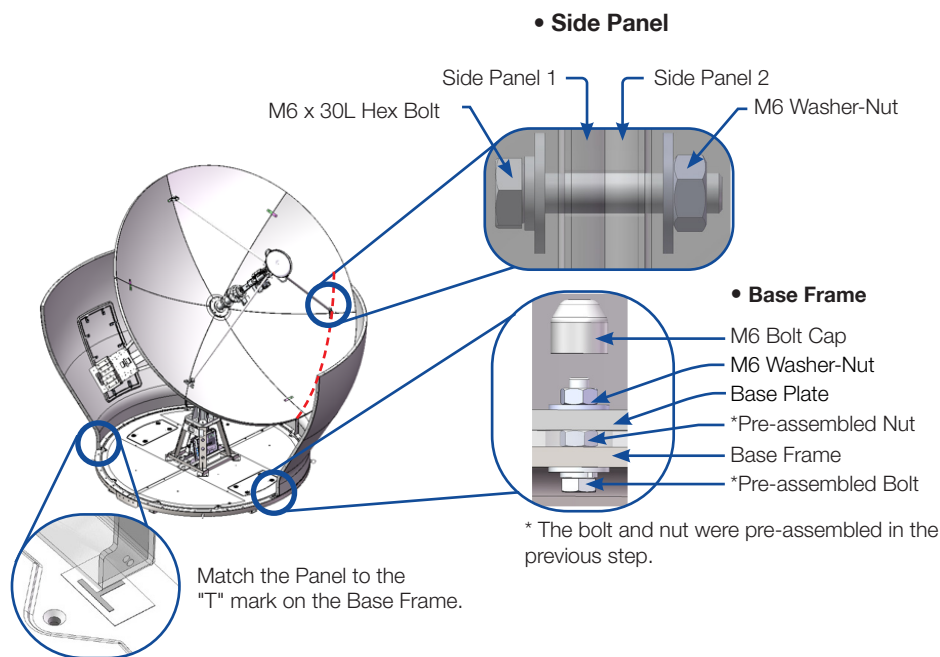


Figure 41: Assembling Bottom Radome



NOTE

Refer to "14.1 Appendix A. Tightening Torque Specification" on page 154 for the bolt tightening torque.

6.11.3 Completing Radome Assembly

To join the Top and Bottom Radome sections, follow the procedures below:

- **Attach the lift brackets under the Top Radome.**
- **Lift and place the Top Radome on top of the Bottom Radome.**
- **Match the Top and Bottom Radomes and Remove the lift brackets.**
- **Connect the Top and Bottom Radomes.**

1. To lift the Top Radome, attach the lift brackets under it, as shown in the figures below. 3 lift brackets should be positioned on the boundary line of two panels as shown in Figure ①, and the bolts should come down through the holes as shown in Figure ②.

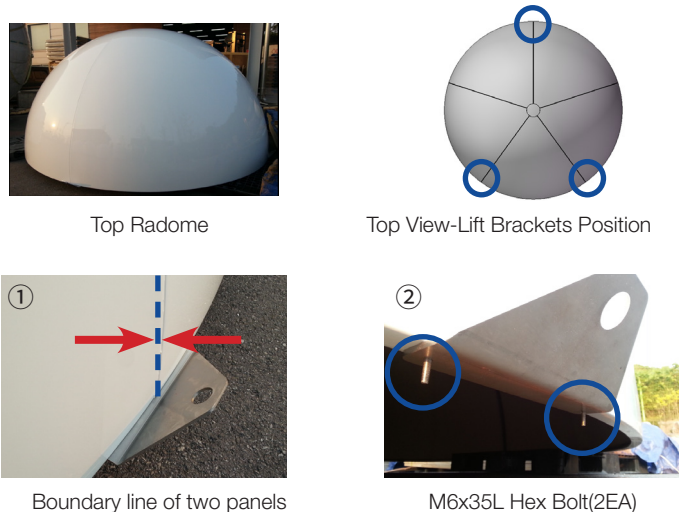
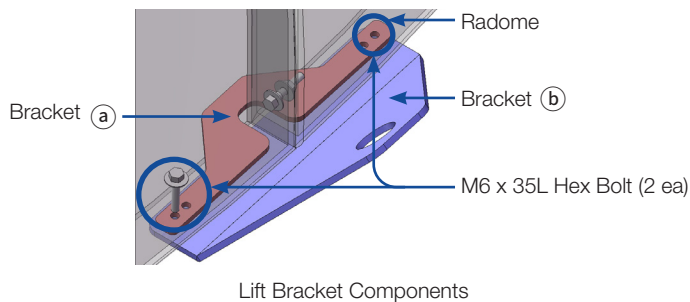


Figure 42: Lift Bracket Attachment

2. Each bracket is composed of (a), (b), and bolts as shown below. Assemble the (a) → Radome → bracket (b) in order using bolts.



WARNING

USE CARE WHEN LIFTING THE HEAVY TOP RADOME. INCORRECT HANDLING OF THE RADOME CAN CAUSE PERSONAL INJURY AND DAMAGE TO THE EQUIPMENT.



NOTE

Refer to “14.1 Appendix A. Tightening Torque Specification” on page 154 for the bolt tightening torque.

- After connecting the three (3EA) Lifting Straps to the 3 lift brackets, slowly Lift the Top Radome and place it on top of the Bottom Radome as shown in the figure below.

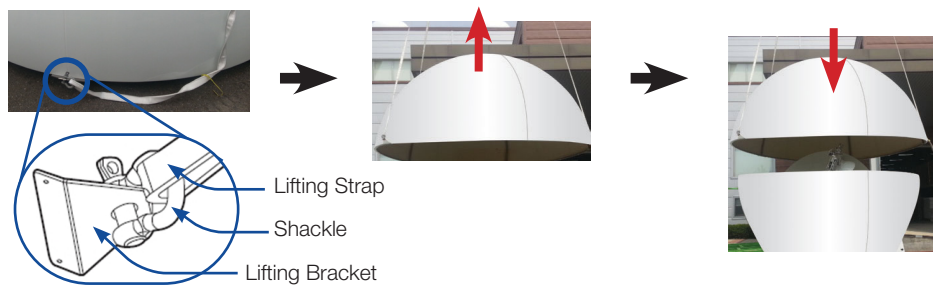
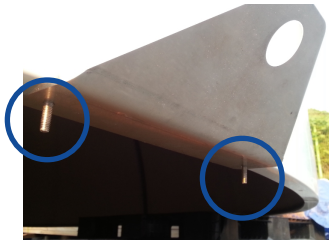


Figure 44: Placing Top Radome on Top of Bottom Radome

- Before placing the Top Radome on the Bottom Radome, position the two ends of the bracket bolts in conjunction with the holes on the Bottom Radome as shown below. Run a silicone bead on the binding surface of the Bottom Radome before lowering the top section.



Check Position of Bracket Bolts



Spread Silicone on Surface

Figure 45: Assembling Top Radome and Bottom Radome

- Match the ends of Bolt (2 EA) to the holes located on the binding surface of the Bottom Radome.

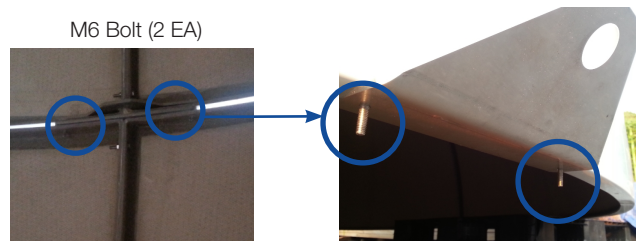


Figure 46: Matching Two Ends of M6 Bolts to Bottom Radome

- Get the wooden stool from the Top Radome Package (Crate 2) and use it while assembling Radome. First, temporarily assemble bolts to join the Top Radome and the Bottom Radome before removing the lifting bracket.

7. Temporarily assemble the bolts as shown below.

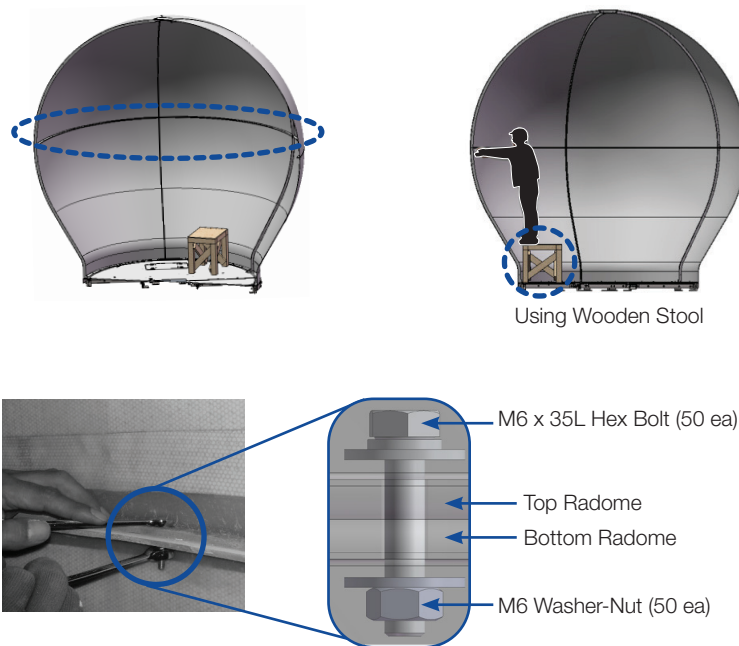


Figure 47: Temporarily Assembling Radome Bolts



IMPORTANT

Do not tighten the bolts at this time, They need to be loose so that the lift brackets can be easily removed in the next step.

8. Remove all lift bracket bolts from inside the Radome, and then remove the brackets from outside as shown below.

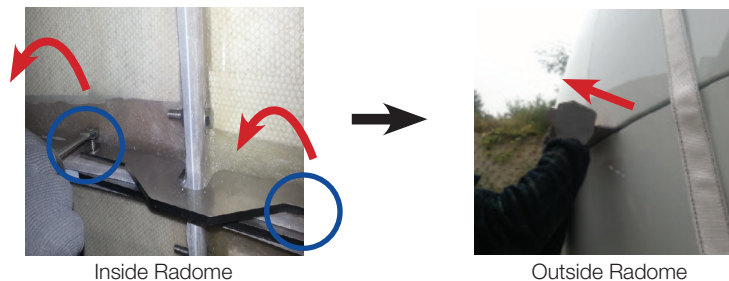


Figure 48: Removing Lift Brackets

9. When all lift brackets are removed, fully tighten the existing bolts which were loosely assembled in the previous step.

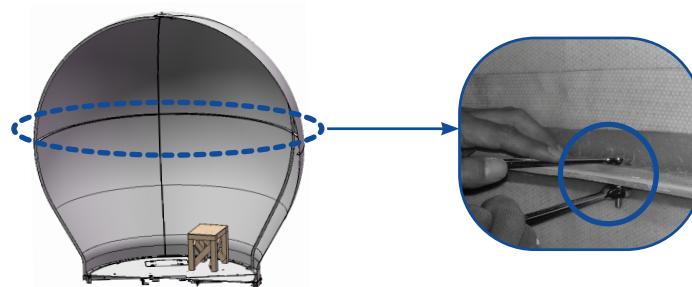


Figure 49: Fully Tightening Existing Bolts



NOTE

Refer to "14.1 Appendix A. Tightening Torque Specification" on page 154 for the bolt tightening torque.

The shape of the completed radome is shown below.



Figure 50: Completed Radome Assembly

6.12 Radome Mounting

1. Get the 14 meter Lifting Straps from the Top Radome Package (Crate 2). Connect the lifting straps to Eye-bolts (4EA) on the Radome bottom as shown in the figure below. Once secured provide a light tension to the straps using a crane.

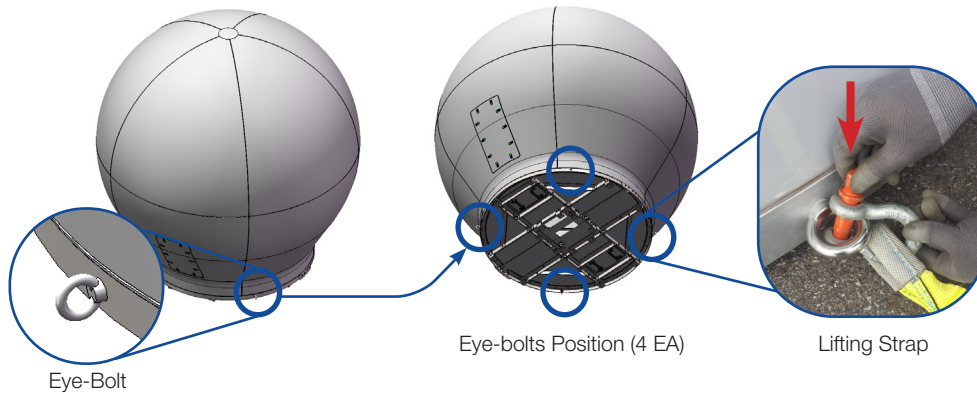


Figure 51: Connecting Lifting Strap

- Lift the Radome by attaching all four lifting straps to the crane hook as shown in the Figure. Straighten out the lifting straps as shown before lifting the entire antenna load.

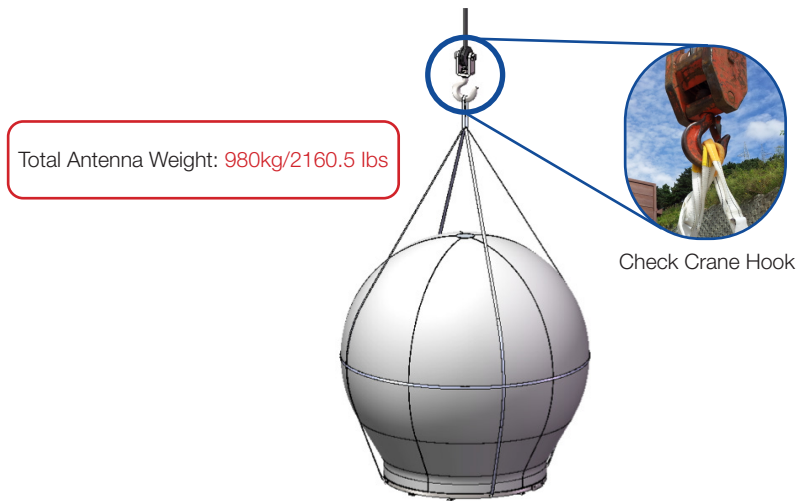


Figure 52: Using the Crane to Lift the Radome

**WARNING**

Be careful when lifting the heavy object. Incorrect handling of the heavy object may lead to injury to the installers and/or cause significant damage to the unit.

- After placing the antenna on the ship's pedestal, tighten the bolts to the bolt holes of the antenna frames to attach the antenna to the pedestal. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened securely.

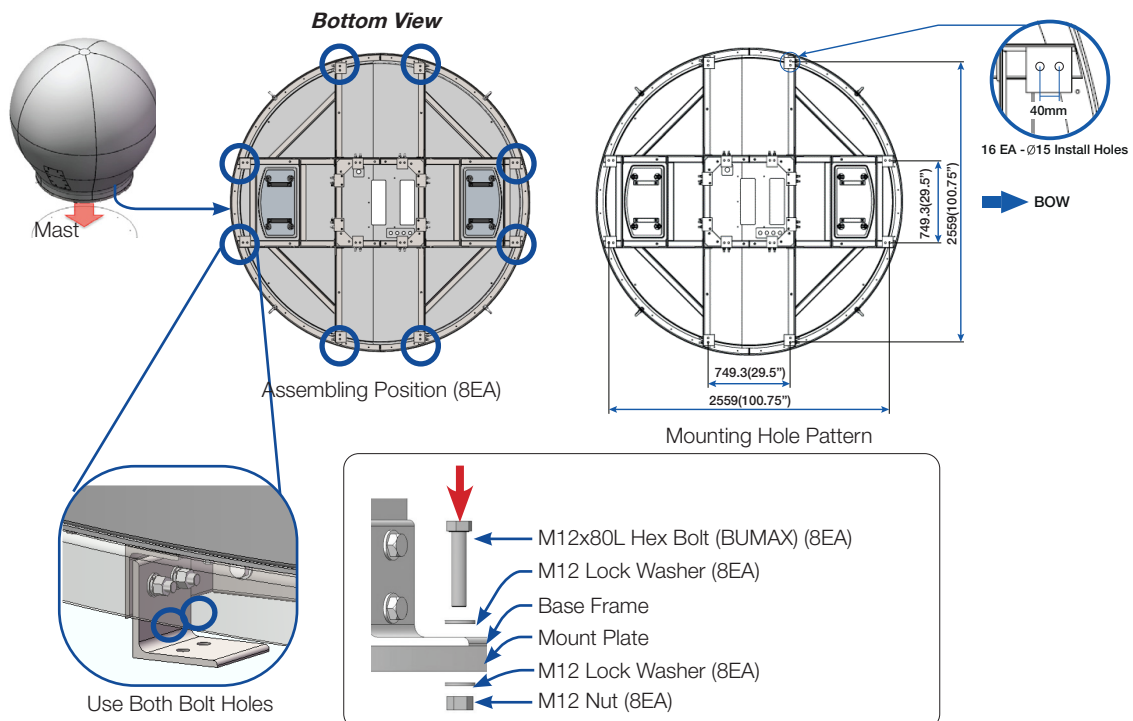


Figure 53: Securing Antenna to Mast

**WARNING**

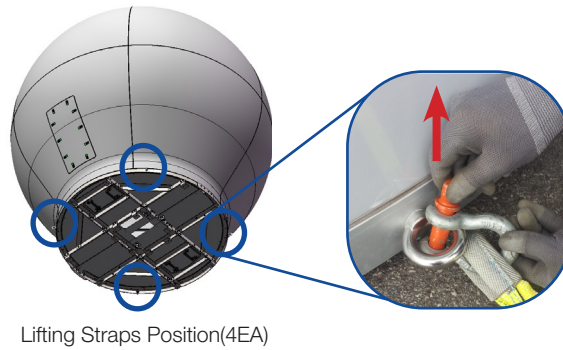
When placing the antenna on the ship's pedestal, move it slowly so the antenna frame does not get damaged.



NOTE

Refer to “14.1 Appendix A. Tightening Torque Specification” on page 154 for the bolt tightening torque.

4. Remove the lifting straps after fixing the antenna frame to the ship’s mast as shown below. The disconnecting procedures for the lifting straps are performed in reverse order of connecting.



Lifting Straps Position(4EA)

Figure 54: Removing the Lifting Straps

Chapter 7. Installing Below Deck Unit

7.1 Selection of ACU Installation Site

The ACU shall be installed below the deck in a dry, cool and ventilated. The front panel of the ACU should be easily accessible by users.



WARNING

This product is installed where the circuit breaker is connected to the power source.

7.2 ACU Dimensions

Confirm the dimensions of the ACU before installing it.

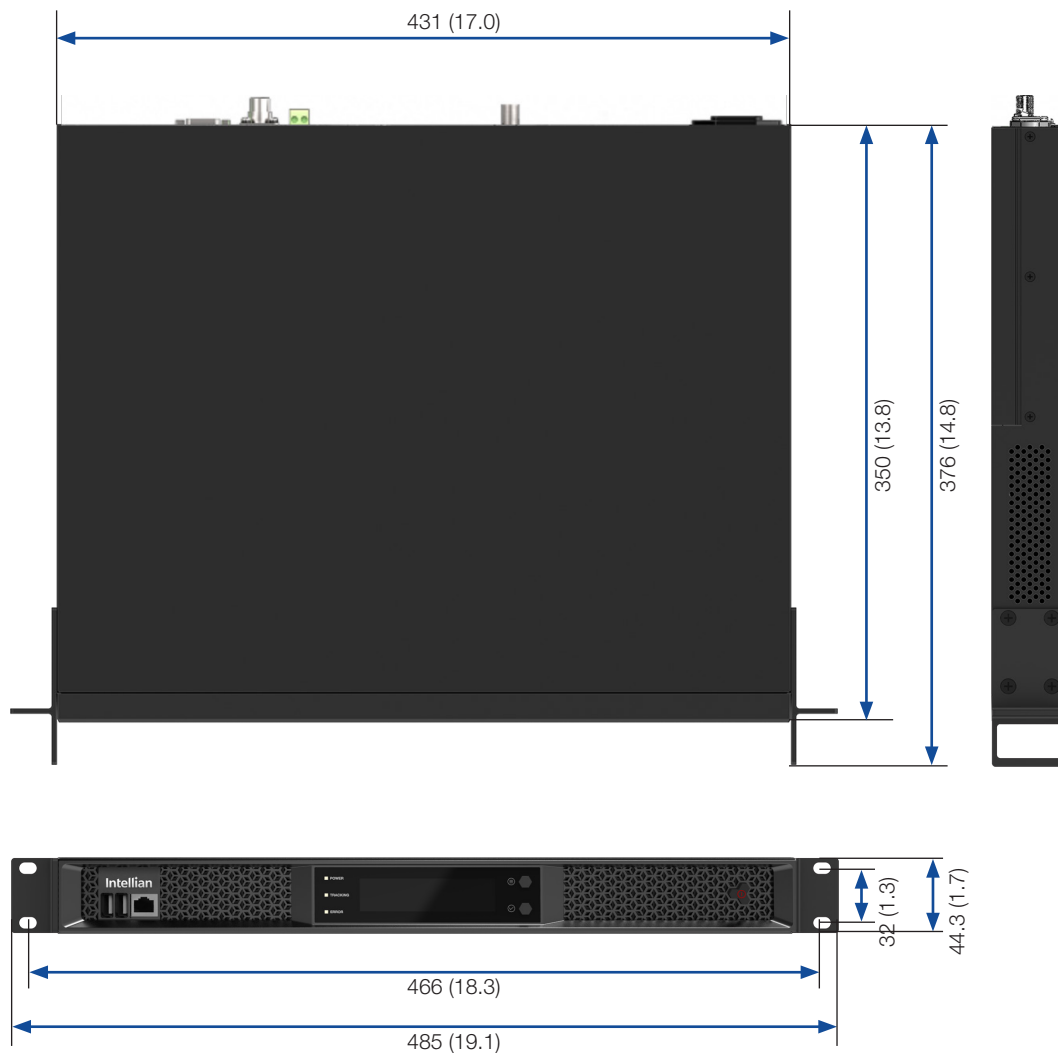


Figure 55: ACU Dimensions

7.3 Mounting ACU

Mounting ACU in a 19" Rack

The ACU can be installed in a 19" rack using the two rack mount brackets 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 56: 19" Rack Mount ACU



WARNING

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

7.4 Selection of Fiber Link Module Installation Site

The Fiber Link Module shall be installed below the deck in a dry, cool and ventilated. The front panel of the Fiber Link Module should be easily accessible to users.



WARNING

This product is installed where the circuit breaker is connected to the power source.

7.5 Fiber Link Module Dimensions

Confirm the dimensions of the Fiber Link Module before installing it.

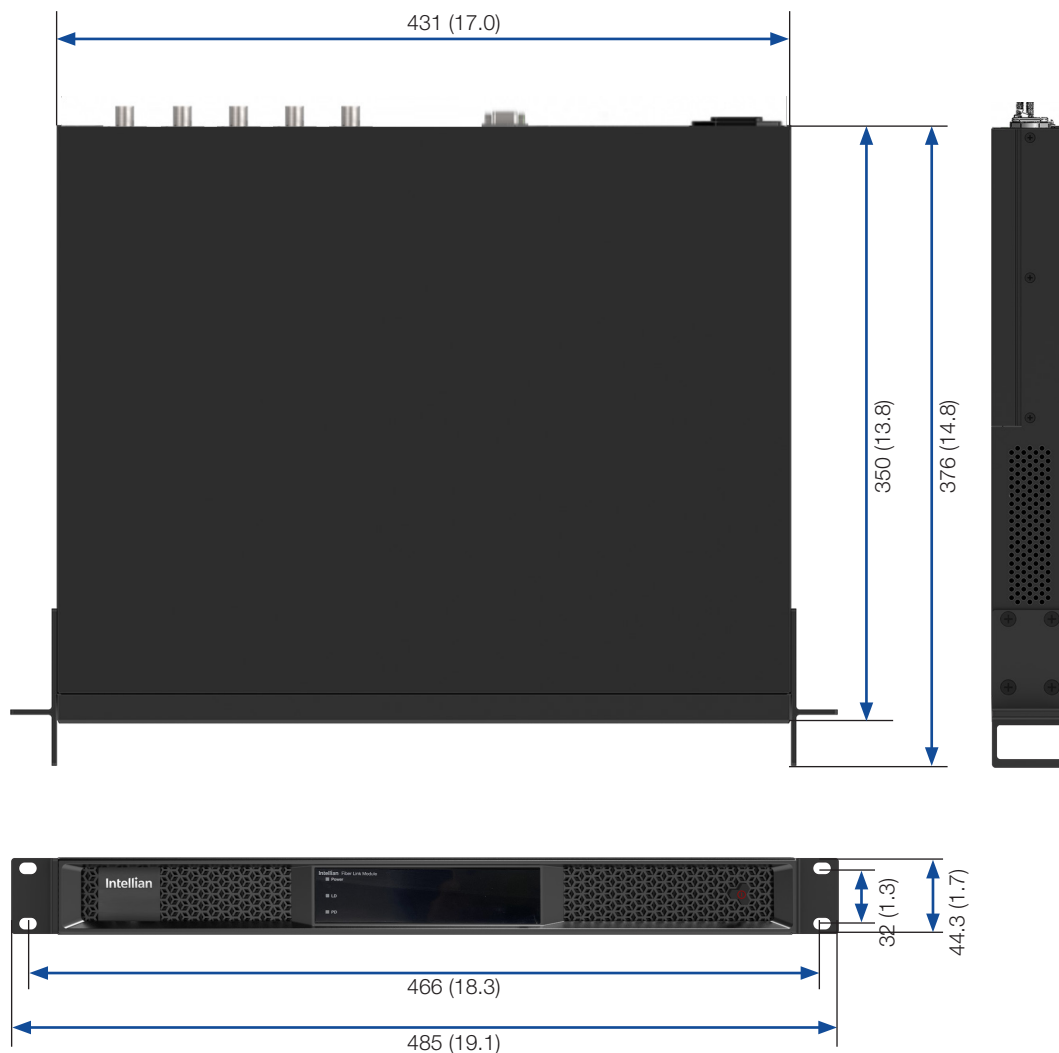


Figure 57: Fiber Link Module Dimensions

7.6 Mounting Fiber Link Module

Mounting Fiber Link Module in a 19" Rack

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



Figure 58: 19" Rack Mount ACU



WARNING

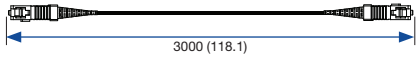
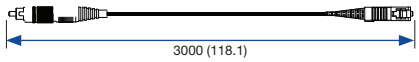
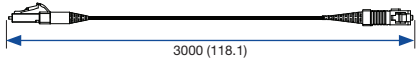
Ensure that the cables connected to the Fiber Link Module are long enough to prevent damage when the Fiber Link Module is pulled out from the rack.

7.7 Fiber Optic Module Testing

Three different fiber optic cables are supplied to connect with the ship IFL patch panel.



Fiber Port of ADU and BDU of Fiber Links
(SC-APC Connector)

Cable Type	Dimensions
SC-APC to SC-APC	 3000 (118.1)
FC-APC to SC-APC	 3000 (118.1)
LC-APC to SC-APC	 3000 (118.1)



CAUTION

- Install the Fiber Optic Cables straight. Do not bend them severely.
- Remove dusts on the connector heads and entries.
- Do not cut or modify the cables.

7.8 Checking LED Status

Power of the Antenna system, and after all modules are connected, check the LED status of the modules.

7.8.1 Fiber Link Unit

The 3 LED lights on the module should be all green in color.

- Power: When it is on, it indicates the power is being supplied properly.
- LD: When it is on, it indicates the Tx status is normal.
- PD: When it is on, it indicates the Rx status is normal.

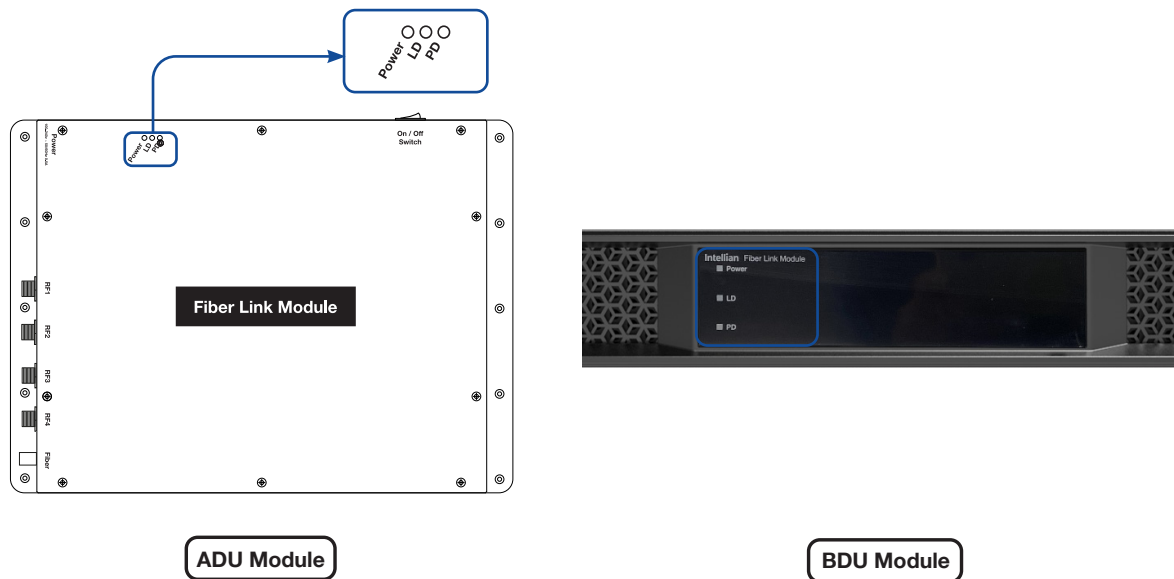


Figure 59: Fiber Link Unit LED Status Indicators

7.9 ACU Cable Connection

7.9.1 ACU Back Panel Connectors

The following figure shows the ACU back panel.

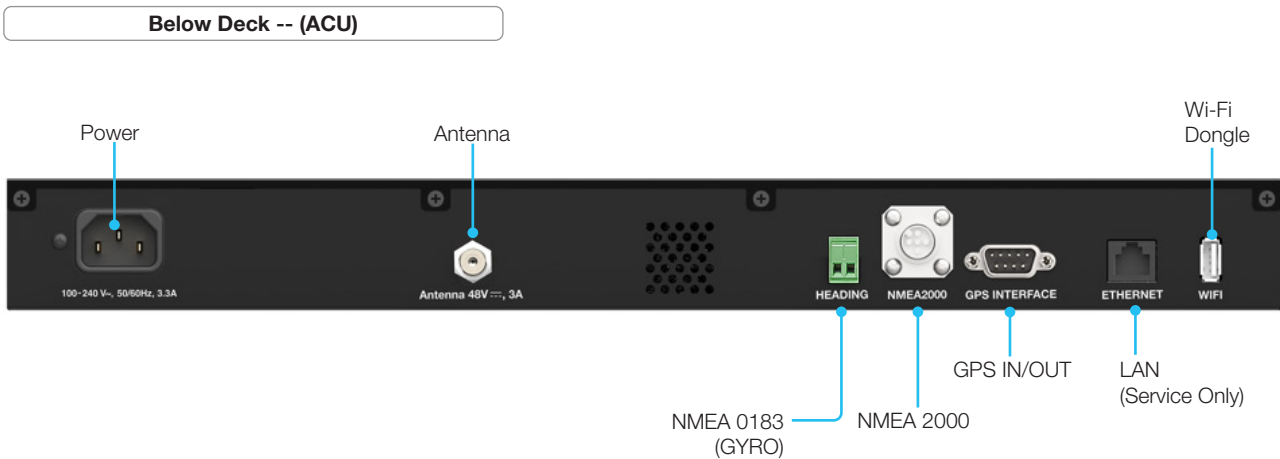
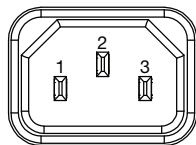


Figure 60: ACU Back Panel Connectors

7.9.2 ACU Connector Pinout Guide

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

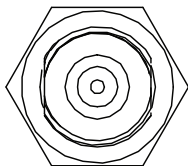
Power Connector



IEC 320 C14 Plug Male

Pin	Signal
1	LIVE
2	GND
3	NEUTRAL

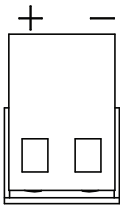
Antenna Connector



RF F Type Female

Conductor	Function
Inner	DATA
Outer	GND

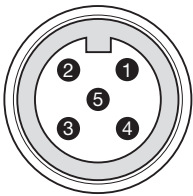
HEADING (NMEA0183) Connector



2-Pin Terminal Block

Conductor	Function
+	HEADING IN
-	HEADING GND

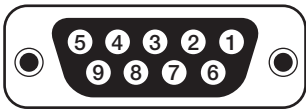
NMEA 2000 Input



Micro-C 5-Pin Male

Pin	Signal
1	Shield
2	NETS, (power supply positive, +V)
3	NETC, (power supply common, -V)
4	NET-H (CAN-H)
5	NET-L (CAN-L)

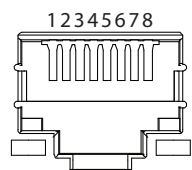
GPS Connector



D-Sub 9-Pin Female

Pin	Signal
1	GND
2	GPS OUTA
3	N/C
4	N/C
5	GPS_IN
6	GPS_OUTB
7	N/C
8	N/C
9	GPS_GND

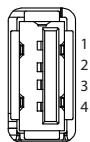
ETHERNET (LAN) Connector



RJ-45 Female

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

Wi-Fi Dongle USB Connector



USB A Female

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

7.9.3 Fiber Link Back Panel Connectors

The following figure shows the Fiber Link Module back panel.

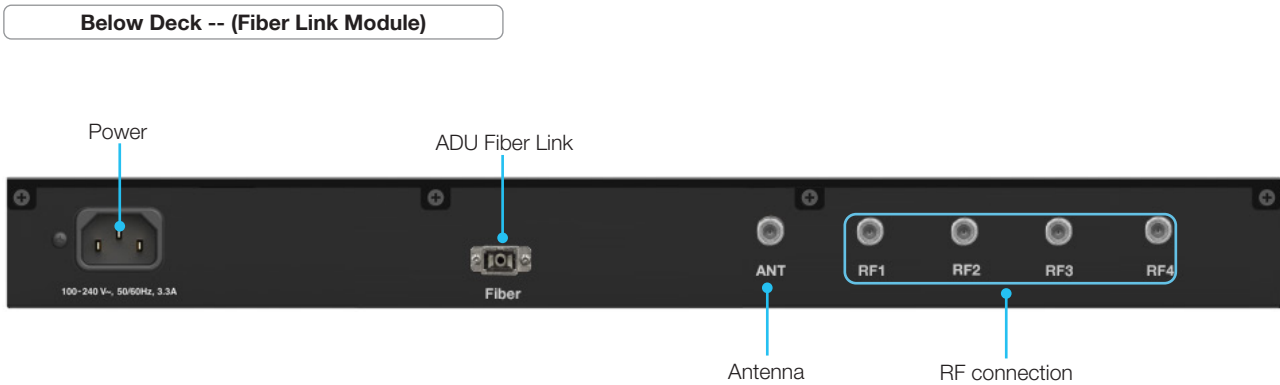
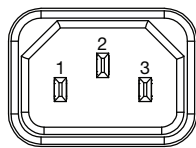


Figure 61: Fiber Link Module Back Panel Connectors

7.9.4 Fiber Link Module Connector Pinout Guide

Reference the following connector pinout information for the connection ports of the Fiber Link Module.

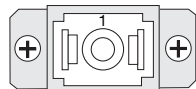
Power Connector



IEC 320 C14 Plug Male

Pin	Signal
1	LIVE
2	GND
3	NEUTRAL

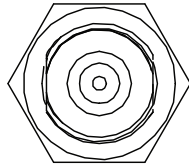
Fiber Link Connector



SC-APC Connector

Pin	Signal
1	Fiber

Antenna / RF 1~4 Connector



RF F Type Female

Conductor	Function
Inner	DATA
Outer	GND

7.9.5 Connecting Power to Fiber Link Module

Connect the power cord from the power supply to the power connector (100-240 VAC) of Fiber Link Module.

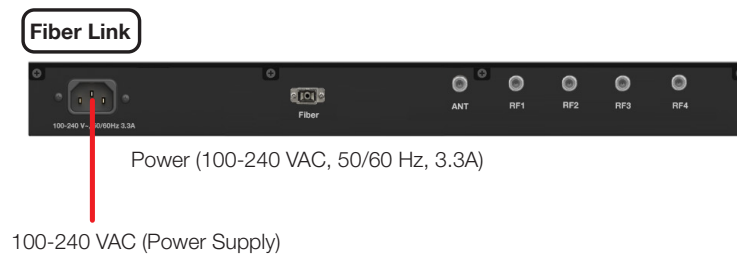


Figure 62: Connecting Power to Fiber Link Module

7.9.6 Connecting Power to ACU

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

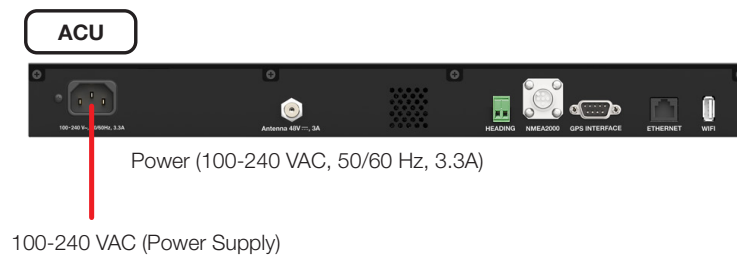


Figure 63: Connecting Power to ACU

7.9.7 Connecting ACU to Ship's 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 different output standard, use a compass converter to supply the required NMEA input. The NMEA 2000 gyrocompass needs to be purchased separately. Refer to **“7.9.2 ACU Connector Pinout Guide” on page 79** for the pin configuration.

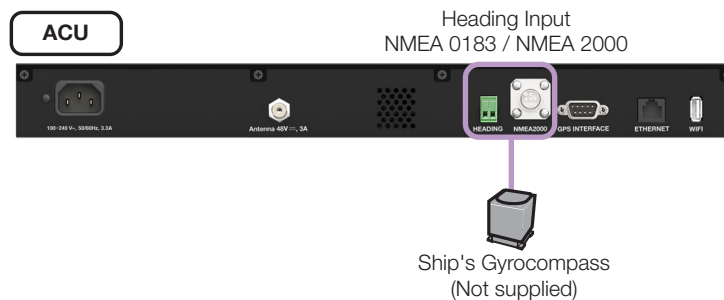
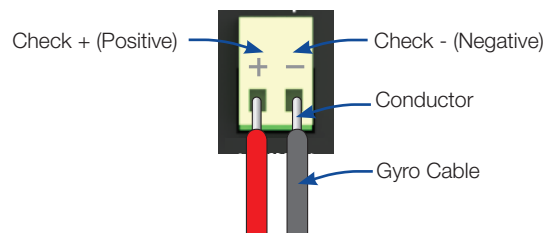


Figure 64: ACU to Ship's Gyrocompass Cable Connection

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. 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.

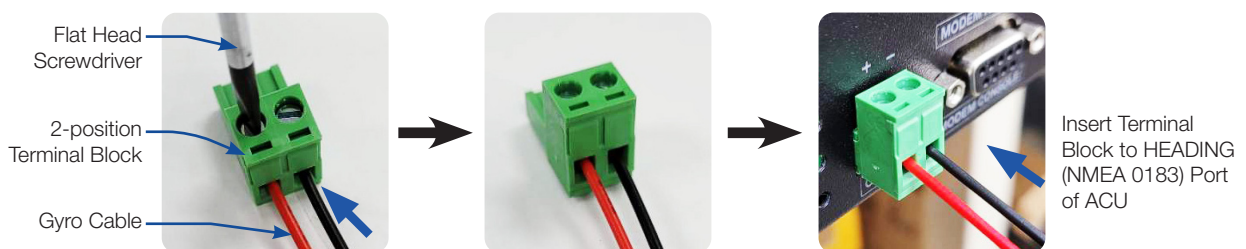


Figure 65: NMEA 0183 Gyrocompass Cable Connection

7.9.8 Connecting RF Cables (RF1-4) to the Multi-Switch (Customer Supplied)

The Intellian t360CK is capable of receiving multiband and multi-polarization satellite TV service around the globe using the Intellian WorldView™ LNB module.

1. Connect the antenna cable from the Antenna connector in the Fiber Link Module to the Antenna connector on the rear of the ACU.
2. Connect RF1 cable to the VL (13 V+0 KHz) port of the multi-switch.
3. Connect RF2 cable to the HL (18 V+0 KHz) port of the multi-switch.
4. Connect RF3 cable to the VH (13 V+22 KHz) port of the multi-switch.
5. Connect RF4 cable to the HH (18 V+22 KHz) port of the multi-switch.
6. Press the POWER button on the front of the ACU and Fiber Link Module to power on the antenna.

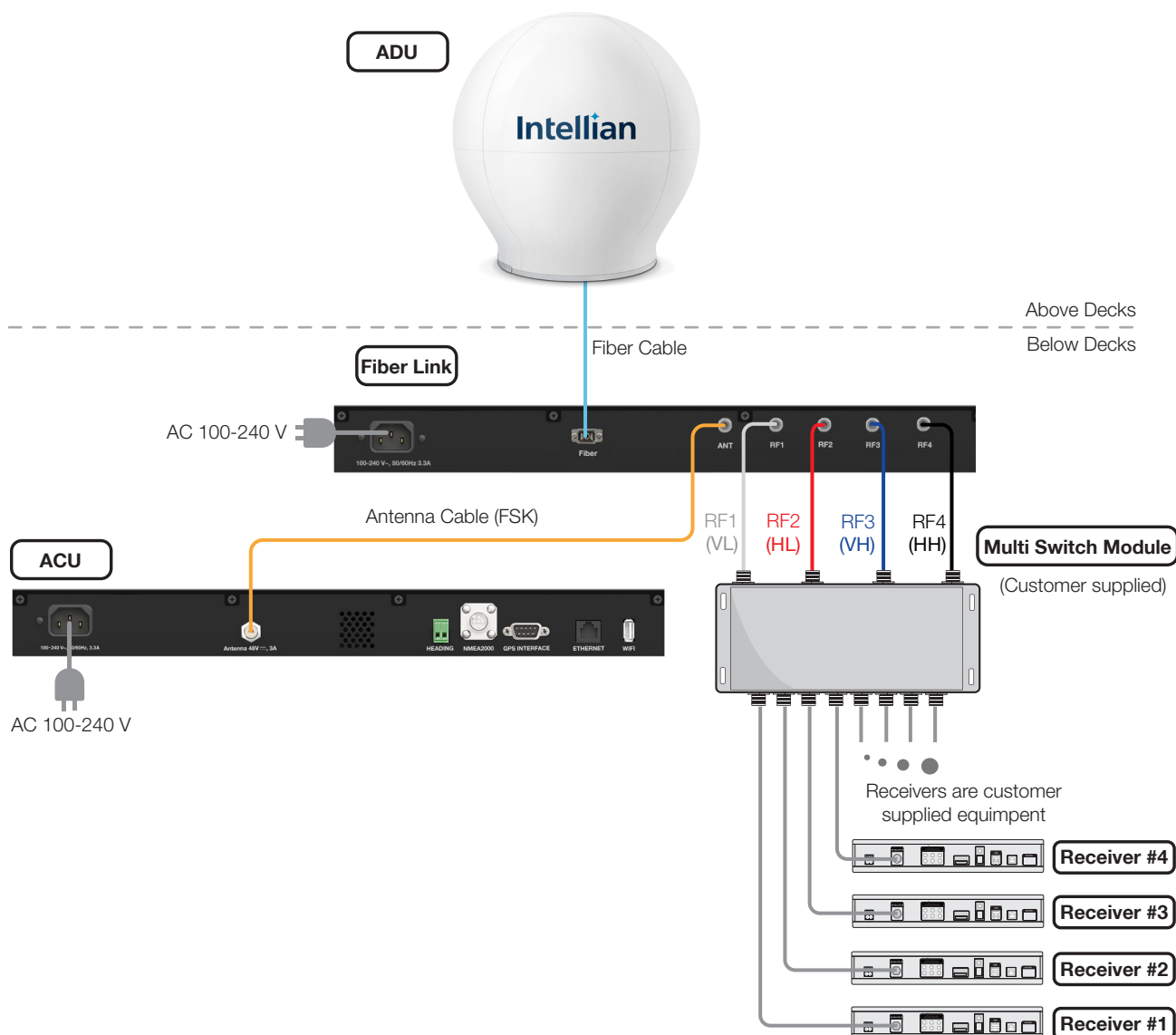


Figure 66: Multi-Switch Connection

**NOTE**

The Intellian t360CK system requires a multi-switch.

Make sure of the following before installing system cables.

1. When you select a target satellite that is configured in single LNB mode (such as 10750 or 11250), the RF1 (VL) and RF2 (HL) have signals from the Worldview LNB module and each signal will be distributed from the RF1 (VL) port to the RF3 port and from the RF2 (HL) port to the RF4 port.

LNB Mode	RF1	RF2	RF3	RF4
Universal LNB Mode	13 V + 0 KHz	18 V + 0 KHz	13 V + 22 KHz	18 V + 22 KHz
	VL (Vertical Low)	HL (Horizontal Low)	VH (Vertical High)	HH (Horizontal High)
Single LNB Mode	13 V + 0 KHz	18 V + 0 KHz	*13 V + 0 KHz	**18 V + 0 KHz
	VL (Vertical Low)	HL (Horizontal Low)	*VL (Vertical Low)	**HL (Horizontal Low)

* :Distributed from the RF1 (VL) in the Single LNB Mode.

** :Distributed from the RF2 (HL) in the Single LNB Mode.

2. The system must have the four inputs x multi outputs multi-switch unit. Do Not connect receivers to the RF1~RF4 cables directly.

7.10 System Configurations

The required components must be connected for the satellite communication system, to operate must properly, as shown in the figures below. A separate ship's gyrocompass connection is necessary.

7.10.1 Single Antenna System Configuration

The basic system consists of an Antenna, a Fiber Link Module and an ACU. Connect the cables as shown in the configuration below.

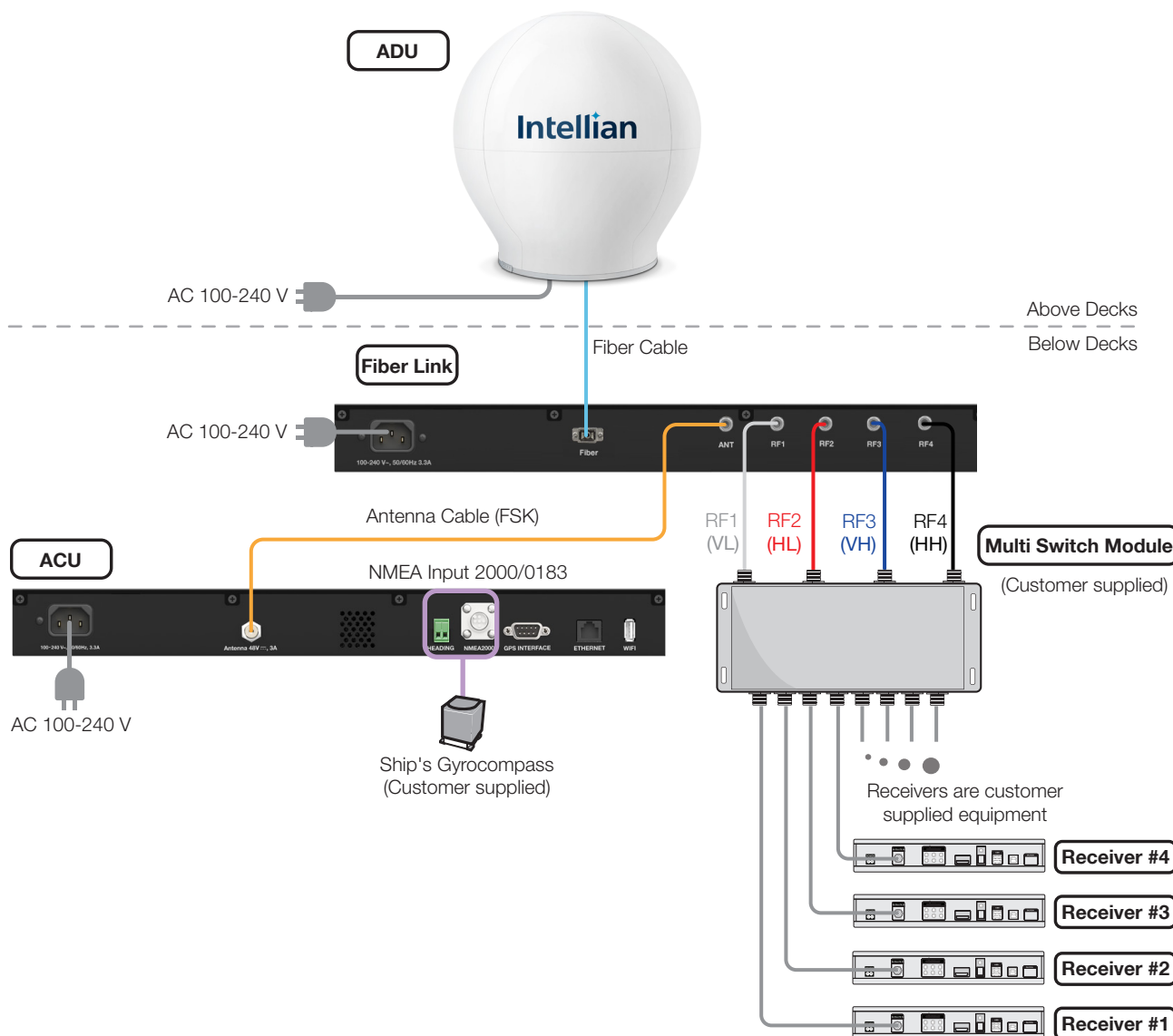


Figure 67: Single Antenna System Configuration (Basic Antenna System)



NOTE

The multi-switch unit (customer supplied) is essential equipment for the system connection.

7.10.2 Dual Antenna System Configuration (Optional)

The dual system configuration comprises two TVRO antennas, two fiber link modules, two ACUs, and one Mediator. The TVRO Mediator, which can control and manage two TVRO antenna systems simultaneously, is sold separately. Cables connections are shown below.

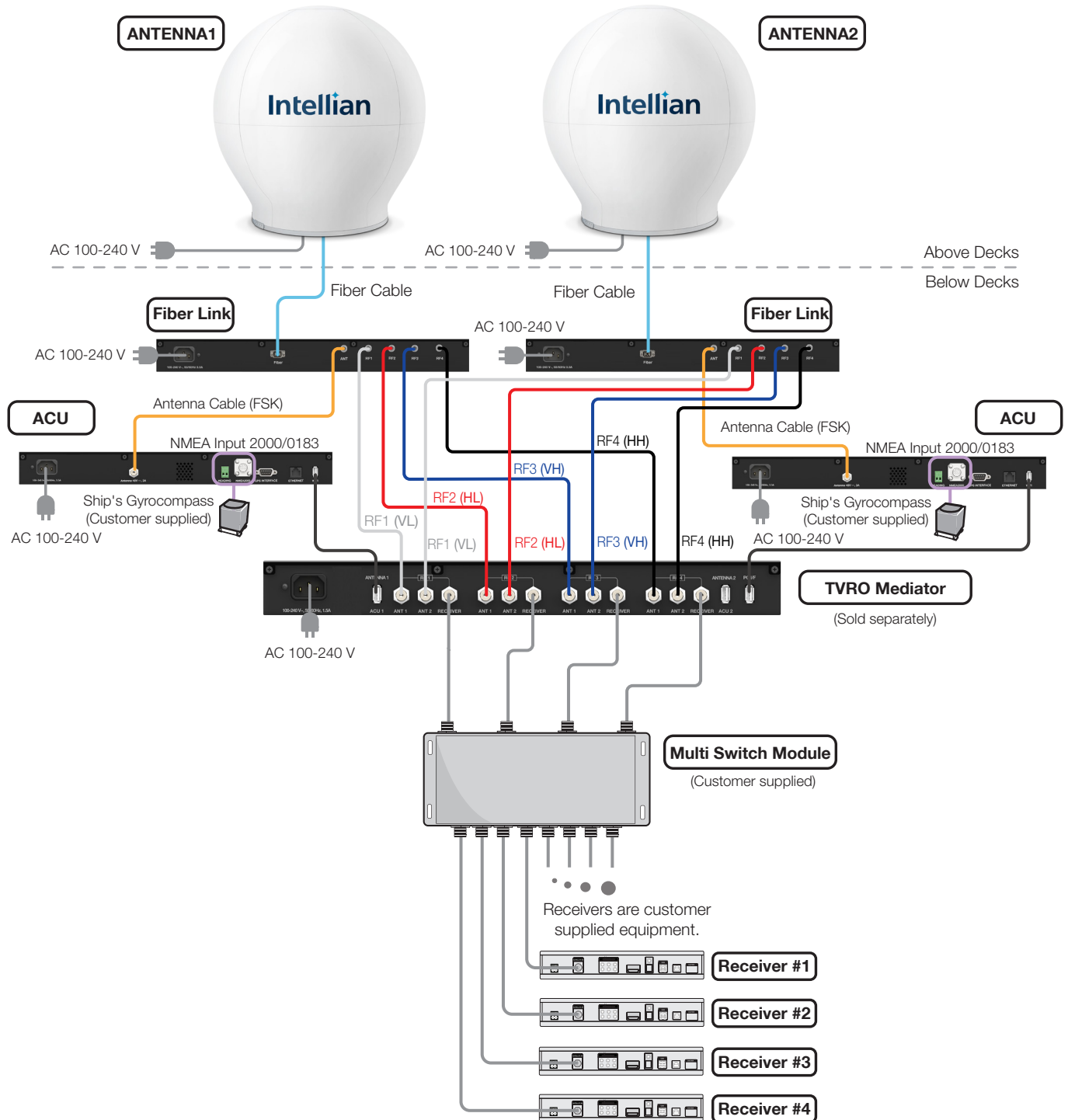


Figure 68: Dual Antenna System with Multi-Switch Connection Configuration



NOTE

The New Dual TVRO Mediator is sold separately.

7.11 System Band Selection Configurations

The required components must be connected for the satellite communication system to operate properly, as shown in the figures below. A separate purchase of a ship's gyrocompass connection is necessary.

7.11.1 Dual C-band Linear / Circular Configuration

For C-band linear and circular polarized satellite signal reception, a multi-switch is required to be connected between the antenna and C-band receivers. This setup enables the reception of both C-band linear and circular signal connections.

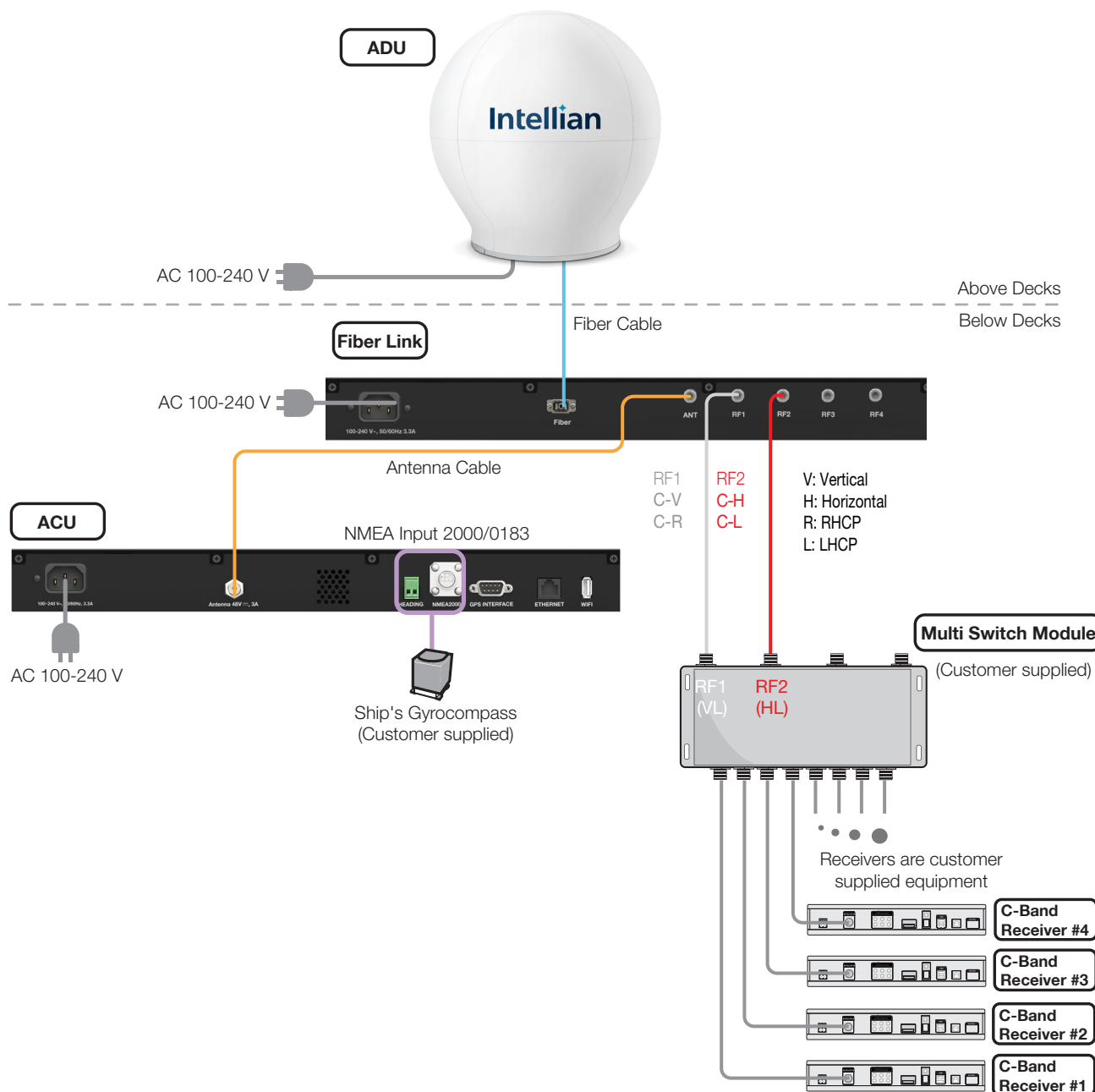


Figure 69: C-Band Linear and Circular with Multi-Switch Connection Configuration

7.11.2 Ku-band Universal Quad Configuration

For simultaneous Ku-band Linear Polarized Low & High satellite signal receptions, a multiswitch is required to be connected between the antenna and Ku-band receivers.

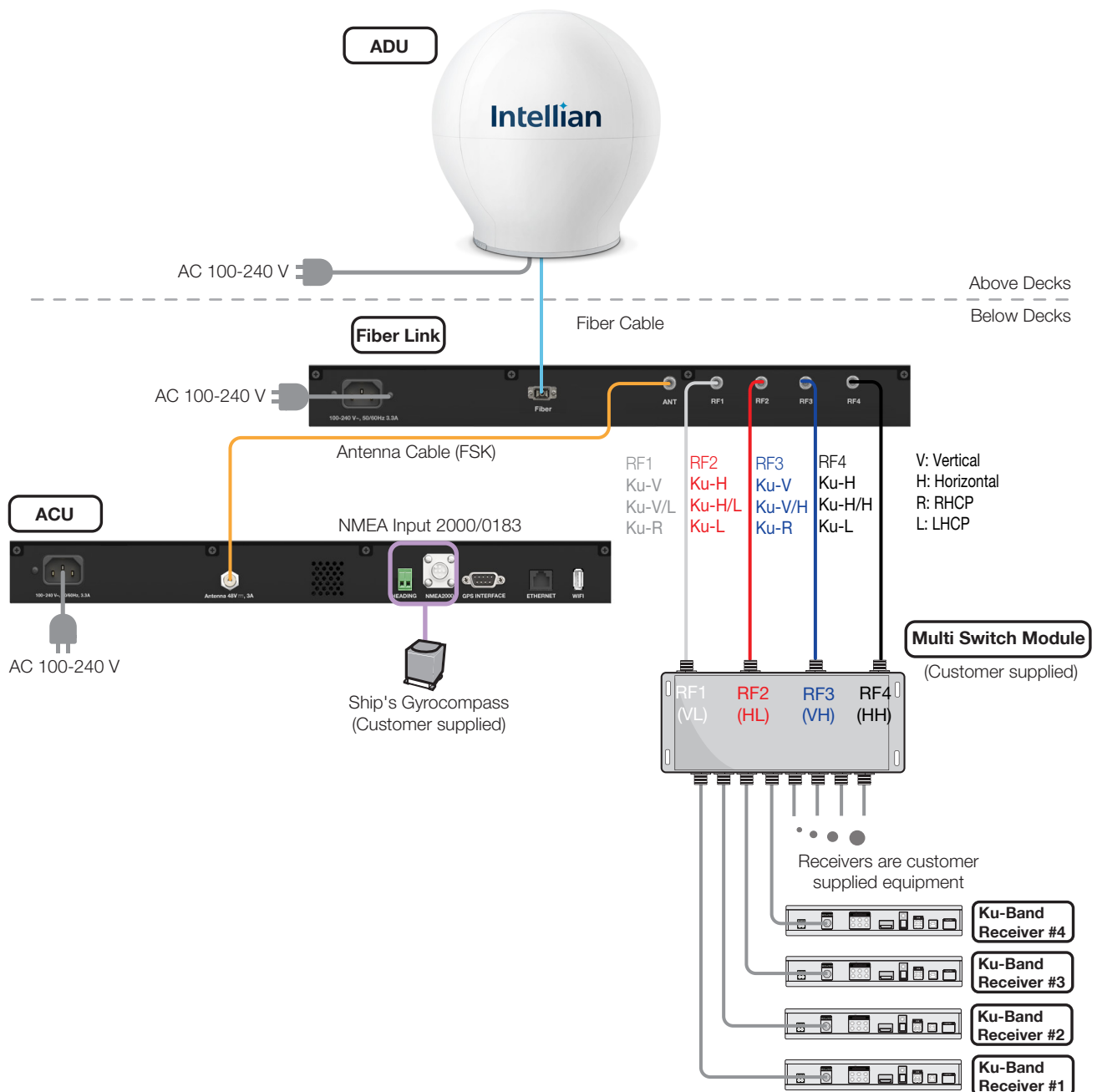


Figure 70: Ku-Band with Multi-Switch Connection Configuration

7.11.3 Dual C-band & Ku-band Configuration

For C-band and Ku-band service reception with any programmed LO satellite signal, a multi switch must be connected between the antenna and the C-band and Ku-band receivers, as displayed below.:

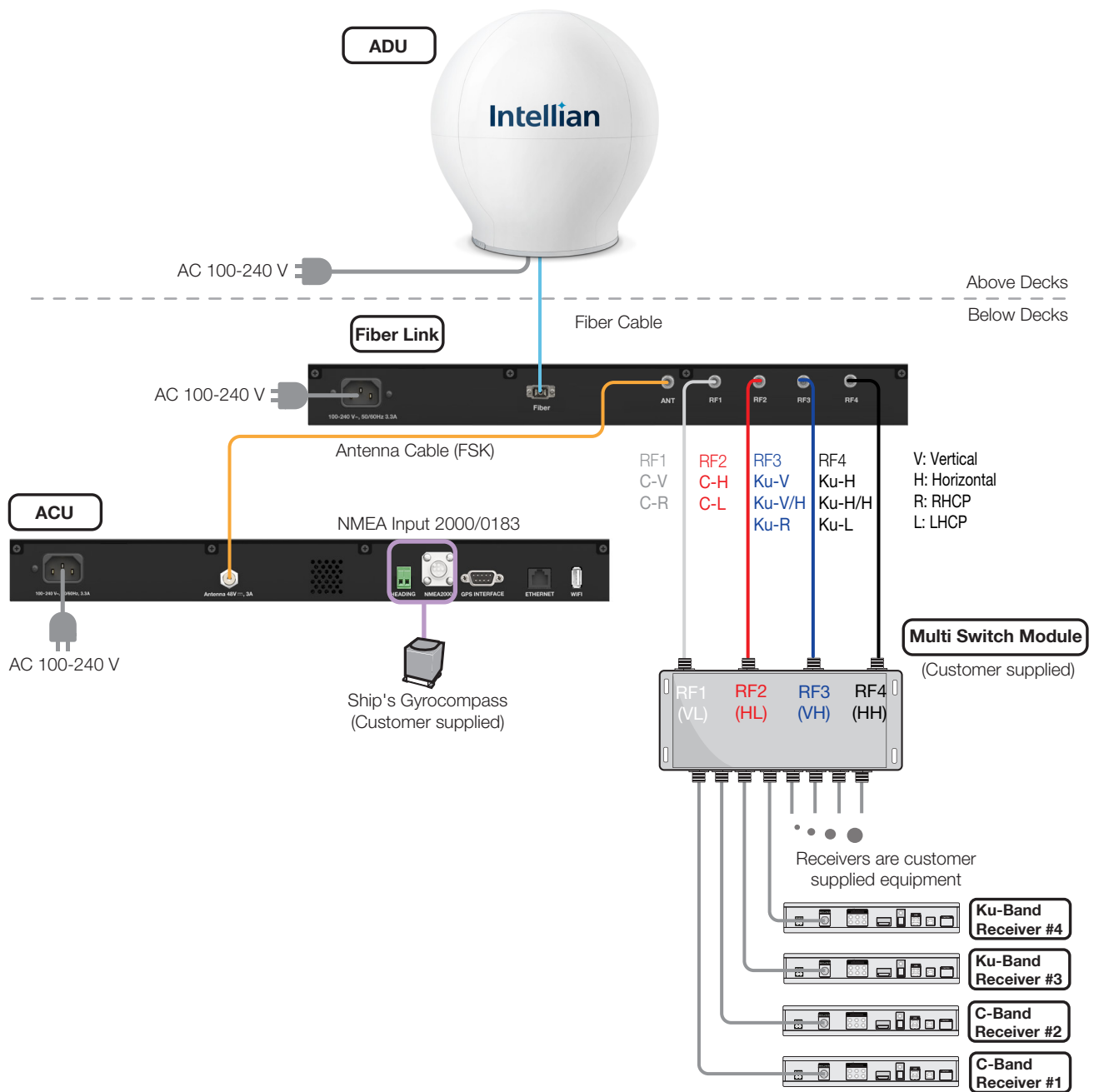


Figure 71: C-Band and Ku-Band with Multi-Switch Connection Configuration

7.11.4 Connecting ACU to ADU

1. Connect a Fiber Optic Cable (SC-APC to SC-APC) Fiber port of the Fiber Link Module to the Fiber port of the ADU Fiber Link Module (antenna).
2. Connect an antenna cable (F to F) (customer supplied) from the ANTENNA (F) port of the ACU to the ANT RF (F) port of the Fiber Link Module.

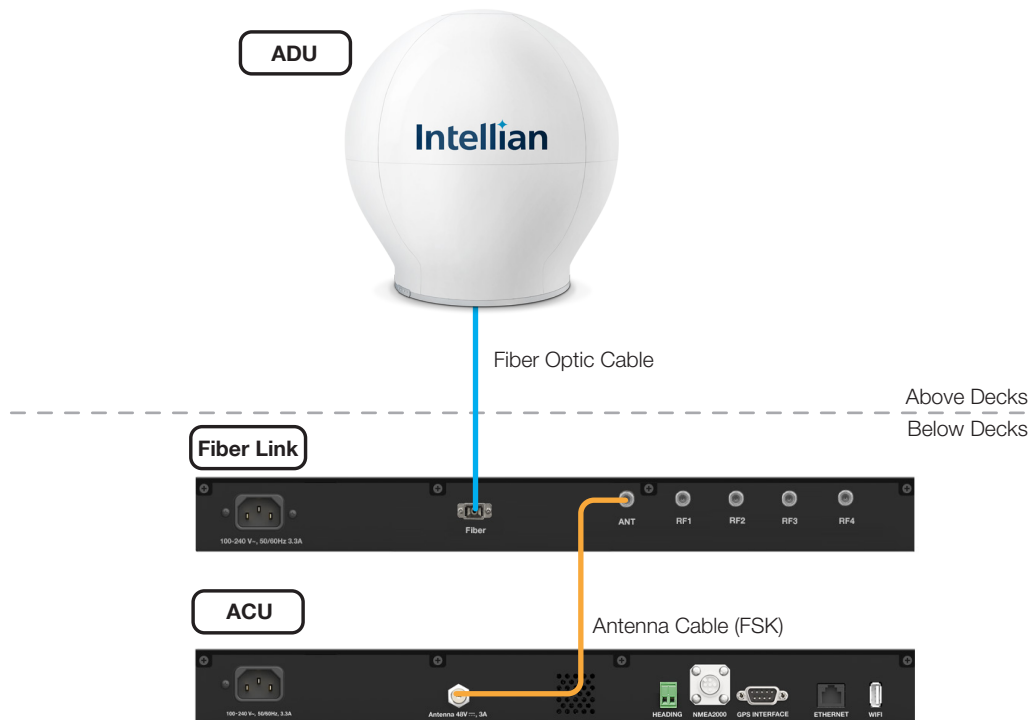


Figure 72: BDU (Fiber Link Module and ACU) to Cable Connection

7.12 ACU to PC Communication Setup

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

7.12.1 TCP/IP Connection

Connecting through Front Panel Management Port

When connected to the front panel port, DHCP automatically configures the network with no additional PC IP configuration required.

1. Connect an Ethernet cable from the Management LAN port on the front of the ACU to the 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 Intellian *Aptus NTV* page.
 - IP Address: 192.168.2.1 (Default)



Figure 73: Front Panel Management LAN Port Connection

7.12.2 USB Connection

Using Right Side USB Port on ACU Front Panel

Connect a USB flash drive to the right side USB port on the front panel of ACU to download logs, backup/restore antenna settings, and upgrade firmware.



NOTE

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



Figure 74: Front Panel USB Port Connection

7.12.3 Wi-Fi Connection

Connecting through Wi-Fi Dongle

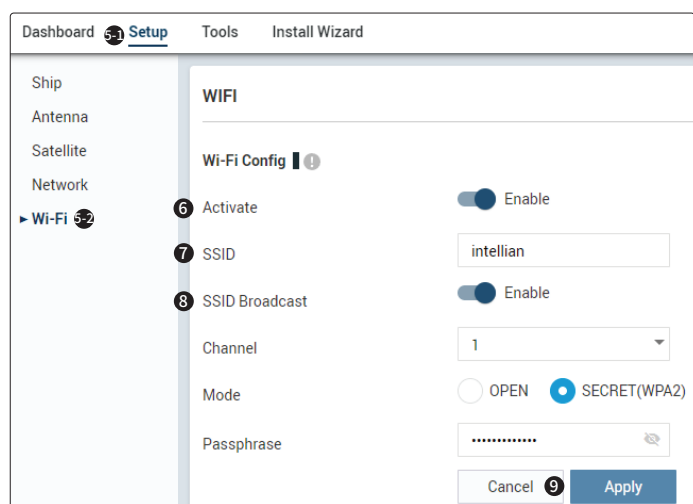
Intellian provides the Wi-Fi Dongle for connectivity to Aptus NTV web services. When on the vessel, you can connect a PC to the ACU via Wi-Fi for easy management and control.

1. To configure the access for the first time, connect an Ethernet cable from the Management LAN port on the front panel of the ACU to a LAN port of a PC. The network connection is established automatically.
2. Find the Wi-Fi Dongle in the ACU box, insert the Wi-Fi Dongle into the USB port on the back panel of ACU.



Figure 75: Rear Panel Wi-Fi Dongle Connection

3. Open a web browser, and then enter the following IP address to access Intellian **Aptus NTV** Login page.
 - **IP Address: 192.168.2.1 (Default)**
4. Log in to **Aptus NTV** 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** 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. Then perform “10.7.5 Wi-Fi” on page 136.
10. After a reboot, you can connect to the Wi-Fi with any network enabled device.



Chapter 8. Installation Wizard

8.1 Turning On System

Make sure the antenna has a clear view of the sky. Press the **POWER** button on the front panel of the Below Deck Unit/ACU, and then wait a few minutes for system to startup. Once the antenna finds the satellite, the **TRACKING** indicator light on the ACU display will turn green.

8.2 Accessing Aptus NTV

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

1. Connect an Ethernet cable from the Management LAN port on the front of the ACU to the 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 **Aptus NTV** Login page.
 - **IP Address: 192.168.2.1 (Default)**
3. Log in to **Aptus NTV** by entering the User ID and Password.
 - **User ID: intellian (Default)**
 - **Password: intellian1@1 (Default)**



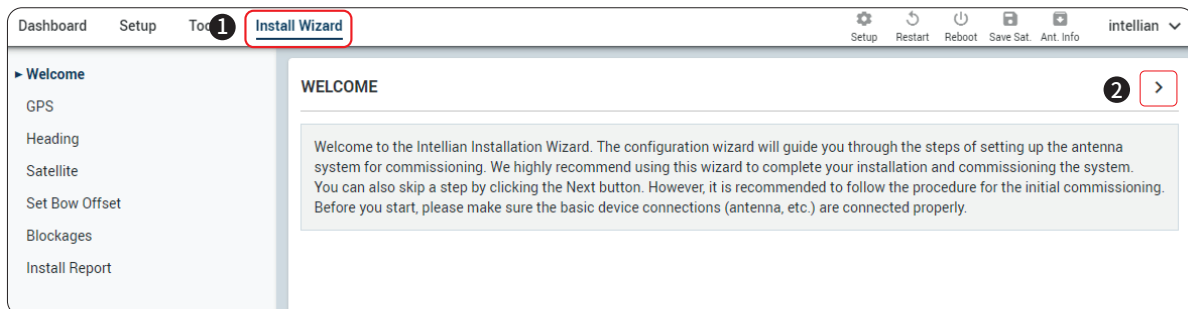
Figure 76: Front Panel Management LAN Port Connection

8.3 Starting Install Wizard

The Install Wizard will guide you by going through the setup steps 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 antenna and gyrocompass, cables are all connected to the ACU properly. After accessing the **Aptus NTV** main page, go to the **Install Wizard** on the main menu then follow the steps.

✓ Welcome Page

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

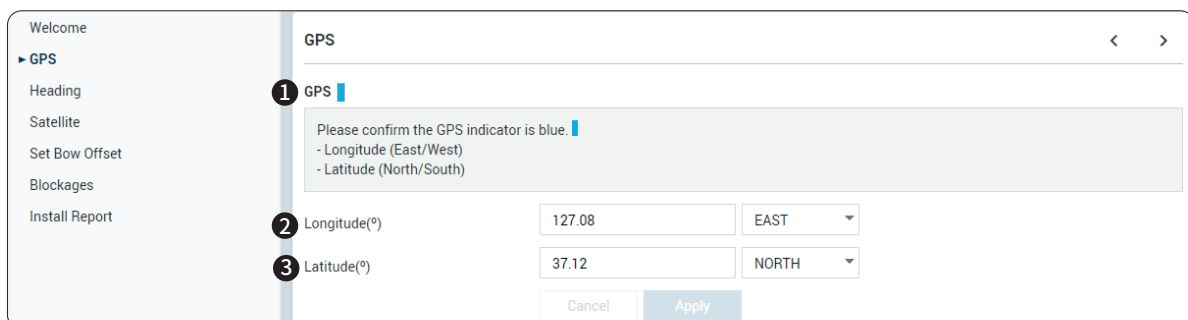


✓ Step 1: GPS

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.
- Longitude (°): Set Longitude information (East / West).
- Latitude (°): Set Latitude information (North / South).

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



✓ Step 2: Heading

Set the Heading Device to NMEA.

- **Heading Device:** The colored indicator next to the title shows the heading device connection status.
 - Blue: Ship's heading device is connected.
 - Black: Ship's heading device is not connected.
- **Current Device:** Select NMEA from the drop-down list, and then click the Apply button to apply the Heading Device setting to the system. Other heading device options include None, NMEA2000 and Static.
- **Heading (°):** Displays the current heading angle from the ship's gyrocompass. To manually set the heading value, enter the value in the box, then click the Apply button. Note, however, that the value will be updated with the actual heading value immediately.

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

The screenshot shows the 'HEADING' configuration screen. On the left is a sidebar with navigation links: Welcome, GPS, > Heading (selected), Satellite, Set Bow Offset, Blockages, and Install Report. The main area is titled 'HEADING' and contains three numbered steps:

- 1 Heading Device**: Includes instructions to set the ship's heading device (NONE, NMEA, NMEA2000, Static) and ship's heading information. A note states: '- The baud rate(4800/9600/19200/38400) must be set if NMEA is selected.'
- 2 Current Device**: Features a dropdown menu currently set to 'NMEA'. A red box highlights the dropdown options: None, NMEA, NMEA2000, and Static. Below this is a 'Baud Rate' dropdown set to '4800'.
- 3 Heading(°)**: Features a text input field set to '0'.

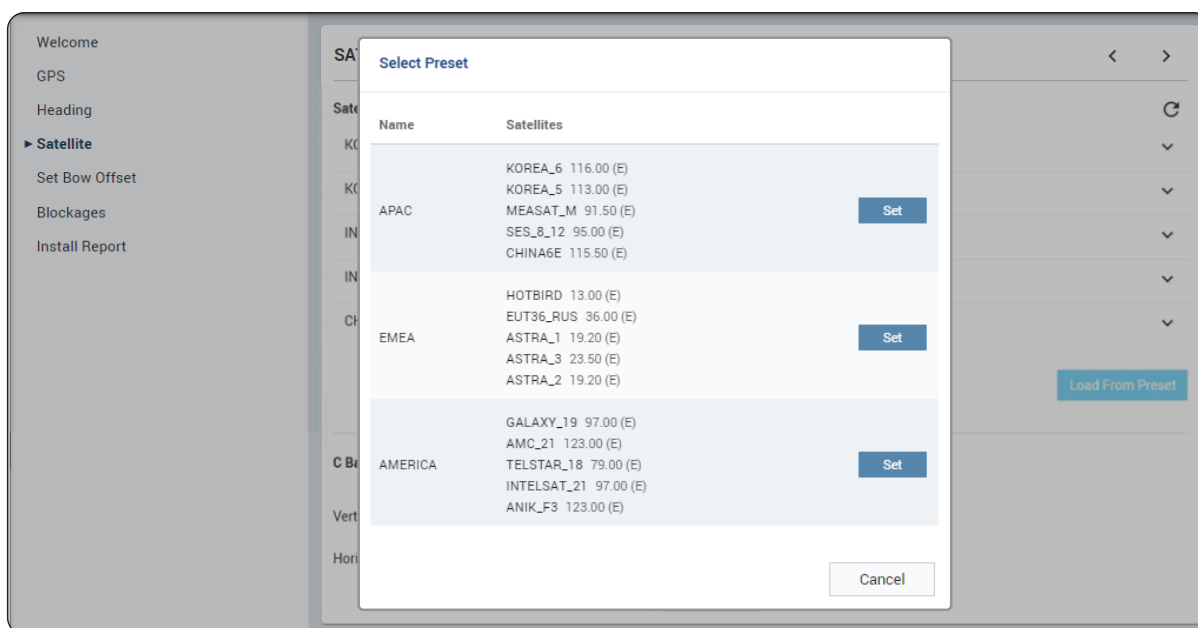
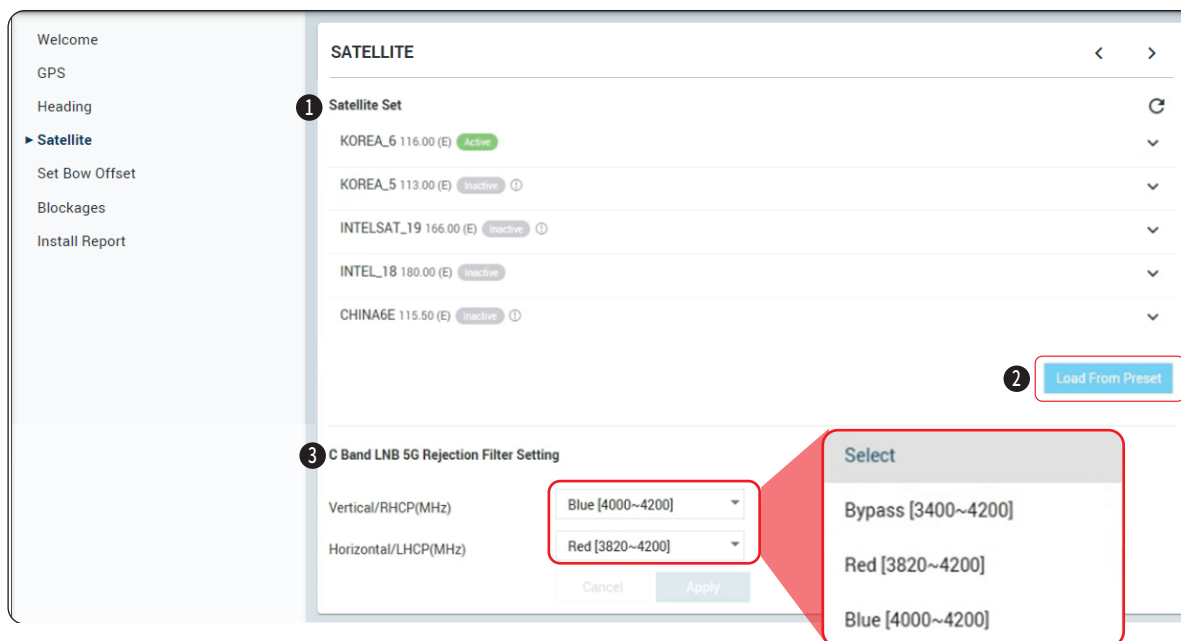
At the bottom of the main area are 'Cancel' and 'Apply' buttons. The 'Apply' button is highlighted with a blue background.

✓ Step 3: Satellite Preset

Display, track, and edit the satellites in the satellite set. For more information about using the Satellite Preset, refer to **“10.8.4 Satellite Preset” on page 143**.

- **Satellite Set:** Displays the five satellites in the current satellite set. The tracked satellite has a green Active icon. Track another satellite in the set by clicking its gray Inactive icon.
- **Load from Preset:** Displays the Select From Library window with all the satellite sets from the preset library.
- **Set:** In the Select From Library window, click the Set button for the satellite set you want loaded into the Satellite Set window.
- **C Band LNB 5G Rejection Filter Setting:** If the 5G filter is installed, you can set the filter setting.

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



✓ Step 4: Set Bow Offset

Set the bow offset by tracking a satellite with a strong signal. First make sure you have selected a satellite with a strong signal on the previous step, Satellite Set.

- Search: Click the Start Searching button to detect the bow offset based on the location of the currently tracked satellite.
- Set Bow Offset: Sets the Bow Offset automatically when antenna is tracking a satellite. When the Current Bow Offset displays and the Lock icon turns green, the bow offset is set.

First, select the satellite from the library and update the satellite information. Then, click the Start Searching button. Make sure the Lock icon turns green, and then click the Save satellite button.

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

The screenshot shows the 'SET BOW OFFSET' wizard interface. On the left is a sidebar with navigation links: Welcome, GPS, Heading, Satellite, **Set Bow Offset** (selected), Blockages, and Install Report. The main content area is titled '1 SET BOW OFFSET' and includes a 'Search' section with instructions to choose a satellite and click 'Start Searching'. Below this is a '2 Set Bow Offset' section with instructions to wait for tracking, a 'Current Bow Offset' of 0°, a 'Lock' status with an 'Unlock' button, and a 'Save Satellite' button. Navigation arrows are visible at the top right of the main content area.

✓ Step 5: Blockage

Up to five antenna blockage zones can be set by entering the relative azimuth and elevation sectors where line of site will be blocked. Setting blockage zones ensures that the programs viewers watch won't be interrupted by anticipating blockages.

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 set elevation angle.

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

BLOCKAGES

1 Blockage

Blockage zone settings for Intellian Satellite TV Antenna can be programmed with relative azimuth and elevation sectors where blockage exists. The user can create up to five zones to name and define known regions where line of site will be blocked. It ensures that the program the viewer is watching will be clear and free from any interruptions if the antenna is not within a defined blockage zone.

Enable	Description	Az. Start ~ End (°)	El. (°)
☒	Blockage	100 ~ 250	90
☐		0 ~ 0	90
☐		0 ~ 0	90
☐		0 ~ 0	90
☐		0 ~ 0	90

Cancel Apply

✓ 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) 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.

1 INSTALL REPORT

Save Export View Last Report

Engineer Information

Name	
Company	
ID	
e-mail	

Antenna Info

Chapter 9. Operating ACU

9.1 Introduction

9.1.1 ACU Front Panel View

The following figure shows the front panel the ACU.

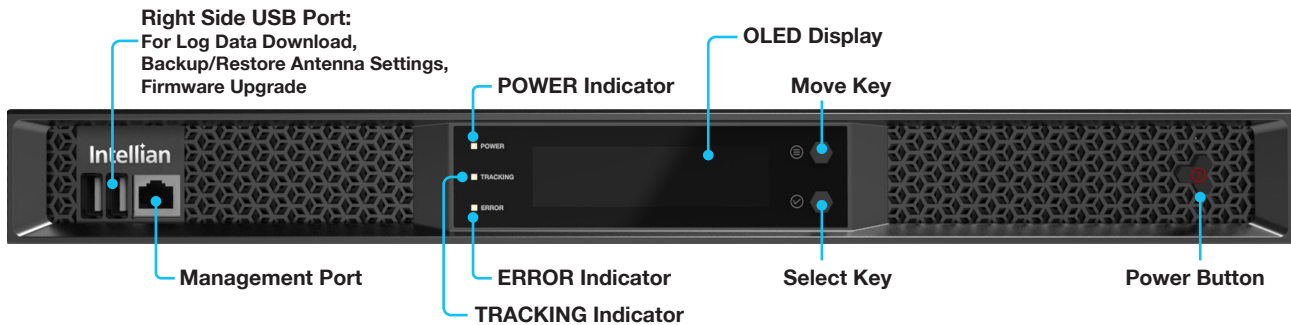


Figure 77: ACU Front Panel View

The following table describes the function of each touch key.

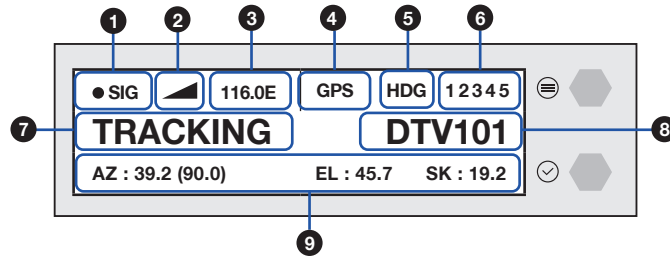
Touch key	Function
Power Button	Powers on/off the System (ACU and ADU).
Move Key	Moves to the desired screen/menu.
Select Key	Selects the desired screen/menu.

The following table describes status indicators on the face of ACU.

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

9.1.2 ACU Display Menu

The following figure shows the ACU display menu.

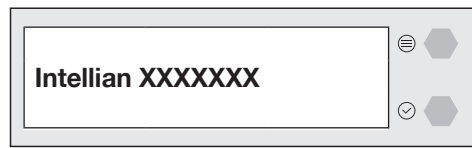


The following table shows the function of each touch key.

No.	Item	Description
①	Satellite Lock	Displays the satellite lock status.
②	Signal Level	Displays the antenna signal level.
③	Target Satellite	Displays the target satellite longitude (E: East, W: West).
④	GPS Lock Status	Displays the GPS lock status.
⑤	Heading Information	Displays heading information (e.g., gyrocompass).
⑥	Active Target Satellite	Displays the active target satellite from among the current satellite set.
⑦	Antenna Status	Displays the antenna status (TRACKING, SEARCH 1, SEARCH 3, BLOCKING).
⑧	Target Satellite Name	Displays the target satellite name.
⑨	Satellite Position	Displays the satellite position using AZ (azimuth), EL (elevation angle), and SK (skew).

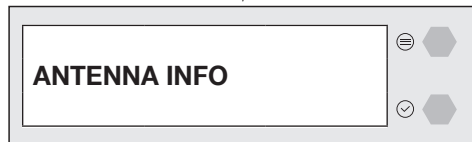
9.2 Startup

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

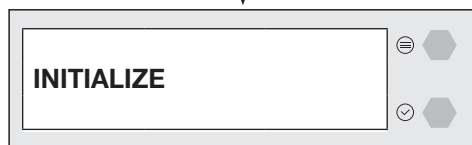


✓ Startup

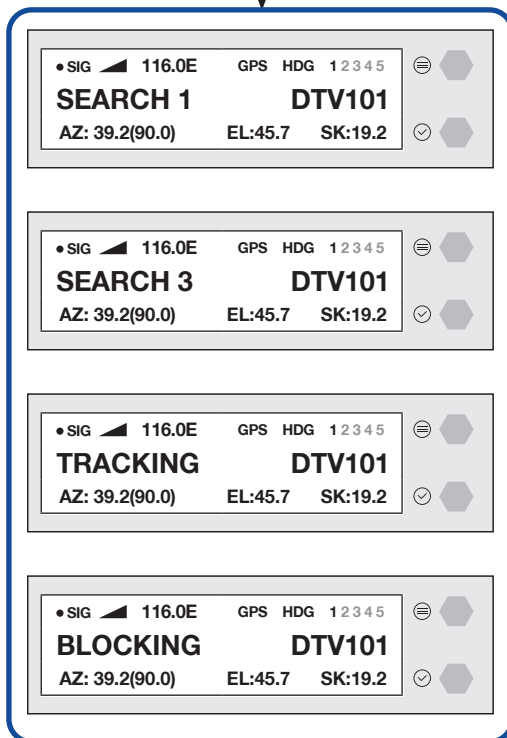
Intellian's model name is displayed.



✓ Initialize Antenna Information



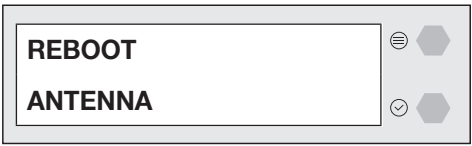
✓ Initialize Elevation Angle or Azimuth Angle



✓ Antenna's Status

SEARCH 1 (Global Search), SEARCH 3 (Local Search), TRACKING, BLOCKING

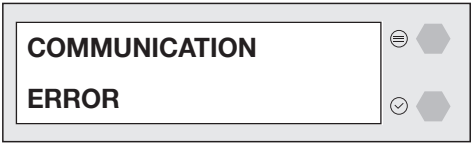
When the antenna is controlled by **Aptus NTV**, the ACU displays the control mode status.



✓ **Control Mode Status**
(Displays REBOOT ANTENNA mode or SETUP MODE)



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

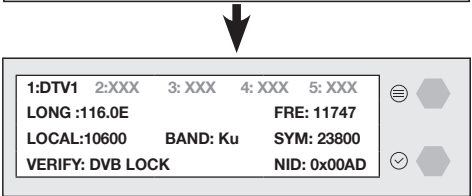


9.3 Satellite Information

Displays the currently registered list of the satellite.



✓ **Main Display**

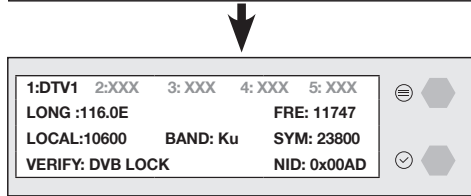


✓ **Satellite Information Display**

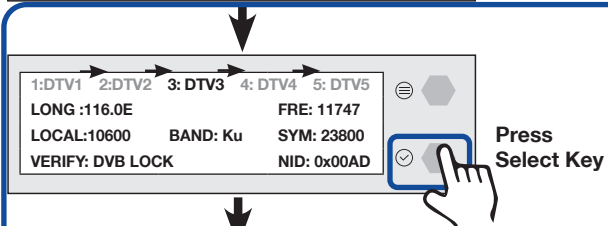
Selecting an other satellite's information.



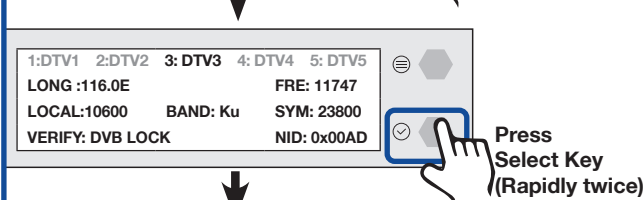
✓ Main Display



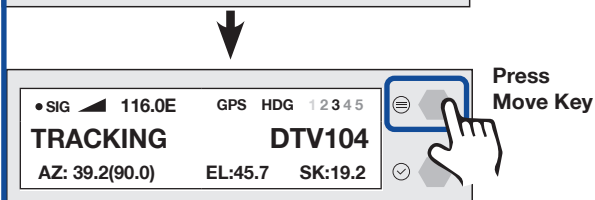
✓ Satellite Information Display



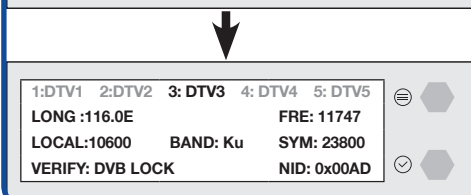
Select the satellite from among the satellite set.



Confirm the selected satellite.

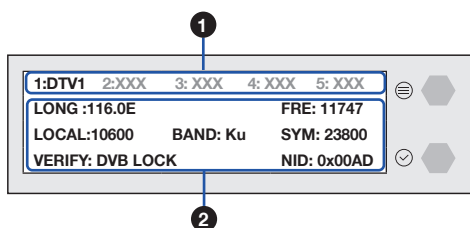


✓ Main Display



✓ Satellite Information Display

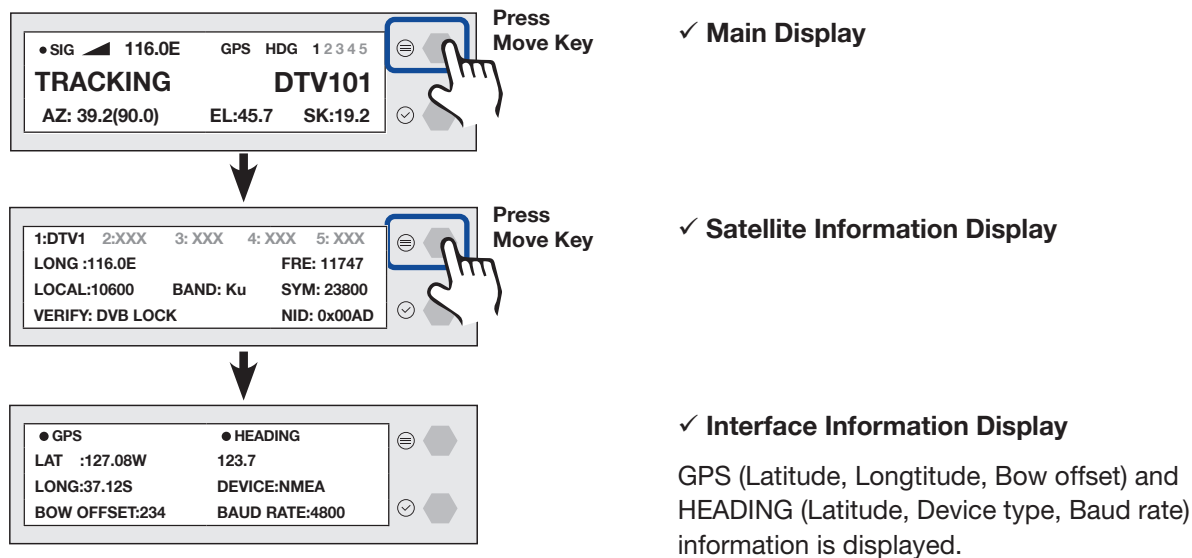
Refer to the Antenna Information display.



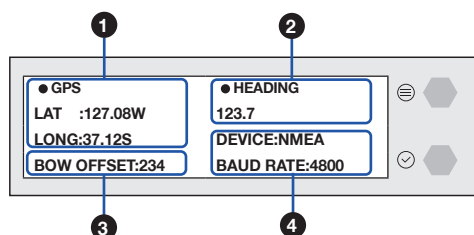
No.	Item	Description
①	Satellite List	Displays the registered satellite list (The target satellite name is displayed bright white, while the other four satellites in the set are dimmed.).
②	Satellite Information	Displays the satellite information (Longitude, Frequency, Local, Band Verify, etc.)

9.4 Interface Information

Displays the GPS/heading type in use and the connection status.



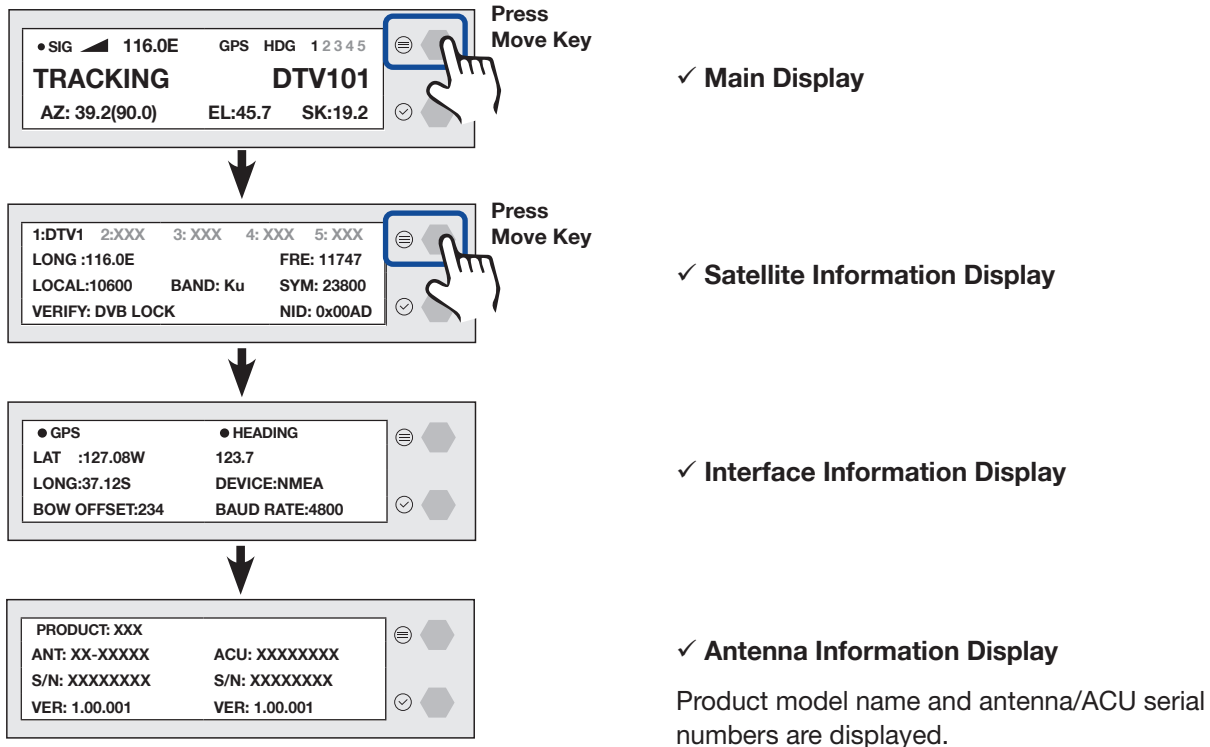
Refer to the Interface Information display.



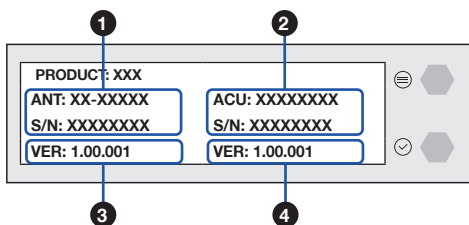
No.	Item	Description
①	GPS Status/Data	Displays GPS status (displayed white if receiving, dimmed if not) and GPS data (Latitude and Longitude).
②	Heading Status/Data	Displays heading status and data.
③	Bow Offset	Displays bow offset.
④	Heading Device	Displays the heading type in use (NONE, NMEA, STATIC) and baud rate. NOTE: Baud rate will be displayed for NMEA Only.

9.5 Antenna Information

Displays the antenna serial number, ACU serial number, firmware version, and ACU software version of the system.



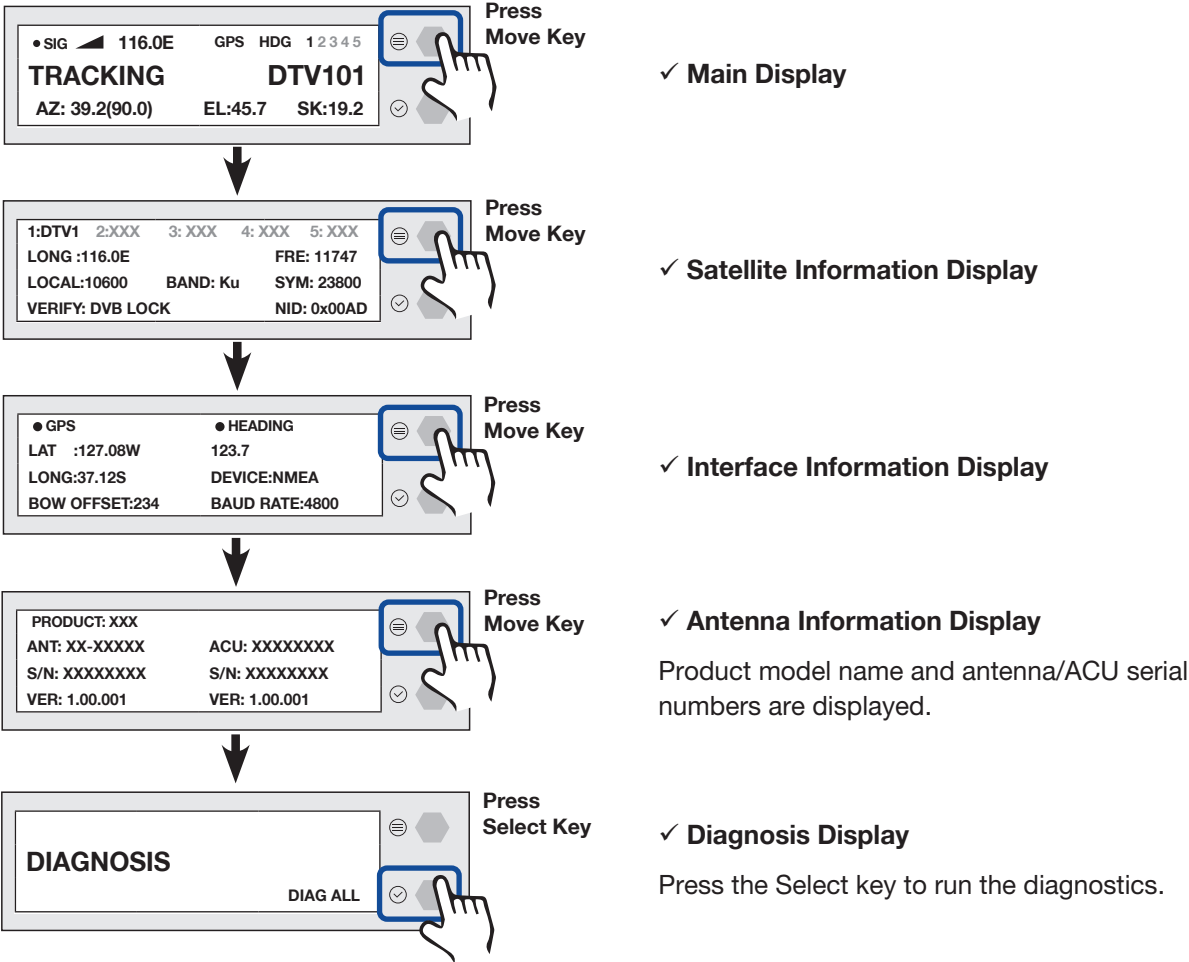
Refer to the Antenna Information display.



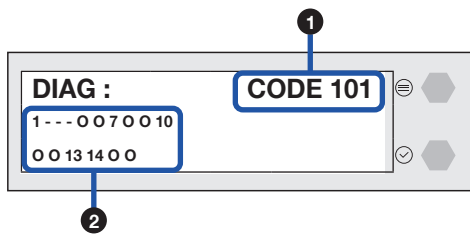
No.	Item	Description
①	Antenna Serial Number	Displays the Antenna serial number. The serial number is displayed depending on the product.
②	ACU Serial Number	Displays the ACU serial number. The serial number is displayed depending on the product.
③	F/W Version	Displays the firmware version.
④	ACU Version	Displays the software version.

9.6 Diagnosis

Executes antenna Diagnosis tests and shows the real-time diagnostic results.



Refer to the diagnosis codes for the test results.



No.	Item	Description																																				
①	Diagnosis Code	Displays the diagnosis code for the test that is currently running. When all tests are complete, DONE is displayed.																																				
		<table><tr><th>Code</th><th>Test</th></tr><tr><td>101</td><td>The data communication between the antenna and the ACU is tested.</td></tr><tr><td>102</td><td>The azimuth axis is tested.</td></tr><tr><td>103</td><td>The elevation axis is tested.</td></tr><tr><td>104</td><td>The cross-level axis is tested.</td></tr><tr><td>105</td><td>Not Available</td></tr><tr><td>106</td><td>Not Available</td></tr><tr><td>107</td><td>The rate sensor is tested.</td></tr><tr><td>108</td><td>Not Available</td></tr><tr><td>109</td><td>Not Available</td></tr><tr><td>110</td><td>The LNB / NBD is tested.</td></tr><tr><td>111</td><td>Not Available</td></tr><tr><td>112</td><td>Not Available</td></tr><tr><td>113</td><td>The antenna power is tested.</td></tr><tr><td>114</td><td>The ACU power is tested.</td></tr><tr><td>115</td><td>Not Available</td></tr><tr><td>119</td><td>C POL is tested.</td></tr><tr><td>120</td><td>Ku POL is tested.</td></tr></table>	Code	Test	101	The data communication between the antenna and the ACU is tested.	102	The azimuth axis is tested.	103	The elevation axis is tested.	104	The cross-level axis is tested.	105	Not Available	106	Not Available	107	The rate sensor is tested.	108	Not Available	109	Not Available	110	The LNB / NBD is tested.	111	Not Available	112	Not Available	113	The antenna power is tested.	114	The ACU power is tested.	115	Not Available	119	C POL is tested.	120	Ku POL is tested.
		Code	Test																																			
		101	The data communication between the antenna and the ACU is tested.																																			
		102	The azimuth axis is tested.																																			
		103	The elevation axis is tested.																																			
		104	The cross-level axis is tested.																																			
		105	Not Available																																			
		106	Not Available																																			
		107	The rate sensor is tested.																																			
		108	Not Available																																			
		109	Not Available																																			
		110	The LNB / NBD is tested.																																			
		111	Not Available																																			
		112	Not Available																																			
		113	The antenna power is tested.																																			
		114	The ACU power is tested.																																			
		115	Not Available																																			
119	C POL is tested.																																					
120	Ku POL is tested.																																					
②	Diagnosis Result	• Below is an example of a diagnosis result: 1 - - - 0 0 7 0 0 1 0 0 0 13 14 0 0 ← Diagnosis Result of Code 101~110 ← Diagnosis Result of Code 111~120 Each place in the results corresponds to the last one (codes 101 through 109) or two (codes 110 through 120) digits of a diagnosis code. - If a dash (-) is displayed, the system passed the test. In the above example, the system passed the tests for codes 102, 103, and 104. - If the last 1 or 2 digits of a diagnosis code are displayed, the system failed the test. In the above example, the system failed the tests for codes 101, 107, 110, 113, and 114. - If O is displayed, the test was not performed. In the above example, the tests for codes 105, 106, 108, 109, 111, 112, 115, 119 and 120 were not performed.																																				

9.7 USB Port Function

To use this function, insert the USB flash drive into the right-side USB port on the front of the ACU. The USB Function includes four menus (LOG DOWNLOAD, FIRMWARE UPLOAD, BACKUP TO USB, RESTORE FROM USB). Follow the sequence below to access the USB functions. For detailed information about each function, refer to the following subsections.



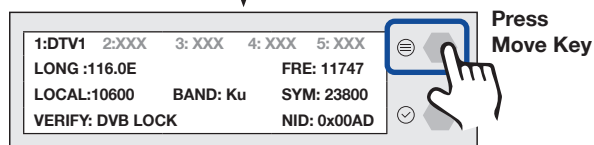
NOTE

The USB function is activated only when a flash drive is detected in the front panel USB port (right side).



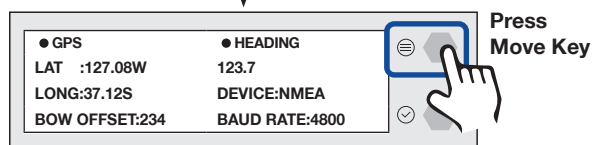
Press
Move Key

✓ Main Display



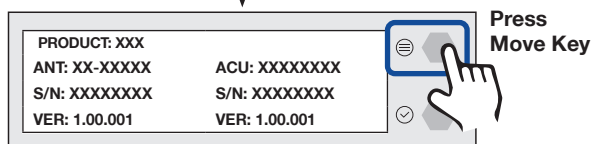
Press
Move Key

✓ Satellite Information Display



Press
Move Key

✓ Interface Information Display



Press
Move Key

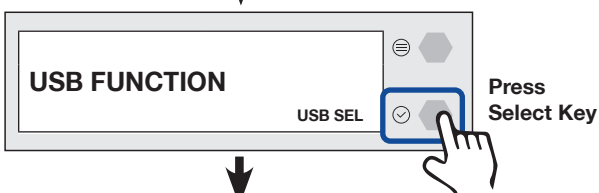
✓ Antenna Information Display

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



Press
Move Key

✓ Diagnosis Display



Press
Select Key

✓ USB Function Display

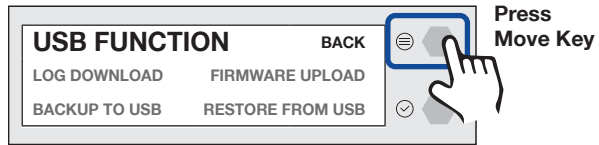
The USB function is activated only when a flash drive is detected in the front panel USB port (right side).



✓ USB Function Menu Display

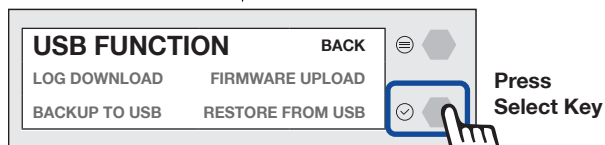
9.7.1 Log Download

Downloads all data logs to the USB flash drive.

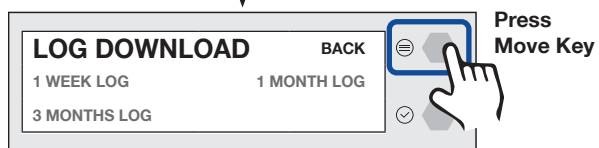


Press
Move Key

✓ USB Function Menu Display

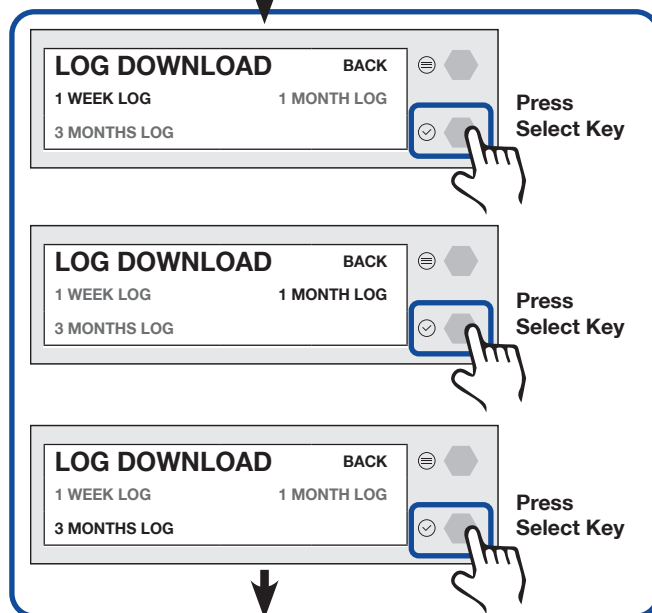


Press
Select Key



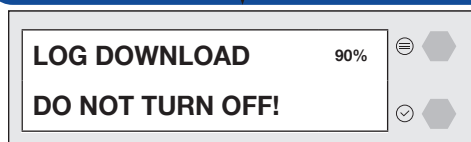
Press
Move Key

✓ Log Download Menu Display



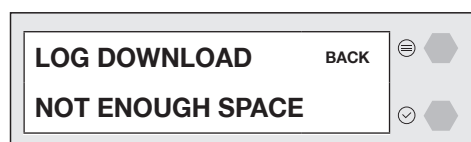
✓ Download Log File to USB

Select one of three options: 1 WEEK LOG, 1 MONTH LOG or 3 MONTHS LOG.



✓ Download Process Display

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



NOTE

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

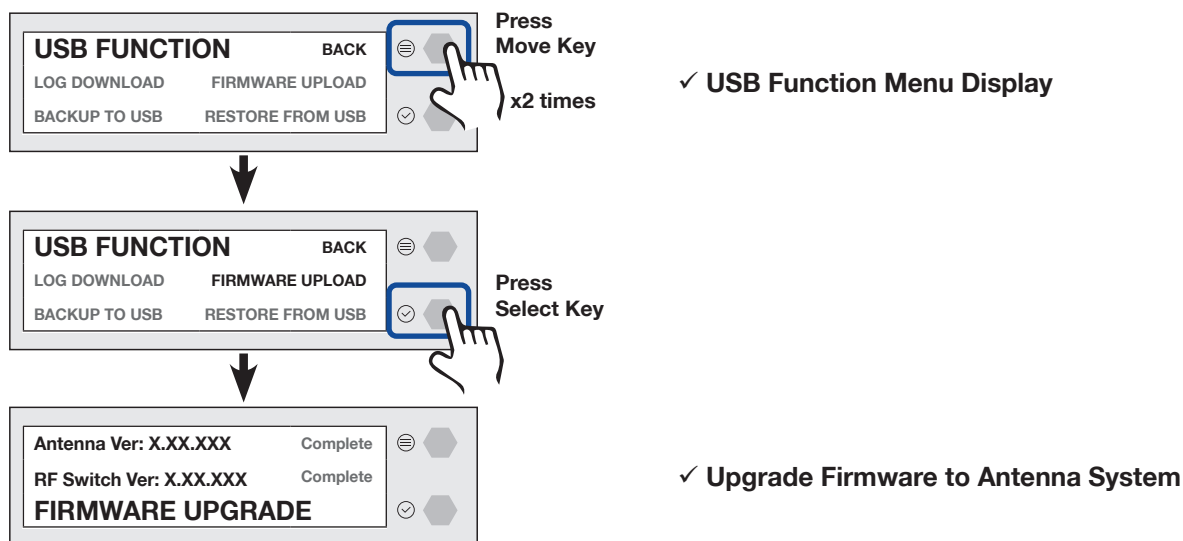
9.7.2 Firmware Upload

To use the Firmware Upload function, you must use the exact folder structure in the figure below. The function supports FAT32 or older formatted drives. You upgrade the antenna system by copying the FWP file to the /intellian/t360CK/firmware folder on a USB flash drive. You also must rename the FWP file to CTR_T4.fwp.

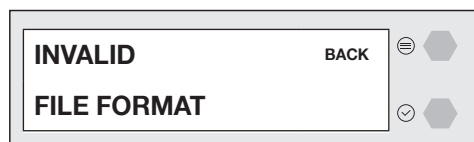


NOTE

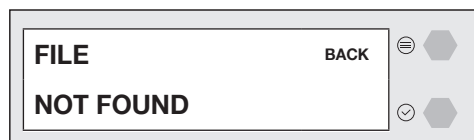
The FWP file name must be renamed to CTR_T4.fwp.



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



If no firmware file is on the USB drive with the correct name and in the correct file structure, the **FILE NOT FOUND** message is displayed.

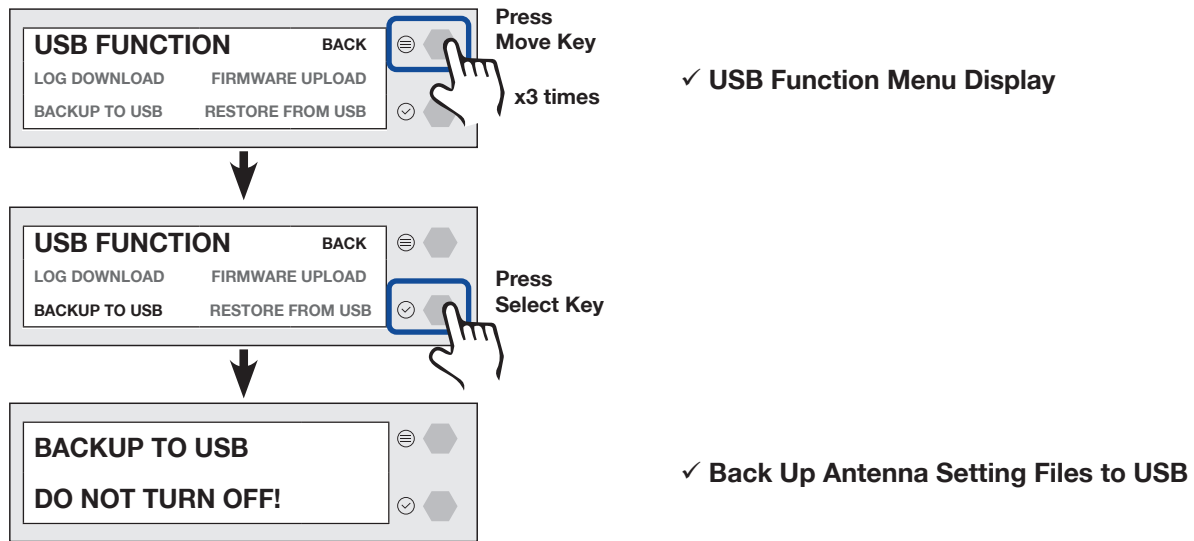


NOTE

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

9.7.3 Backup to USB

Backs up the antenna setting files to the USB flash drive.



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

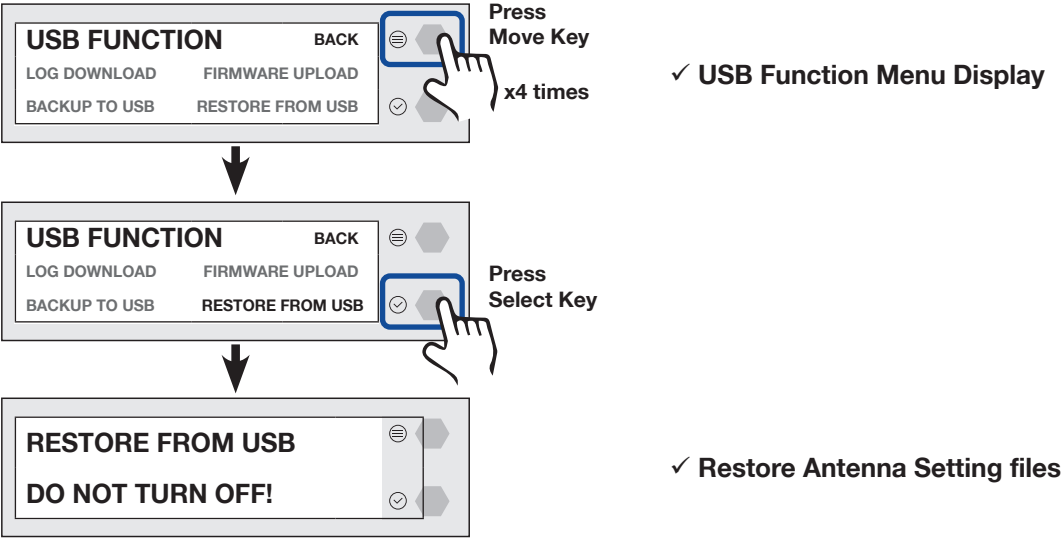


NOTE

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

9.7.4 Restore From USB

Restores the antenna setting by using the setting files saved on the USB flash drive.



NOTE

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

Chapter 10. Using Aptus NTV

10.1 Introduction

With the embedded **Aptus NTV** software, the antenna can be monitored, controlled, and diagnosed remotely from anywhere, anytime through TCP/IP protocol. This saves the time and cost generated by various maintenance activities, such as firmware upgrades, tracking parameter resets, and diagnosing system issues.

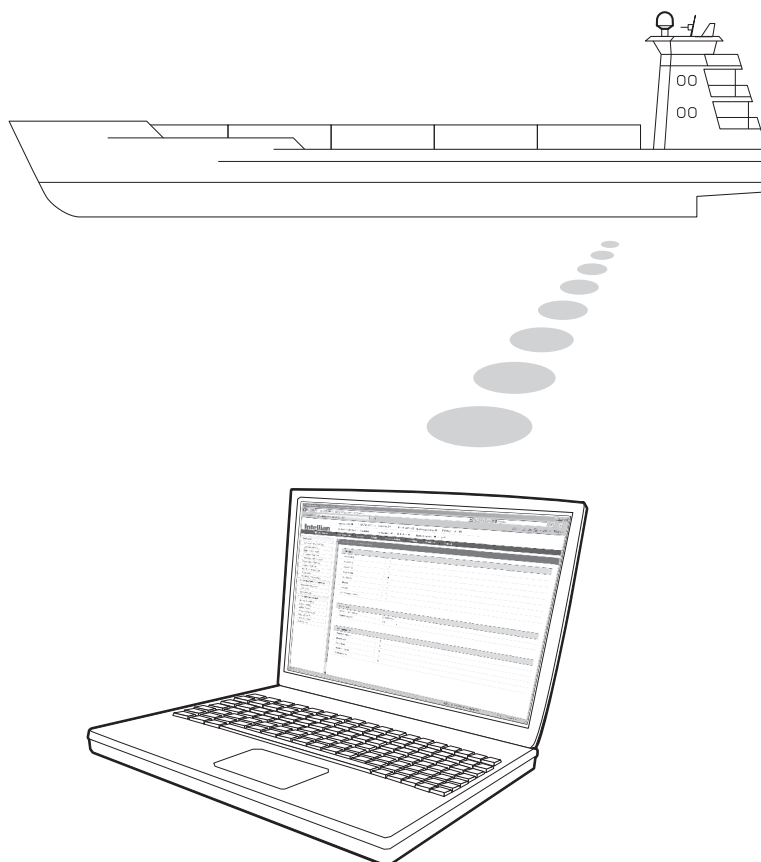
10.2 Accessing Aptus NTV for ACU

1. Connect an Ethernet cable from the management LAN port on the ACU's front panel to a PC's LAN port. This method is generally recommended.
2. Enter the ACU IP address (**Default: 192.168.2.1**) into the address bar of your web browser and **Aptus NTV** Login webpage would be displayed.



NOTE

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

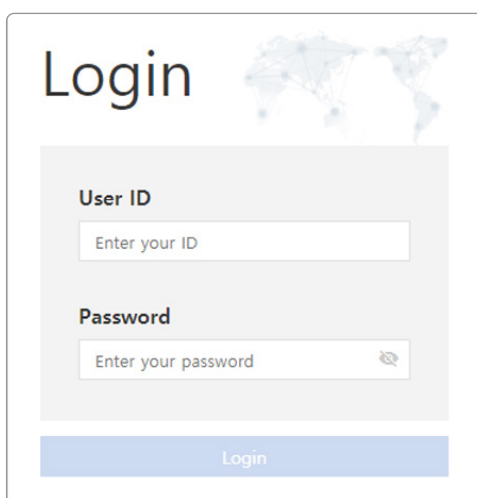


10.3 Main Page (Page Login)

The Intellian software Aptus offers various user access levels to ensure the system operates safely. Depending on the user level, the range of functions available in the software may be limited (see the table) below.

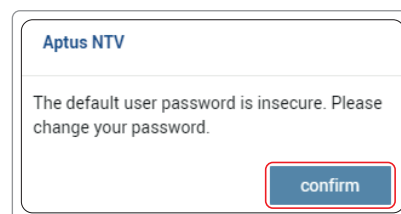
Log in to the ACU by typing in a User ID and Password. The table below contains the factory default values.

User Type	User ID	Password	Access Authority
Admin	sysadmin	sysadmin1@1	All menus for monitoring and 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 NTV** with a default password, the pop-up window for changing the password will appear. Click the Confirm button. The User Management page displays, where you can change the user password.



10.4 Top Menus

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



No.	Item	Description								
①	Target Satellite	Displays the target satellite.								
②	Lock	Displays the satellite lock status. If the lock icon is lit green, the antenna has locked on the satellite. <table><thead><tr><th>Icon</th><th>Status</th></tr></thead><tbody><tr><td></td><td>Tracking</td></tr><tr><td></td><td>Both DVB lock and DVB/DSS decode with mismatched NID</td></tr><tr><td></td><td>Both DVB lock and DVB/DSS decode with NID matching</td></tr></tbody></table> NOTE Lock information can be checked by moving the mouse pointer over the Lock icon.	Icon	Status		Tracking		Both DVB lock and DVB/DSS decode with mismatched NID		Both DVB lock and DVB/DSS decode with NID matching
Icon	Status									
	Tracking									
	Both DVB lock and DVB/DSS decode with mismatched NID									
	Both DVB lock and DVB/DSS decode with NID matching									
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/mode. • Initialize: The antenna system is initializing. • Searching: The antenna is searching for the target satellite. • Tracking: The antenna is tracking the target satellite. • Setup: The antenna is in setup mode. • Diagnostic: The antenna is in diagnostic mode. • Idle: The antenna is idle mode. • Communication Error: Aptus NTV is unable to communicate with the ACU.								
⑤	Main Menu	Select a main menu item (Dashboard, Setup, Tools, Install Wizard). Each main menu item displays side menus on the left of the screen.								
⑥	Setup	Enter the setup mode to modify settings.								
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	Save Sat.	Adjusts and saves bow offset automatically. NOTE: Save Sat Button working at Search 3 conditions.								
⑩	Ant. Info	Obtains current antenna information.								
⑪	Account Button	Click the button to manage the user account The Account, User Management, and System Information menus are for the user management. Click the Logout button to log out of the Aptus NTV web page.								

10.5 Account Menu

1. Click the User ID  to manage the user account.
2. Select **Account**, **User Management**, **System Information** or **Support** for user management. Select **Logout** to log out of *Aptus NTV*.



10.5.1 Account

Account 1

- User Management
- System Information
- Support

USER

2 User Password Change

ID: sysadmin

Old Password:

New Password:

Apply

3 Reset Password

Intellian

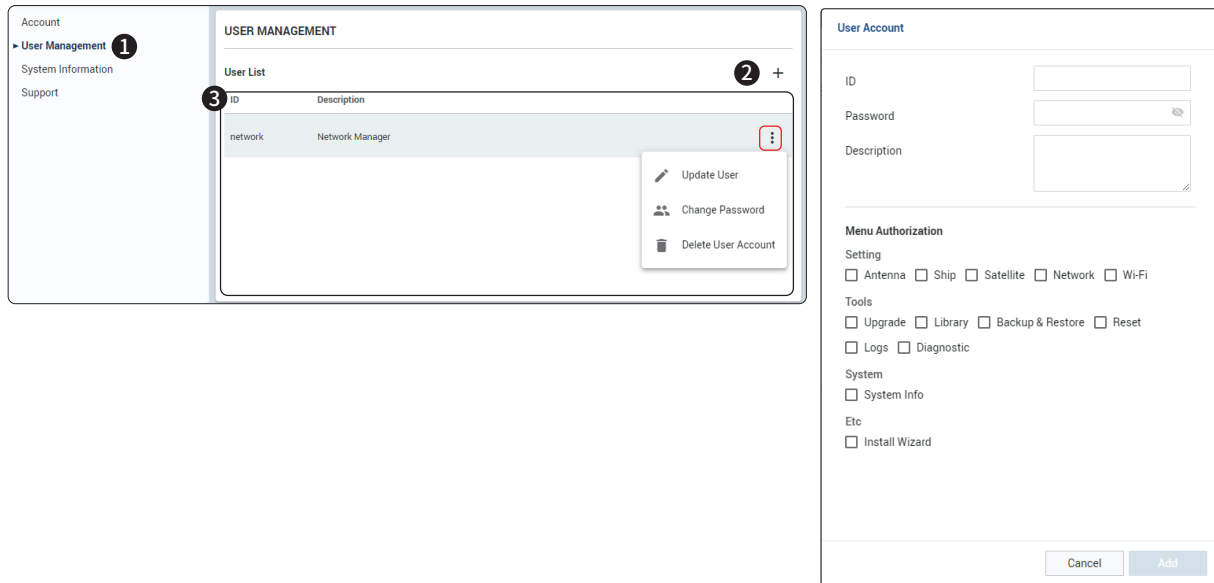
4 Session Timeout Change

Session Time: 60 min

Apply

No.	Item	Description
①	Account	Updates your password and sets time-outs.
②	User Password Change	You can change your Password. - ID: Displays your 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 numbers and one special character. Click the Apply button to apply the settings to the system.
③	Reset Password	You can reset a subaccount's password. If you are logged in as sysadmin, you can reset your intellian account password.
④	Session Timeout Change	Enter the value in minutes (60 is default) for setting the session timeout. Click the Apply button to apply the settings to the system.

10.5.2 User Management



Editable User Permission 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	Sets the User information and Permission. • 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.

10.5.3 System Information

Account

User Management

► System Information ①

Support

SYSTEM

② System Information

Antenna Size	360cm
Antenna Model Name	t360CK
Antenna Model Number	
Antenna S/N	XXXXXXXX
ACU Model Number	
ACU S/N	XXXXXXXX
System Band	
Host controller	v0.18.001
ANT controller	v0.90.902

③ Antenna Information

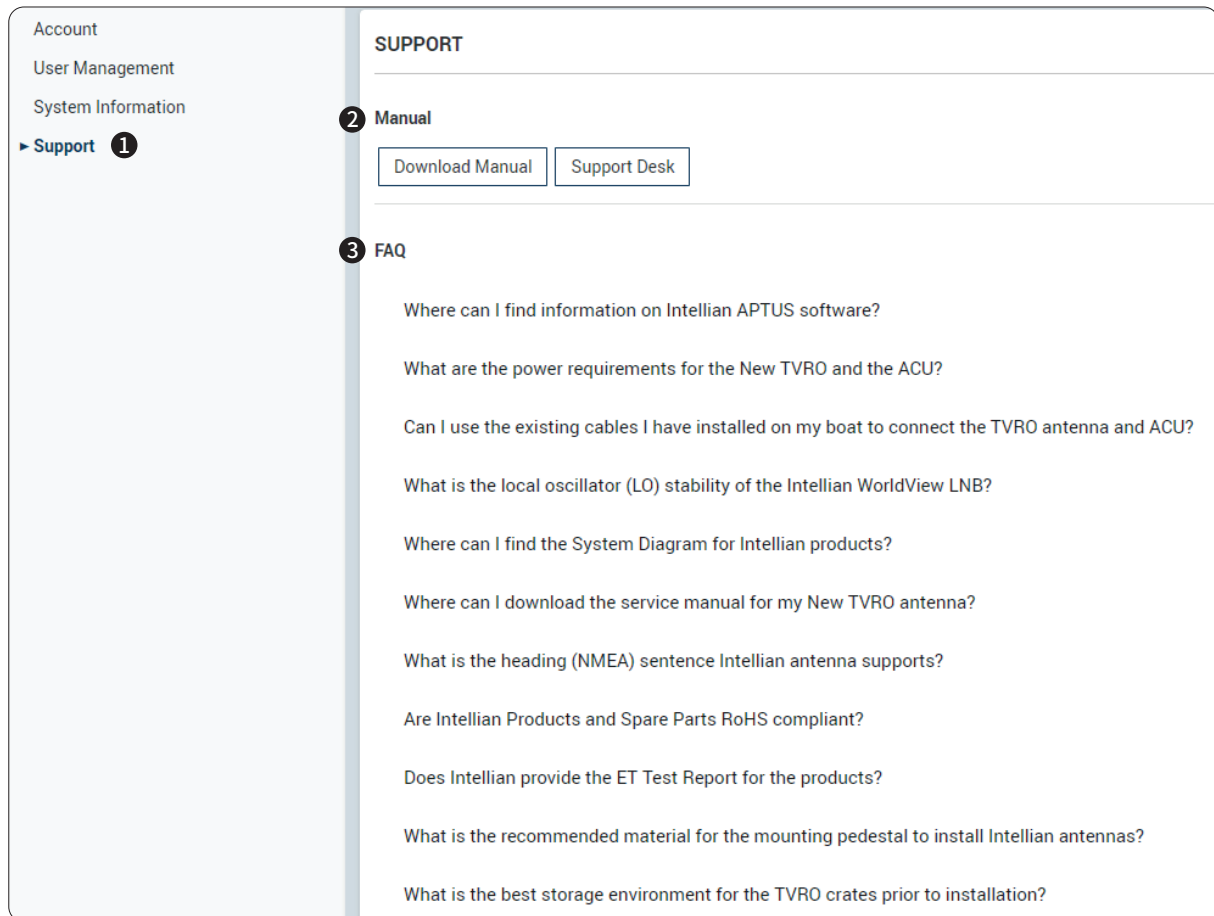
Antenna Name

Aptus NTV

CancelApply

No.	Item	Description
①	System Information	Use this page to display system information and change the antenna name.
②	System Information (Sub-Menu)	Displays detailed antenna information.
③	Antenna Information	Enters the Antenna Name. Click the Apply button to set the antenna name.

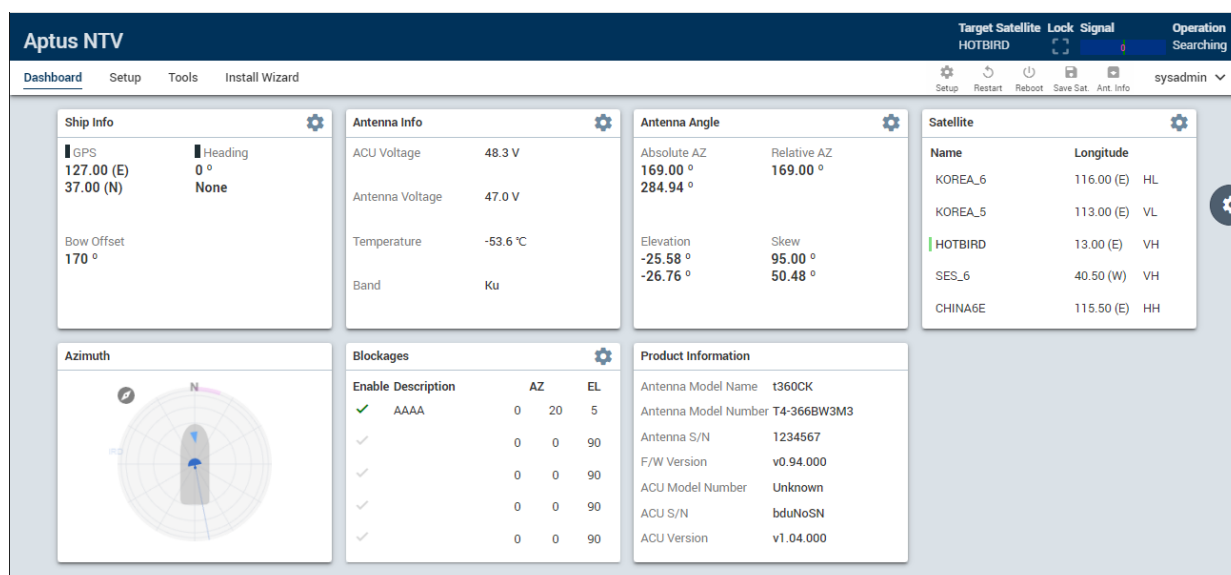
10.5.4 Support



No.	Item	Description
①	Support	Supports manual downloading, support desk and FAQ list.
②	Manual (Download Manual / Support Desk)	Downloads the User Manual and displays Support Desk information. - Download Manual: Click the Download Manual button to view the User Manual. - Support Desk: Click the Support Desk button to open Intellian's contact details for support.
③	FAQ	Provides answers for frequently asked questions about the product.

10.6 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

The measured temperature can be different from the actual temperature.

10.6.1 How to Add & Remove Panels (Dashboard Setting)

Adding Panels

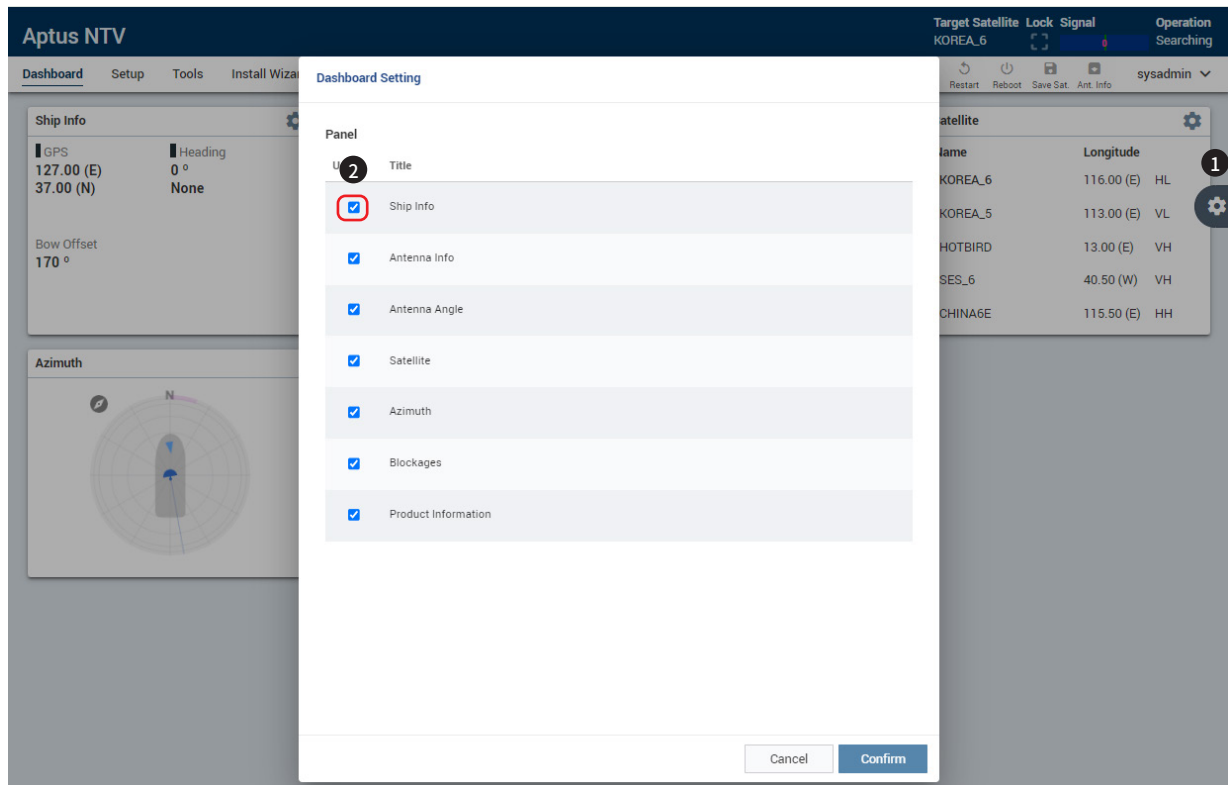
1. Click the gear icon on the right side of the page (see figure below). The Dashboard Setting window displays.
2. Check the boxes of the panels that you wish to add to the dashboard.
3. Click the **Confirm** button to apply the settings to the system.

When the panels are added, they will automatically be placed at the bottom of the page.



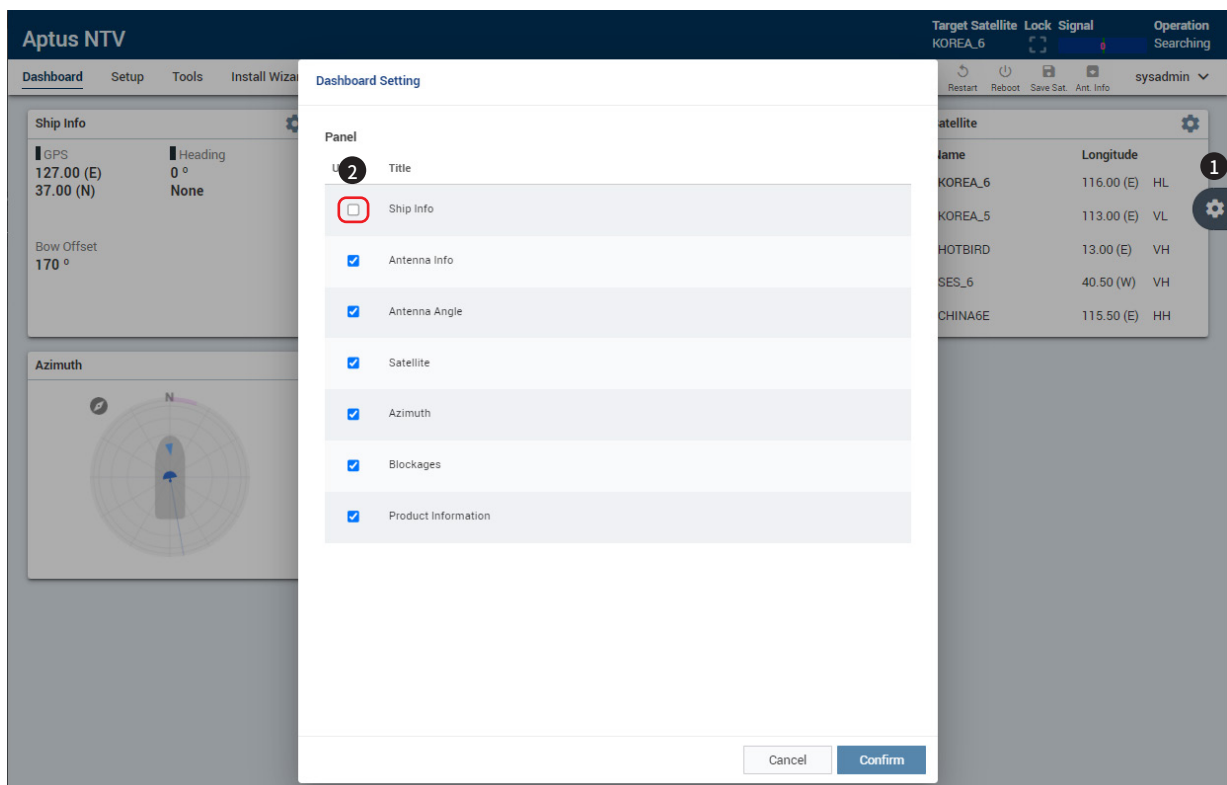
NOTE

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



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 boxes of the panels that you wish to remove from the dashboard.
3. Click the **Confirm** button to apply the settings to the system.



10.6.2 How to Use Shortcut Settings

Many panels on the dashboard provide a 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 (gear icon) of a panel to open its settings page. The settings page for that panel will display.

The screenshot shows the AptusNX dashboard with the following panels and data:

- Ship Info** (Gear icon highlighted):
 - GPS: 127.00 (E), 37.00 (N)
 - Heading: 0°, None
 - Bow Offset: 170°
- Antenna Info**:
 - ACU Voltage: 48.2 V
 - Antenna Voltage: 47.0 V
 - Temperature: -53.6 °C
 - Band: Ku
- Antenna Angle**:
 - Absolute AZ: 170.00°, 197.97°
 - Relative AZ: 170.00°
 - Elevation: -25.58°, 45.75°
 - Skew: 95.00°, 14.21°
- Satellite**:

Name	Longitude	
KOREA_6	116.00 (E)	HL
KOREA_5	113.00 (E)	VL
HOTBIRD	13.00 (E)	VH
SES_6	40.50 (W)	VH
CHINA6E	115.50 (E)	HH
- Azimuth**: A circular diagram showing the antenna's orientation.
- Blockages**:

Enable	Description	AZ	EL
✓	AAAA	0	20
✓		0	0
✓		0	0
✓		0	0
✓		0	0
- Product Information**:
 - Antenna Model Name: t360CK
 - Antenna Model Number: T4-366BW3M3
 - Antenna S/N: 1234567
 - F/W Version: v0.94.909
 - ACU Model Number: Unknown
 - ACU S/N: bduNoSN
 - ACU Version: v1.04.000

2. Check the detailed information and apply the settings that you wish.

10.7 Setup

This menu sets and displays the Ship, Antenna, Satellite, Network, Wi-Fi and Mediator (Optional).

10.7.1 Ship

► Ship 1

Antenna

Satellite

Network

Wi-Fi

Mediator

SHIP

2 GPS ⓘ

Longitude(°)

127.00

EAST

Latitude(°)

37.00

NORTH

Cancel

Apply

3 Heading Device ⓘ

Current Device

None

Cancel

Apply

4 BOW Offset ⓘ

Current Bow Offset(°)

170

Cancel

Apply

5 Blockage ⓘ

Enable	Description	Az. Start~End (°)	El. (°)
☒		0 ~ 20	5
☐		0 ~ 0	90
☐		0 ~ 0	90
☐		0 ~ 0	90
☐		0 ~ 0	90

N

REG

Cancel

Apply

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. GPS Indicator: 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. Heading Device Indicator Blue: a ship's heading device is connected. Black: a ship's heading device is not connected.) • Current Device: Select the heading device (None, NMEA, NMEA2000 Static). If you select NMEA, you can also set the Baud Rate. • 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 Bow Offset Range (0 – 360°). Click the Apply button to apply the settings to the system.
⑤	Blockage	Up to five antenna blockage zones can be set by entering the relative azimuth and elevation sectors where line of site will be blocked. Setting blockage zones ensures that the programs viewers watch won't be interrupted by avoiding usage in these 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.

10.7.2 Antenna Setting

Ship
Antenna
Satellite
Network
Wi-Fi
Mediator

ANTENNA

Antenna Angle

Relative Azimuth
169.00
Absolute Azimuth
169.00 / 284.94
Elevation
-25.58 / -26.76
LNB Pol Angle
95.00 / 50.48

Thresholds Setting

Ku

C

Tracking Level

1

30

Detect Level

1

70

Cancel

Apply

Search Parameter

Search Step(°)

0.2

Search1 Azimuth(°)

400

Search1 Elevation(°)

8

Search3 Azimuth(°)

3

Search3 Elevation(°)

4

Cancel

Apply

Conical Range

Ku

C

Azimuth

100

40

Elevation

100

40

Cancel

Apply

Conical Range Check

Switch Activation

Off

On

Cancel

Apply

El Adjust

El Adjust(°)

0.5

Cancel

Apply

Tilt Sensor Bias

Ready

EL

0.00

1

CL

0.00

1

LNB Skew Offset

Sat Skew Offset(°)

-3

Mechanical Offset(°)

1

Consolidated Offset(°)

4

Mechanical Skew Offset reset

Rate Sensor Bias

AZ

0

EL

0

CL

0

Cancel

Set Rate Sensor Bias

Rate Sensor Calibration

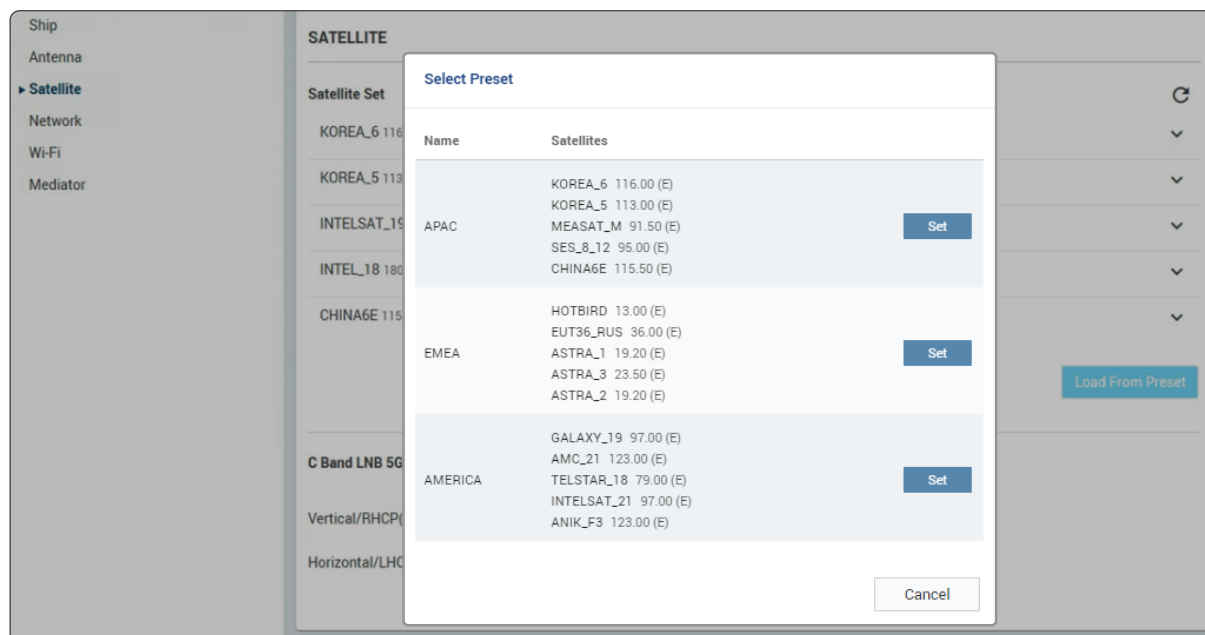
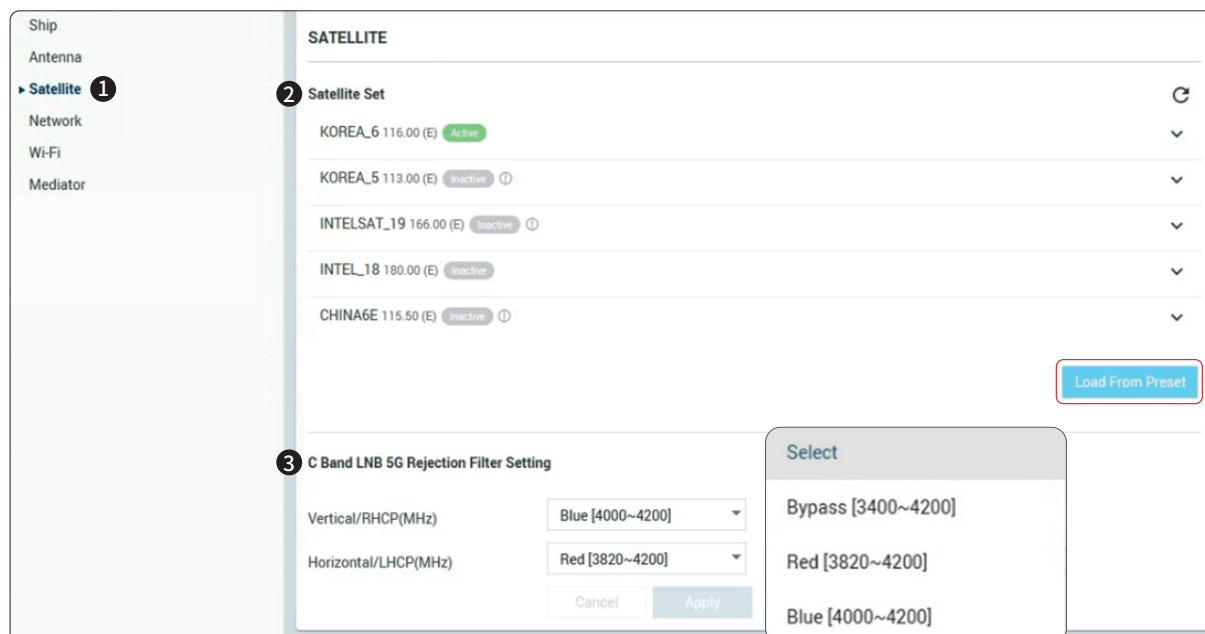
Save Sensor Bias

Set Idle Mode

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. You can move the antenna's azimuth and elevation position by using the arrows or inputting a value to find the desired satellite manually. - Relative Azimuth: Displays the antenna's relative azimuth angle. - Absolute Azimuth: Adjusts the antenna's absolute azimuth angle. - Elevation: Adjusts the elevation angle. - LNB Pol Angle: Adjusts the LNB Pol angle. Click the Apply button to apply the settings to the system.
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. Click the Apply button to apply the settings to the system.
④	Search Parameter	Sets the timeout, search step and search range. - Search Step(°): Set increment step size. - Search1/3: Set Search 1 and 3 search range. Search is conducted in a two-axis pattern consisting of alternate movements in azimuth and elevation to form an expanding square. Click the Apply button to apply the settings to the system.
⑤	Conical Range	The relative force of the motors controlling azimuth and elevation. Sets the conical range while the antenna is in tracking mode. Click the Apply button to apply the settings to the system.
⑥	Conical Range Check	The system must be in Setup Mode to modify these settings. Monitors the Azimuth and the elevation value when the conical range is modified. Switch Activation: Choose whether to use the switch activation function (On / Off).
⑦	EL Adjust	Sets Elevation Offset angle. You can adjust Elevation Offset by inputting a value to find the desired satellite manually. Click the Apply button to apply the settings to the system.
⑧	Tilt Sensor Bias	NOTE: The rate values of the azimuth, elevation, and cross-level axes were calibrated to the optimal condition at the factory prior to shipment. If additional rate adjustment is required, make sure that the antenna is placed on a rigid and flat platform. During the calibration process, avoid any antenna motion, as it can affect the antenna's performance. Maintain the elevation and the cross-level axes to keep the pedestal parallel to the horizon. - Ready: Click the Ready button to bring the elevation and cross-level to 0. - EL/CL: Select EL/CL and click the Up and Down arrow keys to adjust the elevation and cross-level.

No.	Item	Description
⑨	LNB Skew Offset	Calibrates the LNB pol angle when the control board, skew motor or belt is replaced. • Sat Skew Offset: Displays the satellite skew offset value. Each satellite has its own skew offset. Contact your service provider or satellite operator to get the designated satellite skew offset value. To change the Satellite Skew Offset manually: Go to Tracking Setting Tracking Satellite Skew Offset and enter the value. • Mechanical Offset: Displays the antenna skew offset value which was set by the factory as a default value (usually 0, 1 or 2) depending on the antenna assembly condition. The color next to the value box indicates the status of Mechanical Skew Offset. (Blue: Less than $\pm 10^\circ$ / Red: More than $\pm 10^\circ$) • Consolidated Skew Offset: Displays the consolidated skew offset value of Sat Skew Offset and Mechanical Offset. (Consolidated Skew Offset= Mechanical Offset-Sat Skew Offset) • Mechanical Skew Offset Reset: Resets the Mechanical Offset to "0".
⑩	Rate Sensor Bias	NOTE: The rate values of the azimuth, elevation, and cross-level axes were calibrated to the optimal condition at the factory prior to shipment. If additional rate adjustment is required, make sure that the antenna is placed on a rigid and flat platform. During the calibration process, avoid any antenna motion, as it can affect the antenna's performance. Calibrates DC voltage output from the three rate sensors used to sense antenna motion in azimuth, elevation and cross-level axes. These are used to sense antenna motion that corresponds to the ship's motion (roll, pitch, and yaw) for stabilizing the pedestal. The DC voltage output from each of the rate sensors may vary by an amount which is directly proportional to the direction and rate of motion induced on it. • Rate Sensor Calibration: Click the Rate Sensor Calibration button to calibrate the rate sensor automatically. The indicator left of the help button shows the rate sensor calibration status. - Black: The calibration is ready to start. - Blue: The calibration is completed. - Red: The calibration is failed. - Green: The calibration is in process. • Save Sensor Bias: Click the Save Sensor Bias button to save the calibrated value of the rate sensor to the system.
⑪	Set Idle Mode	Sets the motor to idle mode to check the antenna's balance. • Set Idle Mode: The system must be in Setup Mode to modify this setting. Releases the elevation and cross-level motor. • Reboot: Reboots the system.

10.7.3 Satellite



No.	Item	Description
①	Satellite	Sets the current tracking satellite from the library and edits the satellite information.
②	Satellite Set	Sets the current tracking satellite from the library and edits the satellite information. Selects active satellite from the set. The Inactive icon will change to a green Active icon. You can check the satellite information of the activate satellie by clicking . Then you can edit satellite information or change the active satellite from the library. To change satellite set, click the Load From Preset button.

No.	Item	Description
③	C band LNB 5G Rejection Filter Setting	<i>This setting is only available if the antenna has a LNB 5G Rejection filter installed.</i> If the LNB 5G rejection filter is installed, it can protect the satellite carriers within its passband and isolate the 5G carriers outside the passband. You can set the filter setting for Vertical (RHCP) and Horizontal (LHCP). • Bypass [3400~4200 (MHz)]: Use without band restrictions. • Red [3820~4200 (MHz)]: Commissioning band limited to the 3.82-4.2 GHz band. • Blue [4000~4200 (MHz)]: Commissioning band is limited to the 4.0-4.2 GHz band.

10.7.4 Network

The screenshot displays the 'NETWORK' configuration page in the AptusNX interface. On the left, a sidebar lists 'Ship', 'Antenna', 'Satellite', 'Network' (highlighted with a circled 1), 'Wi-Fi', and 'Mediator'. The main content area is titled 'NETWORK' with a circled 1. It contains two configuration sections:

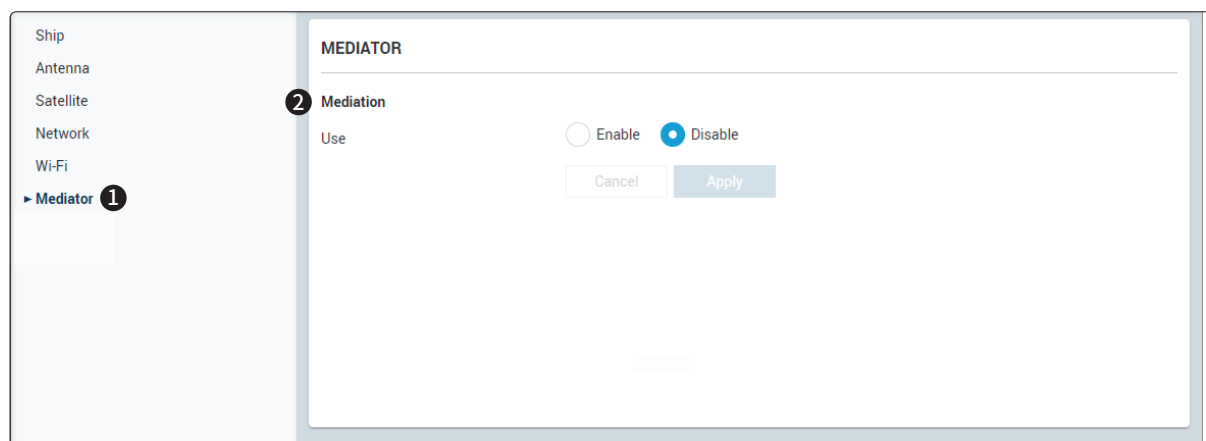
- Management Port Configuration** (circled 2): This section allows setting the network for the Management Port. It includes input fields for IP Address (192.168.2.1), Subnet Mask (255.255.255.0), Lease Start Address (192.168.2.101), Lease End Address (192.168.2.200), and Lease Time (604800). At the bottom are 'Cancel' and 'Apply' buttons.
- Ethernet Port Configuration** (circled 3): This section allows setting the network for the Ethernet port. It includes input fields for IP Address (10.1.124.47), Subnet Mask (255.255.254.0), and Gateway (10.1.124.254). At the bottom are 'Cancel' and 'Apply' buttons.

No.	Item	Description
①	Network	Sets the ACU's internal IP address and ports.
②	Management Port 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: 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	Ethernet Port Configuration	Sets the network configuration of the Ethernet port on the ACU back panel. For service only. - IP Address: Set the network IP address (Factory default: 192.168.0.223). - Subnet Mask: Set the subnet mask (Factory default: 255.255.255.0). - Gateway: Set the gateway IP address (Factory default: 192.168.0.223). Click the Apply button to apply the settings to the system.

10.7.5 Wi-Fi

No.	Item	Description
①	Wi-Fi	Sets up the Wi-Fi connection of ACU.
②	Wi-Fi Config	Displays Wi-Fi configuration. Connect the Wi-Fi dongle to the USB port on the ACU rear panel. When Wi-Fi is enabled, the indicator to the left of the help icon is either blue (Wi-Fi broadcasting) or black (Wi-Fi not broadcasting). • Activate: Sets the Wi-Fi function by toggling the activation button (Enabled/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 (Enabled/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: Set the security mode type (Open/Secret). • Passphrase: Enter the password required to connect to Wi-Fi. Click the Apply button to apply the settings to the system.

10.7.6 Mediator (Optional)



No.	Item	Description
①	Mediator	Sets up the mediation function.
②	Mediation	Sets up the mediation function. This function works in a dual antenna system with a dual TVRO mediator. • Use: Sets the mediation function by toggling the activation button (Enable/Disable). Click the Apply button to apply the settings to the system.



NOTE

Refer to the New Dual TVRO Mediator (sold separately) User Guide for installation and operation information.

10.8 System Tools

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

10.8.1 ACU Upgrade

No.	Item	Description
①	ACU Upgrade	Upgrades antenna software.
②	File Upload	Browse and select the package upgrade 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 network speed. Uploading an incorrect file may cause serious damage to your antenna and ACU. Refer to " Antenna Software Upgrade Procedure " on the following page for more details.
③	System Partition	The ACU has three storage partitions the Sys0, the Sys1 and the Factory Default. Click the Activate button to select the desired storage partition. 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 firmware package file (*.bin) to the antenna module.



File Upload

1 Browse T SERIES_v0.23.01.bin 2 Upload

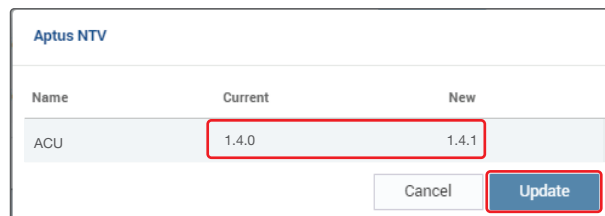


NOTE

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

The antenna software versions are displayed in the pop-up window.

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

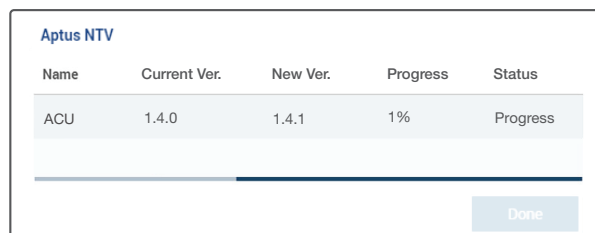


Aptus NTV

Name	Current	New
ACU	1.4.0	1.4.1

Cancel Update

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



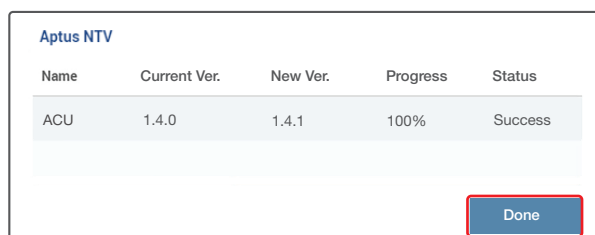
Aptus NTV

Name	Current Ver.	New Ver.	Progress	Status
ACU	1.4.0	1.4.1	1%	Progress

Done

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

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



Aptus NTV

Name	Current Ver.	New Ver.	Progress	Status
ACU	1.4.0	1.4.1	100%	Success

Done

10.8.2 Firmware Upgrade

The screenshot shows a web interface for firmware upgrade. On the left is a sidebar menu with options: ACU Upgrade, F/W Upgrade (highlighted with a circled 1), Library, Satellite Preset, Backup & Restore, Reset, Logs, and Diagnostic. The main content area is titled 'F/W UPGRADE' with a circled 1. It contains two sections: 'File Upload' (circled 2) with a 'Browse' button and an 'Upload' button, and 'Rollback' (circled 3) with a table of firmware versions and 'Restore' buttons.

F/W UPGRADE		
File Upload		
Browse		Upload
Rollback		
New	v0.90.002	Restore
Old	v0.90.002	Restore
Factory	v0.90.002	Restore

No.	Item	Description
①	F/W Upgrade	Upgrades the firmware of antenna.
②	File Upload	Browse and select the firmware file to upload, and then click the Upload button. The upload 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 firmware file may cause serious damage to your antenna and ACU. Refer to " Antenna Firmware Upgrade Procedure " on the following page for more details.
③	Roll Back	Displays the new, previous/latest, and factory default firmware package versions and allows you to roll back to them. • New: Restores to the latest firmware version. • Old: Restores to the previous firmware version. • Factory: Restores to factory default firmware version.

Antenna Firmware Upgrade Procedure

1. Click the **Browse** button and, in the Windows Open dialog box, select the upgrade package file to upload.
2. Click on the **Upload** button to transfer the Firmware file (*.fwp) to the Antenna module.

File Upload

1 Browse

CTR_T4_360_240607_V0.94.909.fwp

2 Upload



NOTE

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

The antenna Software versions are displayed on the pop-up window.

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

Aptus NTV

Name	Current	New
PCU	0.94.000	0.94.909
RF Switch	0.93.000	0.93.909

Cancel

Update

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

Aptus NTV

Name	Current Ver.	New Ver.	Progress	Status
PCU	v0.94.000	v0.94.909	1%	Progress
RF Switch	v0.93.000	v0.93.909	0%	Ready

Done

If the firmware is successfully upgraded, Success is displayed in the Status column.

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

Aptus NTV

Name	Current Ver.	New Ver.	Progress	Status
PCU	v0.94.000	v0.94.909	100%	Success
RF Switch	v0.93.000	v0.93.909	100%	Success

Done

10.8.3 Satellite Library

LIBRARY

Library File

Select Library file to upload

Download Library File

Satellite List

Filter:

Name	Longitude	Band	Skew Offset	Polarity(Ku)	LNB Local(Ku)	Polarity(C)	LNB Local(C)
INTELSAT_18	180.00 (E)	Ku	0	VL	9,750	VL	5,150
EUTELSAT_172B	172.00 (E)	C	0	HH	0(Universal)	HL	5,150
INTELSAT_19	166.00 (E)	Ku	0	HH	9,750	HL	5,150
ABS_6	166.00 (E)	C	0	VH	0(Universal)	VL	5,150
OPTUS_D1	160.00 (E)	Ku	50	HH	9,750	HL	5,150

Satellite Library

Satellite Information

Satellite Name:

Longitude(°):

Polarity:

Band:

Universal: ☒ Disable ☐ Enable

Local Frequency(MHz):

Skew Offset(°):

Inclined Search: ☒ Off ☐ On

Inclined Angle:

Primary Information

Verify Type:

NID:

Frequency(MHz):

No.	Item	Description
①	Library	Displays and edits the satellite library information.
②	Library File	Upload or download the satellite library. - Select a library file to upload: Click the Browse button to select the library file to upload, and then click the Upload button. The update may take a few minutes to complete. - Download a library file : Library data (.isl) can be downloaded. Click the Download button.
③	Satellite List	Displays the satellite list and information. - Filter: Select the filter option (All, 160E~73E, 73E~0E, 0W~61W, 61W~160W) from the drop-down list. - Edit() button: To edit the registered satellite, click the Edit () button. The Satellite Library pop-up window is opened. You can edit the following details: - Satellite Information: Set the current tracking satellite settings. - Satellite Name: Enter the satellite name. - Longitude(°): Enter the satellite orbit position. - Polarity: Select the polarity from the drop-down list. - Band: Select the band from the drop-down list. - Local Frequency(MHz): Select the local frequency from the drop-down list. - Skew Offset(°): Enter the skew offset. - Inclined Search: Set the inclined search. - Inclined Angle: Enter the inclined angle value. - Primary Information: Set primary tracking information. - Verify Type: Select verify type (AGC Only, DVB Lock, DVB Decode or DSS Decode) from the drop-down list. - NID: Enter the network ID for the frequency. - Frequency(MHz): Enter the tracking frequency of the satellite. Click the Apply button to apply the settings to the system.

10.8.4 Satellite Preset

ACU Upgrade
F/W Upgrade
Library
Satellite Preset
Backup & Restore
Reset
Logs
Diagnostic

2

APAC

3

Add Set

4

KOREA_6 116.00 (E)

Satellite Name	Longitude	Skew Offset	Inclined Search	Band												
KOREA_6	116.00 (E)	-12	Off	Ku												
<table border="1"> <thead> <tr> <th colspan="2">Ku</th> <th colspan="2">C</th> </tr> <tr> <th>Polarity</th> <th>Local Frequency(MHz)</th> <th>Polarity</th> <th>Local Frequency(MHz)</th> </tr> </thead> <tbody> <tr> <td>HL</td> <td>10,750</td> <td>HL</td> <td>5,150</td> </tr> </tbody> </table>					Ku		C		Polarity	Local Frequency(MHz)	Polarity	Local Frequency(MHz)	HL	10,750	HL	5,150
Ku		C														
Polarity	Local Frequency(MHz)	Polarity	Local Frequency(MHz)													
HL	10,750	HL	5,150													
<table border="1"> <thead> <tr> <th colspan="4">Primary</th> </tr> <tr> <th>Verify Type</th> <th>NID</th> <th>Frequency</th> <th>Symbol(kSps)</th> </tr> </thead> <tbody> <tr> <td>DVB Decode</td> <td>0x00AD</td> <td>12290</td> <td>29500</td> </tr> </tbody> </table>					Primary				Verify Type	NID	Frequency	Symbol(kSps)	DVB Decode	0x00AD	12290	29500
Primary																
Verify Type	NID	Frequency	Symbol(kSps)													
DVB Decode	0x00AD	12290	29500													
<table border="1"> <thead> <tr> <th colspan="4">Secondary</th> </tr> <tr> <th>Verify Type</th> <th>NID</th> <th>Frequency</th> <th>Symbol(kSps)</th> </tr> </thead> <tbody> <tr> <td>DVB Decode</td> <td>0x00AD</td> <td>12330</td> <td>29500</td> </tr> </tbody> </table>					Secondary				Verify Type	NID	Frequency	Symbol(kSps)	DVB Decode	0x00AD	12330	29500
Secondary																
Verify Type	NID	Frequency	Symbol(kSps)													
DVB Decode	0x00AD	12330	29500													

Edit Satellite Select From Library

KOREA_5 113.00 (E)

MEASAT_M 91.50 (E)

SES_8_12 95.00 (E)

CHINASE 115.50 (E)

Change Preset Name

Delete Preset

Satellite Set

name

Satellite List

+

+

+

+

+

Cancel

Create

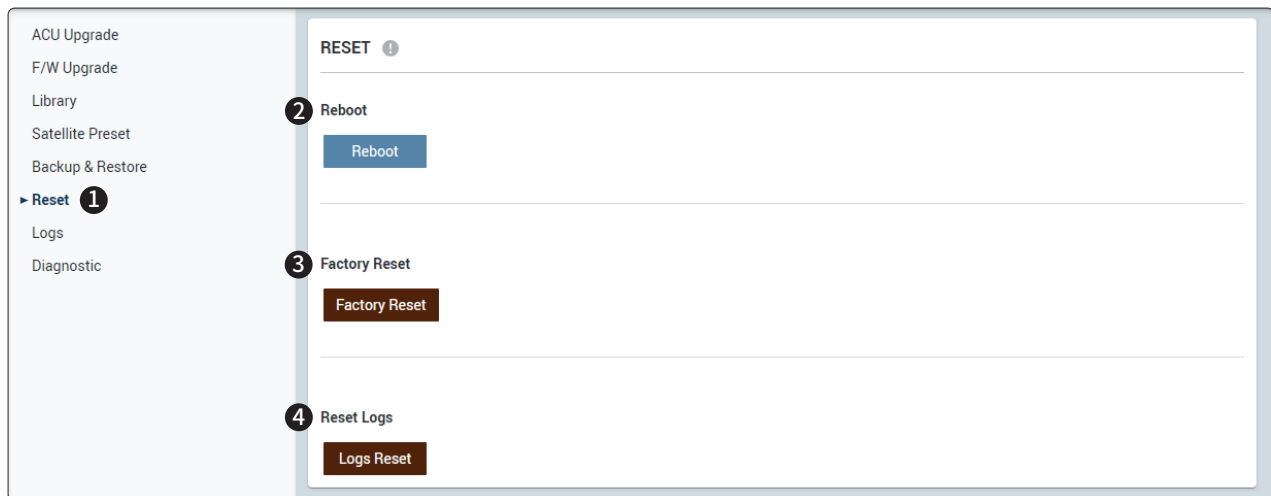
No.	Item	Description
①	Satellite Preset	Satellite Preset Menus.
②	Satellite Preset list	Select a registered satellite preset from the drop-down list. You can change a preset list name. Click Change Preset Name and change it.
③	Satellite Set	Create the satellite preset from the library. Click the Add Set button. - name: Enter a preset list name. - Satellite List: Add a satellite from the library. Click the  button and select the satellite. Click the Create button to register the preset list.
④	Satellite	Display current preset satellites. You can edit satellite information or prest list. - Edit Satellite: Edit detailed satellite information. - Select from Library: Edit the current preset list by selecting a new satellite from the library. - Delete Preset: Delete current preset list. - Change Preset Name: Change the name of the current preset list.

10.8.5 Backup & Restore

The screenshot shows the 'Backup & Restore' web interface. On the left, a sidebar menu lists various system functions, with 'Backup & Restore' selected and marked with a circled '1'. The main content area is titled 'BACKUP & RESTORE'. It is divided into two main sections. The first section, 'ACU Backup & Restore' (marked with a circled '2'), includes a 'Backup' button and an 'ACU Restore' section with a 'Browse' button and a 'Restore' button. The second section, 'Antenna Backup & Restore' (marked with a circled '3'), includes a 'Backup' button and an 'Antenna Restore' section with a 'Browse' button and a 'Restore' button.

No.	Item	Description
①	Backup and Restore	Backs up user configuration files to PC and Restores the ACU/Antenna settings.
②	ACU Backup & Restore	Backs up or restores ACU setting. - ACU Backup: Stores user Host configuration files on your PC. Click the Backup button to store the ACU configuration on your PC. - ACU Restore: Restores the ACU 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 Restore button to restore the ACU setting.
③	Antenna Backup & Restore	Backs up or restores antenna settings. - 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 setting by 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.

10.8.6 Reset



No.	Item	Description
①	Reset	Resets the antenna system, settings and logs.
②	Reboot	Click the Reboot button to reboot the antenna system. The user configuration is not reinitialized.
③	Factory Reset	Click the Factory Reset button to initialize the antenna system. The user configuration is initialized.
④	Reset Logs	Click the Logs Reset button to initialize all logs. The antenna system and logs are cleared.

10.8.7 Logs

ACU Upgrade
F/W Upgrade
Library
Satellite Preset
Backup & Restore
Reset
Logs ①
Diagnostic

LOGS ⓘ

2 Log Download

From
10/7/2022

To
10/7/2022

☒ Include Antenna Backup

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).

10.8.8 Diagnostic

ACU Upgrade
F/W Upgrade
Library
Satellite Preset
Backup & Restore
Reset
Logs
► Diagnostic ①

DIAGNOSTIC

② Diagnostic

☐ Test

Status

Result

☒ Ant. Communication

-

☒ Az Motor

-

☒ El Motor

-

☒ Cl Motor

-

☒ Skew

-

☒ Sensor

-

☒ LNB

-

☒ Antenna Power

-

☒ ACU Power

-

☒ C Polarity

-

☒ Ku Polarity

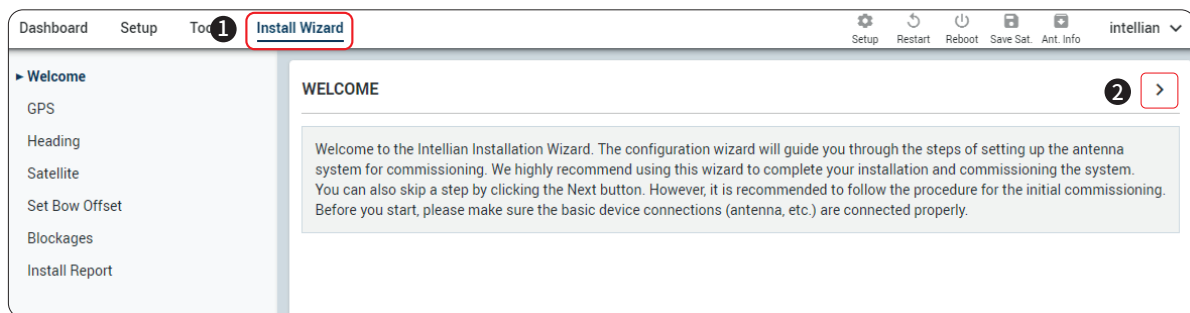
-

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.

10.9 Install Wizard

Refer to “8.3 Starting Install Wizard” on page 98 for information about running the wizard.



Chapter 11. Warranty

Warranty Policy

Intellian systems are warranted against defects in parts and workmanship, these warranties cover THREE (3) YEAR of parts and TWO (2) YEAR of factory repair labor to return the system to its original operational specification.

Warranty periods commence from the date of shipment from Intellian facility or date of installation, whichever is sooner. The warranty provides a maximum of 6 months additional coverage if submission of an authorized form that describes installation occurs within 6 months from the shipment date.

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

Chapter 12. Specification

12.1 Antenna Specification

Item		
Antenna Radome Height		4360 mm (171.5")
Antenna Radome Diameter		Ø4270 mm (168")
Antenna Reflector Diameter		Ø4000 mm (157.5")
Antenna Unit Weight		525 kg (1,157.4 lbs)
Radome Weight		455 kg (1,003.1 lbs)
Total Weight		980 kg (2,160.5 lbs)
Platform		3-axis: Azimuth, Elevation, Cross-level
Positioning		3-axis position mode PID Control: Azimuth, Elevation, Cross-Level
Pedestal Motion Range	Azimuth	Unlimited
	Elevation	-10° to +115°
	Cross-Level	Up to ±25°
Stabilization Accuracy		0.2° max in presence of specified ship motions
Ship Motions	Roll	±15° at 8-12 second
	Pitch	±10° at 8-12 second
	Yaw	±8° at 15-20 second
	Turning Rate	Up to 12 deg/sec and 15 deg/sec
Motor	Azimuth	Brushless DC motor with Encoder embedded
	Elevation, Cross-level	Brushless DC motor with Break embedded
Sensor		3 axis Gyro-Rate Sensor, 3 axis Acceleration IMU Sensor (Fixed Sensor)

12.2 RF Specification

Item		
C-Band	Rx Frequency	3.7 GHz ~ 4.2 GHz
	Rx Gain	> 41.7 dBi @ 4.2 GHz (excl/ Radome)
	Minimum EIRP	28.5dBW
	Cross-pol Isolation	Circular : >17dB, Linear : >25dB
	Polarization	Circular & Linear (Auto switching)
Ku-Band	Rx Frequency	10.7 GHz ~ 12.75 GHz
	Rx Gain	> 49.6 dBi @ 12.5 GHz (excl/ Radome)
	Minimum EIRP	32 ~ 33dBW
	Cross-pol Isolation	Circular : >17dB, Linear : >25dB
	Polarization	Circular & Linear (Auto switching)

12.3 Below Deck Unit (BDU) Specification

Below Deck Unit	
Antenna Control Unit	
ACU Size	431 mm x 350 mm x 44.3 mm (17.0" x 13.8" x 1.7")
ACU Weight	<4.8 kg (10.6 lbs)
Display	256 x 64 Graphic OLED
Key	Two Push Keys
LED Indicator	Three LEDs for Power, Tracking and Error
USB Port	Two Ports at front panel and One for WiFi dongle at rear panel
Ship's Gyrocompass Interface	NMEA 2000, NMEA 0183
GPS Interface	GPS IN/OUT
Ethernet port	One Management Port at front panel and One External Port at rear panel
Input power	100-240 VAC, 50/60 Hz, 3.3 A
Fiber Link Module	
Size	431 mm x 380 mm x 44.3 mm (17.0" x 15.0" x 1.7")
Weight	<5.0 kg (11.0 lbs)
LED Indicator	Three LEDs for Power, LD and PD
Connector Typ.	One SC/APC Fiber port, Five F-Typ. RF port
Input power	100-240 VAC, 50/60 Hz, 3.3 A

12.4 Environmental Specification

Test	Intellian Standard	
Temperature (ADU)	Operational	IEC-60945 (-25° C to +55° C, Power On)
	Survival	IEC-60945 (-40° C to +80° C, Powered On and a non-functional state)
	Storage	IEC-60945 (-40° C to +85° C, Power off)
Temperature (ACU)	Operational	IEC-60945 (-15° C to +55° C)
	Survival	IEC-60945 (-25° C to +70° C)
	Storage	IEC-60945 (-40° C to +85° C)
Wind	56 m/sec (125 mph)	
Humidity	IEC-60068-2-30 Upper Test Temp: +40° C (-3), Humidity 98% Lower Test Temp.: +15° C (+3), Humidity 71% ~ 78%	
Vibration	Operational	IEC-60945, Method: IEC60068-2-6 Freq.: 5 to 13.2 Hz/1mm 13.2 to 100 Hz/0.7g Sweep rate 0.5 Oct/min
	Survival	IEC-60721-3-6 Class 6M3, Method: IEC 60068-2-6 Freq.: 4 to 18 Hz/1.5mm 18 to 200 Hz/2g Sweep rate 1 Oct/min
Shock	Operational	IEC-60721-2-27 2 g/20 ms, 4 g/20 ms, 10 g/11 ms, 20 g/7 ms ±X, ±Y, ±Z each Axis 3 Times
	Survival	IEC-60721-3-6 Class 6M3 10 g/11 ms, 30 g/6 ms, 50 g/3 ms ±X, ±Y, ±Z each Axis 3 Times
	Bump	IEC-60721-3-6 Class 6M3 25 g/6 ms ±X, ±Y, ±Z each Axis 100 Times
Salt Mist	Saline solution : 5 ±1 % NaCl Storage period: 7 Days (IEC-60945)	
Waterproofing	IPX5	
Solar	1,120W per square meter, 55° Celsius	

Chapter 13. Warranty

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

Chapter 14. Appendix

14.1 Appendix A. Tightening Torque Specification

This table shows the recommended values of tightening torques.

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

14.2 Appendix B. Coaxial Cable connection (Optional)

14.2.1 Coaxial Connection Configuration

The system also connected using a coaxial cable. Connect the cables as shown in the configuration below.

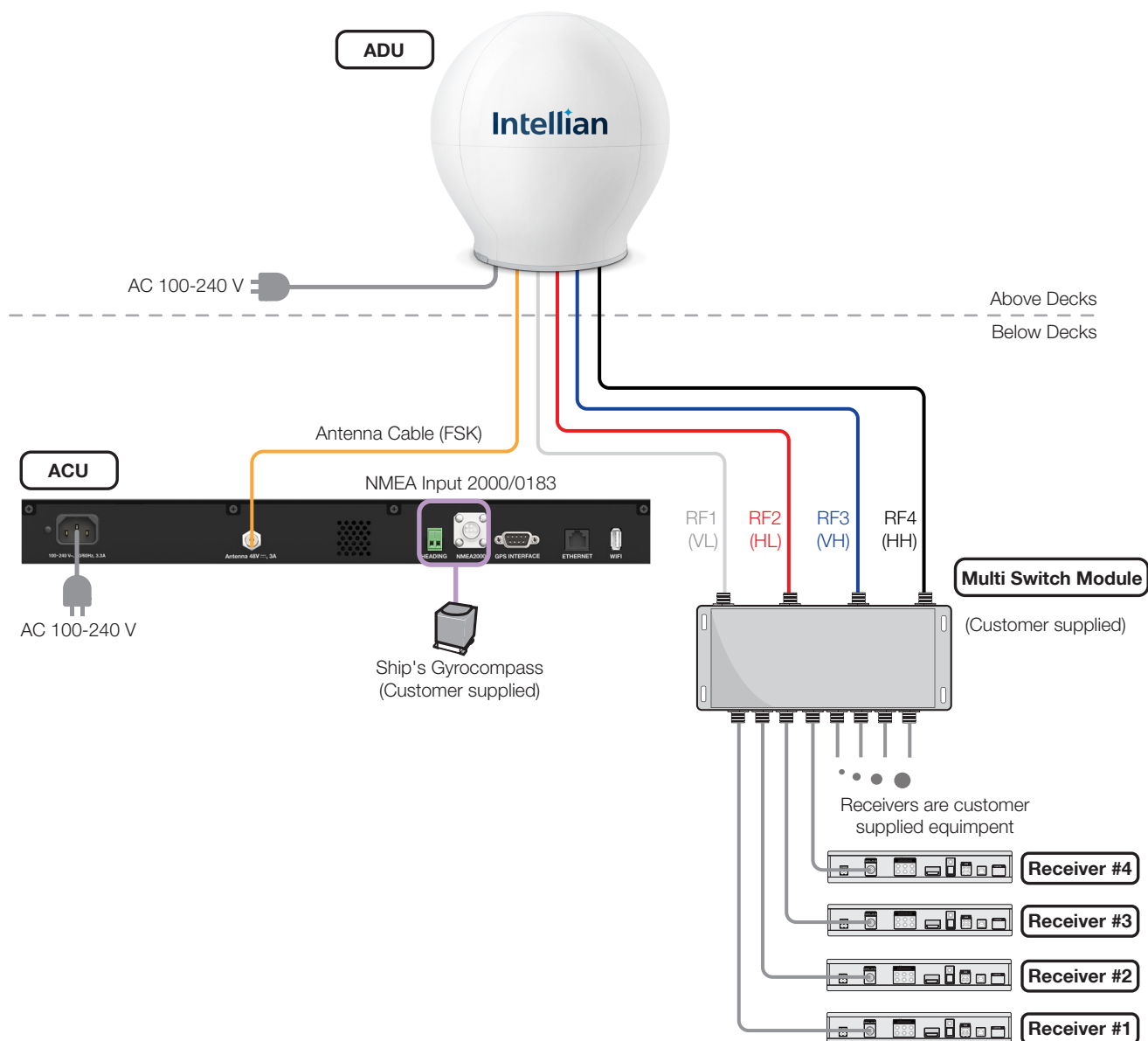


Figure 78: Coaxial Connection Configuration

14.2.2 Dual Coaxial Connection Configuration

The system also connected using a coaxial cable. Connect the cables as shown in the configuration below.

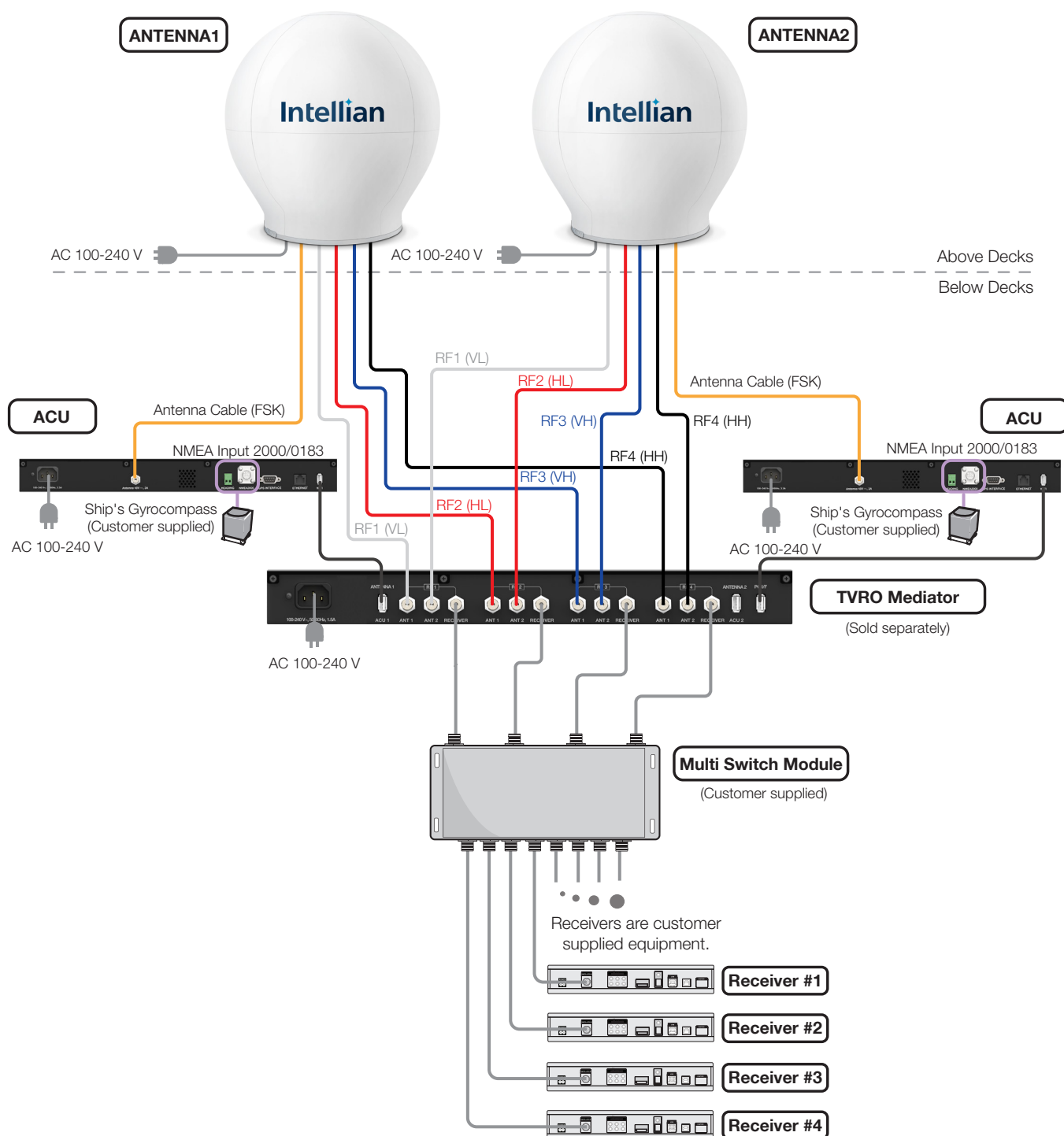


Figure 79: Dual Coaxial Connection Configuration

14.3 Appendix C. Glossary

Term	Meaning
ACU	Antenna Control Unit
ADE	Above Decks Equipment
ADU	Above Deck Unit
AIU	ATC/LTE Interface Unit
APC	Angled Physical Contact
ATA	Analog Telephone Adapter
ATC	Ancillary Terrestrial Component (rejection circuit)
AZ	Azimuth
BAT	BGAN Application Tester
BDE	Below Decks Equipment
BDU	Below Deck Unit
BGAN	Broadband Global Network
BMCP	BGAN Multi Channel Physical (layer tester)
BRM	BGAN Radio Module
BUC	Block UP Converter
CL	Cross Level
DDC	Dual Data Center
DVB	Digital Video Broadcasting
EIRP	Equivalent Isotropic Radiated Power
EL	Elevation
EoC	Ethernet over Coaxial
FB	Fleet Broadband
FC	Fiber Channel
FCC	Federal Communications Commission
FEM	Front End Module
GEO	Geostationary Earth Orbit
GND	Ground
GNSS	Global Navigation Satellite System
GPIO	General Purpose Input/Output
GPS	Global Positioning System
GUI	Graphic User Interface
IF	Intermediate Frequency
IFL	Interfacility Link
LEO	Low-Earth Orbit
LNB	Low Noise Block (downconverter)
LTE	Long-Term Evolution (rejection circuit)
M&C	Monitor and Control
MA	Micro-Antenna
MCU	Main Control Unit
MEO	Medium Earth Orbit
NBD	Narrow Band Detector

Term	Meaning
NID	Network ID
NMEA	National Marine Electronics Association
NOC	Network Operation Center
PBX	Private Branch Exchange
PC	Personal Computer
POTS	Plain Old Telephone Service
RF	Radio Frequency
R-USIM	Remote USIM
SDC	Single Data Center
SDK	Software Development Kit
SNMP	Simple Network Management Protocol
SNR	Signal to Noise Ratio
TFT	Tack Free Time
TVRO	Television Receive Only
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
VSAT	Very Small Aperture Terminal