Intellian

v240MT

Multi-band Antenna System

Installation and Operation User Guide

Global Leader in Marine Satellite Antenna Systems

Serial number of the product

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

Intellian

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Disclaimer

The information in this user guide is subject to change without prior notice through a product life cycle. A printed version of the user guide is periodically updated and may contain inaccuracies or omissions compared to the recent product information. The most up-to-date information can be readily accessible on a supplied USB memory stick or on our website at http://www.Intelliantech.com.

Doc. No. UM-S2-180608-V1.0

Precautions

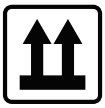
Warnings, Cautions, and Notes

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

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

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 noting the direction of the arrow.
	**FRAGILE** • Since the Radome is fragile, handle it with care. Do not apply excessive pressure or shock. These may cause surface cracking or other damage.
	**DO NOT STACK** • Do not stack boxes/crates as there is a risk boxes/crates may fall.
	**KEEP DRY** • Always make sure the antenna is stored on a dried floor. • The antenna can withstand ordinary rain. However, its water resistance cannot be guaranteed if submerged. • Keep the antenna in a cool, dry place with sufficient ventilation. Do not store it outside with a tarp, tent, etc.

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Certifications

FCC Declaration of Conformity

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

FCC §25.221 defines the provisions for blanket licensing of ESV antennas operation in the C-band. It defines the antennas radiation, and each article regulates the followings;

§25.221 (a)(1)(i)(A): Regulation for Azimuth Direction & Co Polarization
§25.221 (a)(1)(i)(B): Regulation for Other Direction & Co Polarization
§25.221 (a)(1)(i)(C): Regulation for Cross Polarization

FCC §25.222 defines the provisions for blanket licensing of ESV antennas operation in the Ku-band. It defines the antennas radiation, and each article regulates the followings;

§25.222 (a)(1)(i)(A): Regulation for Azimuth Direction & Co Polarization
§25.222 (a)(1)(i)(B): Regulation for Other Direction & Co Polarization
§25.222 (a)(1)(i)(C): Regulation for Cross Polarization

FCC §25.222 defines the provisions for blanket licensing of ESV antennas operation in the Ka-band. It defines the antennas radiation, and each article regulates the followings;

§25.222 (a)(1)(i)(A): Regulation for Azimuth Direction & Co Polarization
§25.222 (a)(1)(i)(B): Regulation for Other Direction & Co Polarization
§25.222 (a)(1)(i)(C): Regulation for Cross Polarization

Intellian Technologies, Inc. declares that v240MT complies with the threshold level as defined in §25.221(a)(1)(i)(A):/ §25.222(a)(1)(i)(A):/ §25.222(a)(1)(i)(A), and declares that v240MT is in accordance with all defined regulations from §25.221(a)(1)(i)(B) to §25.221(a)(1)(i)(C) / from §25.222(a)(1)(i)(B) to §25.222(a)(1)(i)(C) / from §25.222(a)(1)(i)(B) to §25.222(a)(1)(i)(C) at the below stated input power spectral density, with an N value of 1.

Product description	Intellian v240MT, 2.4m Multi-band maritime VSAT antenna system
EIRP spectral density limit	C-band: -6.08 dBW/ 4kHz
	Ku-band: -13.69 dBW/ 4kHz
	Ka-band: +2.28 dBW/ MHz

Intellian Technologies, Inc. declares that the above antenna will maintain a pointing error of less than or equal to 0.2 degree under specified ship motion conditions in accordance with the requirements of §25.221 (a)(1)(ii) / §25.222 (a)(1)(ii).

Intellian Technologies, Inc. declares that the above antennas will automatically cease the transmission with a mute command to the modem within 100 milliseconds if the target satellite and the axis of the main lobe of the ESV antenna exceeds 0.5 degree and will not resume until such angle is less than or equal to 0.2 degree in accordance with the requirements of §25.221 (a)(1)(iii) / §25.222 (a)(1)(iii).

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

Authority: **Steve Cha**
Vice President, Research & Development

Signature: 

Date: April 4, 2018

Introduction

Intellian v240MT Introduction

Intellian v240MT Features

Intellian v240MT Introduction

The Intellian Multiband v240MT antenna is a stabilized 2.4m maritime VSAT antenna system designed to be deployed for a wide range of maritime and semi-fixed applications such as on shipping vessels, oil rigs, and cruise liners etc. The Multiband system is capable of operating in one of the two following modes via the motorized feed assembly and choice of external modems;

- C/Ku/Ka Tri-band MEO/GEO
- Ku/Ka Dual-band MEO/GEO

The change of the frequency band of operation with the same 2.4m reflector is done electronically via configuration control or by the operators using the user-friendly GUI at the Below Deck Unit(BDU) Web Interface.

The 2.4m Multiband reflector and its radome are optimized and tuned for Ka-band operation and hence the MEO network it can provide economical, high-speed and low latency Internet access, IP trunking, and mobile backhaul to a wide customer base(telcos, businesses, maritime service providers, government entities, and small businesses).

The v240MT requires minimal involvement to commission. It is easy to operate and also simple to upgrade and manage. Each unit comes preloaded with a ready-to-use, customizable satellite library that can be conveniently tailored via Aptus®, Intellian's remote antenna control software. The Wi-Fi enabled ACU provides easy connection to and control of the antenna, simplifying routine processes, such as firmware updates, routine maintenance and diagnostics.

Robust and versatile, the v240MT marks a new era for VSAT connectivity on the open water for deep sea vessels that require global coverage.

Intellian v240MT Features

Automatic Frequency Band Switching
The Multiband Antenna automatically changes between C-band, Ku-band and Ka-band operations since it does not require any manual or physical changes to the antenna system. When a target satellite or operational frequency is selected from the ACU or the Aptus® program, the patented band changing assembly is automatically adjusted.

MEO/GEO tracking
For GEO satellite tracking the Multiband antenna will derive automatically the azimuth and elevation angle to point to the wanted satellite via program pointing, and then followed by continuous tracking of the satellite using the conical scanning method.
For MEO satellite tracking method in the Ka-Band, the individual antenna will follow the Schedule and Frequency plans over the broadcast channel using ephemeris data of the satellite constellation. The antenna continuously tracks MEO satellite for the entire contact time as defined by ephemeris data.

RF Switch Enabled Intelligent Mediator
The Intelligent Mediator allows the user to install either one single satellite modem for C-band, Ku-band and Ka-band or separate modems to support each frequency band. When operating in a network that offers intelligent beam switching, a single modem may be used. When the user requires the enhanced features of a more specialized modem, then the Intelligent Mediator manages this, removing the need to swap cables onboard.

Wireless Communication with the ACU
The v240MT's ACU offers upgraded functions. The built-in wireless network card enables the ACU to be wirelessly connected and can be activated or deactivated by a switch on the rear of the ACU. Once enabled, the antenna can be managed and controlled from any PC via the Aptus software.

Antenna Data Log and Firmware Upgrade through USB
The v240MT ACU now automatically stores all function data onto a built-in memory. All existing logs are stored in the built-in memory for six months of the period and can be transferred onto USB drives. In addition, the ACU firmware can be automatically updated and upgraded by plugging in a USB drive which contains the firmware update files.

Dual Data Center(DDC) system
The Dual Data Center (DDC) system provides the interface(IFL Switch) that supports the selective connection between one antenna(ADE) and two data centers(BDE).
When one of the data centers fails due to unfavorable environmental conditions, power outages, technical issues or blocked by obstacles, the DDC system can be easily switched to the other data center by using the Intelligent Mediator to maintain the antenna operation and the network continuously.

Maximized RF Performance
The main reflector, Feed-horn and other RF parts are newly designed to maximize the antenna performance for maritime applications. With the highest level of gain and Maximum Allowed EIRP Density amongst the similar-sized VSAT antenna systems, the Intellian v240MT also conforms to various ESV (Earth-Station-on Vessels) standards and FCC requirements.

Easy Installation, Setup and Operation
The v240M installation and setup are easier than ever before through the fiber optic integrated system. Once a satellite's peak signal position is acquired during initial setup, the unit automatically readjusts accordingly every time it boots (bow, home sensor offset, azimuth and elevation position), saving you huge amounts of time and effort.

Optimized Antenna Radome
The v240MT is available in 154" or 168" radome. Both radomes are able to get the maximum performance in operation and meet the antenna performance across the multi-bands, i.e. C, Ku, and Ka.

Future Proof Satellite Network
With the v240MT, end-users and service providers will enjoy greater flexibility of space segment selection, allowing them access to greater data rates, lower cost space segment, better performance, and enhanced regulatory compliance, now and into the future.

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Installation Kit (for 154" radome antenna)

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System Package

Antenna Unit

The v240MT antenna is composed of the following components:

- Mechanical Unit – manipulates the antenna to provide optimal satellite tracking.
- Control Unit – controls mechanical operation of the antenna.
- RF Unit – transmits the optimum satellite signal to the modem.
- Radome – protects the antenna from the severe marine environment. The v240MT provide two Radome types(168" and 154" Radome).

v240MT Antenna Unit with 168" Radome

v240MT Antenna Unit with 154" Radome

Antenna Control Unit (ACU)

The Antenna Control Unit (ACU) controls the various settings of the antenna. The functions of the ACU are as follows:

- Monitors the antenna status.
- Changes the target satellite.
- Sets up the user environment.
- Sets the current GPS information.
- Sets satellite information.
- Moves the antenna manually
- Built-in real-time diagnostics function and event log recorder
- Sets up the interface with a PC.
- Supports Wi-Fi operation.
- Logs data and firmware upgrade through USB
- Built-in web-based remote control management

Antenna Control Unit (ACU)

Intelligent Mediator Unit

The Intelligent Mediator provides various functions as followings:

- RF Switch Enabled Modem Mediator
- Redundant Modem Support
- Simple and Easy Installation
- Support Various Modem Interfaces
- Intellian Network Device Monitoring
- Automatic Switchover Between 3 VSAT Antenna Systems
- Redundant Antenna Systems

Intelligent Mediator Unit

Installation Kit (for 168" radome antenna)

Before beginning installation, make sure you have all the included components. Each component consists of three(3) pallets as the table below.

Antenna Package (Pallet 1) (Size: W x D x H : 2715mm x 2295mm x 2225mm)			
Pedestal			
Description	Q'ty	Size	Remarks
VSAT 2.4m Pedestal	1		Pedestal Unit
EL Support Frame			
Description	Q'ty	Size	Remarks
EL Support Frame	1		
Antenna Control Unit(ACU) box			
Description	Q'ty	Size	Remarks
Antenna Control Unit(ACU)	1	43.1 x 38 x 4.4cm	Antenna Control Unit(ACU)
Wifi Antenna	1	110mm	
ACU Side Bracket (Rack)	2		ACU to 19inch Rack
ACU Side Bracket (Table)	2		ACU to Table
USB Cable (A-A)	1	1.8m	ACU(Front Panel) to PC
D-Sub 9 pin Male Connector	2		For ACU-Modem Interface-Console port
N(M) to F(F) Adaptor	1		
USB Flash Drive	1		
Antenna User Guide	1		For Antenna and ACU unit
RF Hazard Sticker	1		Radiation Safety Distance Label (40m)
Self-Tapping Screw	5	M4x16L	Bolt Kit for Table Mount Bracket
Sems Bolt	5	M3x12L	
Flat Head Screw	10	M4x12L	Bolt Kit for Rack Mount Bracket
Fiber Link box (Optional: In case of purchasing Dual Data Center System, 2 Fiber Link Boxes are provided.)			
Description	Q'ty	Size	Remarks
AC Power Cord (CEEE7/7)	1	1.5m	ACU Power (220V)
AC Power Cord (USA)	1	1.5m	ACU Power (110V)
RG6 Cable (RF Cable)	1	3m	ACU to Mediator
PC Serial Cable	1	1.8m	ACU to PC
Modem Interface Cable (For iDirect Modem)	1	1.5m	ACU(RS232&RS422) to Modem(iDirect Modem)
Modem Interface Cable (For Comtech Modem_DB-9 pin Male)	1	1.5m	ACU(Console) to Modem(Comtech Modem)
Ethernet Cable (RJ45 / LAN)	1	1.5m	ACU to PC/Intellian M&C
N(M) to N(M) Cable	1	1.3m	
SMA(M) to SMA(M) Cable	1	1.3m	ACU to Mediator
N(M) to SMA(F)	1		For ACU
SMA(F) to F(M)	1		For ACU
Fiber Link Module	1	27 x 17 x 3.6cm	Fiber Link Module
Fiber Link Bracket	1		Fiber Link to Table

Sems Bolt	5	M4x8L	Bolt Kit for Fiber Link Mount Bracket
Sems Bolt	3	M4x12L	
Wrench Bolt	5	M5x15L	Bolt Kit for Fiber Link A/C Frame Bracket
Flat Washer	10	M5	
Lock Nut	5	M5	
N(M) to N(M) Rx Cable	1	1.8m	Fiber Link Module to Rotary Joint
N(M) to N(M) Tx Cable	1	1.8m	
IFL Switch(VMT-1203) box (Optional: Only case of purchasing Dual Data Center System, this box is provided.)			
Description	Q'ty	Size	Remarks
IFL Switch Module	1	27 x 17 x 3.6cm	IFL Switch Module
Sems Bolt	10	M4x8L	
Sems Bolt	3	M4x12L	
Wrench Bolt	5	M5x15L	Bolt Kit for Fiber Link A/C Frame Bracket
Flat Washer	10	M5	
Lock Nut	5	M5	
N(M) to N(M) Cable	4	1.3m	IFL Switch to Fiber Link Module
Rope Box Components			
Description	Q'ty	Size	Remarks
Main Reflector Fixed Rope	1	5m	Fix to Antenna Assembly
EL Weight Plate Side R	2		Antenna Assembly
EL Weight Plate Side L	2		Antenna Assembly
C-Feeder Fixed Bar	1		Antenna Assembly
Module Joint Block	2		Antenna Assembly
Bolt Kit for Installation Box			
Description	Q'ty	Size	Remarks
Hex Bolt	4	M16x40	Bolt Kit for Stable Mount
Flat Washer	4	M16	
Spring Washer	4	M16	
Hex Bolt (BUMAX)	25	M12x60L	Bolt Kit for Antenna Mounting
Lock Washer	50	M12	
Nut (BUMAX)	25	M12	
Wrench Bolt	7	M10x40L	Bolt Kit for EL Support Bar
Flat Washer	7	M10	
Spring Washer	7	M10	
Wrench Bolt	10	M10x40L	Bolt Kit for EL Weight Plate
Flat Washer	10	M10	
Spring Washer	10	M10	
Wrench Bolt	28	M8x20L	Bolt Kit for EL Side Plate
Flat Washer	28	M8	
Spring Washer	28	M8	
Wrench Bolt	3	M8x70L	Bolt Kit for Reflector Support Pipe
Flat Washer	6	M8	
Spring Washer	3	M8	
Nut	3	M8	

Wrench Bolt	5	M6x20L	Bolt Kit for Reflector Square Support Bar
Flat Washer	5	M6	
Spring Washer	5	M6	
Wrench Bolt	2	M8x70L	
Flat Washer	2	M8	
Spring Washer	2	M8	
Weight CL 04 (1t)	10	PL1t x 70 x 42	Weight Kit for Antenna Balance Adjustment
Weight CL 03 (2t)	10	PL2t x 70 x 43	
Flat Washer	20	M5	
Spring Washer	20	M5	
Wrench Bolt	10	M5x12L	
Wrench Bolt	10	M5x15L	
Wrench Bolt	8	M6x20L	Bolt Kit for Triple/Dual Module
Flat Washer	8	M6	
Spring Washer	8	M6	
Wrench Bolt	6	M6x30L	Bolt Kit for Feed Horn Support
Flat Washer	6	M6	
Spring Washer	6	M6	
Wrench Bolt	4	M6x70L	
Flat Washer	8	M6	
Spring Washer	4	M6	
Nut	4	M6	
Wrench Bolt	3	M10x25L	Bolt Kit for Reflector Support Pipe
Flat Washer	3	M10	
Spring Washer	3	M10	
Stable Mount Jig	1		
Cable tie	30		
Loctite 262 or 263	1		
Module Support Frame	1		

Intelligent Mediator(M3-TB03) box

Description	Q'ty	Size	Remarks
Intelligent Mediator	1	43.1 x 38 x 8.8cm	2U Type Mediator Unit
Mediator User Guide	1		For Mediator Unit
Mediator Side Bracket (Rack)	2		Mediator to 19inch Rack
Mediator Side Bracket (Table)	2		Mediator to Table
Flat Head Screw	16	M4x12L	Bolt Kit for Rack Mount Bracket
Self-Tapping Screw	5	M4x16L	Bolt Kit for Table Mount Bracket
Sems Bolt	5	M3x12L	
SMA(M) to SMA(M) Cable	3	1.3m	Mediator to Modem(ACU)
N(M) to N(M) Cable	3	1.3m	Mediator to Modem(ACU)
N(M) to SMA(F) Adaptor	3		
Modem Interface Cable (For Comtech Modem_DB-9 pin Female)	2	1.5m	Mediator(RS232&Console:C-band, Ku-band) to Modem (Comtech Modem:C-band, Ku-band)
RG6 Cable (RF Cable)	4	3m	For RX/TX connection: Mediator to Modem(C-band, Ku-band)
PC Serial Cable	2	1.8m	For seriel modem & BUC interface

Ethernet Cable (RJ45 / LAN)	3	1.5m	ACU to PC/Intellian M&C
AC Power Cord (CEEE7/7)	1	1.5m	Mediator Power (220V)
AC Power Cord (USA)	1	1.5m	Mediator Power (110V)
USB Cable (A-A)	1	1.8m	Mediator to PC
D-Sub 9 pin Female Connector	2		For Mediator-Modem Interface

Upper Radome Package (Pallet 2) (Size: W x D x H : 2805mm x 2295mm x 2225mm)			
Radome			
Description	Q'ty	Size	Remarks
Top Radome_168inch	5		
Radome Cap	1		
Radome Base Frame Outside BKT_168inch	2		
Radome Base Frame Inside BKT_168inch	2		
Radome Kit for Installation Box			
Description	Q'ty	Size	Remarks
Silicon	3		
Silicon Gun	1		
Cable tie	10		
Radome Lift Kit for Installation Box			
Description	Q'ty	Size	Remarks
Radome Top Lift Bracket	3		
Radome Top Lift Bracket Plate_168inch	3		
Shackle(3/8")	4		
Lifting strap_4m	3	4m	
Radome Bolt Kit for Installation Box			
Description	Q'ty	Size	Remarks
Hex Bolt	44	M6x30L	Bolt Kit for Radome Base Assembly
Flat Washer	88	M6(Ø18)	
Spring Washer	44	M6	
Nut	88	M6	
Bolt Cap	44	M6	
Hex Bolt	220	M6x30L	Bolt Kit for Radome Assembly
Flat Washer	440	M6(Ø18)	
Spring Washer	220	M6	
Nut	220	M6	
Hex Bolt (BUMAX)	30	M12x50L	Bolt Kit for Base Frame Assembly
Flat Washer	60	M12	
Spring Washer	30	M12	
Nut	30	M12	

Hex Bolt (BUMAX)	14	M12x60L	Bolt Kit for Base FRP Assembly
Flat Washer (Ø38)	14	M12	
Flat Washer	14	M12	
Spring Washer	14	M12	
Nut	14	M12	
Hex Bolt (BUMAX)	14	M12x65L	Bolt Kit for Air-conditioner Frame Assembly
Lock Washer	28	M12	
Nut	14	M12	

Bottom Radome Package (Pallet 3)	**(Size: W x D x H : 3075mm x 2295mm x 2225mm)**		
Radome			
Description	Q'ty	Size	Remarks
Bottom Radome_168inch	4		
Bottom Radome_Hatch_168inch	1		
Assy_Side Hatch_168inch	1		
Radome Base Front_168inch	1		
Radome Base Rear_168inch	1		
Assy_Radome Base Hatch	2		
Radome Base Frame_Half	2		

Installation Kit (for 154" radome antenna)

Before beginning installation, make sure you have all the included components. Each component consists of three(3) pallets as the table below.

Antenna Package (Pallet 1) (Size: W x D x H : 2715mm x 2295mm x 2225mm)			
Pedestal			
Description	Q'ty	Size	Remarks
VSAT 2.4m Pedestal	1		Pedestal Unit
EL Support Frame			
Description	Q'ty	Size	Remarks
EL Support Frame	1		
Antenna Control Unit(ACU) box			
Description	Q'ty	Size	Remarks
Antenna Control Unit(ACU)	1	43.1 x 38 x 4.4cm	Antenna Control Unit(ACU)
Wifi Antenna	1	110mm	
ACU Side Bracket (Rack)	2		ACU to 19inch Rack
ACU Side Bracket (Table)	2		ACU to Table
USB Cable (A-A)	1	1.8m	ACU(Front Panel) to PC
D-Sub 9 pin Male Connector	2		For ACU-Modem Interface-Console port
N(M) to F(F) Adaptor	1		
USB Flash Drive	1		
Antenna User Guide	1		For Antenna and ACU unit
RF Hazard Sticker	1		Radiation Safety Distance Label (40m)
Self-Tapping Screw	5	M4x16L	Bolt Kit for Table Mount Bracket
Sems Bolt	5	M3x12L	
Flat Head Screw	10	M4x12L	Bolt Kit for Rack Mount Bracket
Fiber Link box (Optional: In case of purchasing Dual Data Center System, 2 Fiber Link Boxes are provided.)			
Description	Q'ty	Size	Remarks
AC Power Cord (CEEE7/7)	1	1.5m	ACU Power (220V)
AC Power Cord (USA)	1	1.5m	ACU Power (110V)
RG6 Cable (RF Cable)	1	3m	ACU to Mediator
PC Serial Cable	1	1.8m	ACU to PC
Modem Interface Cable (For iDirect Modem)	1	1.5m	ACU(RS232&RS422) to Modem(iDirect Modem)
Modem Interface Cable (For Comtech Modem_DB-9 pin Male)	1	1.5m	ACU(Console) to Modem(Comtech Modem)
Ethernet Cable (RJ45 / LAN)	1	1.5m	ACU to PC/Intellian M&C
N(M) to N(M) Cable	1	1.3m	
SMA(M) to SMA(M) Cable	1	1.3m	ACU to Mediator
N(M) to SMA(F)	1		For ACU
SMA(F) to F(M)	1		For ACU
Fiber Link Module	1	27 x 17 x 3.6cm	Fiber Link Module
Fiber Link Bracket	1		Fiber Link to Table
Sems Bolt	5	M4x8L	Bolt Kit for Fiber Link Mount Bracket
Sems Bolt	3	M4x12L	

Wrench Bolt	5	M5x15L	Bolt Kit for Fiber Link A/C Frame Bracket
Flat Washer	10	M5	
Lock Nut	5	M5	
N(M) to N(M) Rx Cable	1	1.8m	Fiber Link Module to Rotary Joint
N(M) to N(M) Tx Cable	1	1.8m	
IFL Switch(VMT-1203) box (Optional: Only case of purchasing Dual Data Center System, this box is provided.)			
Description	Q'ty	Size	Remarks
IFL Switch Module	1	27 x 17 x 3.6cm	IFL Switch Module
Sems Bolt	10	M4x8L	
Sems Bolt	3	M4x12L	
Wrench Bolt	5	M5x15L	Bolt Kit for Fiber Link A/C Frame Bracket
Flat Washer	10	M5	
Lock Nut	5	M5	
N(M) to N(M) Cable	4	1.3m	IFL Switch to Fiber Link Module
Rope Box Components			
Description	Q'ty	Size	Remarks
Main Reflector Fixed Rope	1	5m	Fix to Antenna Assembly
EL Weight Plate Side R	2		Antenna Assembly
EL Weight Plate Side L	2		Antenna Assembly
C-Feeder Fixed Bar	1		Antenna Assembly
Triple Module Joint Block	2		Antenna Assembly
Bolt Kit for Installation Box			
Description	Q'ty	Size	Remarks
Hex Bolt	4	M16x40	Bolt Kit for Stable Mount
Flat Washer	4	M16	
Spring Washer	4	M16	
Hex Bolt	250	M6x35L	Bolt for Radome Assembly
Flat Washer	500	M6(Ø18)	Washer & Nut for Radome & Radome Base Assembly
Spring Washer	250	M6	
Nut	250	M6	
Hex Bolt	10	M6x35L	Bolt Kit for Upper Radome Lift Bracket
Flat Washer	20	M6(Ø18)	
Spring Washer	10	M6	
Hex Bolt (BUMAX)	25	M12x60L	Bolt Kit for Antenna Mounting
Lock Washer	50	M12	
Nut (BUMAX)	25	M12	
Wrench Bolt	7	M10x40L	Bolt Kit for EL Support Bar
Flat Washer	7	M10	
Spring Washer	7	M10	
Wrench Bolt	10	M10x40L	Bolt Kit for EL Weight Plate
Flat Washer	10	M10	
Spring Washer	10	M10	
Wrench Bolt	28	M8x20L	Bolt Kit for EL Side Plate
Flat Washer	28	M8	
Spring Washer	28	M8	

Wrench Bolt	3	M8x70L	Bolt Kit for Reflector Support Pipe
Flat Washer	6	M8	
Spring Washer	3	M8	
Nut	3	M8	
Wrench Bolt	5	M6x20L	Bolt Kit for Reflector Square Support Bar
Flat Washer	5	M6	
Spring Washer	5	M6	
Wrench Bolt	2	M8x70L	
Flat Washer	2	M8	
Spring Washer	2	M8	
Wrench Bolt	8	M6x20L	Bolt Kit for Triple/Dual Module
Flat Washer	8	M6	
Spring Washer	8	M6	
Wrench Bolt	6	M6x30L	Bolt Kit for Feed Horn Support
Flat Washer	6	M6	
Spring Washer	6	M6	
Wrench Bolt	4	M6x70L	
Flat Washer	8	M6	
Spring Washer	4	M6	
Nut	4	M6	
Wrench Bolt	3	M10x25L	Bolt Kit for Reflector Support Pipe
Flat Washer	3	M10	
Spring Washer	3	M10	
Weight CL 04 (1t)	10	PL1t x 70 x 42	Weight Kit for Antenna Balance Adjustment
Weight CL 03 (2t)	10	PL2t x 70 x 43	
Flat Washer	20	M5	
Spring Washer	20	M5	
Wrench Bolt	10	M5x12L	
Wrench Bolt	10	M5x15L	
Radome Top Lift Bracket	4		
Radome Top Lift Bracket Plate	4		
Stable Mount Jig	1		
Silicon	3		
Silicon Gun	1		
Cable tie	30		
Loctite 262 or 263	1		
Triple Module Support Frame	1		

Intelligent Mediator(M3-TB03) box

Description	Q'ty	Size	Remarks
Intelligent Mediator	1	43.1 x 38 x 8.8cm	2U Type Mediator Unit
Mediator User Guide	1		For Mediator Unit
Mediator Side Bracket (Rack)	2		Mediator to 19inch Rack
Mediator Side Bracket (Table)	2		Mediator to Table
Flat Head Screw	16	M4x12L	Bolt Kit for Rack Mount Bracket
Self-Tapping Screw	5	M4x16L	Bolt Kit for Table Mount Bracket
Sems Bolt	5	M3x12L	

SMA(M) to SMA(M) Cable	3	1.3m	Mediator to Modem(ACU)
N(M) to N(M) Cable	3	1.3m	Mediator to Modem(ACU)
N(M) to SMA(F) Adaptor	3		
Modem Interface Cable (For Comtech Modem_DB-9 pin Female)	2	1.5m	Mediator(RS232&Console:C-band, Ku-band) to Modem (Comtech Modem:C-band, Ku-band)
RG6 Cable (RF Cable)	4	3m	For RX/TX connection: Mediator to Modem(C-band, Ku-band)
PC Serial Cable	2	1.8m	For seriel modem & BUC interface
Ethernet Cable (RJ45 / LAN)	3	1.5m	ACU to PC/Intellian M&C
AC Power Cord (CEEE7/7)	1	1.5m	Mediator Power (220V)
AC Power Cord (USA)	1	1.5m	Mediator Power (110V)
USB Cable (A-A)	1	1.8m	Mediator to PC
D-Sub 9 pin Female Connector	2		For Mediator-Modem Interface

Radome Package (Pallet 2) (Size: W x D x H : 3015mm x 2265mm x 2225mm)

Radome

Description	Q'ty	Size	Remarks
Top Radome_154inch	4		
Bottom Radome_154inch	3		
Cap Radome_154inch	1		
Bottom Radome_Hatch_168inch	1		
Assy_Side Hatch_168inch	1		

Frame Package (Pallet 3) (Size: W x D x H : 2515mm x 2265mm x 2225mm)

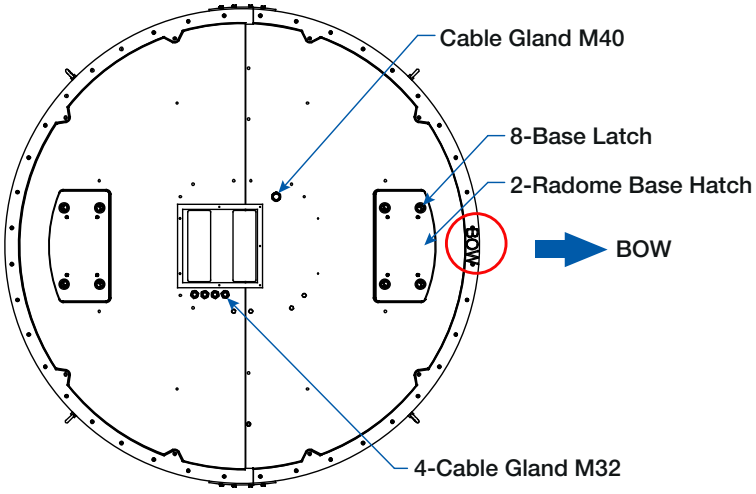
Radome Kit for Installation Box

Description	Q'ty	Size	Remarks
Base frame and air-conditioner frame	1		
Post	1		
Air conditioner (optional)	1		

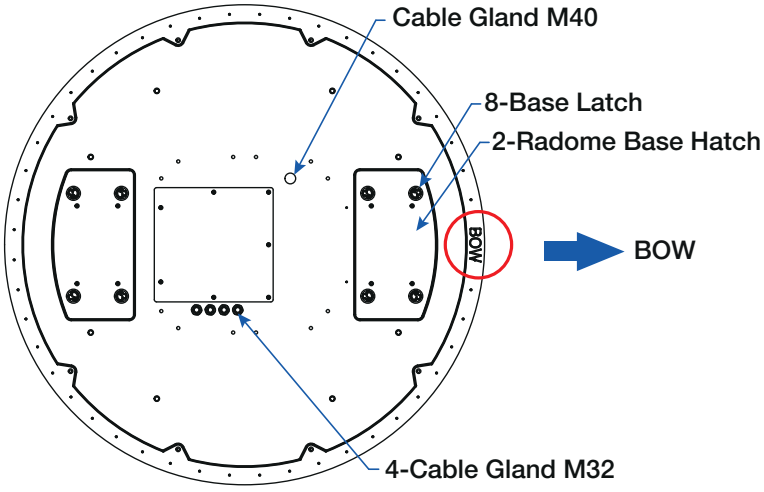
Antenna Specification

Heading Alignment

The radome assembly should be positioned with the BOW marker aligned as close as possible to the center line of the ship.



168" Radome Antenna Heading Alignment



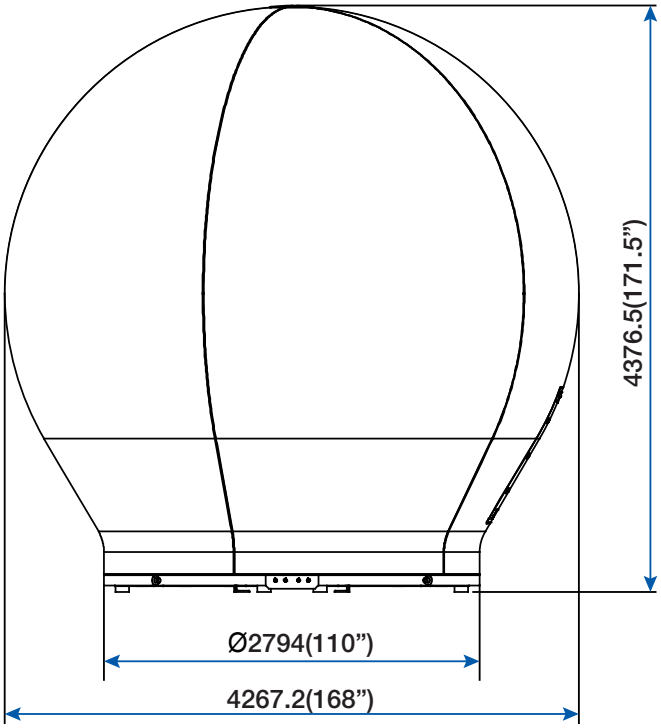
154" Radome Antenna Heading Alignment

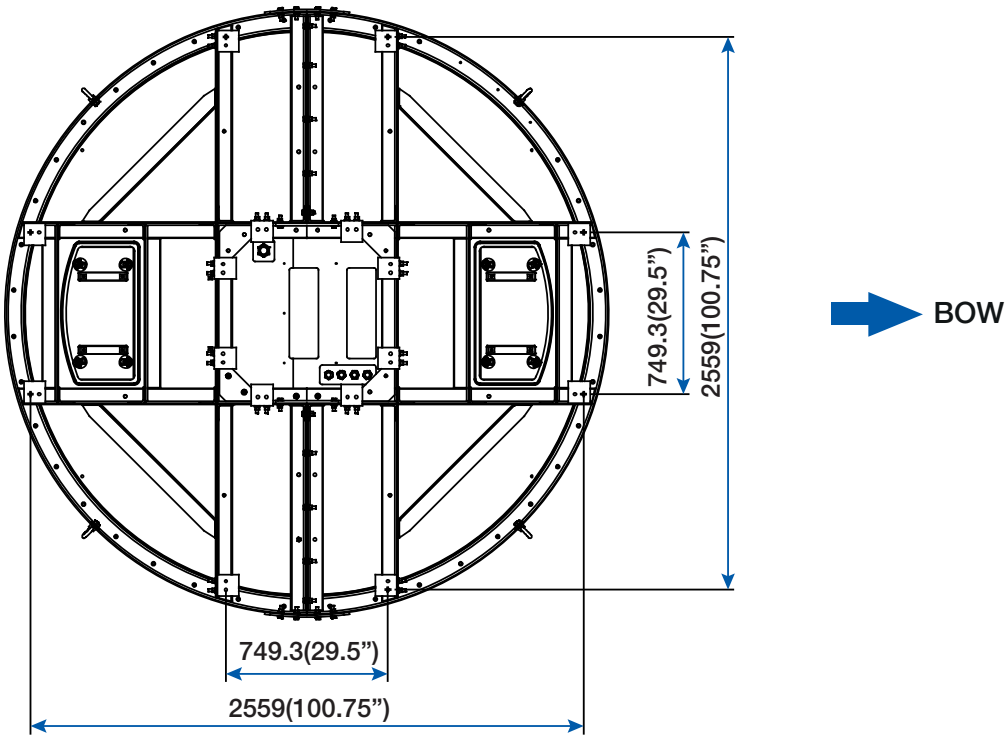
Radome Dimensions

Confirm the height and diameter of the bottom surface of the antenna unit before installing it. The mounting surface and overall space occupied by the antenna must be sufficient for the height and diameter of the fully constructed radome on top of its base frame.

The height and the diameter of the bottom surface of the antenna are as shown in the following drawing. It is strongly suggested that the installation is conducted using a crane.

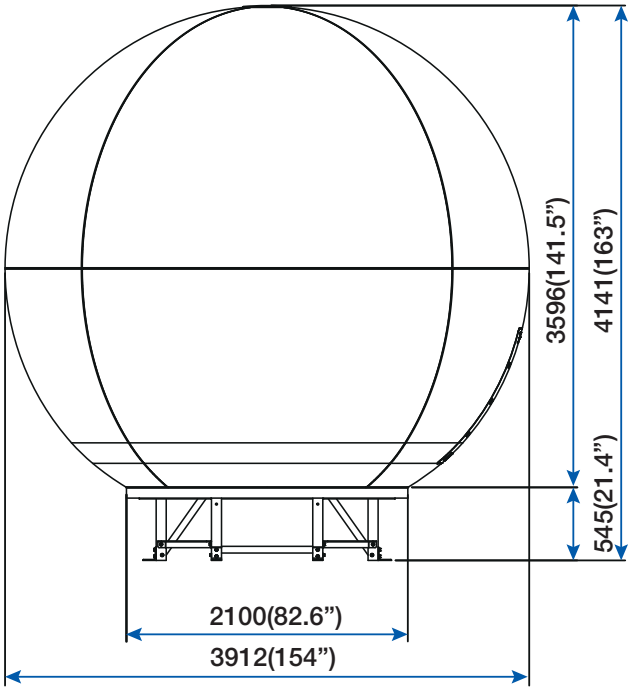
(Unit: mm)

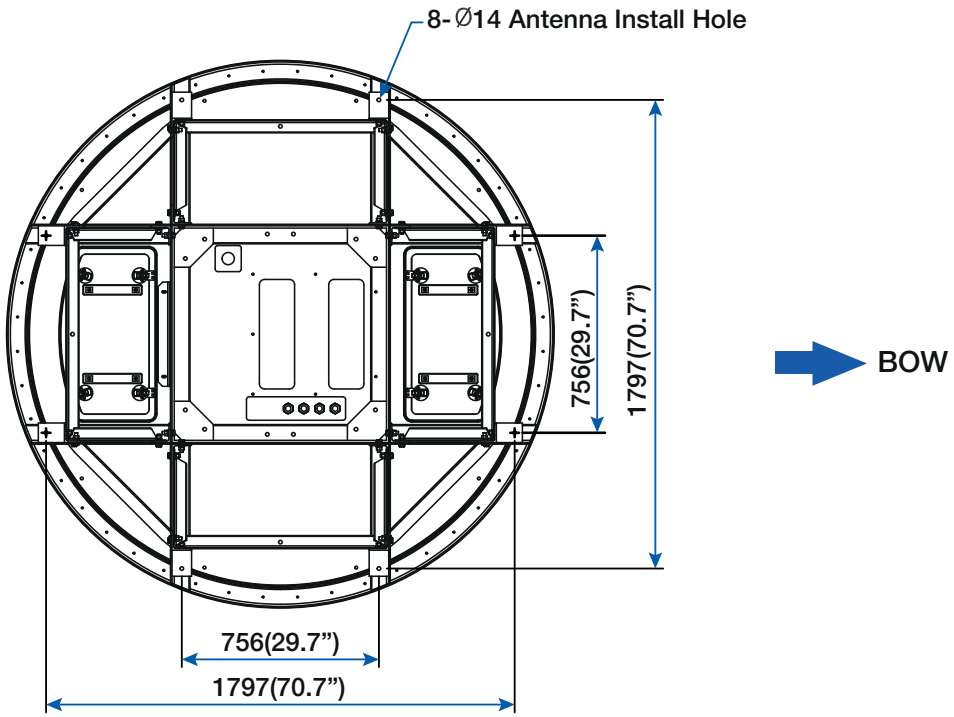




168" Radome Antenna Dimensions

(Unit: mm)





154" Radome Antenna Dimensions

Planning the Installation

The v240MT installation requires extreme precaution and safety measures given its size and weight. Failure to follow the correct installation process may lead to injury of the installer and/or cause damage to the system. In order to maximize the performance of the system, a thorough review of this installation guide is strongly recommended, as well as executing the installation process as it is noted in this manual.

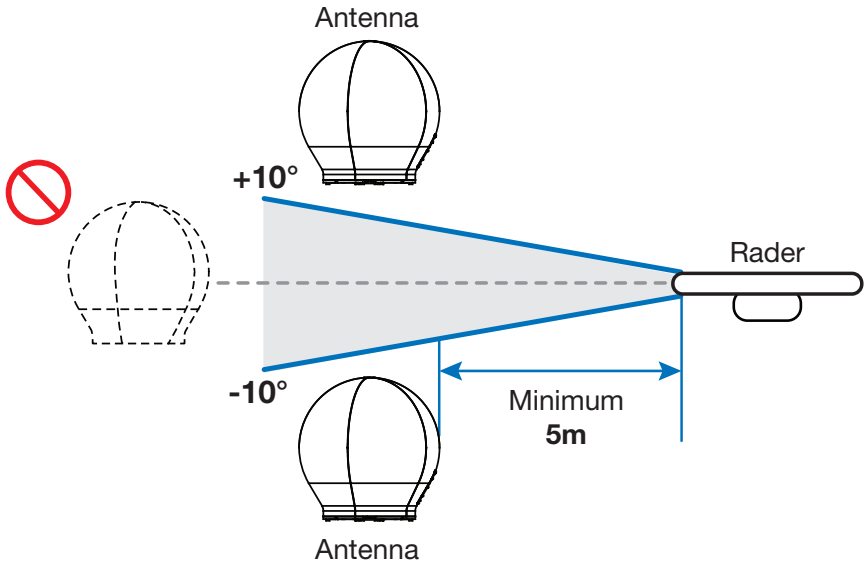
Selection of Installation Site

The system should be placed in an area onboard the vessel with little to no RF signal blockage. A safe mounting place and a restricted access location should be selected due to its heavy weight and size.

When the antenna is transmitting, obstacles in way of the beam path will cause decreases satellite signal strength. The antenna unit should have direct line-of-sight with the desired satellite without any obstacles in the beam path. Certain minimum distances between the antenna and other onboard devices must also be considered during installation.

RF Interference and Recommended Distance

The Antenna Unit should be mounted more than 2.5 meters away from any of the following devices: L-band satellite antennas, magnetic compass installations, and GPS receiver antennas. Additionally, please note the diagram below, in which safe distances and mounting planes are shown for the v240MT in relation to any on-board radar assembly. A minimum safe distance of 5m is recommended. The antenna should also be mounted 10 degrees above or below the radar plane, as shown.



RF Interference and Recommended Distance

Recommended Distances	Other Antenna Affecting the ADE
5 meters(1)	All Radar antenna
5 meters	Any high power shortwave antenna
4 meters	Any short range antenna

(1) The C-band ADE is 10 meters from S-band Radar antennae if the ADE is C-band.

Cables

Four types of cables used for standard installation are introduced in the subsections below. For cables that run longer than Intellian's recommendations, please consult Intellian Technologies.

• System Cables

Before installing the system cables, you need to take the following points into consideration.

1. All cables need to be well clamped and protected from physical damage and exposure to heat and humidity.
2. Cable with an acute bend is not allowed.
3. Where a cable passes through an exposed bulkhead or deck head, a watertight gland or swan neck tube should be used.

• Power Cables

The cable sizes recommended in the following table are the input power cable size for standard system installation.

Cable Length	Cable Cross- Sectional Area	AWG (American Wire Gauge) Size
Up to 100m	2.62 mm^2	13
Up to 200m	4.15 mm^2	11

• Fiber Optic Cables (Customer Furnished)

A single fiber optic cable(Single mode type) connects the antenna to the Antenna Control Unit(ACU), reducing the number of cables required, making installation more straightforward. Intellian recommends the use of up to 2000 meters cable to avoid the signal loss across the length of the cable.

• Gyrocompass Cables (Customer Furnished)

Due to the environment of various type of vessel, Intellian recommend the general cable types compatible with v240MT.

- Gyrocompass Interface Cable Information

	NMEA 0183	NMEA 2000
Connector Type	2 Conductors	Mini-C 5 pin
Heading Sentence	xx HDT (4800 Baud, 8, N, 1). *If there is no HDT sentence then use HDM sentence instead.*	PGN Number = 127250 (Vessel Heading)

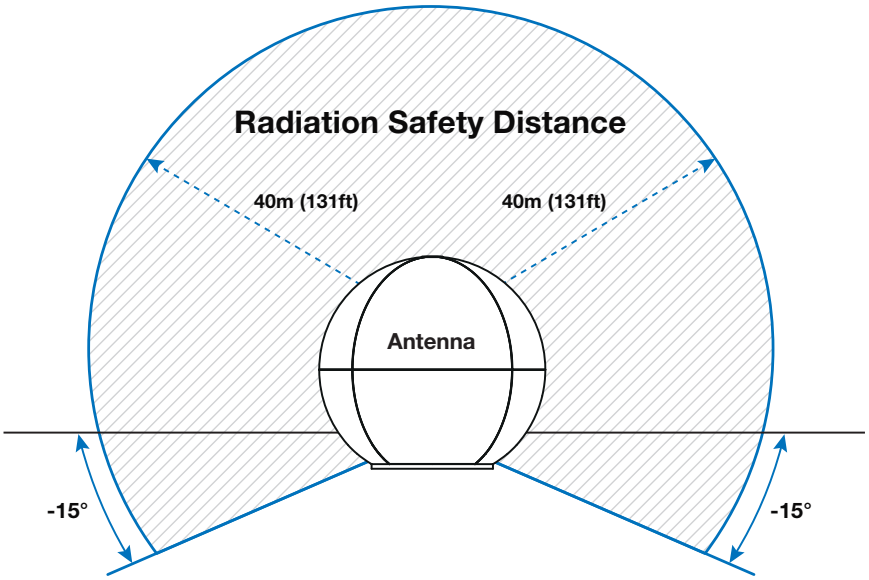
Power Requirements

The Intellian v240MT has been designed to work on a vessel's power supply rated at 100-240 VAC. Intellian recommends that all ADE and BDE equipment use a suitable UPS for all A/C power applications. An additional A/C power run is needed for optional Air Conditioners and Heaters.

RF Hazard Precautions

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

During transmission, ensure to keep the minimum safety distance. The recommended minimum safety distance to the reflector on the focal line is about 40m, based on a radiation level of 5mW/ cm2 that applies under occupational/controlled environment. No hazard exists >15° below the antenna's mounting plane.



Safe access from radiation hazard

Installing the Antenna

Package Composition

168" Radome Antenna Package

154" Radome Antenna Package

Base Frame Assembly(only for 168" radome model)

Uncrating Lower Radome Package

Assembling Base frame

Uncrating Upper Radome Package

Assembling Air-Conditioner Frame

Assembling Air-Conditioner(Optional)

Assembling the Fiber Link & IFL Switch Module

Assembling the Single Fiber Link Module(For SDC System)

Cabling Single Fiber Link Module

Assembling the Additional Fiber Link and IFL Switch Module(Optional: For DDC System)

Cabling the Additional Fiber Link and IFL Switch Module(Optional)

Checking the LED Status

Reflector and Pedestal Assembly

Uncrating Antenna Radome Package

Removing the Dummy Blocks

Removing the Shipping Brackets

Assembling the Reflector and Base Frame

Turning the Counterweight Plate

Assembling the EL Arms and EL Arm Support Frame

Changing GPS Location

Removing the EL Limits

Turning the Reflector

Removing the Feed Horn Bracket(Only for Triple-band model)

Triple/Dual Module Assembly

Unpacking the Triple/Dual Module Assembly

Assembling the Waveguide

Assembling the Module Support Frame

Assembling the Feed Horn Support

Assembling the Triple/Daul Module

Attaching the Joint Blocks

Assembling the Reflector Support Pipe

Arranging Triple/Dual Module Cables

Removing Triple/Dual Module Bracket and CL Brackets

Connecting Triple/Dual Module Cables

Checking Skew Movement and Cable Connections

Radome Assembly

Assembling Upper Radome

Assembling Lower Radome

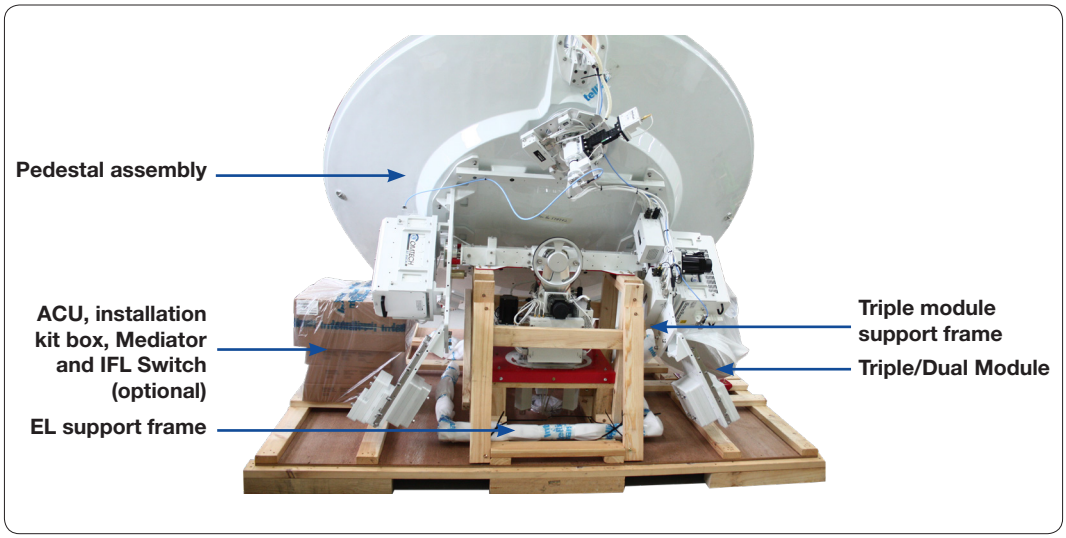
Completing Radome Assembly

Radome Mounting

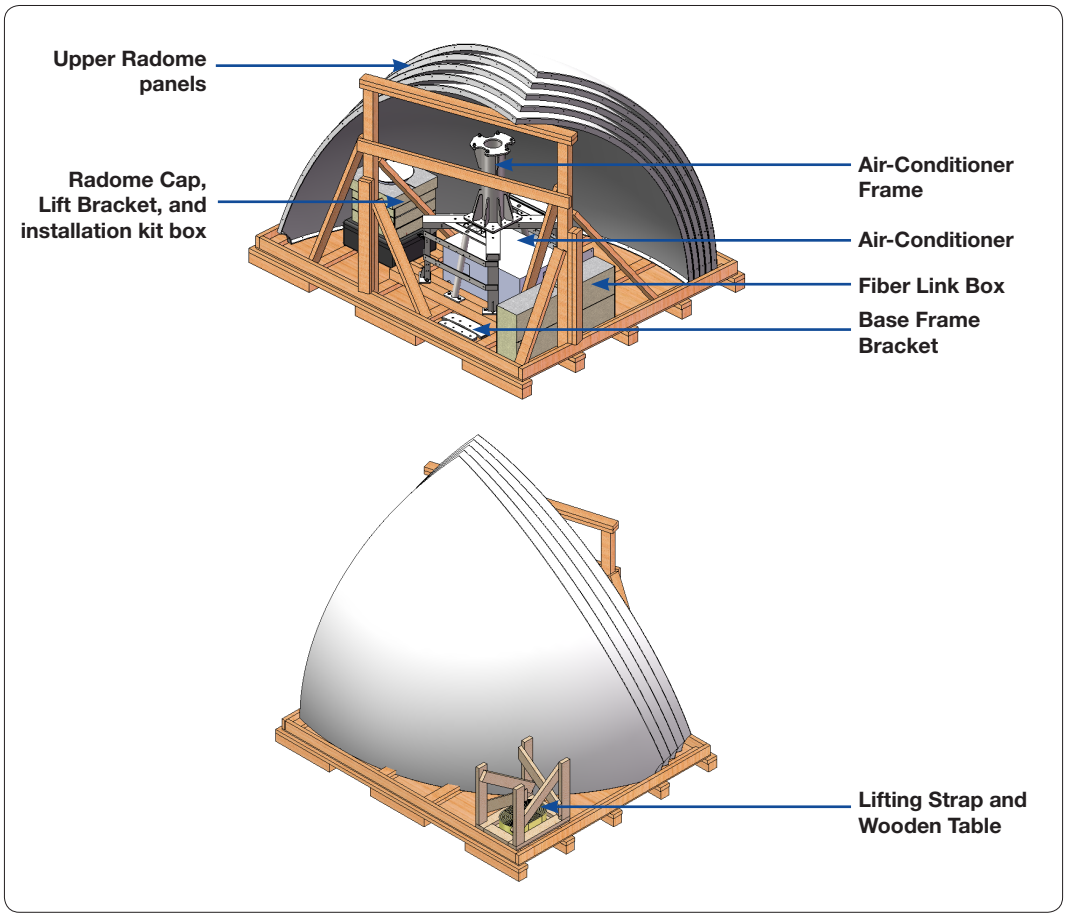
Package Composition

168" Radome Antenna Package

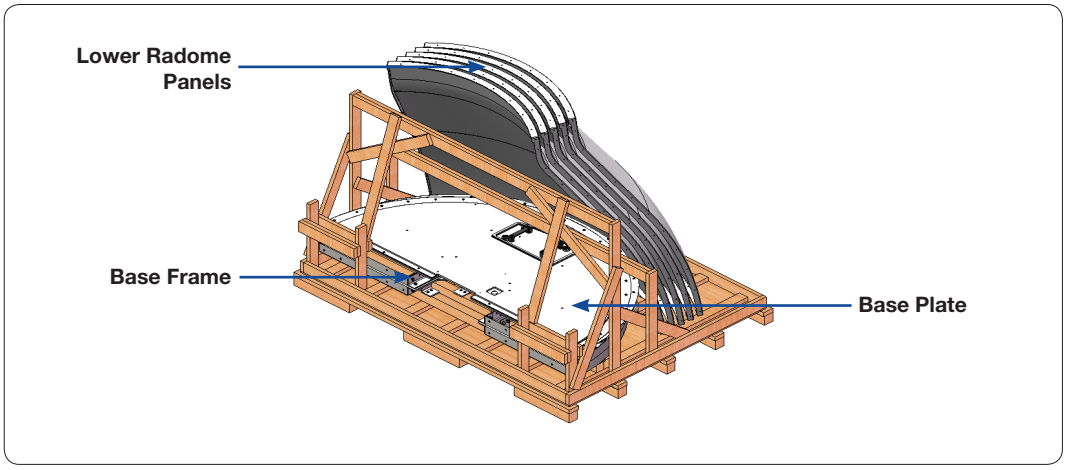
The 168" radome Antenna consists of three packages: Antenna Package, Upper Radome Package and Lower Radome Package as shown in the picture below.



Antenna Package



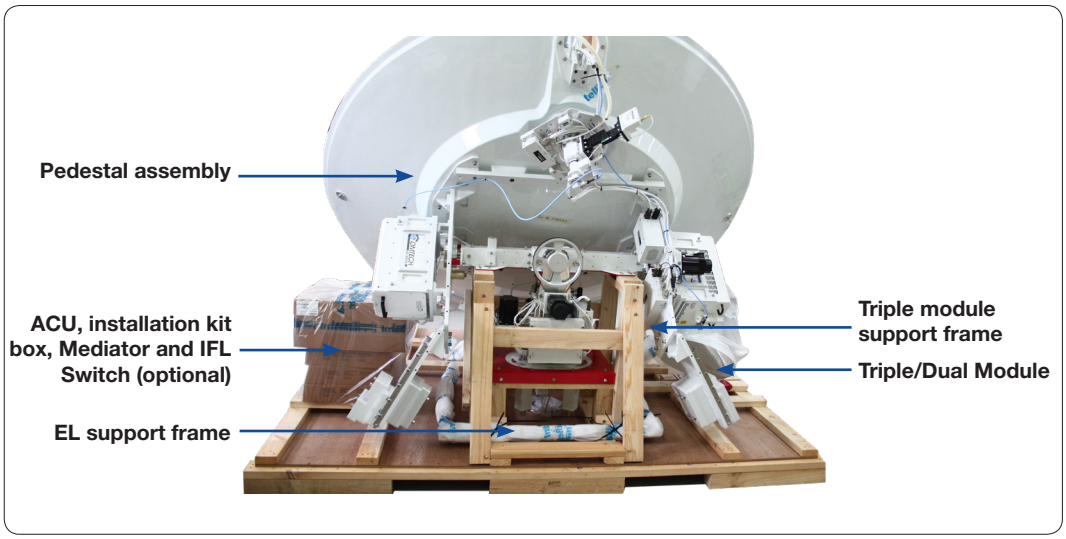
Upper Radome Package



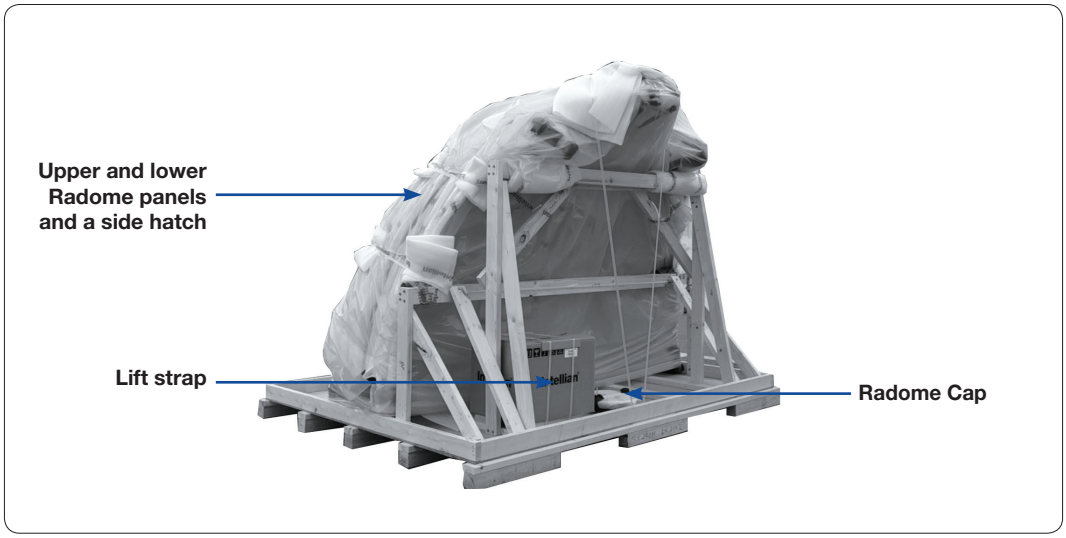
Lower Radome Package

154" Radome Antenna Package

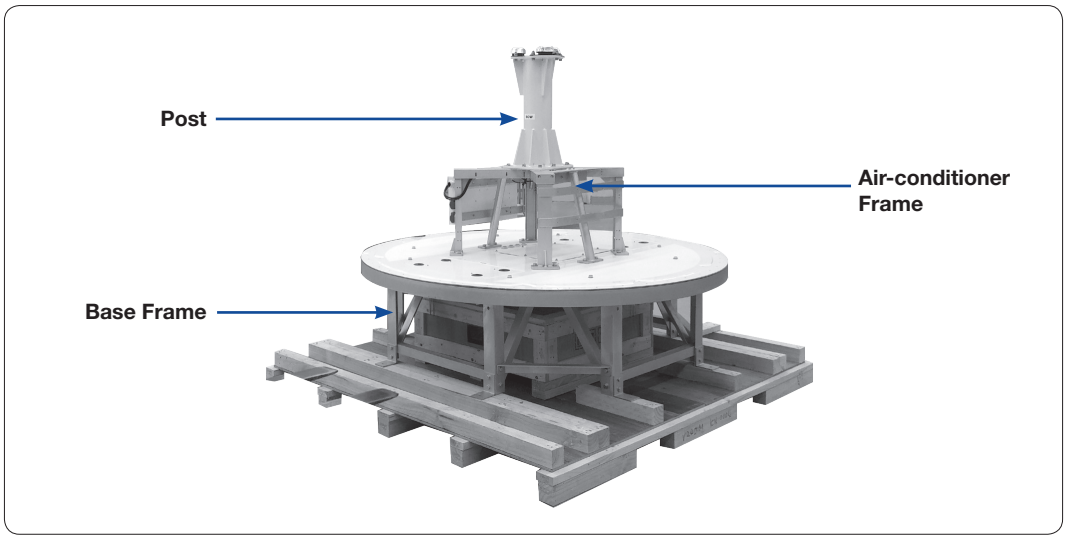
The 154" radome Antenna consists of three packages: Antenna Package, Radome Package and Frame Package as shown in the picture below.



Antenna Package



Radome Package

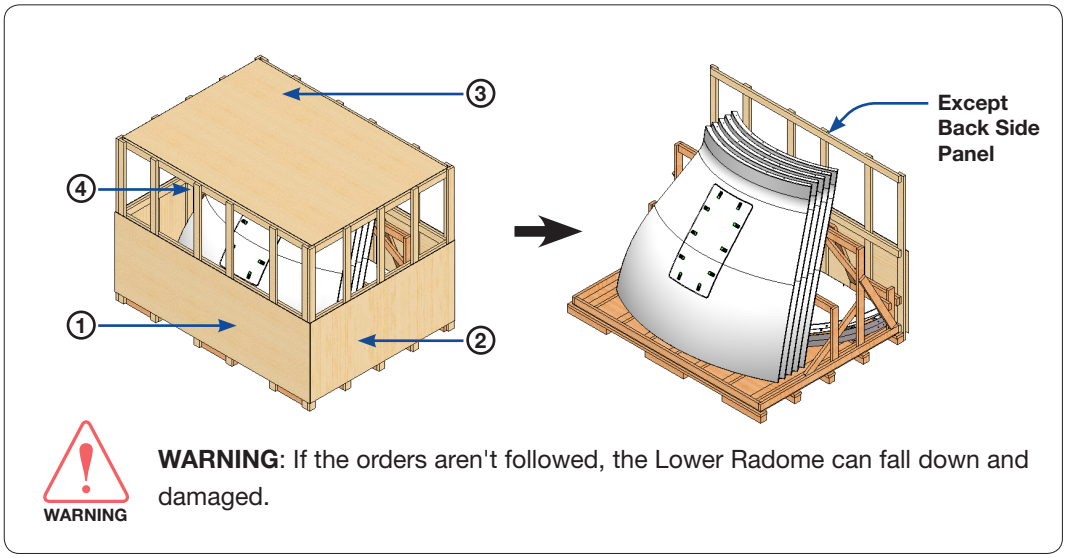


Frame Package

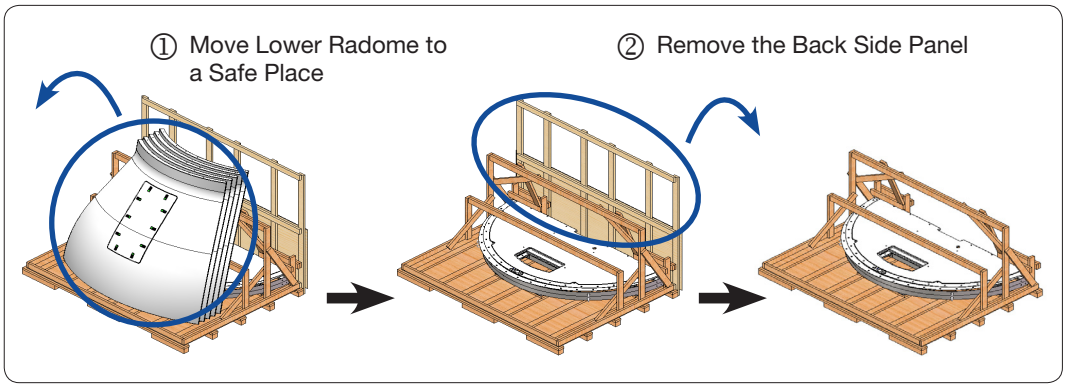
Base Frame Assembly(only for 168" radome model)

This chapter is only for 168" radome model. For 154" Radome model, the base frame was fully assembled and shipped.
The Lower Radome Package consists of Base frame. And the Upper Radome Package consists Air-conditioner frame. The set of two frames is assembled to make one set.

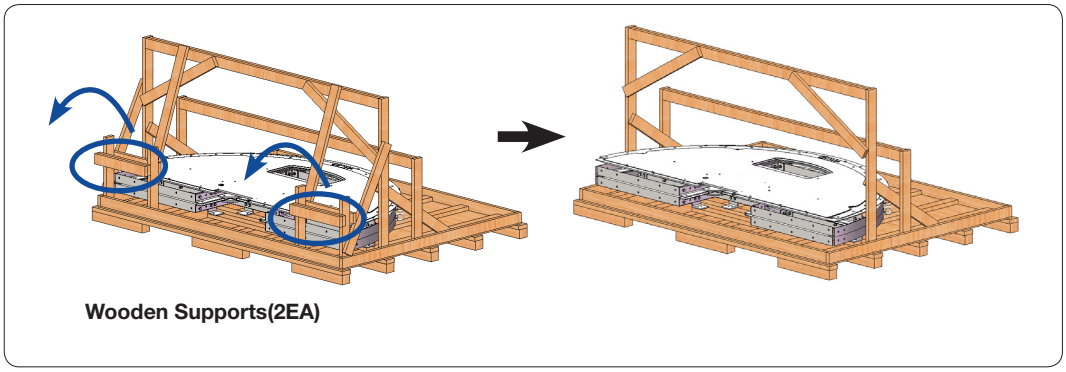
Uncrating Lower Radome Package
Remove the bolts securing top panel ① and lift off using the forklift. And then remove side panels in order. Make sure the back side panel must be left as shown in the picture below.



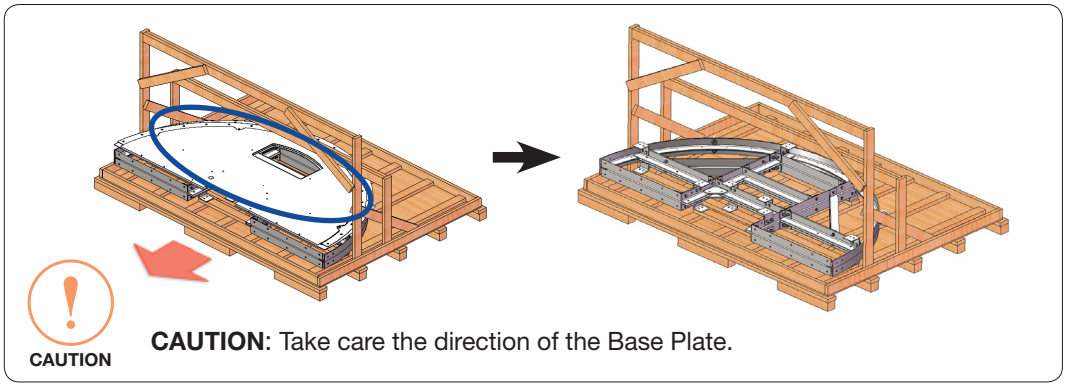
Remove Panels of Package Crate



Remove the Lower Radome and the Back Side Panel.



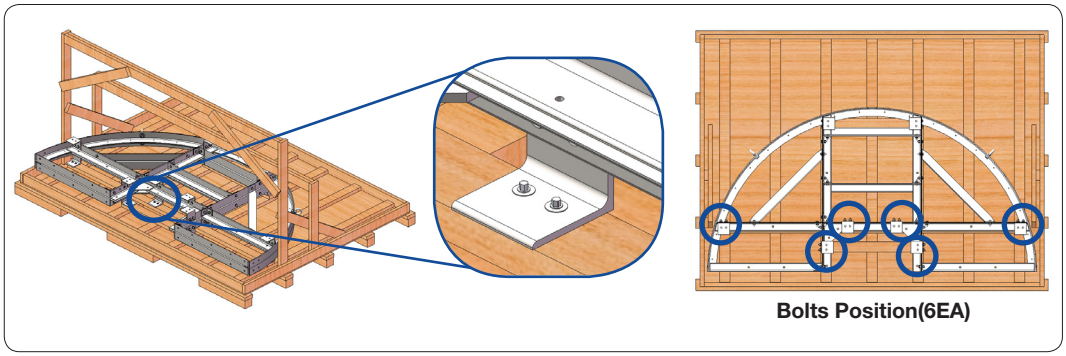
Remove the Wooden Supports



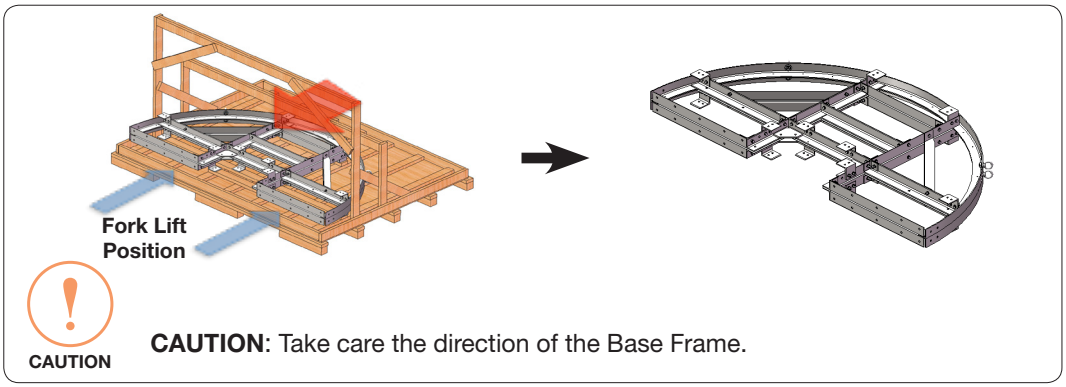
CAUTION

CAUTION: Take care the direction of the Base Plate.

Draw the Base Plate from the crate



Remove the Bolts Securing Frame Leg



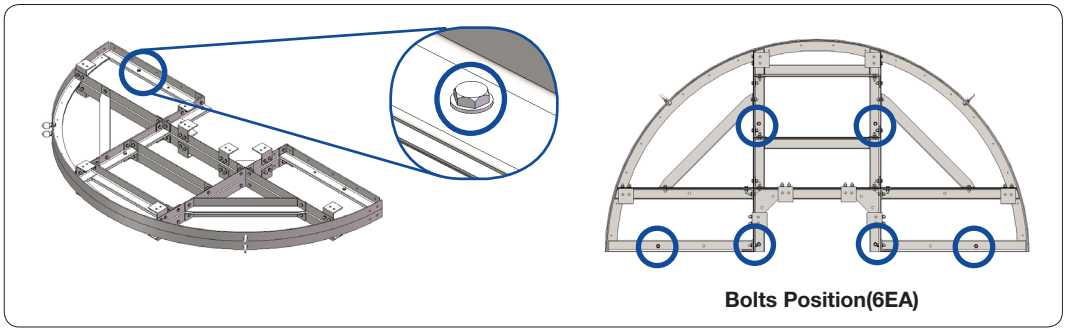
CAUTION

CAUTION: Take care the direction of the Base Frame.

Draw the Base Frame by using a Forklift

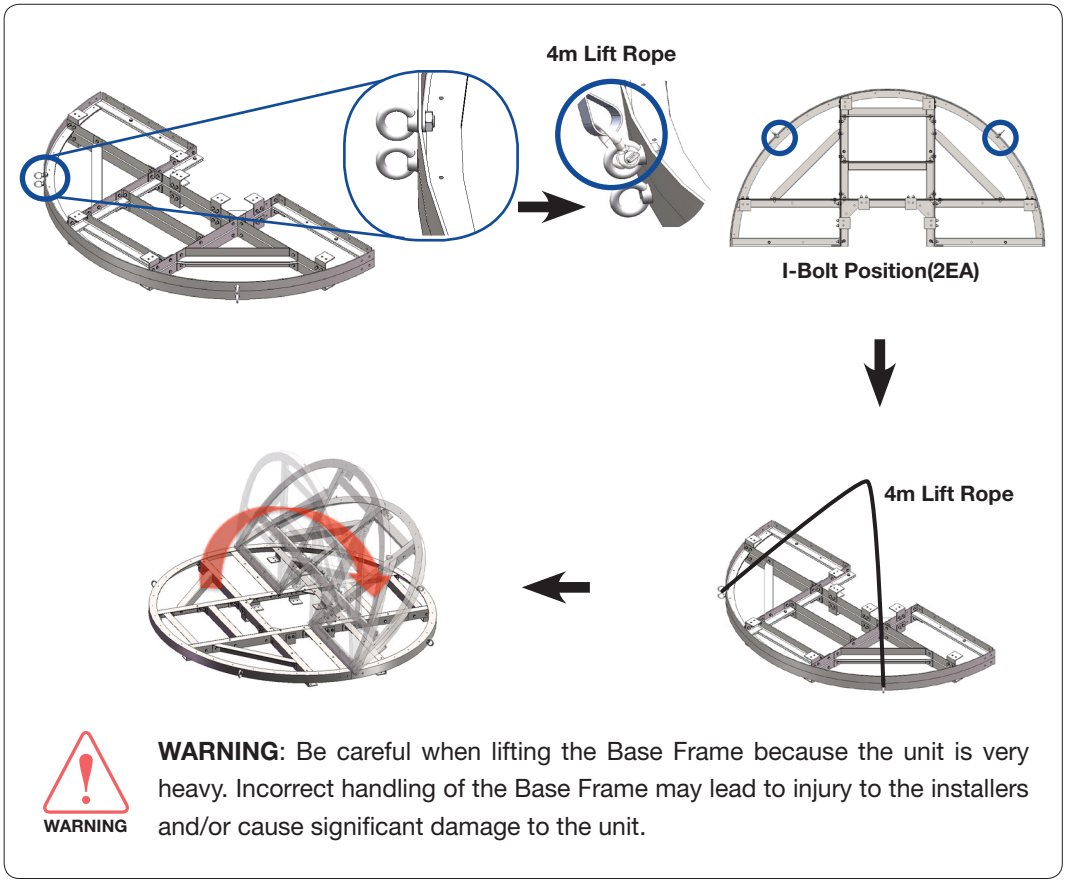
Assembling Base frame

To assemble the Base frame, Follow the procedures below.



Remove the Bolts Securing Base Frame

Bring the 4m lift ropes from the Antenna Package. Connect Lift Ropes to I-Bolts(2EA) on the Base Frame. Lift the Base Frame using the forklift and unfold one side of Base Frame to make circular.



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

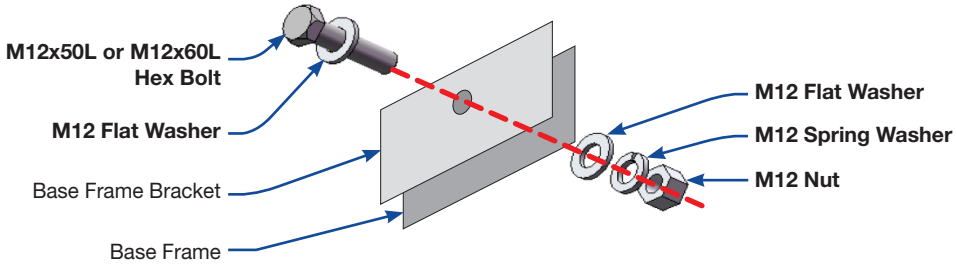
Lift and unfold Base Frame

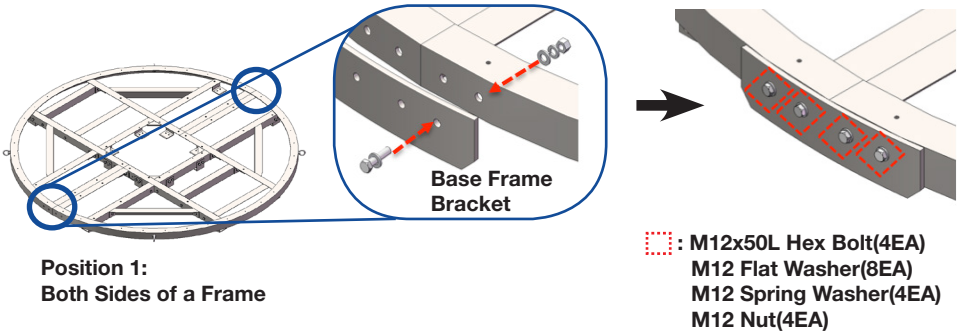
Bring the brackets(three types) from the Upper Radome Package. Temporarily assemble bolts to both sides of a frame. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly. If the step isn't followed, the frame assembly may not be possible.

NOTE

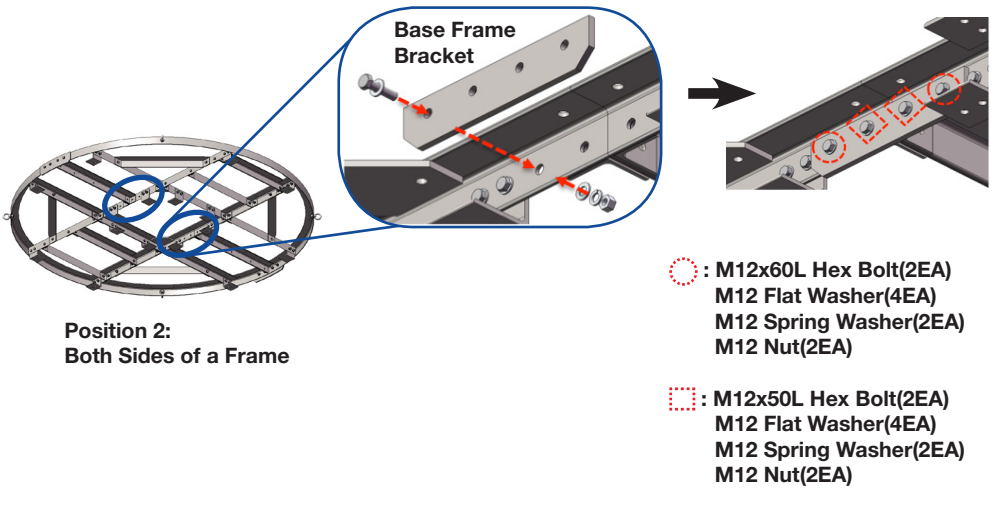
NOTE

All bolts are temporarily assembled to three kinds of Base Frame Brackets as shown in the picture below.

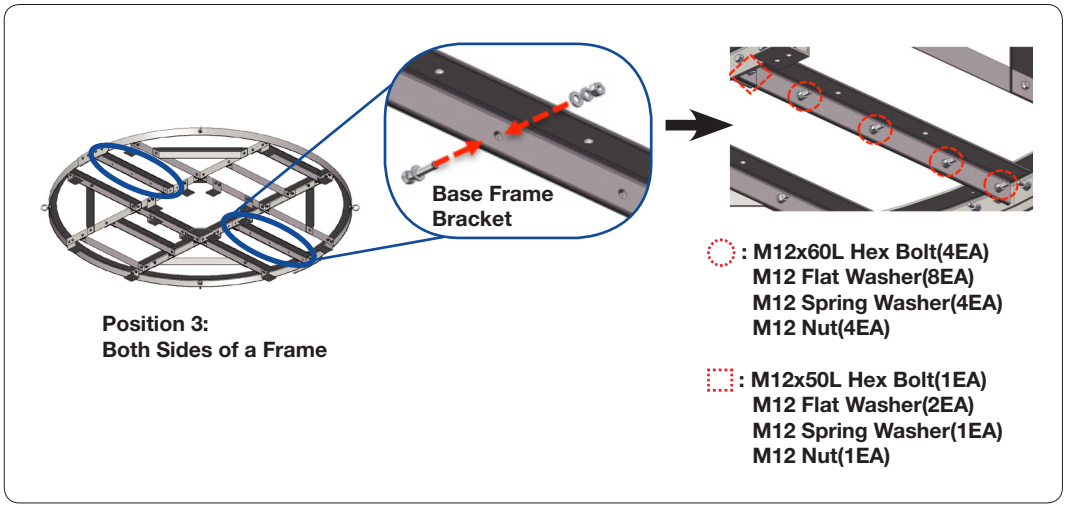




Temporarily Assemble Brackets to the Base Frame(Position 1)



Temporarily Assemble Brackets to the Base Frame(Position 2)

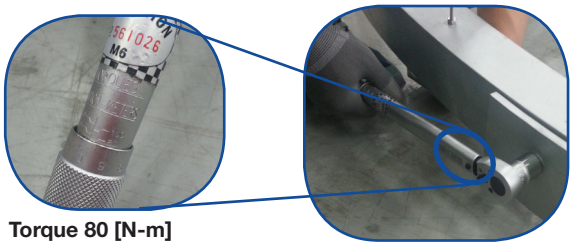


Temporarily Assemble Brackets to the Base Frame(Position 3)

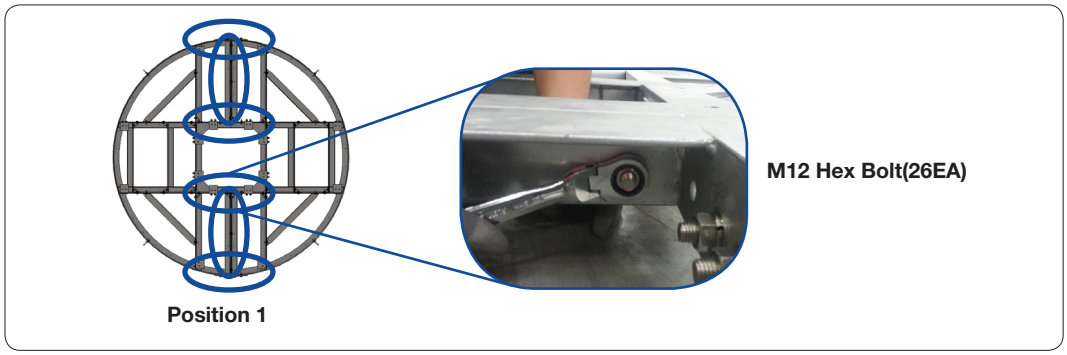
NOTE

NOTE

Set the strength of the torque wrench as an 80 [N-m] when tightening M12 Wrench Bolts.

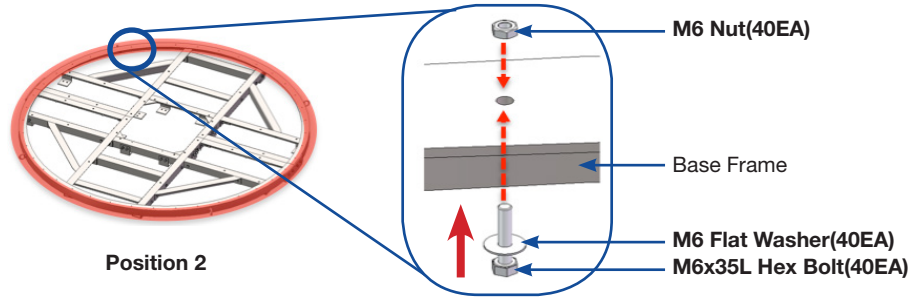


Tighten bolts which were applied temporarily in an earlier step.



Tighten Frame Bolts(Position 1)

Assemble bolts on the edge of the base frame.

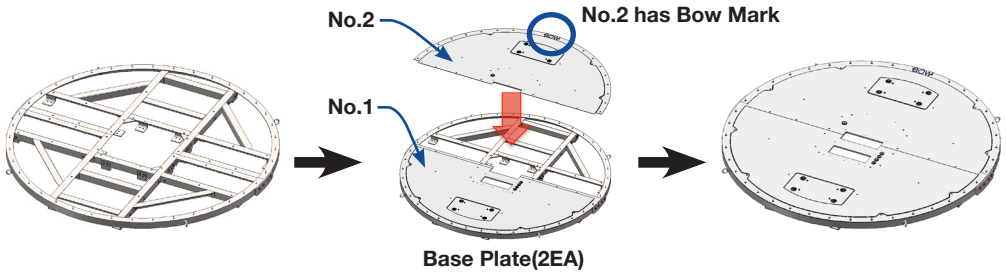


CAUTION

CAUTION: Take care the assembling direction of bolts. Assemble bolts from the bottom to top.

Tighten Frame Bolts(Position 2)

Place the Base Plate on the Base Frame in order.



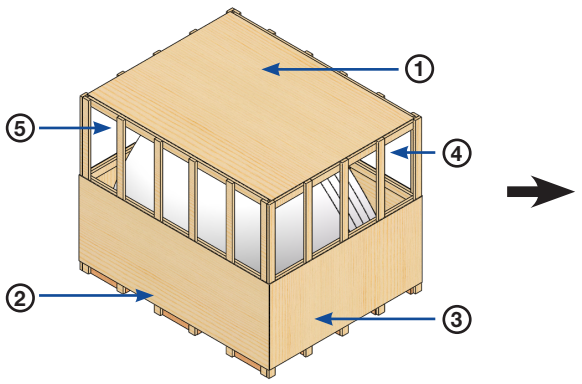
CAUTION

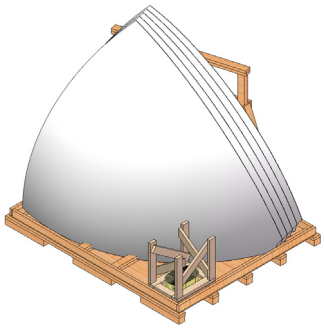
CAUTION: Take care of the order. (Base Plate 1 ➔ Base Plate 2)

Place Base Plate on the Base Frame

Uncrating Upper Radome Package

Remove the bolts securing top panel ① and lift off using the forklift. And then remove side panels in order.



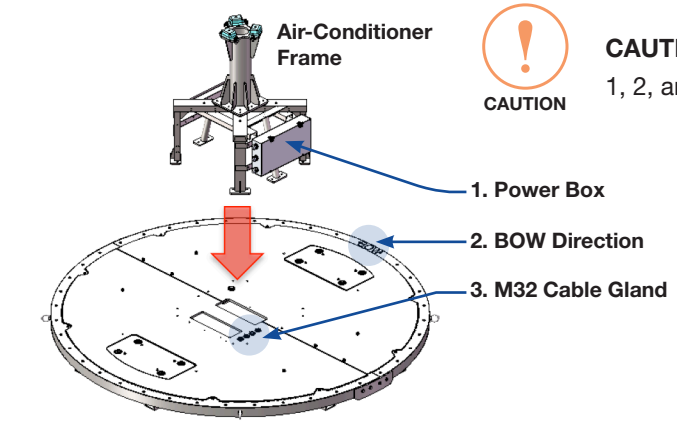


WARNING: If the orders aren't followed, the Upper Radome can fall down and damaged.

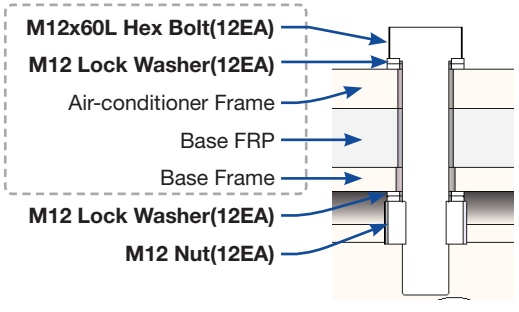
Remove Panels of Package Crate

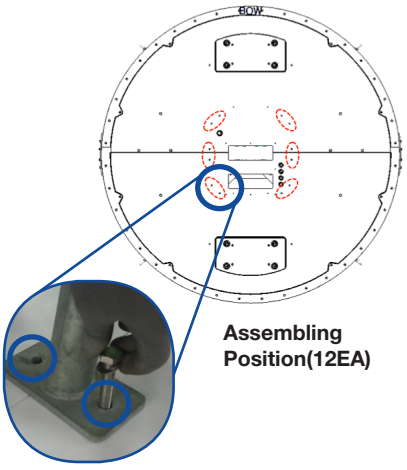
Assembling Air-Conditioner Frame

Bring the Air-Conditioner Frame from the Upper Radome Package. Place the Air-Conditioner Frame on the Base Frame and insert bolts and washers to 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.



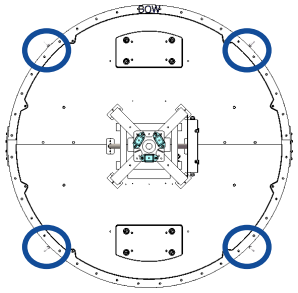
CAUTION: Take care the direction of 1, 2, and 3 items.



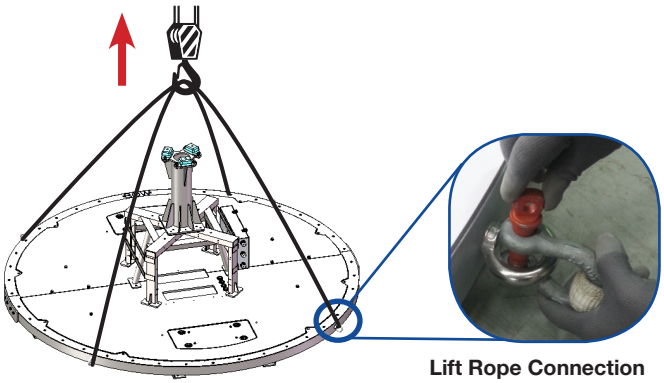


Assemble the Air-conditioner Frame on the Base Frame

Connect Lift Ropes to I-Bolts(4EA) on the Base Frame. Lift the Base Frame using the crane and make a stable condition.



I-Bolts position(4EA)



Lift Rope Connection

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

Lift the Base Frame

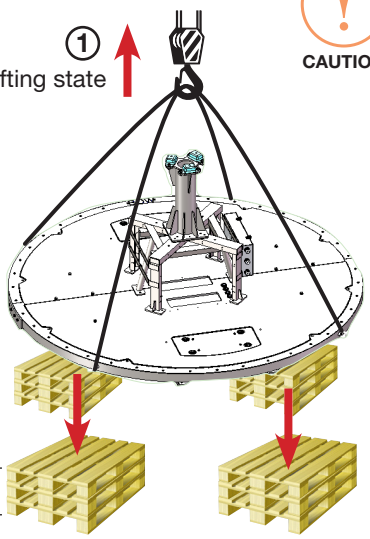
Bring the strong supports(4EA) to withstand the weight of the base frame. The supports must be more than 600mm to assemble bolts from under the base frame safely. The support location should be as shown in the picture below. Then put the base frame down on supports while maintaining lifting state to assemble bolts to the Base Plate.

WARNING: Make sure that the Base Frame is only put down on supports that can withstand the weight of the unit. Incorrect handling of the unit may lead to injury to the installers and/or cause significant damage to the unit.

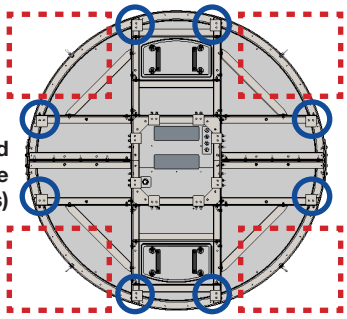
CAUTION: When placing the base frame on the supports, avoid the edge of base frame(marked as ○) otherwise the base frame may not be positioned securely.

① Maintaining lifting state

② Put the Base Frame down on supports



More than 600mm

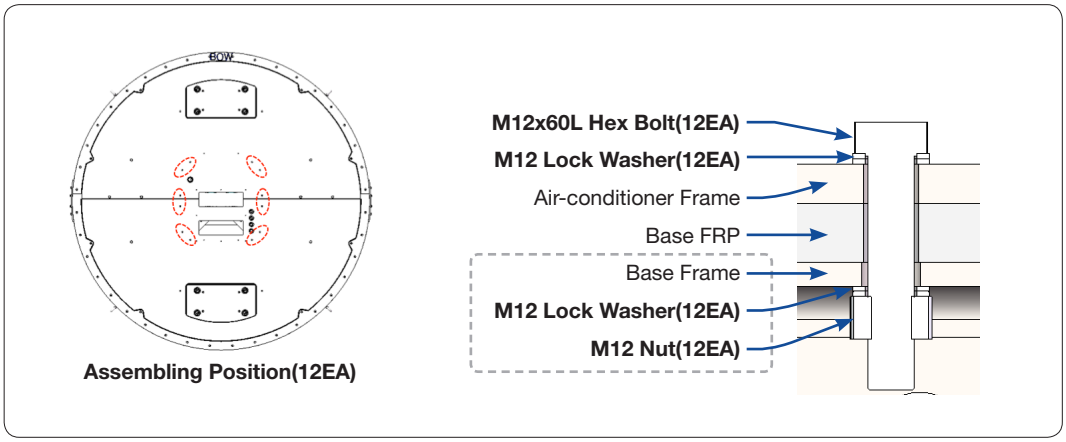


Avoid Edge (8 sides)

Botton View-
Support position(4 sides)

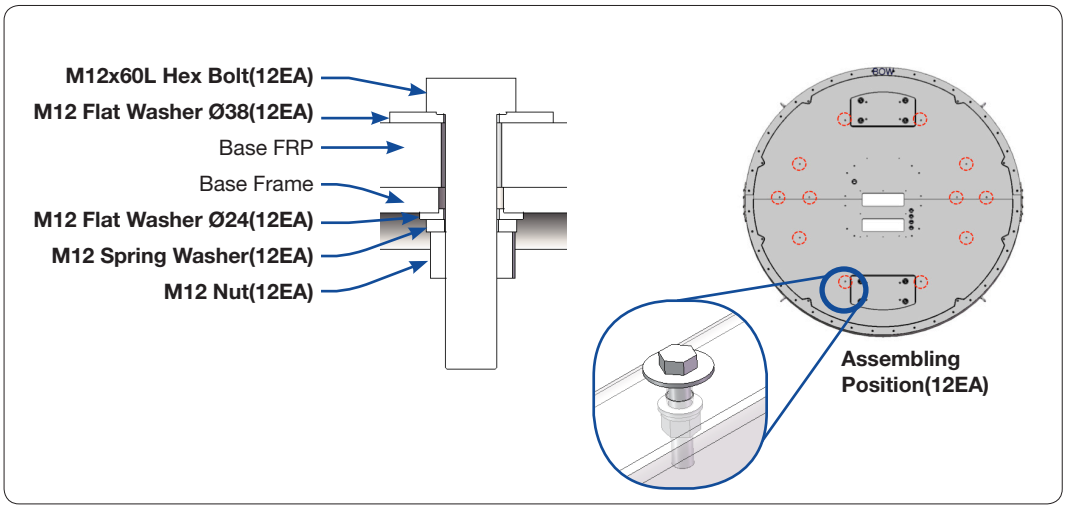
Place the Base Frame on supports

Tasten the Nuts and Washers under the Base Frame to fasten the Air-Conditioner frame.



Assemble the Air-conditioner Frame on the Base Frame

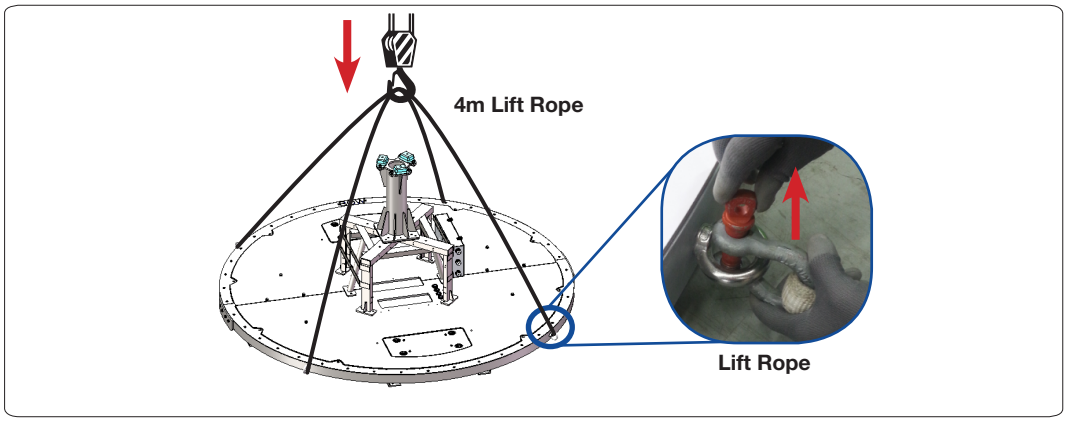
Assemble bolts inside the Base Frame to fasten the Base Frame.



Fix the Base Plate to the Base Frame

Placing the Base Frame

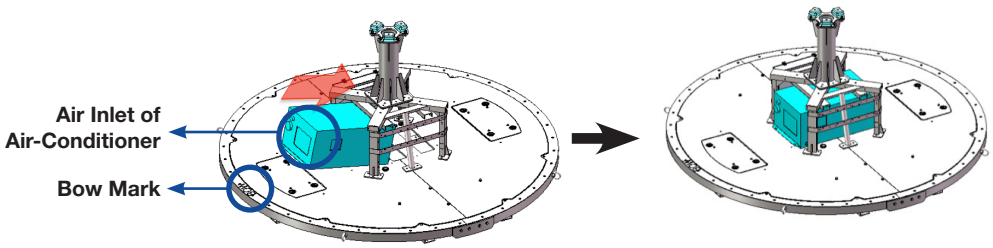
Place the Base Frame on a safe floor using the forklift and remove lift ropes.



Place the Base Frame on a Safe Floor

Assembling Air-Conditioner(Optional)

Bring the Air-Conditioner from the Upper Radome Package. Put the Air-Conditioner into the Air- Conditioner frame completely.

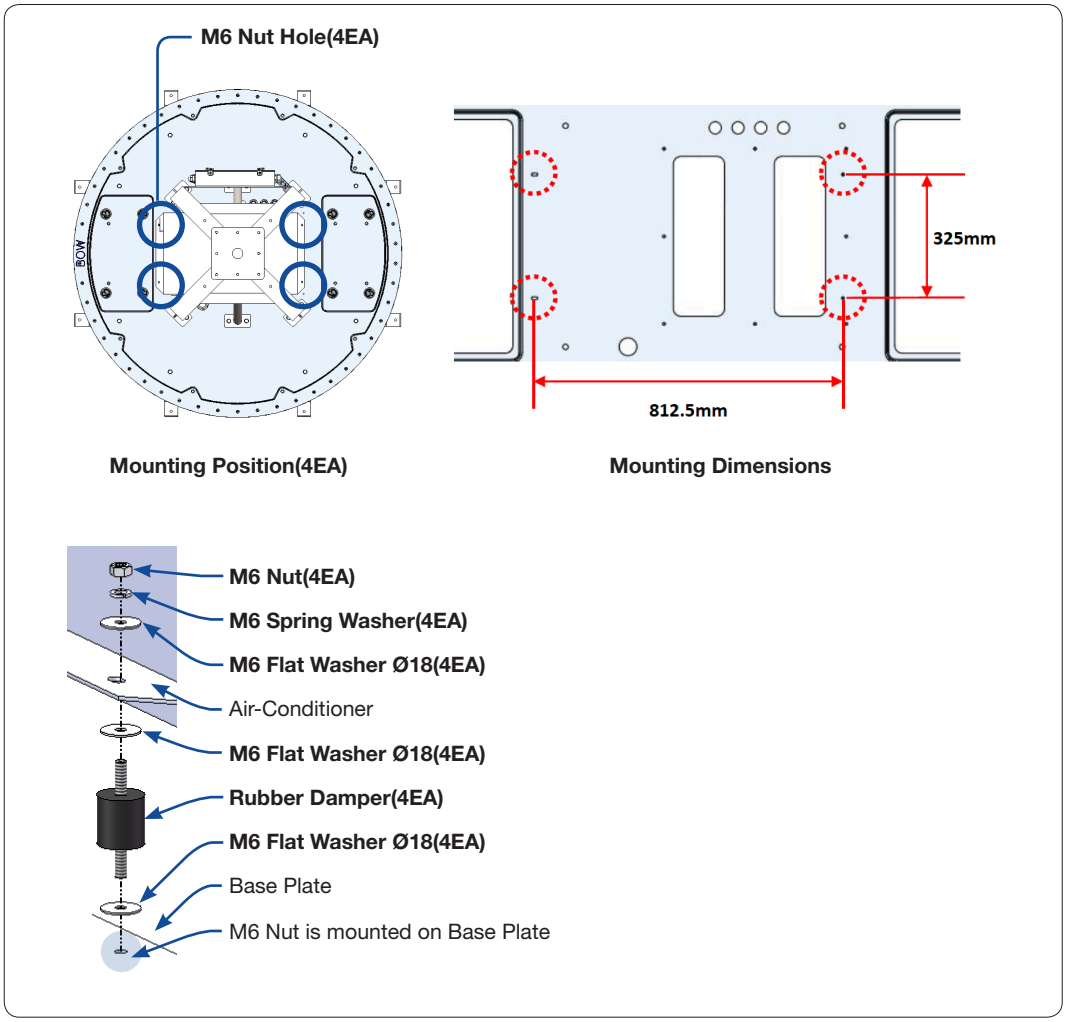


CAUTION

CAUTION: Take care the location of the Air-Conditioner. The Air Inlet is the same direction as the Bow Mark.

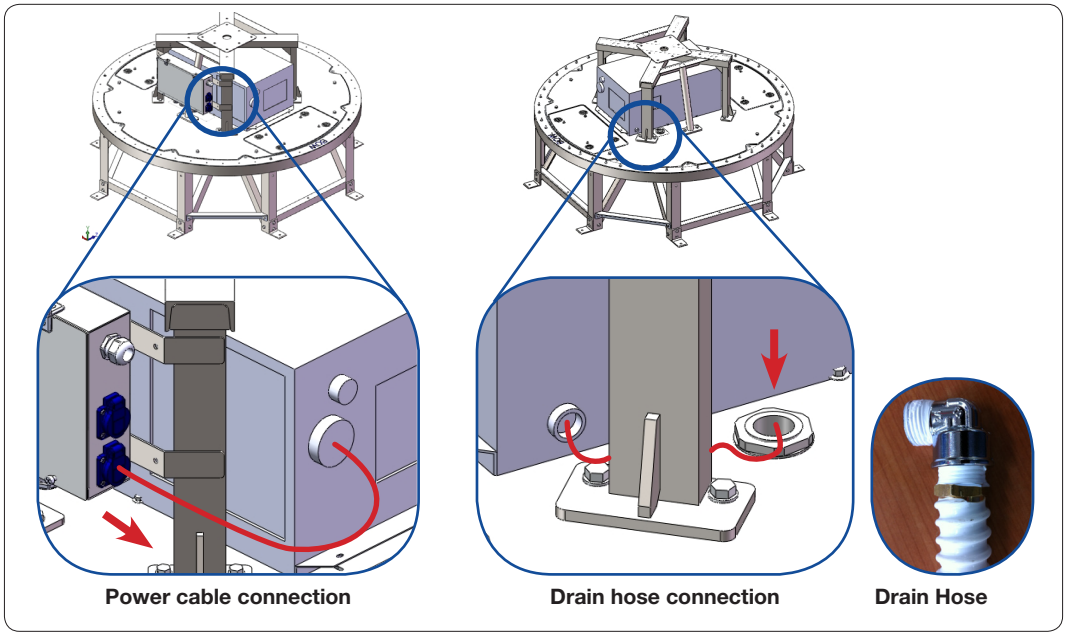
Assemble Air-Conditioner on the Base Plate

Place the Air-Conditioner on the Base Plate and then tighten the rubber damper and bolts to the M6 Nut Holes on Base Plate.



Assemble Air-Conditioner

After assembling the Air-Conditioner, connect the power cable and the drain hose.



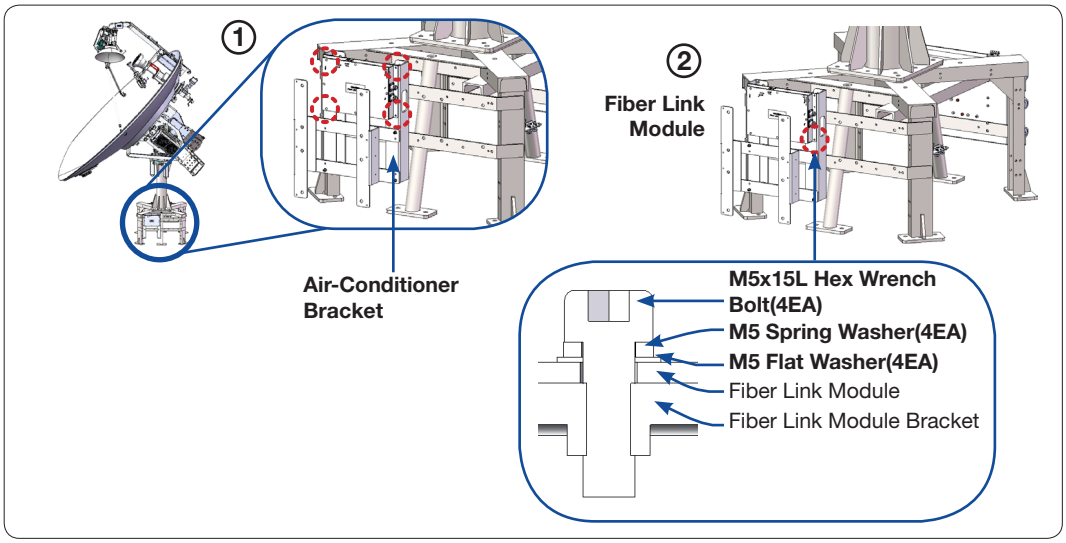
Assemble the Air-Conditioner (II)

Assembling the Fiber Link & IFL Switch Module

Assembling the Single Fiber Link Module(For SDC System)

To use the Single Data Center(SDC) System, the antenna needs to be installed a Fiber Link Module to support the SDC System operation.

1. Check the hole location(4EA) on the Air-Conditioner Bracket for installation.
2. Place the Fiber Link Module on the holes.
3. Make sure that the Fiber Link Module Is positioned correctly and fixate it using bolts(4EA). Apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.



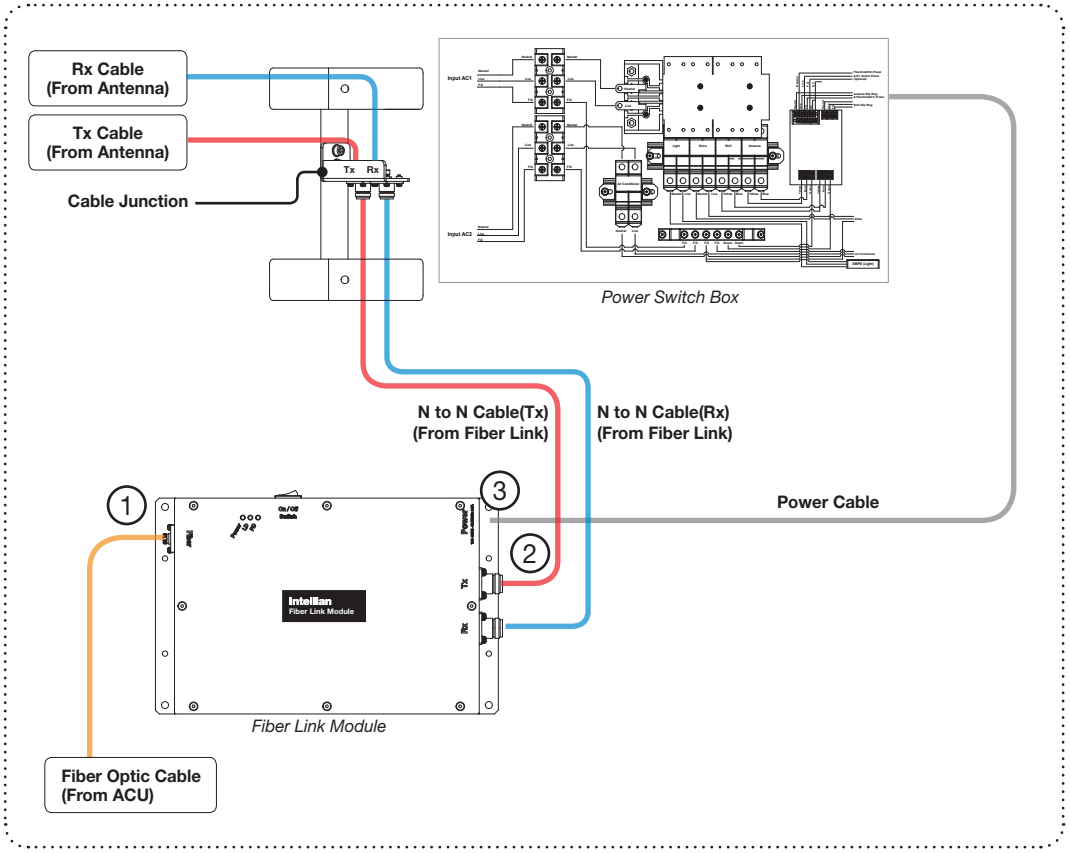
Assemble the Fiber Link Module on the Air-Conditioner Bracket

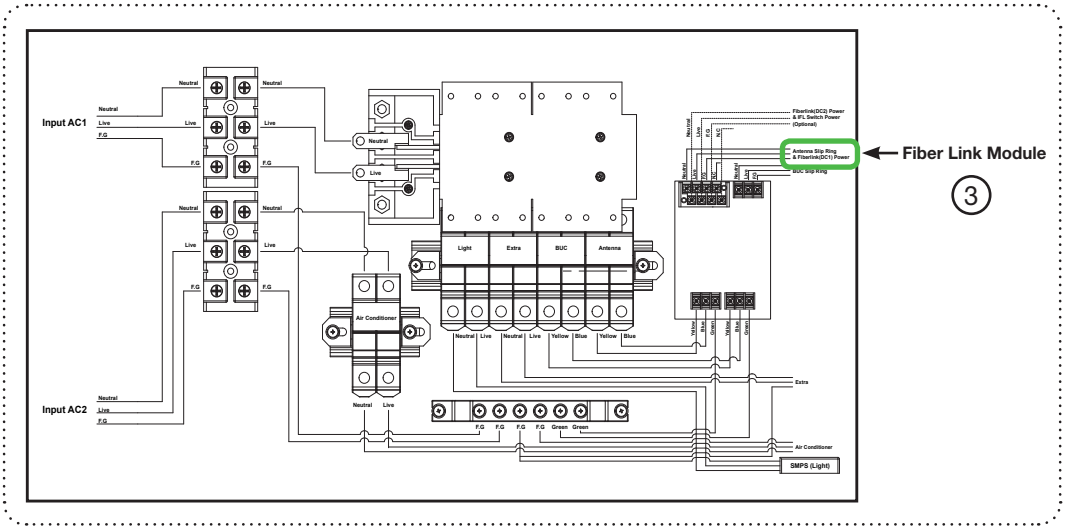
Cabling Single Fiber Link Module

Refer to the diagram to connect the Fiber Link Module and the Power Switch Box.

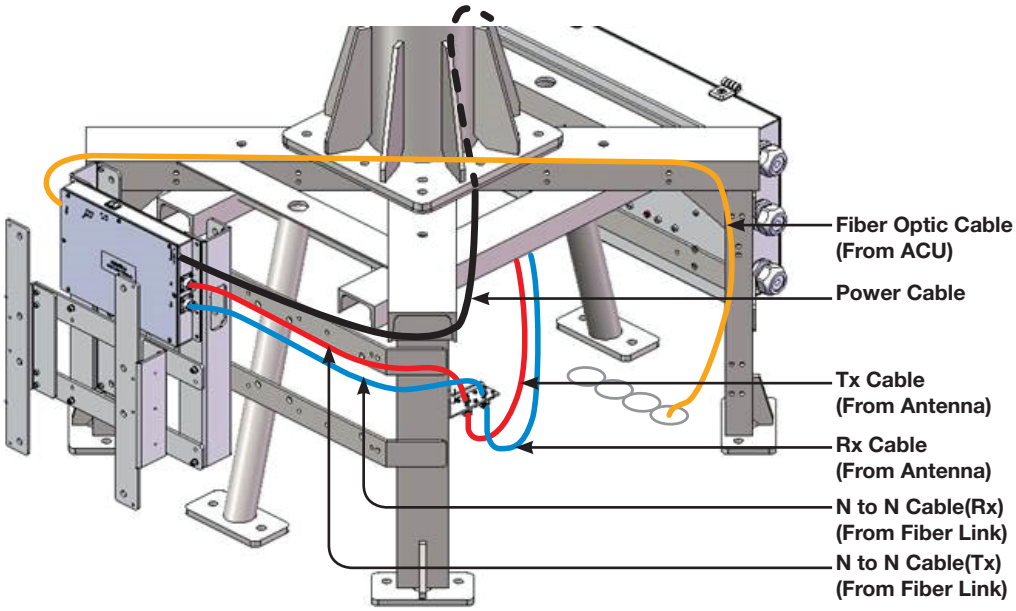
1. Connect the Fiber Optic Cable (not supplied by Intellian) to the FIBER port on the Fiber Link module.
2. Connect the N to N Cables (Rx, Tx) from the Fiber Link Module to the cable junction to connect the Rx, Tx Cables from the Antenna.
3. Connect the Power Cables from the Fiber Link module to the Power Switch Box.

   NOTE: See the green box in the figure below to connect the Power Cables to the Power Breaker in the Power Switch Box. After connecting all cables, turn on the power switch.





Power Switch Box(Inner part)



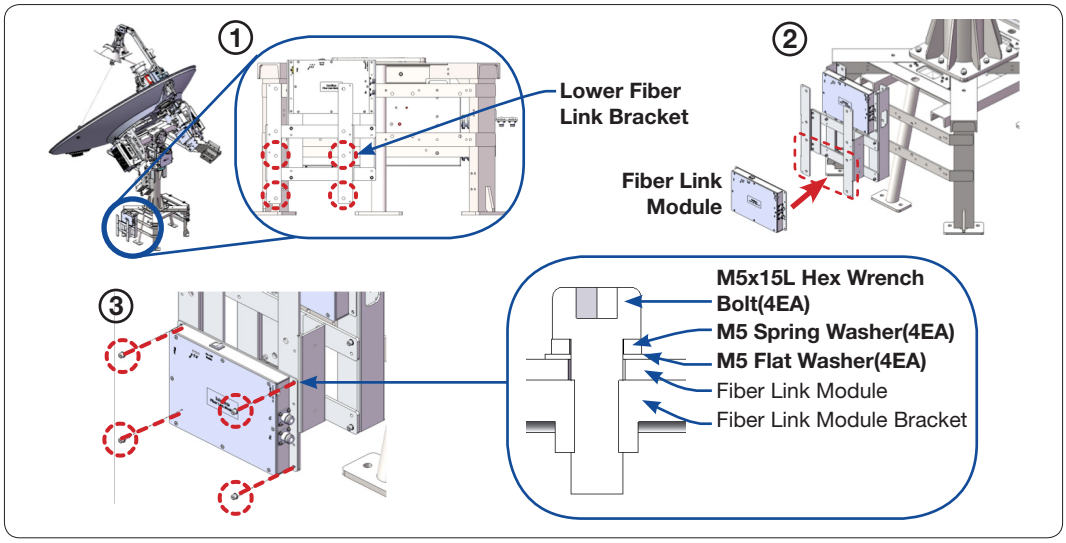
Single Fiber Link Module Cable Connection

Assembling the Additional Fiber Link and IFL Switch Module(Optional: For DDC System)

To use the Dual Data Center(DDC) System, the antenna needs to be installed an additional Fiber Link Module and an IFL Switch Module to support the DDC System operation.

Assembling the Additional Fiber Link Module(Optional)

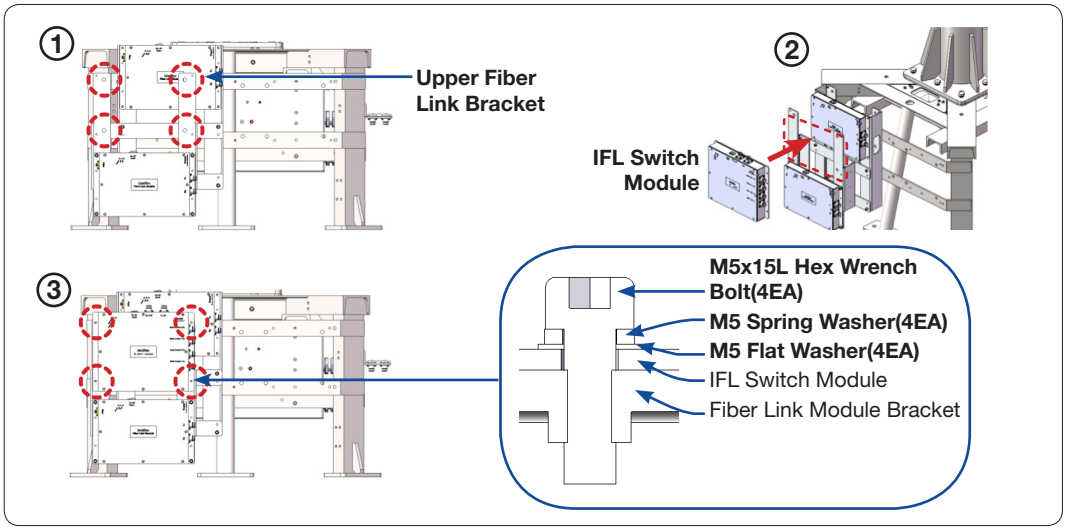
1. Check the hole location(4EA) on the Lower Fiber Link Bracket for installation.
2. Place the additional Fiber Link Module on the holes.
3. Make sure that the Fiber Link Module Is positioned correctly and fixate it using bolts(4EA). Apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.



Assemble the Additional Fiber Link Module on the Lower Fiber Link Bracket

Assembling the IFL Switch Module(Optional)

1. Check the hole location(4EA) on the Upper Fiber Link Bracket for installation.
2. Place the IFL Switch Module on the holes.
3. Make sure that the IFL Switch Module Is positioned correctly and fixate it using bolts(4EA). Apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.



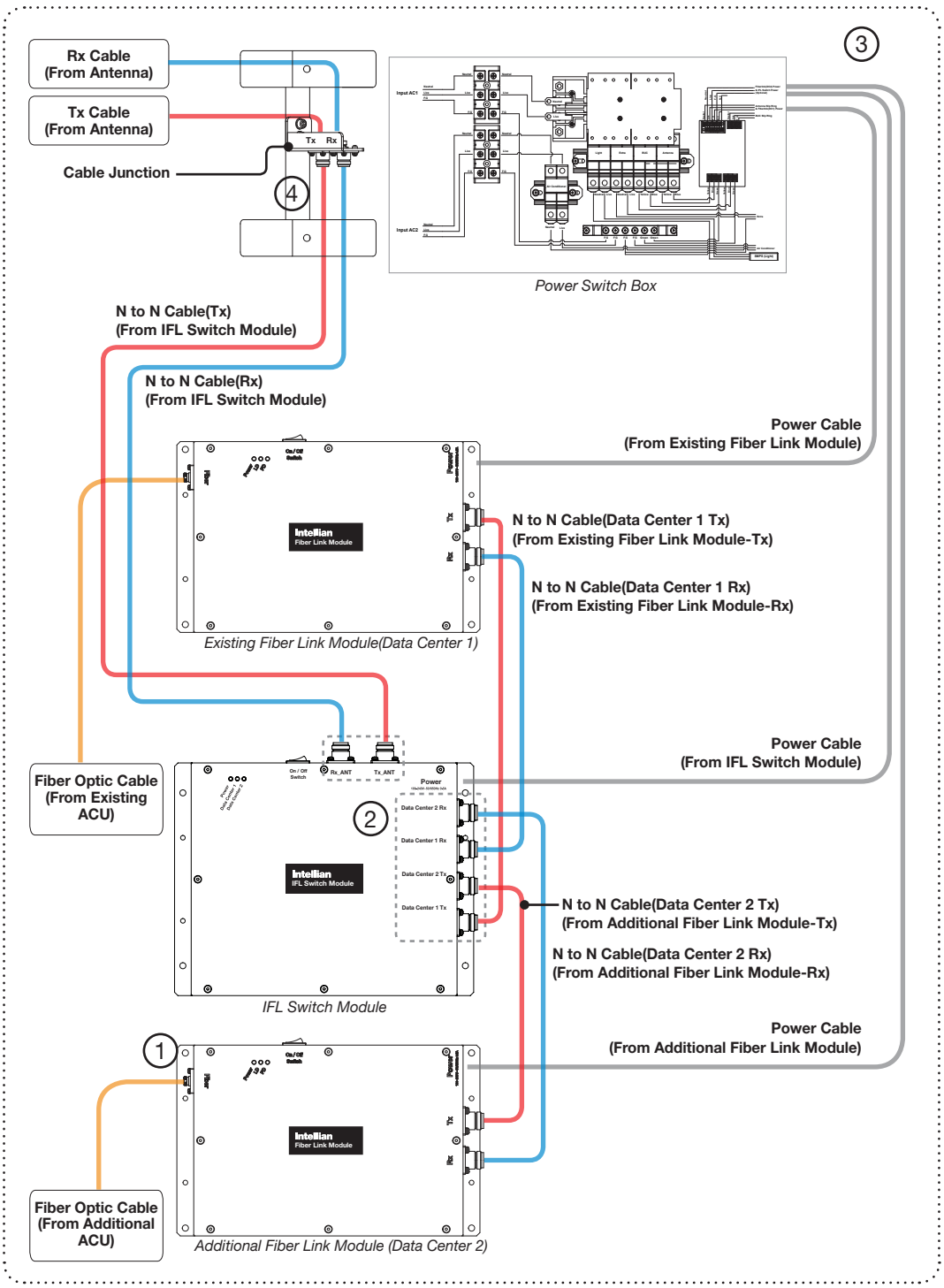
Assemble the IFL Switch Module on the Upper Fiber Link Bracket

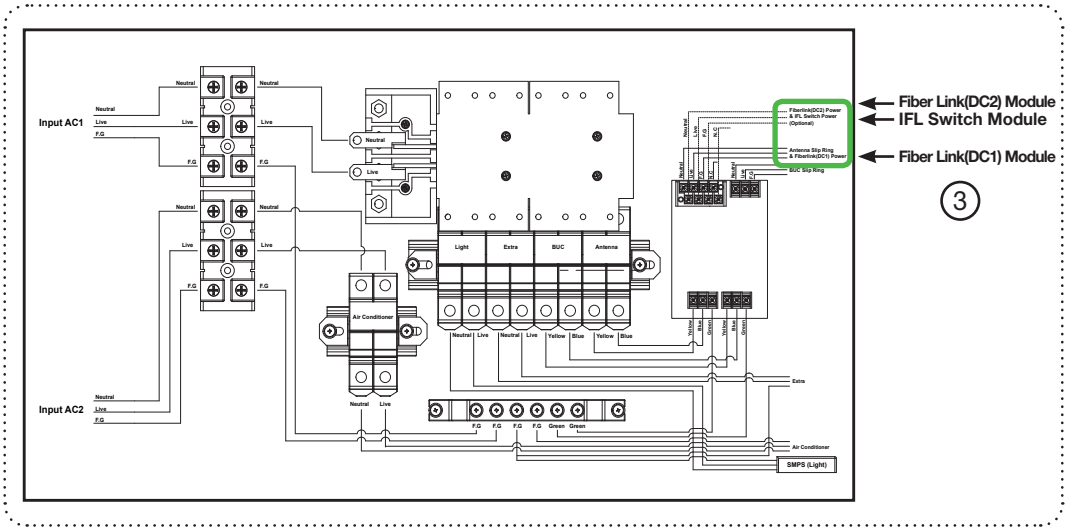
Cabling the Additional Fiber Link and IFL Switch Module(Optional)

Refer to the diagram to connect the IFL Switch Module and the Power Switch Box.

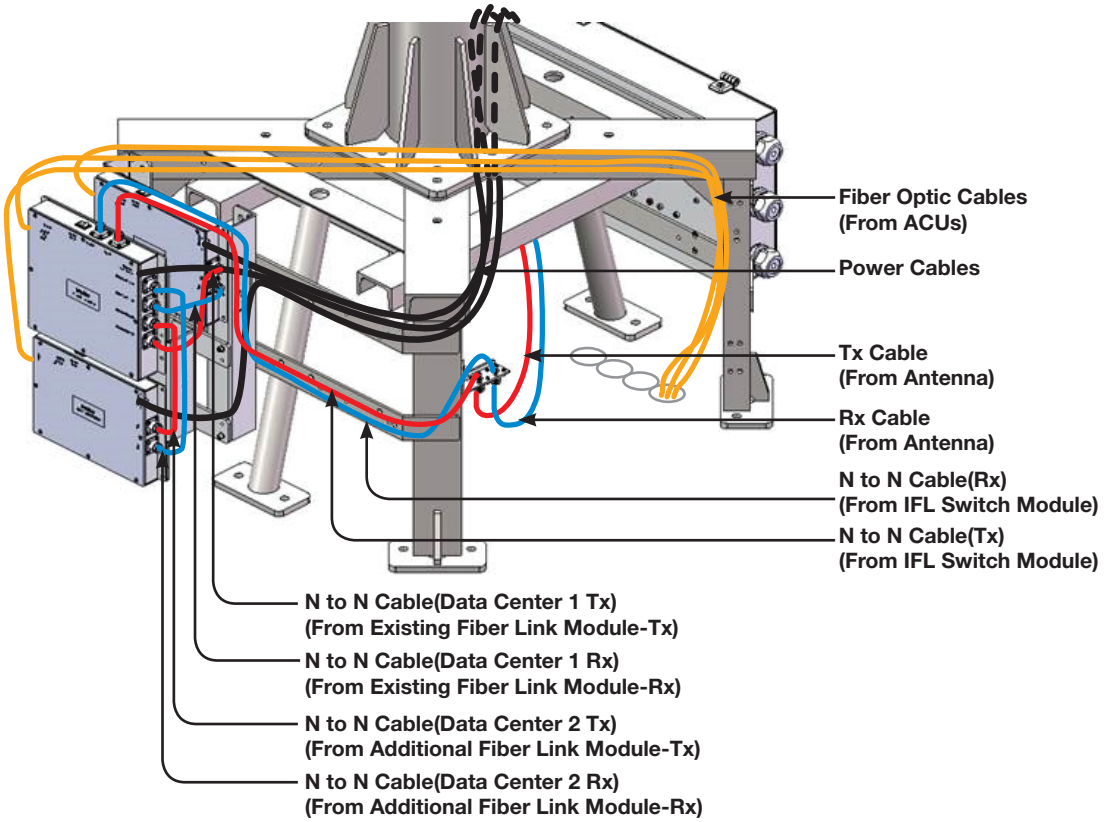
1. Connect the Fiber Optic Cable(not supplied by Intellian) to the FIBER port on the Additional Fiber Link module.
2. Connect the N to N Cables (Rx, Tx) from the each Fiber Link Module to the Data Center 1/2(Tx/Rx) connectors(4EA) on the IFL Switch Module. (Refer to the following diagram for more details.)
3. Connect the Power Cables from the Additional Fiber Link module and IFL Switch Module to the Power Switch Box connector.

   NOTE: See the green box in the figure below to connect the Power Cables to the Power Breaker in the Power Switch Box.
4. Connect the N to N Cables (Rx, Tx) from the IFL Switch Module to the cable junction to connect the Rx, Tx Cables from the Antenna. After connecting all cables, turn on the power switch.


Rx Cable
(From Antenna)
Tx Cable
(From Antenna)
Cable Junction
Tx
Rx
4
3
Power Switch Box
N to N Cable(Tx)
(From IFL Switch Module)
N to N Cable(Rx)
(From IFL Switch Module)
Power Cable
(From Existing Fiber Link Module)
Intellian
Fiber Link Module
N to N Cable(Data Center 1 Tx)
(From Existing Fiber Link Module-Tx)
N to N Cable(Data Center 1 Rx)
(From Existing Fiber Link Module-Rx)
Existing Fiber Link Module(Data Center 1)
Fiber Optic Cable
(From Existing
ACU)
Power Cable
(From IFL Switch Module)
2
Intellian
IFL Switch Module
Data Center 2 Rx
Data Center 1 Rx
Data Center 2 Tx
Data Center 1 Tx
N to N Cable(Data Center 2 Tx)
(From Additional Fiber Link Module-Tx)
N to N Cable(Data Center 2 Rx)
(From Additional Fiber Link Module-Rx)
IFL Switch Module
Power Cable
(From Additional Fiber Link Module)
1
Intellian
Fiber Link Module
Fiber Optic Cable
(From Additional
ACU)
Additional Fiber Link Module (Data Center 2)



Power Switch Box(Inner part)

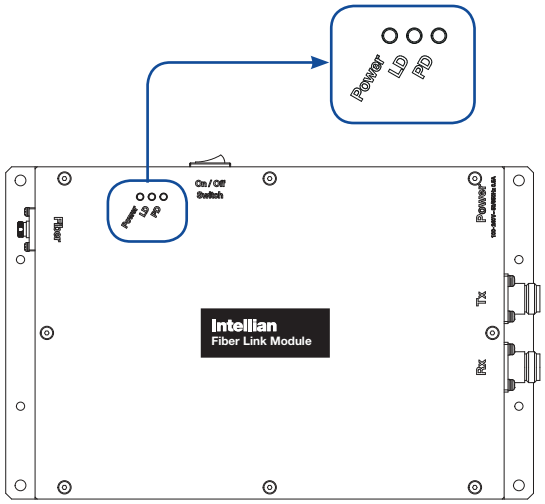


Additional Fiber Link and IFL Switch Module Cable Connection

Checking the LED Status
After module connection, check LED status of the module.

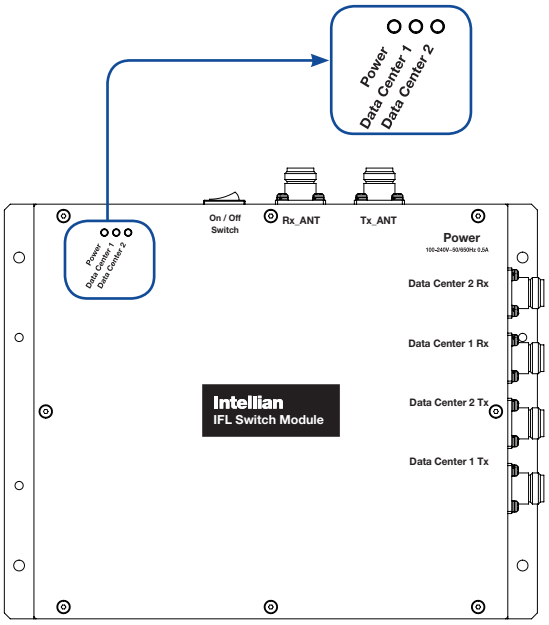
Fiber Link module (Optional: In case of using DDC System, 2 Fiber Link module are assembled.)
The 3 LED lights on the module are all green in color. They are all on when the connection is normal. The three lights display system status as follows:

- 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.



IFL Switch Module (Optional: Only case of using DDC System, this module is assembled.)
The 3 LED lights on the module are all green in color. The three lights display system status as follows:

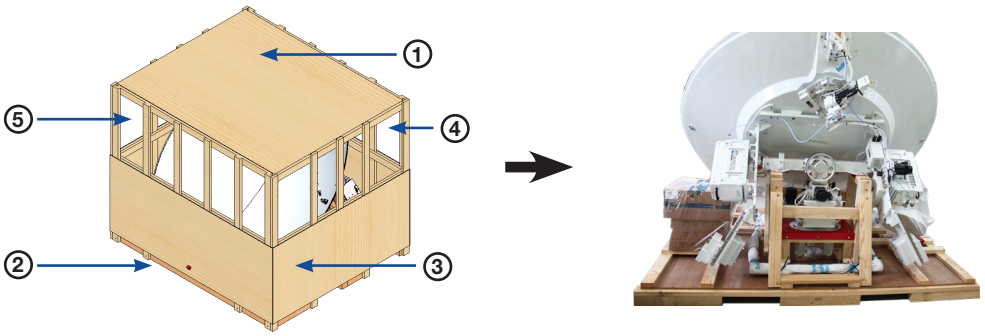
- Power: When it is on, it indicates the power is being supplied properly.
- Data Center 1 or 2: When it is on, it indicates the Data Center 1 or 2 is connected.



Reflector and Pedestal Assembly

Uncrating Antenna Radome Package

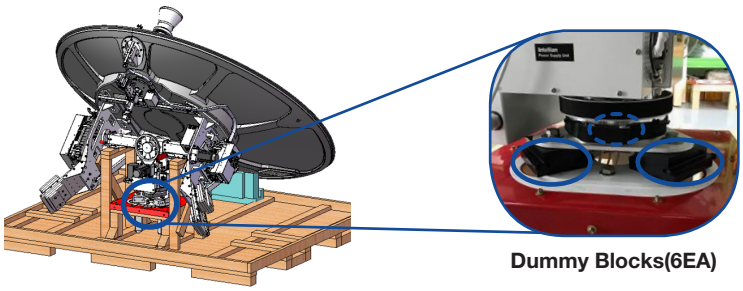
Remove the bolts securing top panel ① and lift off using the forklift. And then remove side panels in order.



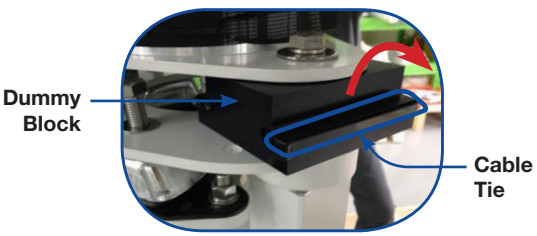
Remove Panels of Package Crate

Removing the Dummy Blocks

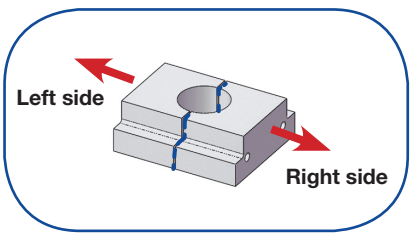
WARNING: Make sure the fixed Dummy Blocks must be removed before removing the Shipping Brackets for safe installation.



Apply the process below to the Three(3) Sets of Dummy Blocks.



Step 1: Remove the cable tie securing the Dummy Block.



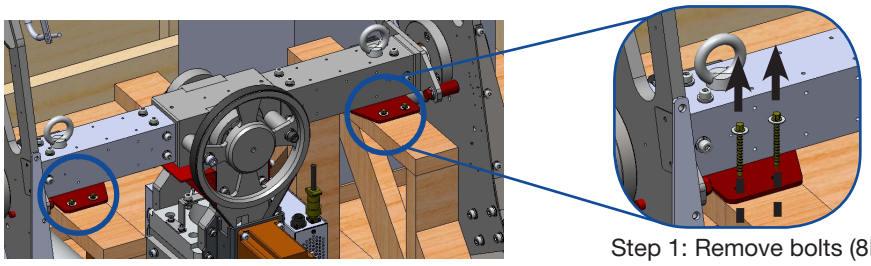
Step 2: Carefully pull the Dummy Blocks(2EA) to both directions as above and remove them.

Remove Three(3) Sets of Dummy Blocks

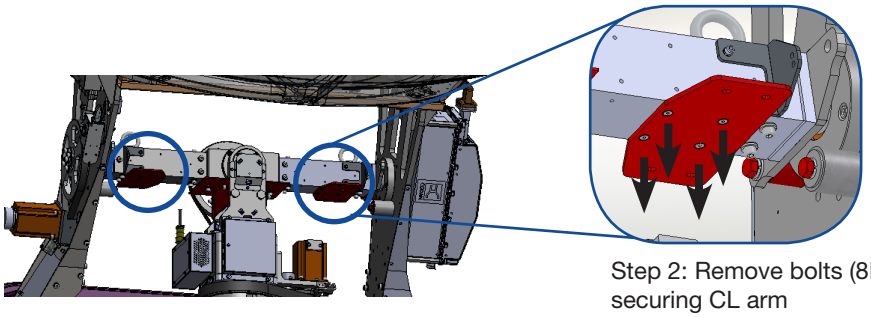
Removing the Shipping Brackets

Remove the two(2) brackets on each side of the cross-level arm.

Apply the assembly process below to both sides.



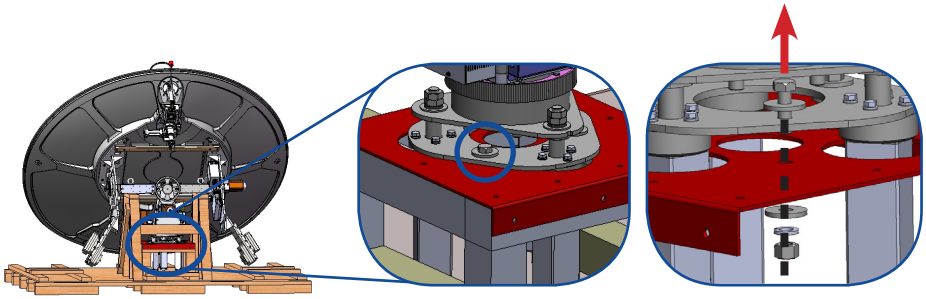
Step 1: Remove bolts (8EA) securing wooden supports



Step 2: Remove bolts (8EA) securing CL arm

Remove Two(2) Brackets on both sides of CL Arm

Remove the bracket on the Pedestal.



Remove bolts (3EA) securing the pedestal

Remove the Bracket from the Pedestal

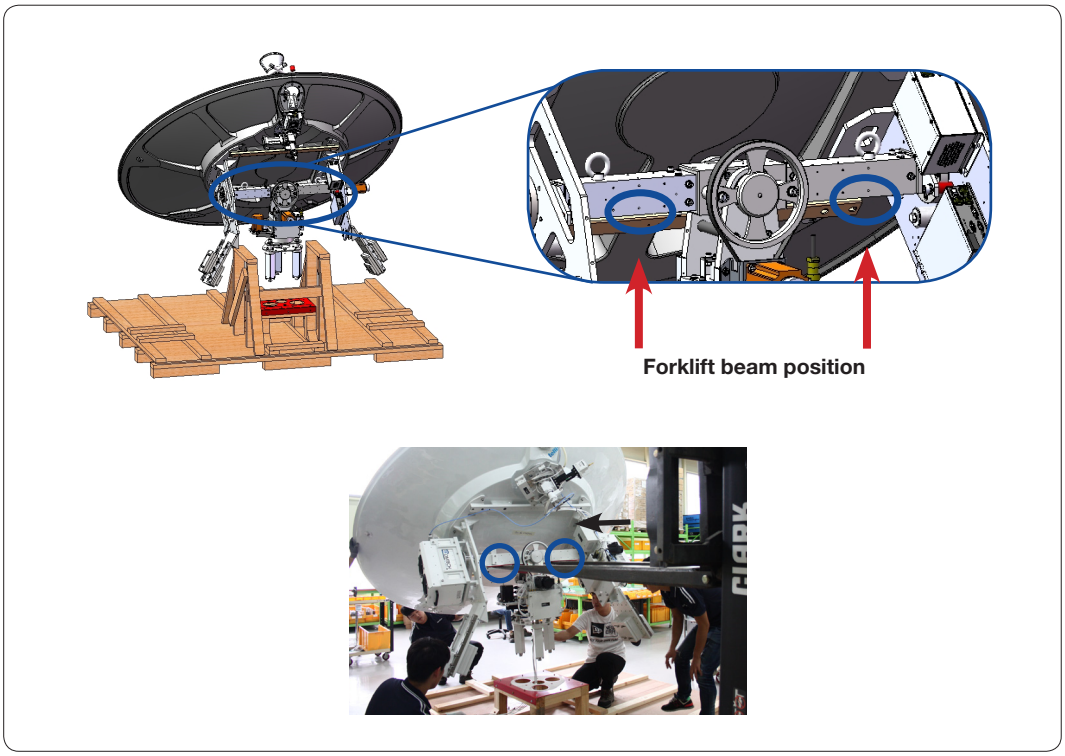
Assembling the Reflector and Base Frame

CAUTION

CAUTION

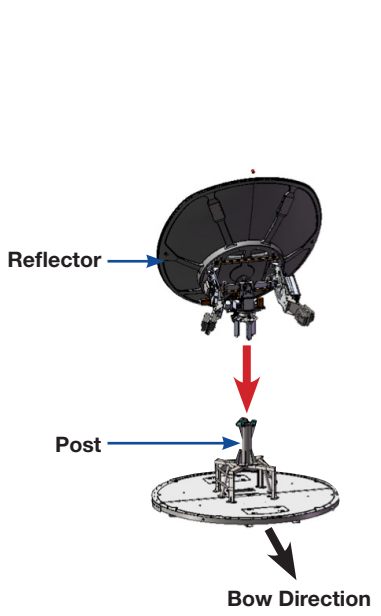
In case of using a forklift, be careful not to damage the peripheral module and cables while inserting the fork. Intellian is not responsible or liable for any damage incurred due to improper handling.

Lift up the Reflector using a forklift, and move it above to the post located on the air-conditioner frame.

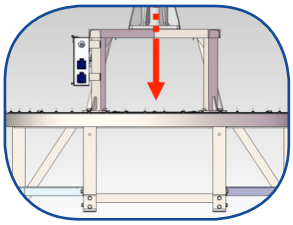


Move Reflector using Fork Lift Truck

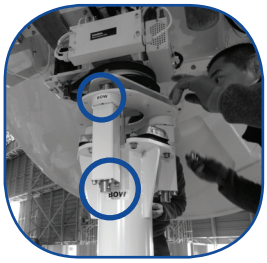
Now it is time to assemble the Reflector and the Post. Before putting the reflector down onto the post, be sure the cables go through the center hole of the post, and that the two BOW markers on the pedestal and the post are in the same direction.



1. Make a cable from the antenna pass through the center hole of Vertical Middle Plate.



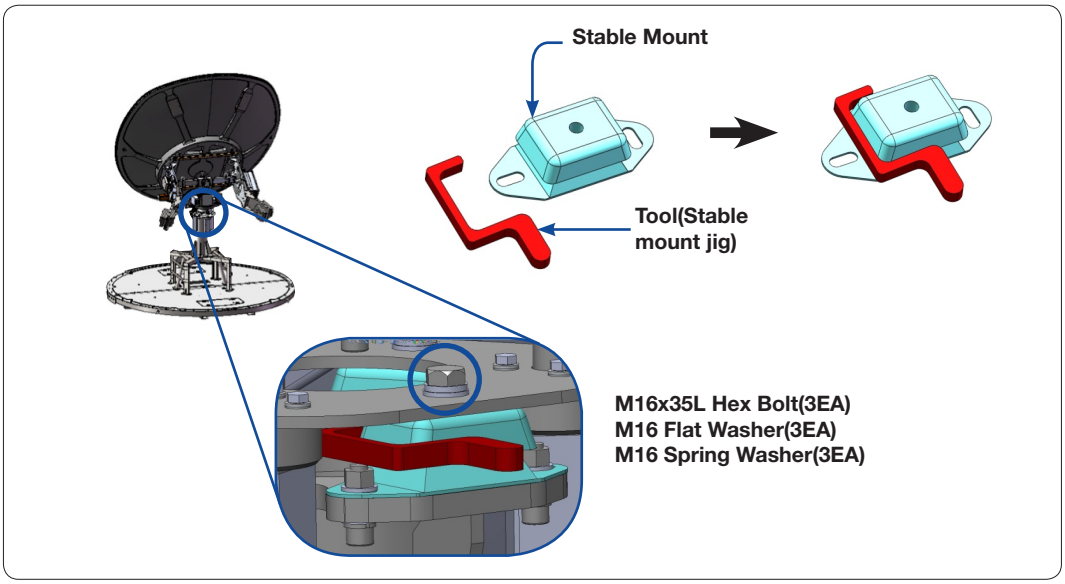
2. Make the cable pass through that hole and pull out to the under the post bottom.



3. Check the two BOW markers on the pedestal and the post are in the same direction.

The Cables in the Post Center and BOW Markers in the Same Direction

After putting the Reflector and the Post together, they should be fastened with the Stable Mounts(3EA) using bolts as shown in the picture below. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly. Use the Tool(Stable mount jig) to adjust the Stable Mount position.

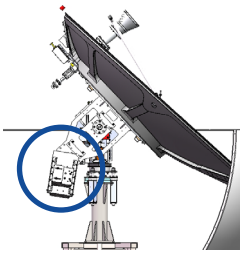


Fasten the Reflector and the Post

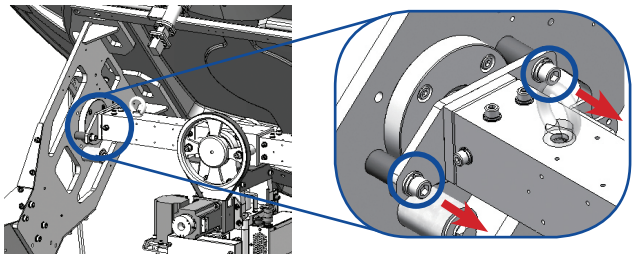
Turning the Counterweight Plate

To simplify the assembly process, the Reflector should be turned and maintained a horizontal position. The Counterweight Plate should be assembled following the procedures as shown in the figure below. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.

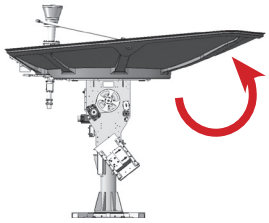
Apply the assembly process below to both sides of the Counterweight Plate.



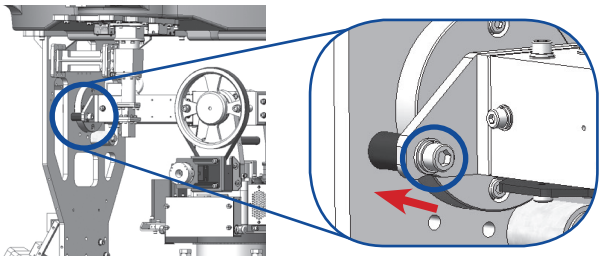
① Before turning the Counterweight Plate.



② Remove the M12 Wrench Bolts(2EA).

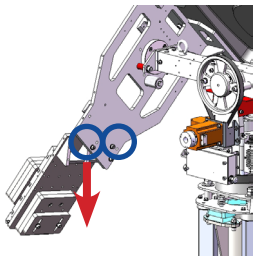


③ Turn the reflector and maintain a horizontal position to turn the counterweight plate easily.

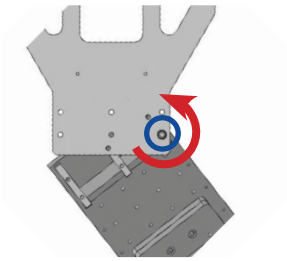


④ When the holes on the EL Arm and frame hole match, screw them together using the M12 Wrench Bolts(1EA).

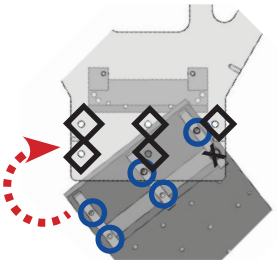
WARNING: Be careful when turning the reflector because the unit is very heavy. Incorrect handling of the reflector may lead to injury to the installers who must hold both sides of the reflector during installation and/or cause significant damage to the unit.



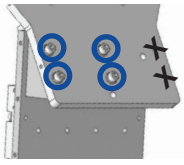
⑤ Remove the M10 Wrench Bolts(2EA).



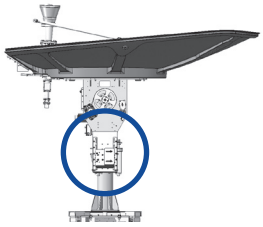
⑥ Loosen the M10 Wrench Bolt lock(1EA) for easy turning of the plate in the next step.



⑦ Turn the plate to match a circle and a square as a pair.



⑧ Tighten the M10 Wrench Bolts circled above(4EA) while keeping the lower bolts open(2EA). The lower bolts(2EA) will be tightened when assembling Support Frame.



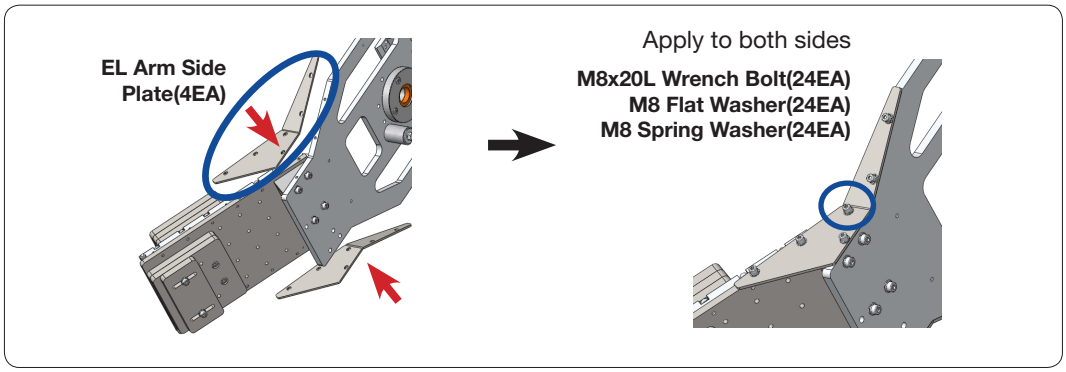
⑨ After completing the Counterweight Plate assembly.

Turning the Counterweight Plate

Assembling the EL Arms and EL Arm Support Frame

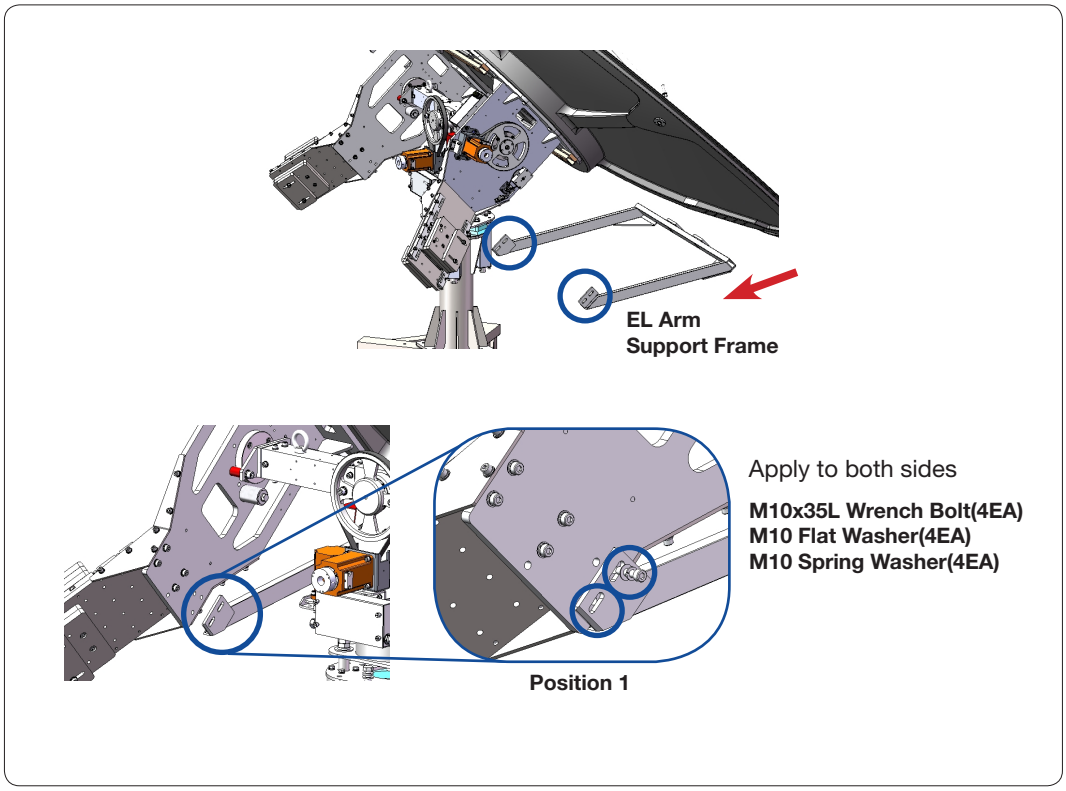
Bring the EL Arm Side Plate and EL Arm Support Frame from the Antenna Package. Assemble the EL Arm Side Plates to the EL Arms on both sides. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.

Place and assemble the EL Arm Plates(2EA) using bolts on both the left and right EL Arms. Apply it to both sides of the Counterweight Plate.



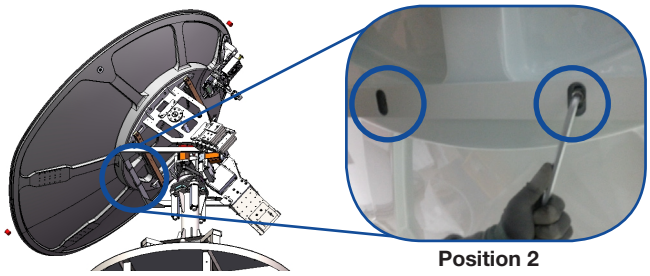
Assemble EL Arm Plates

After assembling the EL Arm Plates, attach the EL Arm Support Frame to the EL Arm using bolts as shown in the figure below. This procedure must be performed on both the left and right EL Arms.



Assemble EL Arm Support Frame(Position 1)

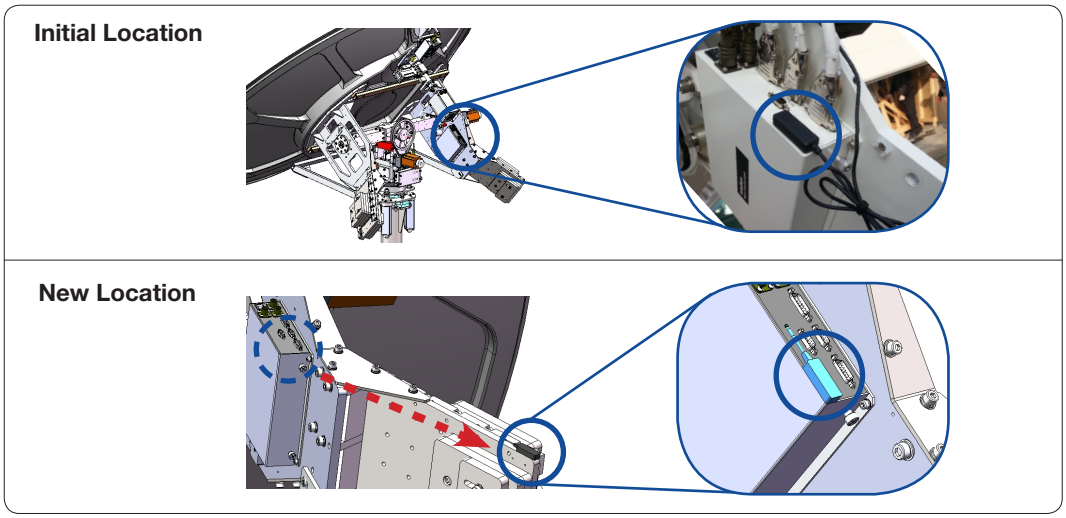
After tightening both sides of the EL Arms, the middle of the frame should be tightened as shown in the figure below. Tighten the bolts in the middle of the EL Arm Support Frame.



Assemble EL Arm Support Frame(Position 2)

Changing GPS Location

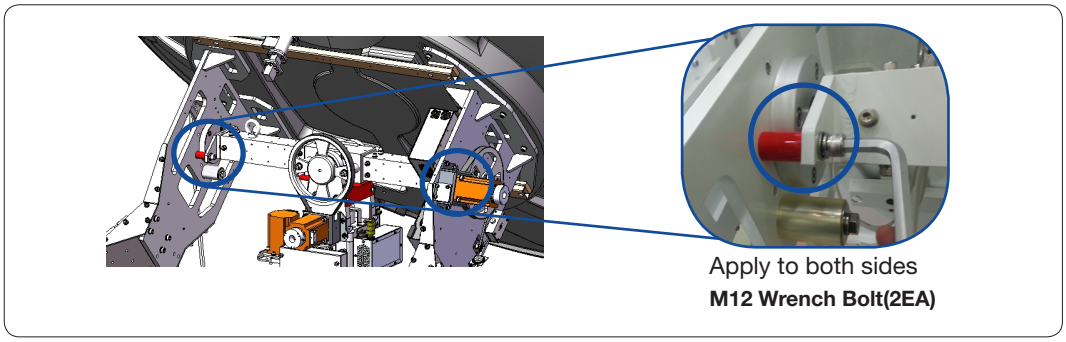
The GPS unit should be moved from the surface of the Control Board Case to the end of the EL Arm Counterweight Plate. Double sided tape attached on the GPS will make it easy to move and secure to the EL Arm Counterweight Plate.



Move GPS Location

Removing the EL Limits

Remove the fastened bolts to disassemble the EL Limit. One EL Limit on the left and another on the right EL Arms must be removed.



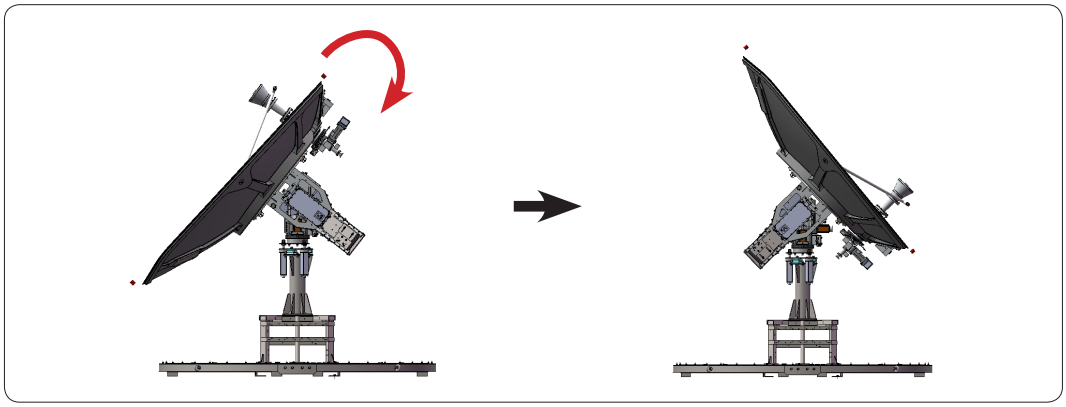
Remove EL Limits

Turning the Reflector

Now it is time to turn the Reflector clockwise to change the EL angle after disassembling the EL Limits.

CAUTION

CAUTION: When turning the Reflector, move it slowly so the teeth on the belts are not get damaged.



Turn the Reflector

Since the Weight Balance is not yet adjusted, please be careful when turning the Reflector. If the antenna is fixed using the supplied strap as shown in the figure below the turning the procedure will be easier.

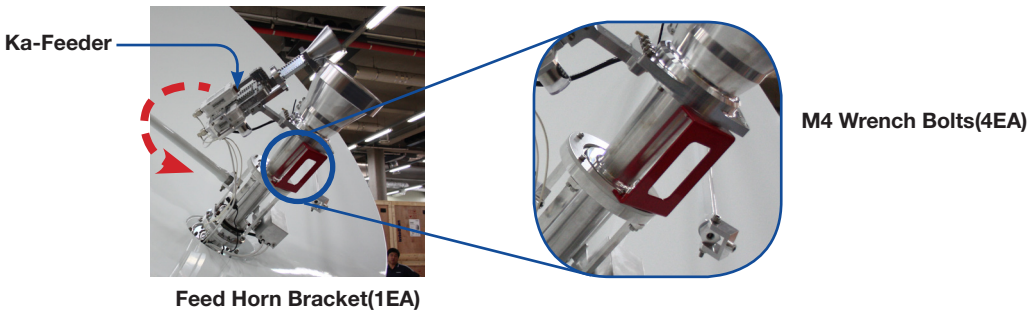
Fix the Reflector using the Supplied Strap

Removing the Feed Horn Bracket(Only for Triple-band model)

To remove the Feed Horn bracket, unscrew M4 Wrench Bolts(4EA) on the bracket.

WARNING

WARNING: Be careful when removing the bracket because the sudden movement of the Ka-Feeder may lead to injury to the installers who must hold the Ka-Feeder while removing the bracket.

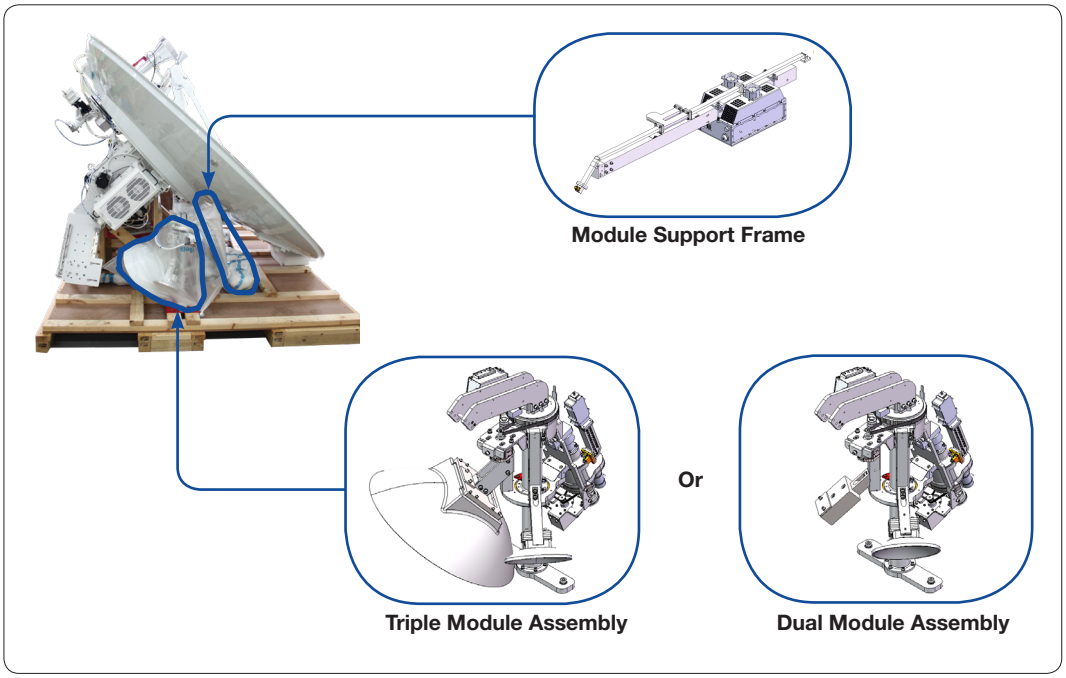


Remove Feed Horn Bracket

Triple/Dual Module Assembly

Unpacking the Triple/Dual Module Assembly

Take out the Triple/Dual Module from the Antenna Package.



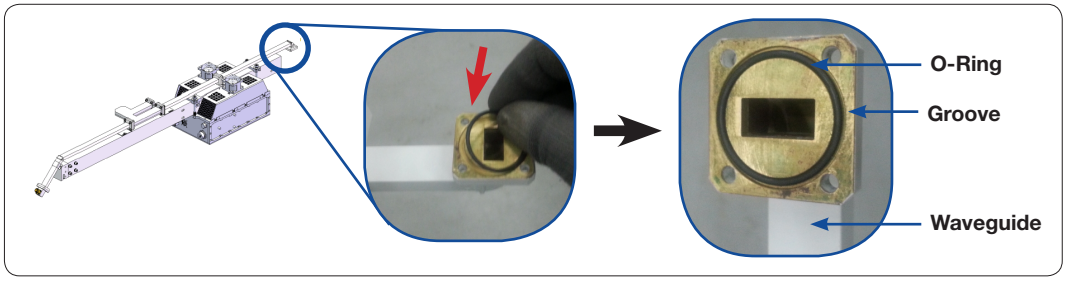
Unpack Antenna Package

NOTE

Keep the bolt kit which is taped on the Ku-band BUC. When connecting the flexible waveguide to the Ku-band BUC, this bolts(4EA) must be used.

Assembling the Waveguide

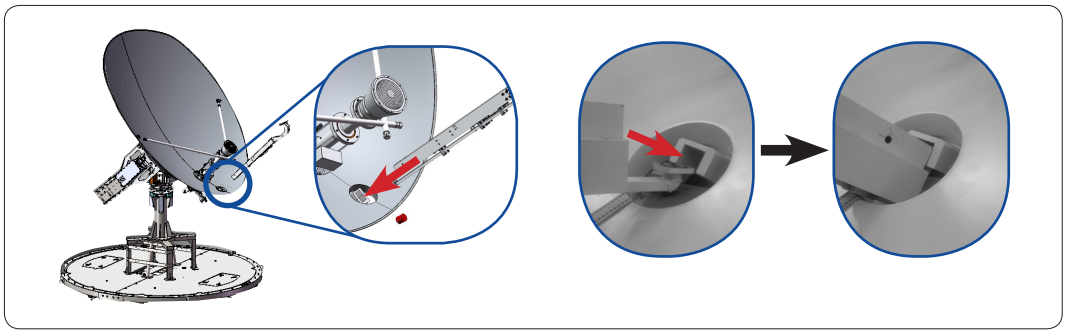
Before inserting the Module Support Frame into the Reflector, place the O-Ring into the groove on the Waveguide (located on the end of Support Frame) as shown in the figure below.



Assemble O-Ring

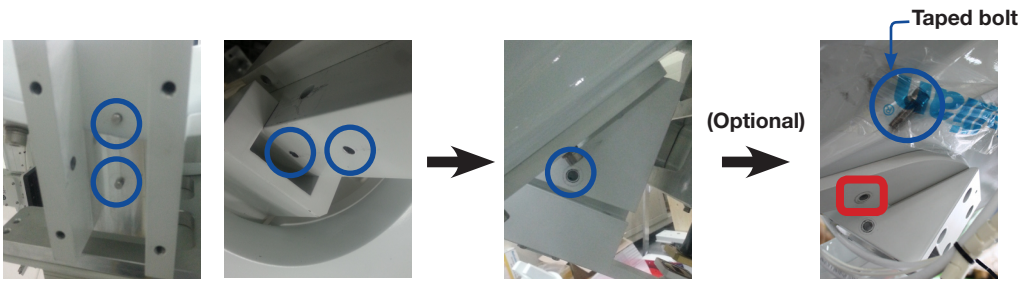
Assembling the Module Support Frame

Now, insert the Module Support Frame into the hole of Reflector shown in the figure below. While inserting the frame, be careful not to damage the Waveguide.



Insert Module Support Frame

Fix the position of the Module Support Frame to match the holes. When the holes on the frame and frame hole match, fixate them by sliding the pins into the holes. And then screw them together using a bolt temporarily. When tightening a bolt, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.



NOTE

NOTE: If there is an extra bolt which is tapped on the upper side of the bolt hole, assemble it to next to the tightened bolt(marked as ▭).

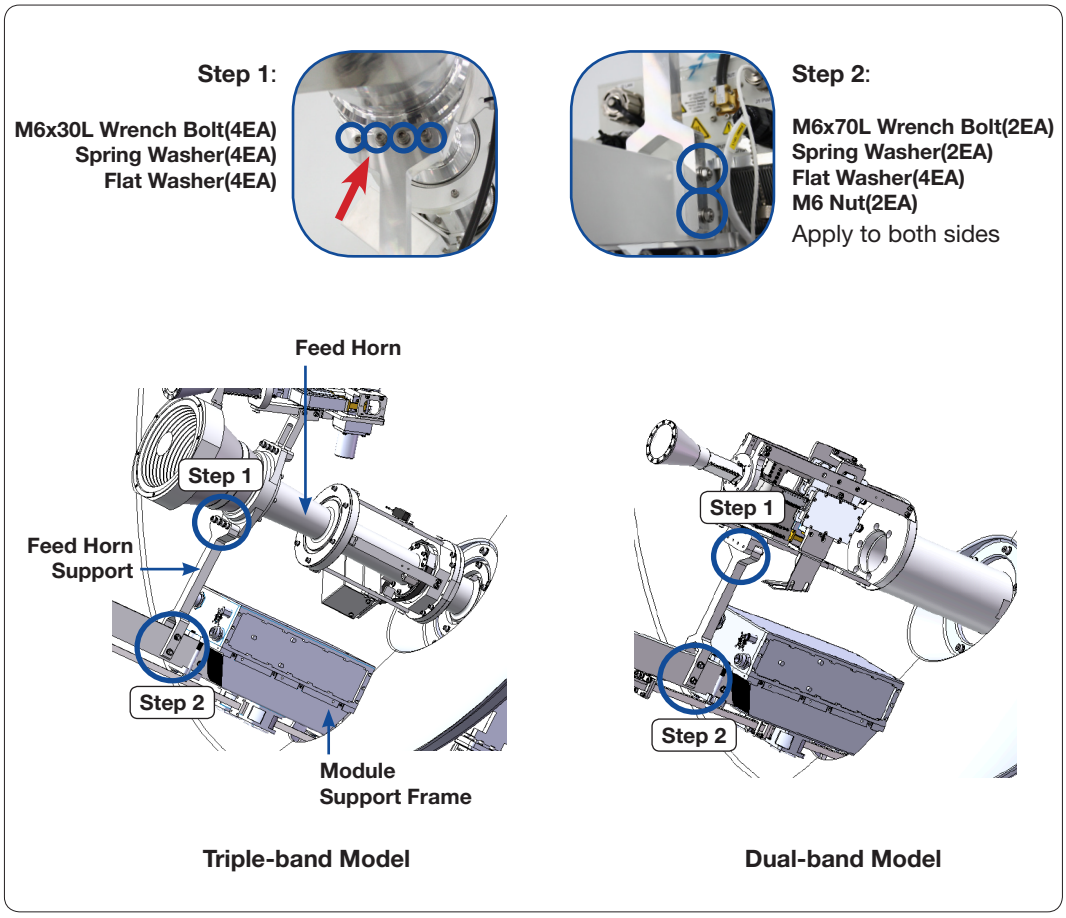
Match the Holes

Tighten M6x20 Wrench Bolts(4EA) first as shown below, and then tighten the M8 Bolt which were applied temporarily in an earlier step.

Tighten Bolts

Assembling the Feed Horn Support

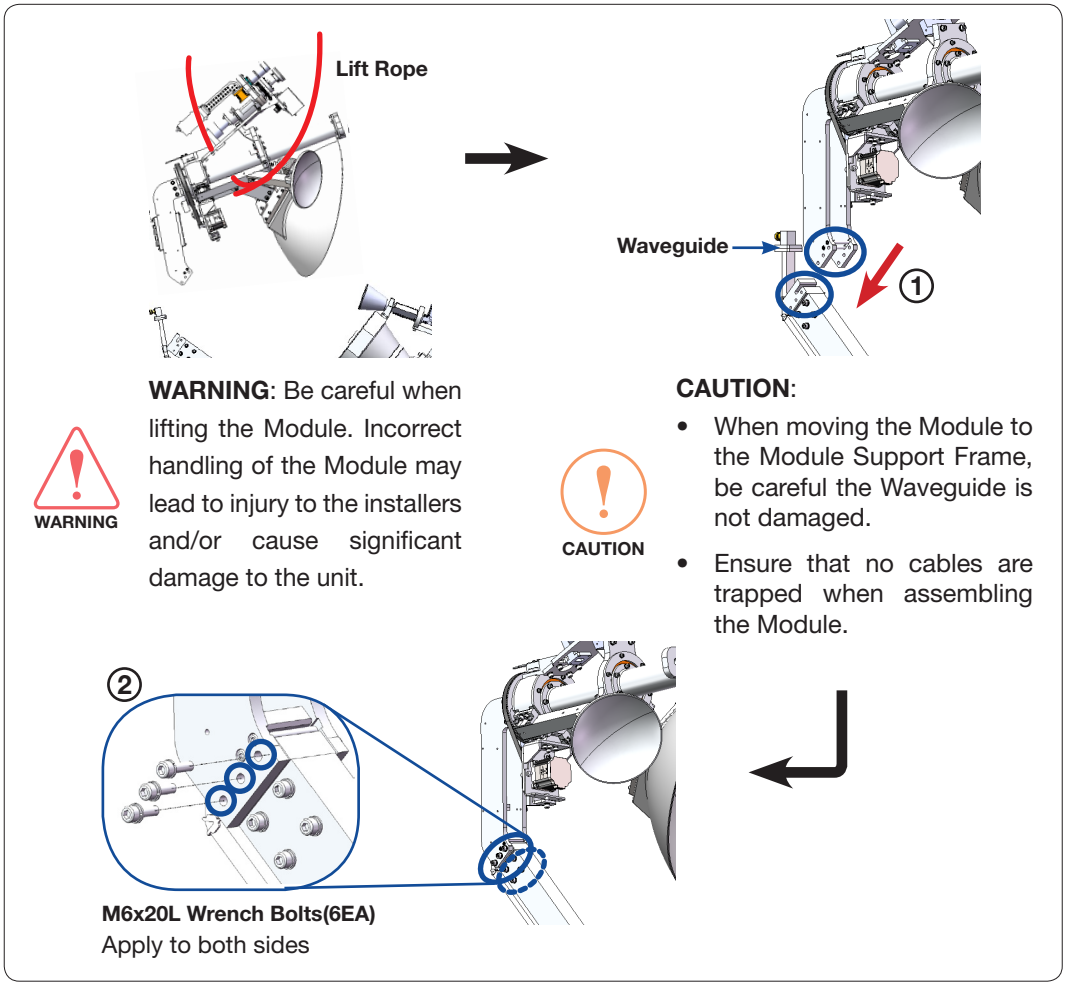
Assemble the Feed Horn Support to fix the Module Support Frame and the Feed Horn using bolts.



Assemble Feed Horn Support for Dual-band Model

Assembling the Triple/Daul Module

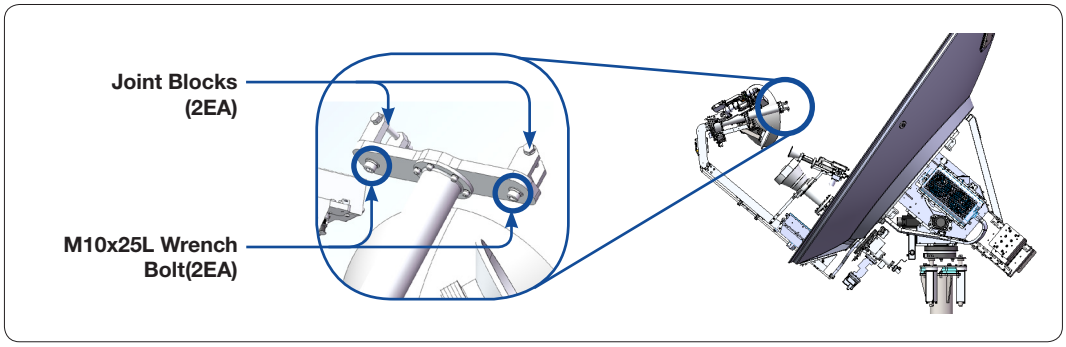
Connect the lift rope to the Triple/Dual Module and lift it using the forklift or crane. And then Insert the Triple/Dual Module in the direction of the **Arrow** ① as shown below. Tighten bolts on each side of the Triple/Dual Module ②.



Connect Triple/Dual Module and Module Support Frame

Attaching the Joint Blocks

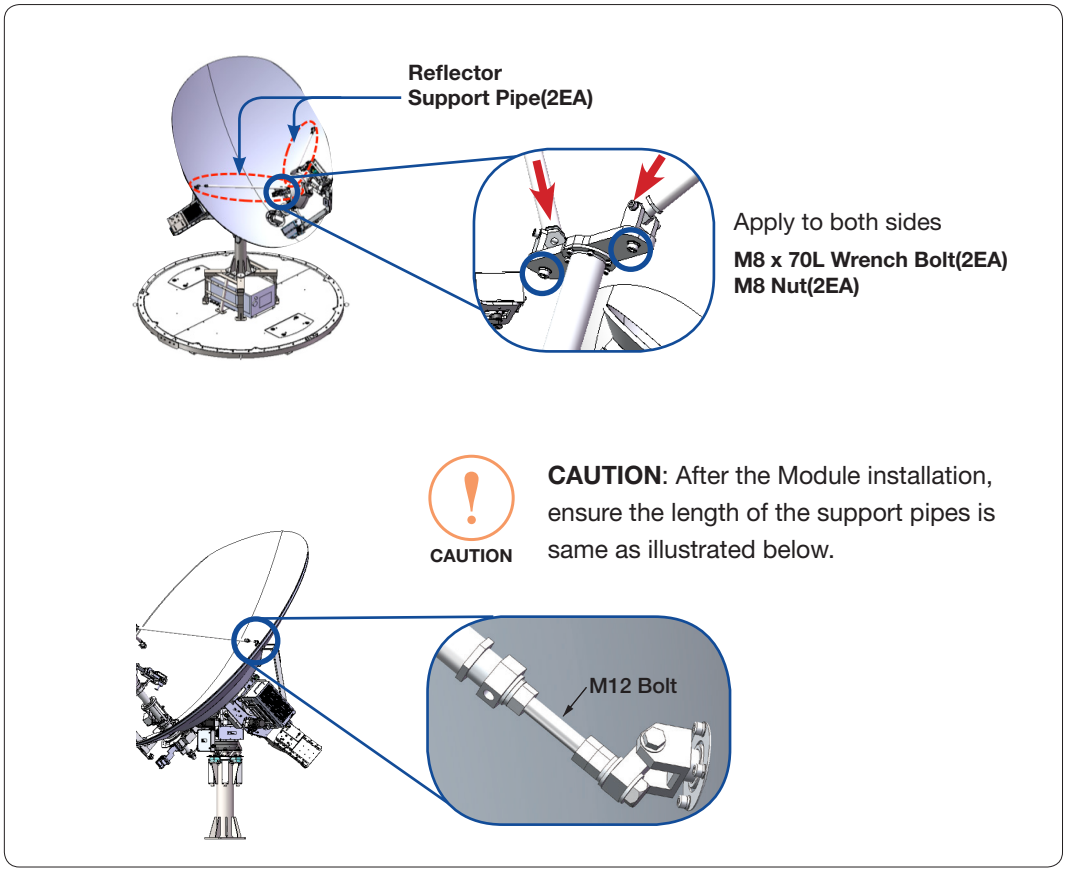
Attach the Joint Blocks(2EA) to the end of Triple/Daul Module using bolts.



Assemble Waveguide Bracket

Assembling the Reflector Support Pipe

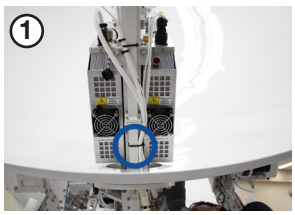
Assemble the Triple/Daul Module and Reflector Support Pipes using bolts as shown in the figure below. The Triple/Daul Module should be connected to both the left and right pipes. The support pipes are pre-assembled at the factory. However, if they need to be re-assembled after part replacement, the length of the M12 bolts on the support pipes must be adjusted to such proper settings to ensure stable performance.



Assemble Triple/Daul Module and Reflector Support Pipes

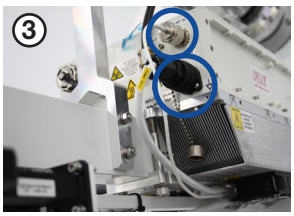
Arranging Triple/Dual Module Cables

After passing the Triple/Dual Module Cables through the Reflector Hole, organize them using cable ties as shown in the figure below.

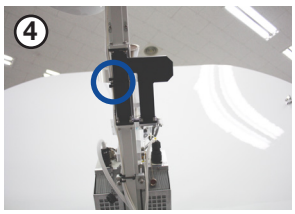


Secure cables(5EA) using a cable tie.

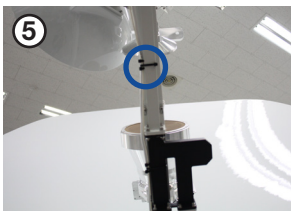
Connect a cable(1EA) to the connector on the left side of Ku-band BUC.



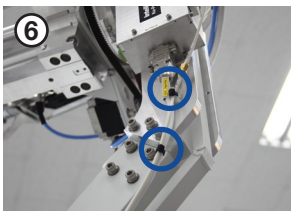
Connect cables(2EA) to the each connector on the right side of Ku-band BUC.



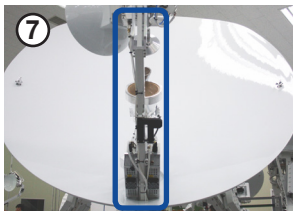
Secure cables(2EA) using a cable tie.



Secure cables(2EA) using a cable tie.



Secure cables(2EA) using a cable tie at each point.

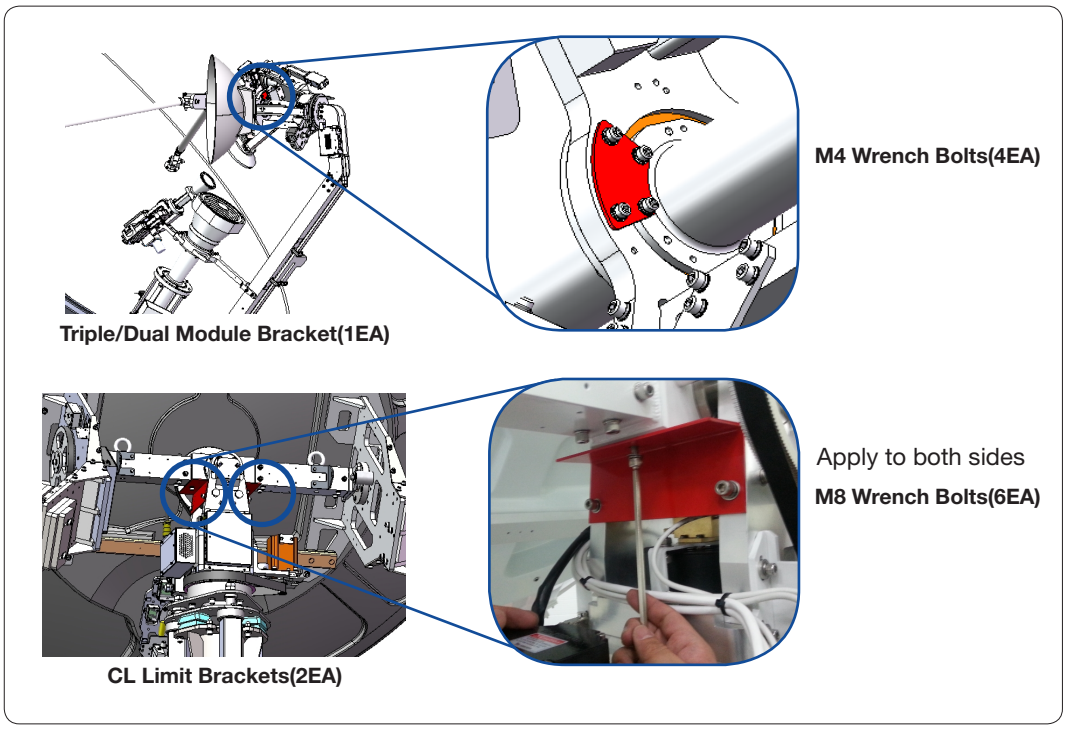


After connecting all cables, ensure all connectors are tightened.

Triple/Dual Module Cable Arrangement

Removing Triple/Dual Module Bracket and CL Brackets

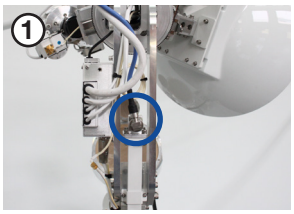
Finally, the Triple/Dual Module Assembly is completed by removing the Triple/Dual Module bracket and CL Limit Brackets. To remove the Triple/Dual Module bracket(1EA), unscrew M4 Wrench Bolts(4EA) on the bracket. To remove the CL Limit Brackets(2EA) unscrew M8 Wrench Bolts(3EA) on both side brackets.



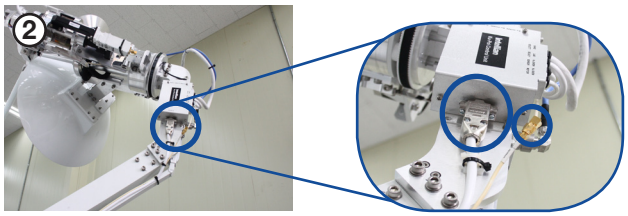
Remove Triple/Dual Module bracket and CL Brackets

Connecting Triple/Dual Module Cables

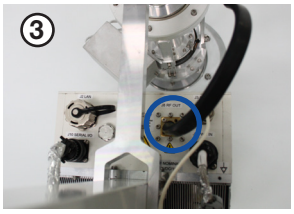
Triple/Dual Module Assembly Cables should be connected following the procedures as shown in the figure below.



Connect a cable to the connector in the middle of Triple/Dual Module Assembly.



Connect cables(2EA) to the connectors on the left side of Triple/Dual Module Assembly.

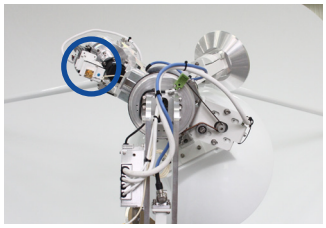


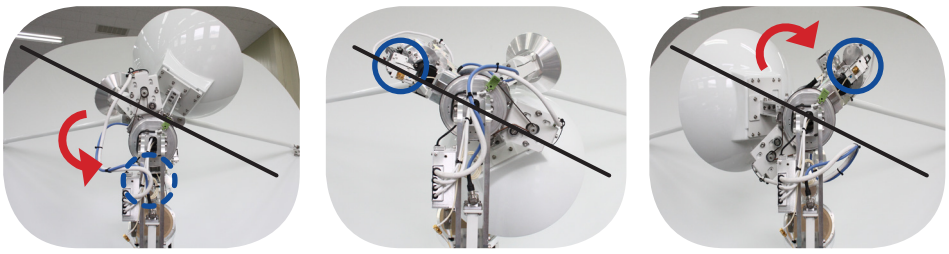
Connect the flexible waveguide to the Ku-band BUC. The taped bolts(4EA) on the Ku-band BUC must be used.
After connecting all cables, ensure all connectors are tightened.

Triple/Dual Module Cable Connections

Checking Skew Movement and Cable Connections

Turn the Skew ±90° left and right as shown below and check if the cables are excessively folded.





Left Side | Middle | Right Side

Check Skew Movement

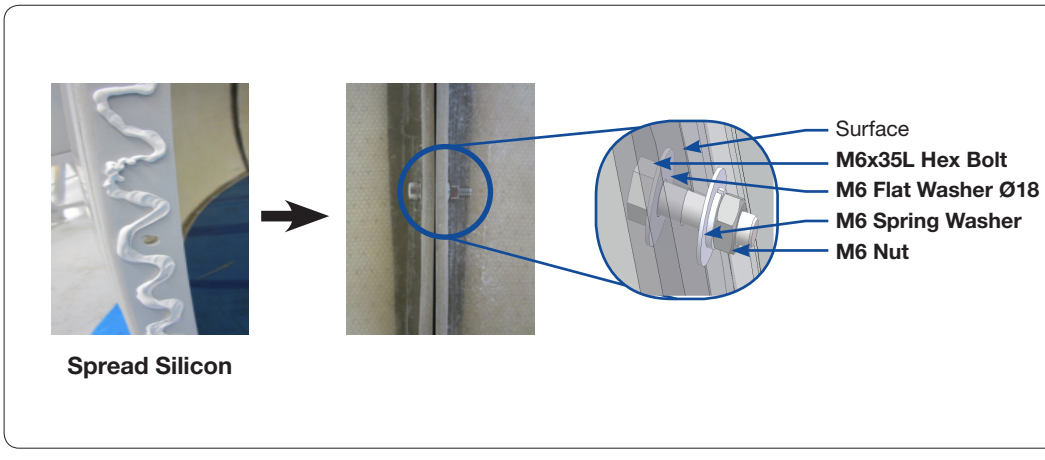
Radome Assembly

Assembling Upper Radome

The Upper Radome consists of panels. (168" Radome: Five(5), 154" Radome: Four(4))
To assemble the Upper Radome, follow the procedures below:

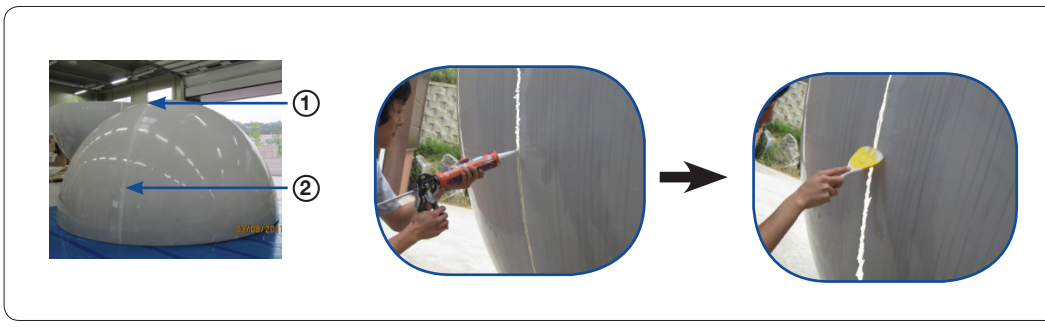
1. Two panels are assembled to make the first set.
2. Place the Cap on top of the Radome.
3. The other three panels are assembled in order to make the upper Radome.

As shown in the figure below, spread silicon on the binding surface of each panel, and connect them together using bolts. Keep the bolts loosened temporarily. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.



Upper Radome Assembly

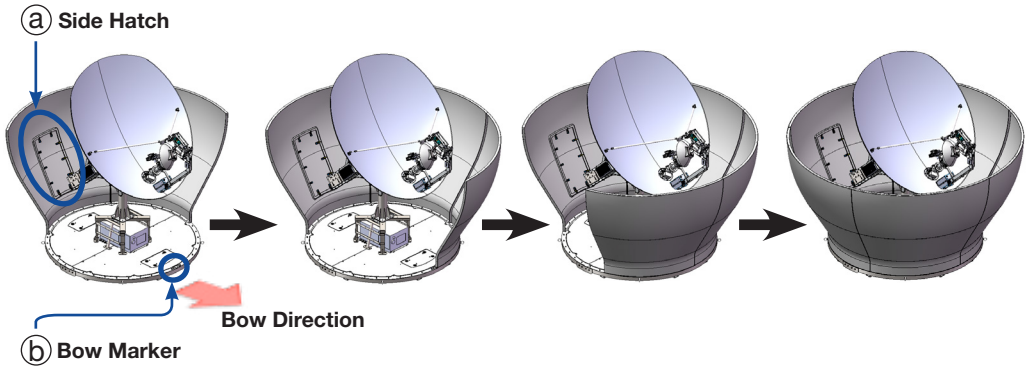
After joining the panels together, apply silicon to panels (① and ②) from the outside as shown in the figure below. After applying the silicon, remove excess silicon from each bead and clean the surface of the Radome.



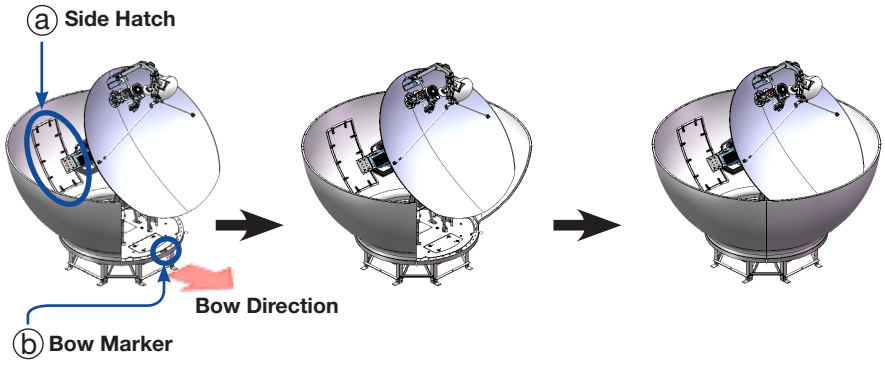
Spread Silicon between Radome Panels

Assembling Lower Radome

The Lower Radome consists of panels. (168" Radome: Five(5), 154" Radome: Four(4))
Before assembling Lower Radome, check the Side Hatch(ⓐ) is located on the opposite side of the Bow Marker(ⓑ) as shown below. Then assemble the rest of Lower Radome firmly.



168" Lower Radome



154" Lower Radome

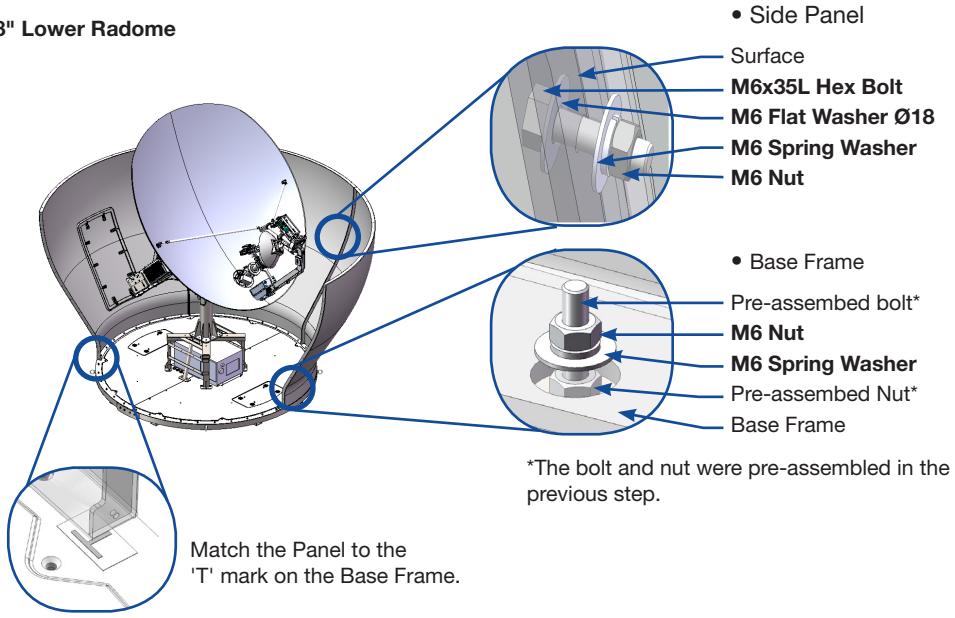
Lower Radome Assembly Steps

As shown in the picture below, spread silicon on the binding surface of each panel, and connect them together using the bolts provided. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.

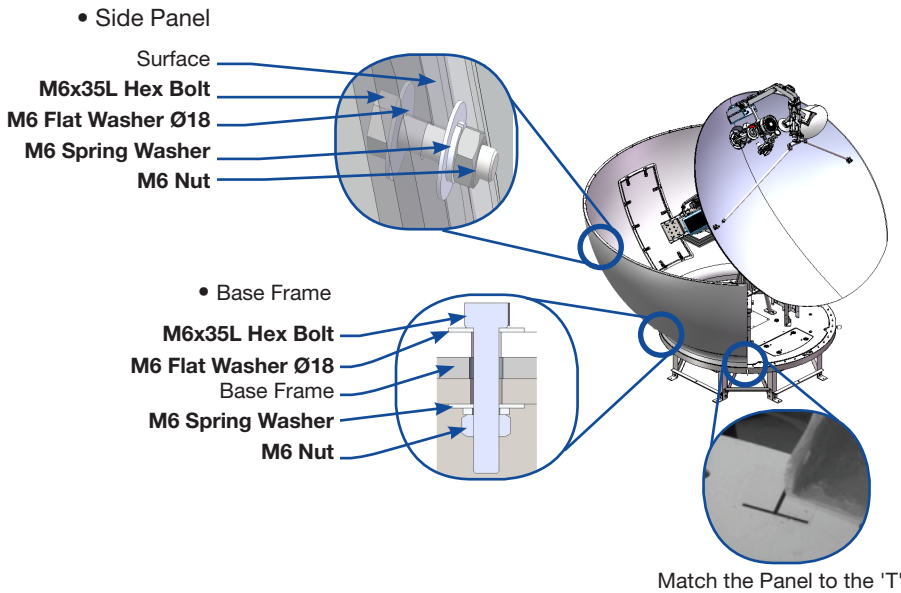
① Spread silicon on the Base Frame and Side Panel.

② Tighten bolts to fix panels as shown in the picture below.

168" Lower Radome



154" Lower Radome



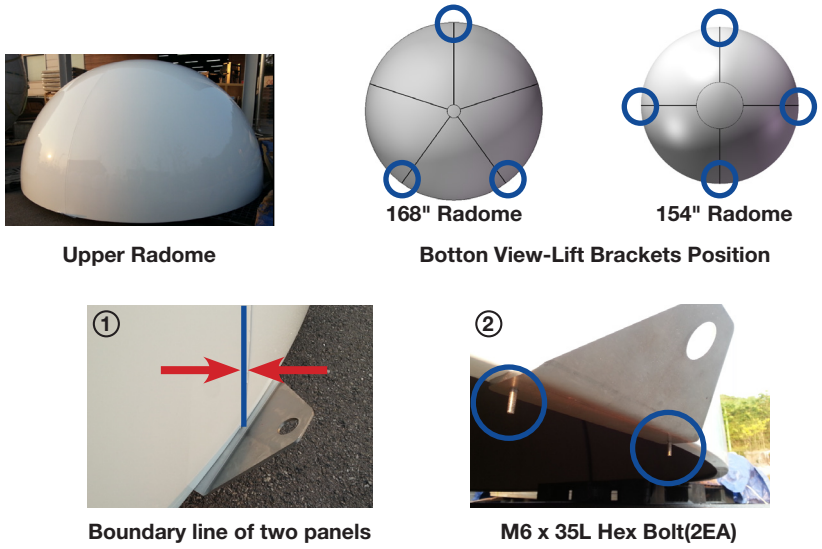
Lower Radome Assembly

Completing Radome Assembly

To join the upper and lower Radome sections, follow the procedures below:

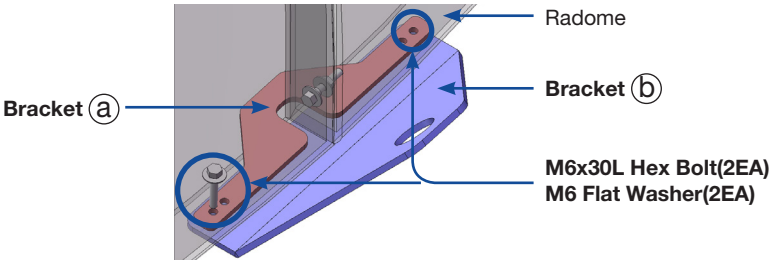
1. Attach the lift brackets under the upper Radome.
2. Lift and place the upper Radome on top of the lower Radome.
3. Match the upper and lower Radomes and Remove the lift brackets.
4. Connect the upper and the lower Radomes.

Before lifting the upper Radome, attach the lift brackets under the upper Radome as shown in the figure below. Each lift bracket(168" Radome: Three(3), 154" Radome: Four(4)) 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.



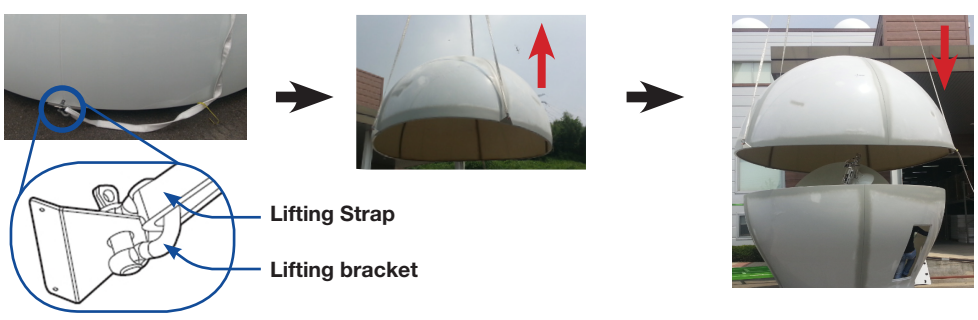
Lift Bracket Attachment

Each bracket is composed of ⓐ , ⓑ, and bolts as shown below. Assemble bracket ⓐ ➔ Radome ➔ bracket ⓑ in order by using bolts.



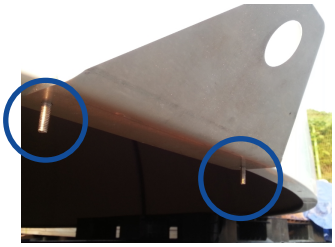
Lift Bracket Components

After connecting the Lifting Strap to the lift brackets (168" Radome: Three(3), 154" Radome: Two(2)), slowly lift up the upper Radome and place it on top of the lower Radome as shown in the figure below.



Place the Upper Radome on top of the Lower Radome

Before laying down the upper Radome on the lower Radome, position the two ends of the bracket bolts in conjunction with the holes on the lower Radome as shown below. Spread silicon on the binding surface of the lower Radome prior to lowering the top section.

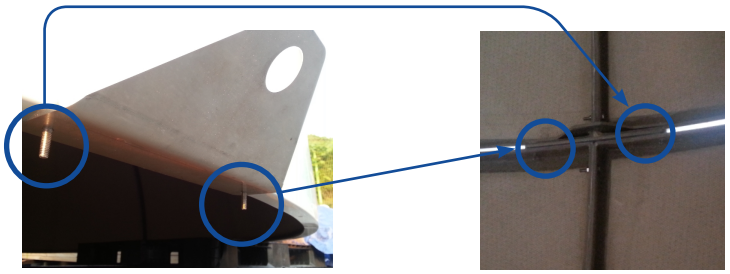


Check position of bracket bolts

Spread silicon on the surface

Assemble the Upper Radome and the Lower Radome

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



Match the Two Ends of M6 Bolts to the Lower Radome

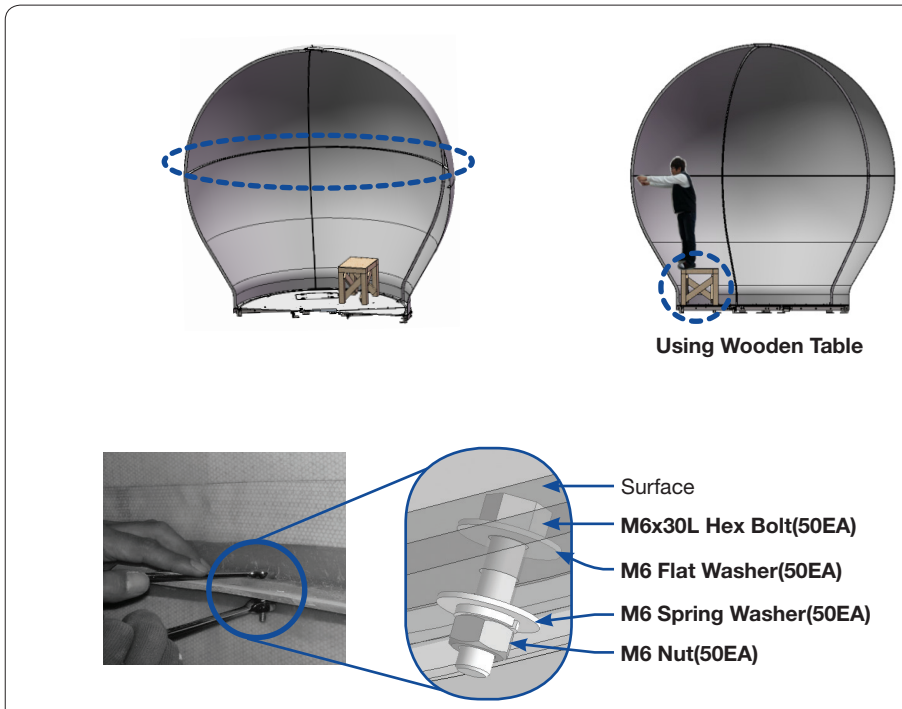
Remove all lift bracket bolts from inside the Radome, and then take out the brackets from outside as shown below.

Inside Radome

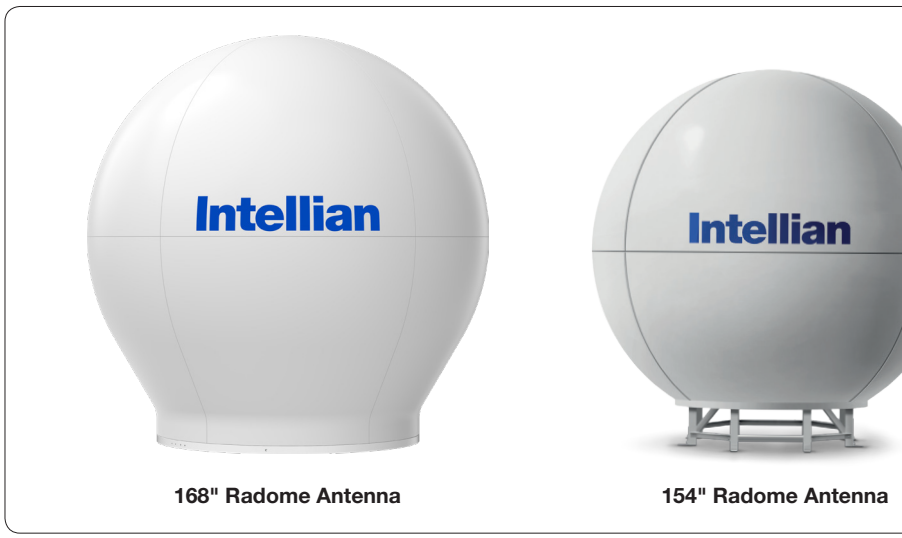
Outside Radome

Remove the Lift Brackets

Bring a wooden table from the Upper Radome Package and use it while assembling Radome. When all lift brackets are removed, start to connect the upper Radome and the lower Radome using bolts. Keep the bolts loosened temporarily. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.



Connect the Upper Radome and the Lower Radome

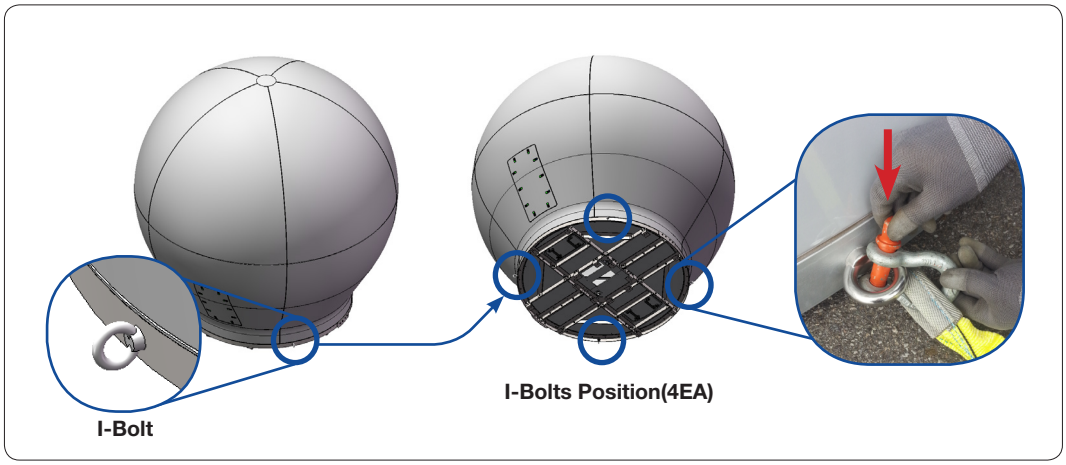


Radome Assembly Complete

Radome Mounting

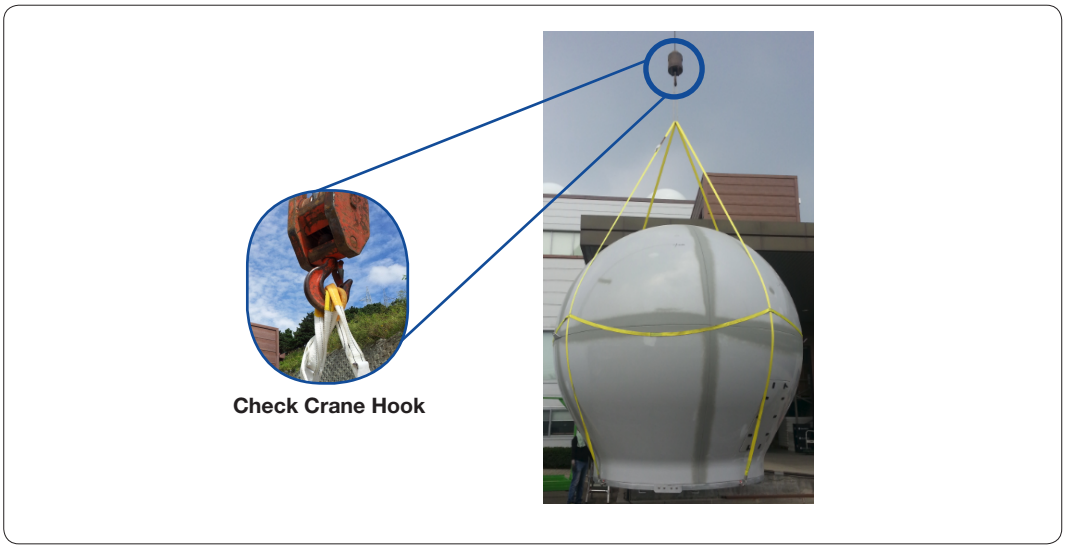
168" Radome Antenna

Bring a lifting strap from the Upper Radome Package. Connect the lifting straps to I-Bolts (4EA) on the Radome bottom as shown in the picture below. Once secured and lightly tensioned using a crane.



Connect the Lifting Strap

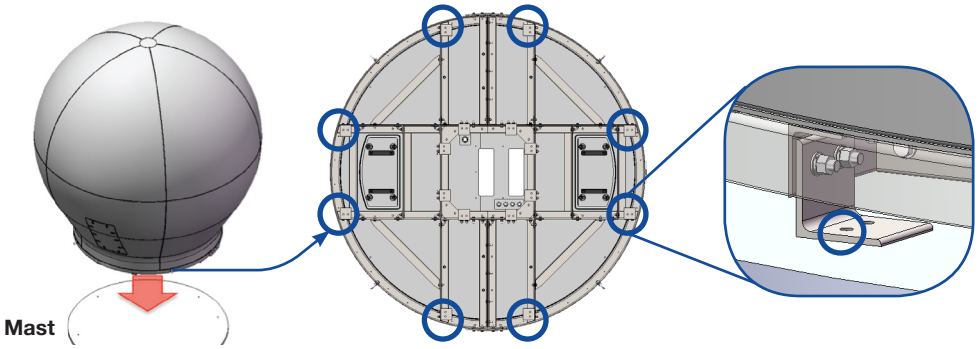
Lift up the Radome hanging all four straps on a crane hook as shown in the figure below. Straighten out the lifting straps as shown below prior to lifting the entire load of the antenna.



Lifting up the Radome using the Crane

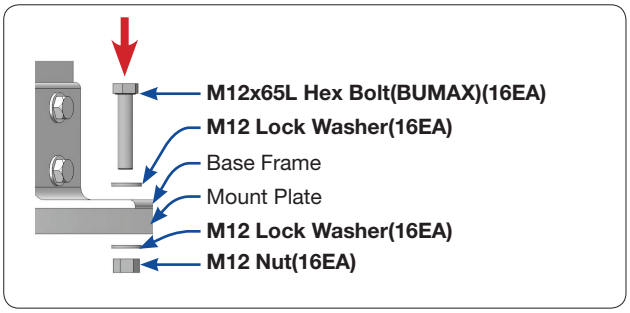
WARNING: Be careful when lifting up the antenna because the unit is very heavy. Incorrect handling of the antenna may lead to injury to the installers who must hold both sides of the reflector during installation and/or cause significant damage to the unit.

After placing the antenna on the ship's mast, fixate the antenna frame to the mast using bolts. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.



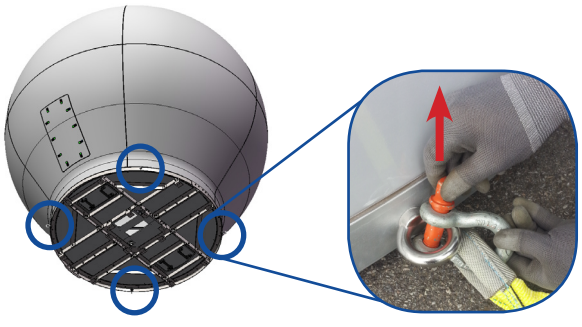
WARNING

WARNING: when placing the antenna on the ship's mast, move it slowly so the antenna frame is not get damaged.



Fix the Antenna to the Mast

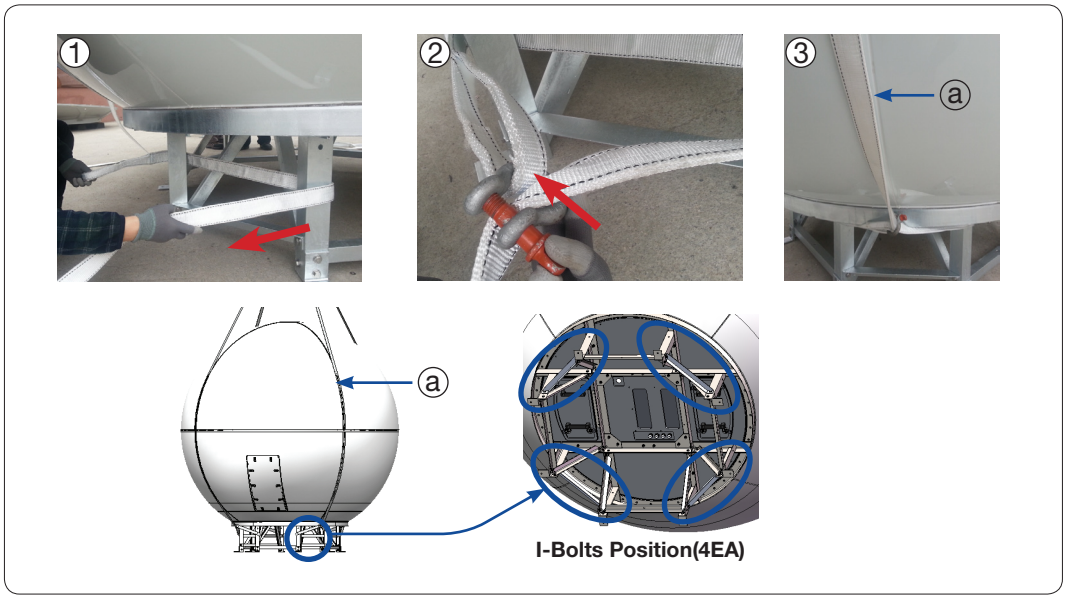
Remove the lifting straps after fixing the antenna frame to the ship's mast as shown below. The removing procedures for the lifting straps are performed in reverse order of assembling.



Remove the Lifting Strap

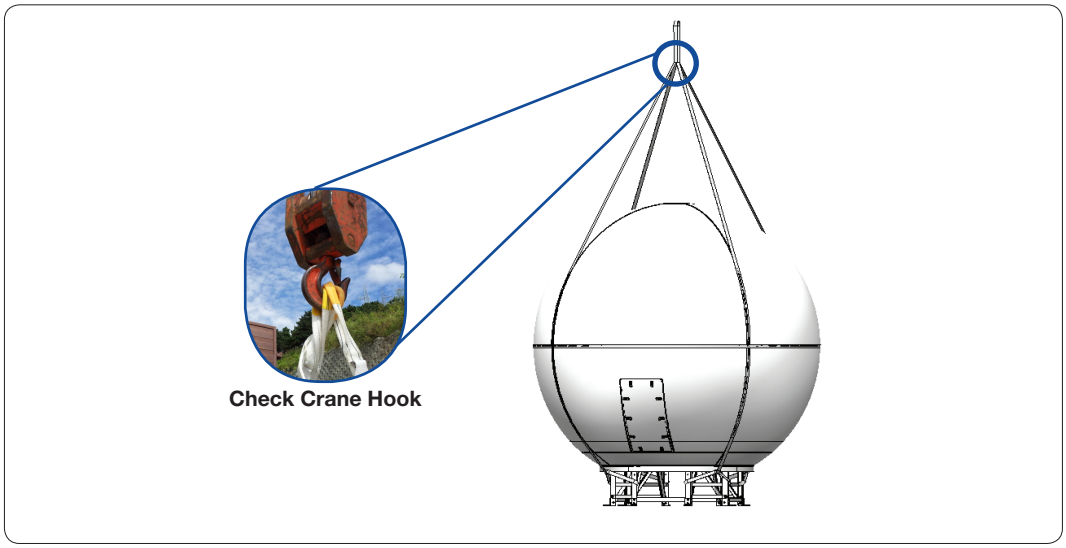
154" Radome Antenna

Hook the two(2EA) frame legs using the lifting strap as shown in ①, and tie the strap as shown ink below. Once secured and lightly tensioned using a crane, check to be sure the straps match the vertical connection lines of the Radome panels as shown in ③.



Connect the Lifting Strap

Lift up the Radome hanging all four straps on a crane hook as shown in the figure below. Straighten out the lifting straps as shown below prior to lifting the entire load of the antenna.

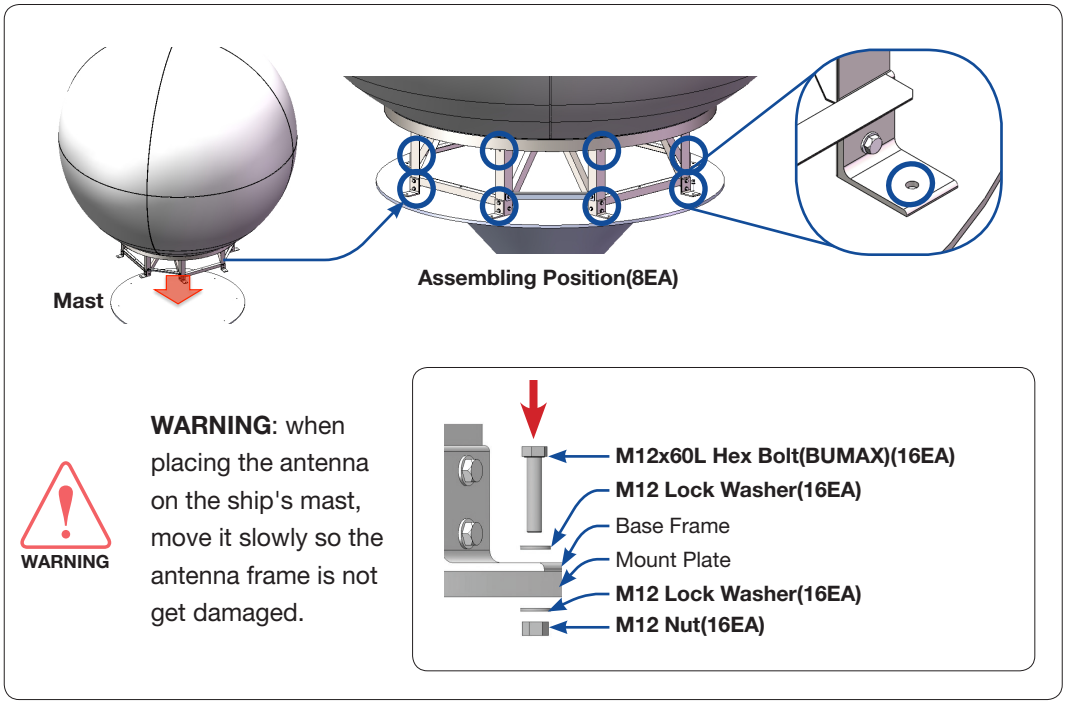


Lifting up the Radome using the Crane

WARNING

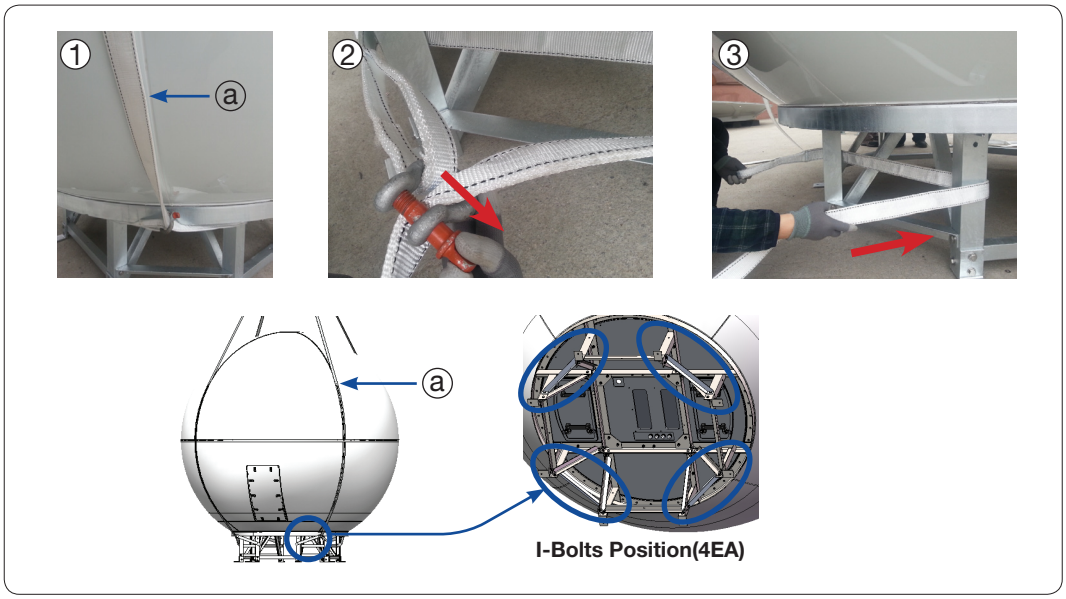
WARNING: Be careful when lifting up the antenna because the unit is very heavy. Incorrect handling of the antenna may lead to injury to the installers who must hold both sides of the reflector during installation and/or cause significant damage to the unit.

After placing the antenna on the ship's mast, fixate the antenna frame to the mast using bolts. When tightening bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.



Fix the Antenna to the Mast

Remove the lifting straps after fixing the antenna frame to the ship's mast as shown below. The removing procedures for the lifting straps are performed in reverse order of assembling.



Remove the Lifting Strap

Installing the ACU/Mediator

Mounting the ACU

19" Rack Mount Type

Table Mount Type

ACU Dimensions

Selection of ACU Installation Site

Mounting the Mediator

19" Rack Mount Type

Table Mount Type

Mediator Dimensions

Selection of Intelligent Mediator Installation Site

System Configurations

Basic System Configuration (Single Data Center)

Dual Data Center System Configuration

ACU Cable Connection

Name of Rear Panel

Connecting to the Antenna

Connecting to the Router

Connecting to the Mediator

ACU Connector Pinouts Guide

Console Connector(Modem Interface)

RS232 Connector (BUC Interface)

RS232 Connector (Modem & Mediator Interface)

RS422 Connector (Modem & Mediator Interface)

NMEA 2000 Connector

PC to ACU Communication Setup

Mediator Cable Connection

Name of Rear Panel

Connecting to the Router

Connecting to C-band Modem

Connecting to Ku-band Modem

Connecting to Ka-band Modem

Connecting the System with a Ship's Gyrocompass

Mediator Connector Pinouts Guide

Console Connector (C/Ku/Ka Modem Interface)

Console Connector (Comtech Modem Interface)

Console Connector (Ka BUC Interface)

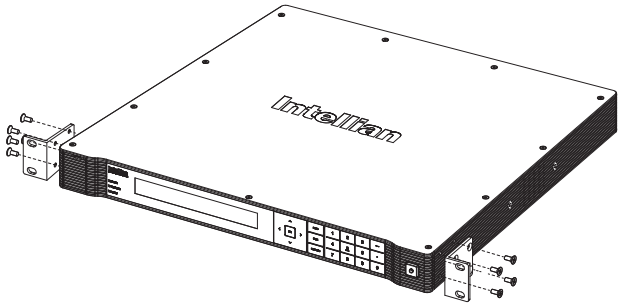
NMEA 2000 Connector

PC to Mediator Communication Setup

Mounting the ACU

Intellian supplies two types of mounting methods: a 19" Rack Mount Type and a Table Mount Type to mount the ACU.

19" Rack Mount Type



19" Rack Mount Type ACU

The ACU should be installed using the two supplied 19" Rack Mounting Brackets. Using the Flat Head Screw supplied, attach the mounting brackets to the sides
of the ACU. Place the ACU in the location where it is going to be installed.
Connect the cables to the rear of the ACU.

Table Mount Type

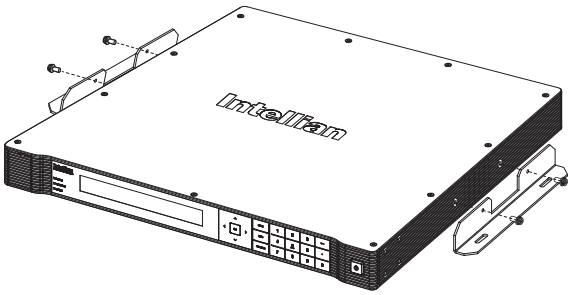


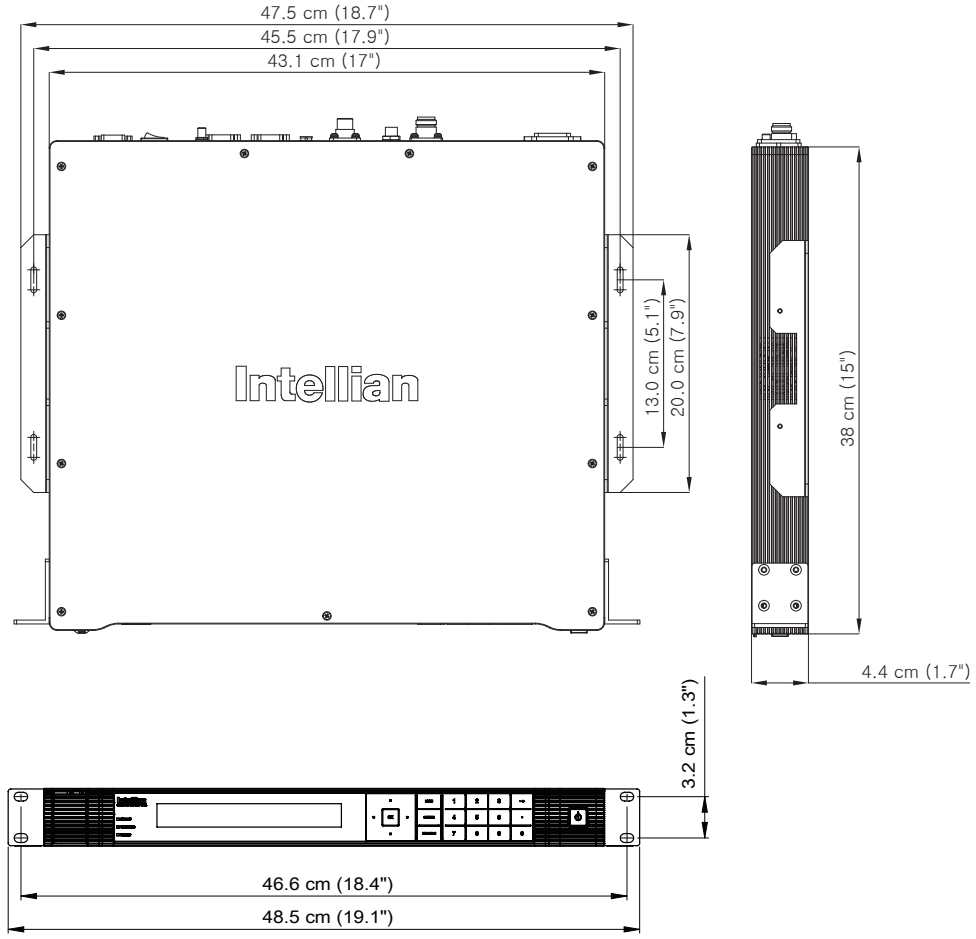
Table Mount Type ACU

The ACU should be installed using the two supplied Table Mounting Brackets which allow for a top or bottom mounting configuration.
Using the Sems Bolt supplied, attach the mounting brackets to the sides of the ACU.
Place the ACU in the location where it is going to be installed.
Using a pencil to mark the 4 hole positions (2 on each side), and use the appropriate drill bit to screw down the brackets.
Connect the cables to the rear of the ACU.

WARNING

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

ACU Dimensions



ACU Dimensions

Selection of ACU Installation Site

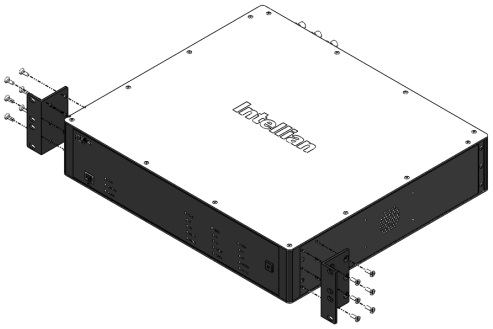
The ACU should be installed below deck, in a location that is:

– Dry, cool, and ventilated.
– Allows easy access. Near to the Intelligent Mediator and satellite modem.

Mounting the Mediator

Intellian supplies two types of mounting methods: a 19" Rack Mount Type and a Table Mount Type to mount the Intelligent Mediator.

19" Rack Mount Type



19" Rack Mount Type Intelligent Mediator

The Intelligent Mediator should be installed using the two supplied 19" Rack Mounting Brackets. Using the Flat Head Screw supplied, attach the mounting brackets to the sides of the Intelligent Mediator. Place the Intelligent Mediator in the location where it is going to be installed. Connect the cables to the rear of the Intelligent Mediator.

Table Mount Type

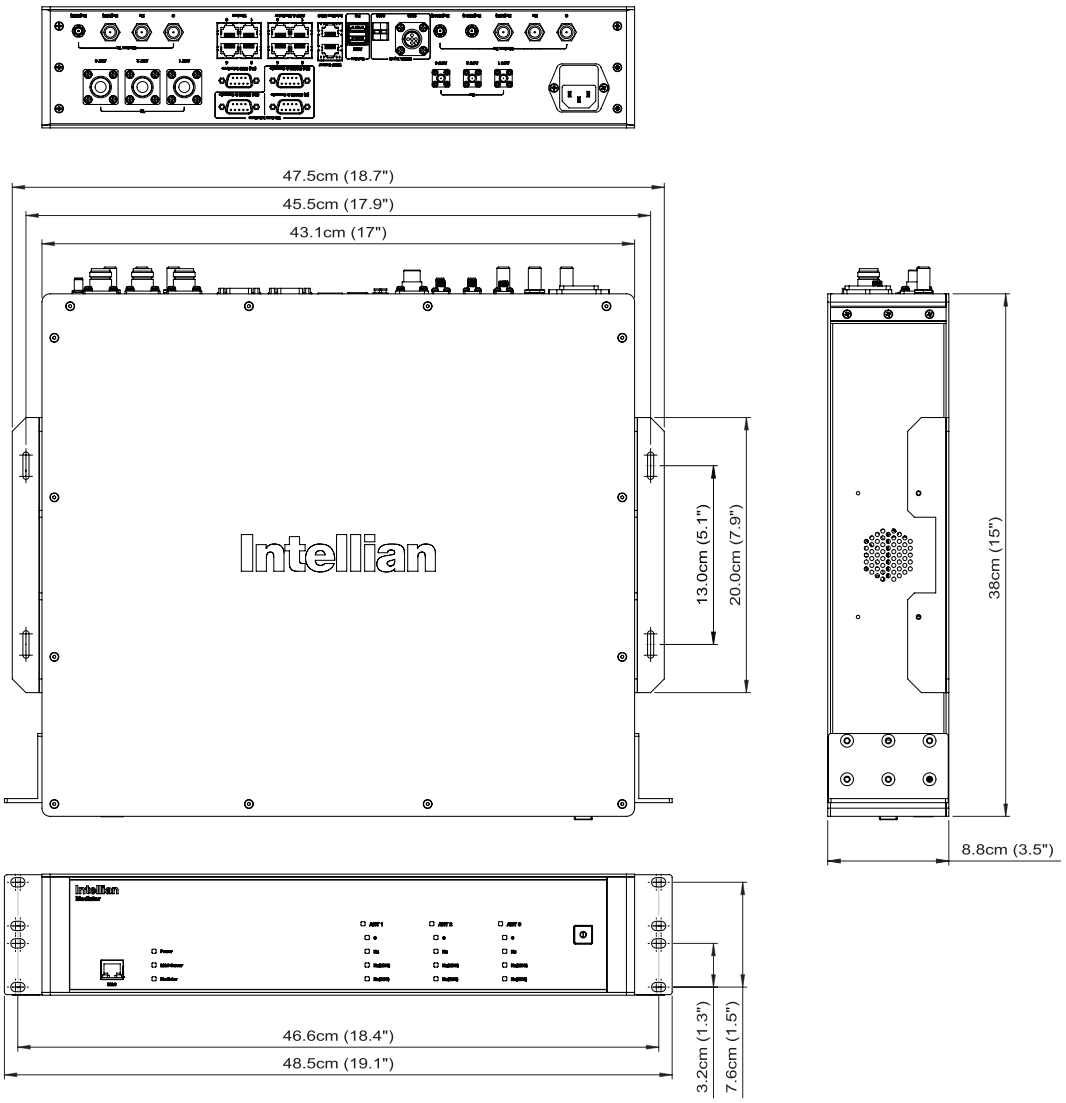
Table Mount Type Intelligent Mediator

The Intelligent Mediator should be installed using the two supplied Table Mounting Brackets which allow for a top or bottom mounting configuration.
Using the Sems Bolt supplied, attach the mounting brackets to the sides of the Intelligent Mediator. Place the Intelligent Mediator in the location where it is going to be installed.
Using a pencil to mark the 4 hole positions (2 on each side), and use the appropriate drill bit to screw down the brackets. Connect the cables to the rear of the Intelligent Mediator.

WARNING

WARNING: Ensure that the cables connected to the Intelligent Mediator are long enough to prevent damage when the Intelligent Mediator is pulled out from the rack.

Mediator Dimensions



Intelligent Mediator Dimensions

Selection of Intelligent Mediator Installation Site

The Intelligent Mediator should be installed below deck, in a location that is:

– Dry, cool, and ventilated.

– Allows easy access. Near to the Antenna Control Unit and satellite modem.

System Configurations

The Intellian Multiband Antenna system is versatile to support different variants of operations by the customers. Refer to the following block diagrams to connect system cables.

Basic System Configuration (Single Data Center)

The basic configuration consists of three antenna system and one data center. This mode of operation can provide the connection via GEO satellite constellations operating in C and Ku band with the adoption of the appropriate modems supported by the satellite network. The modem mediator is required to select electronically via pre-configuration the correct modem to be connected to the Multiband antenna system. The minimum system configuration is shown in the figure below which can provide seamless operation across the tri-band operation.
With the triple Antenna Mediator, 3 multi-band antennas can be configured to provide redundancy to blockages where the 3 antennas would be installed at different locations on a vessel. This will provide seamless and un-disrupted connectivity to any satellite constellation.

NOTE

NOTE: The system configuration may differ depending on the modem type(C/Ku/Ka-band). The GEO(C/Ku-band) can use the I/O console system optionally.

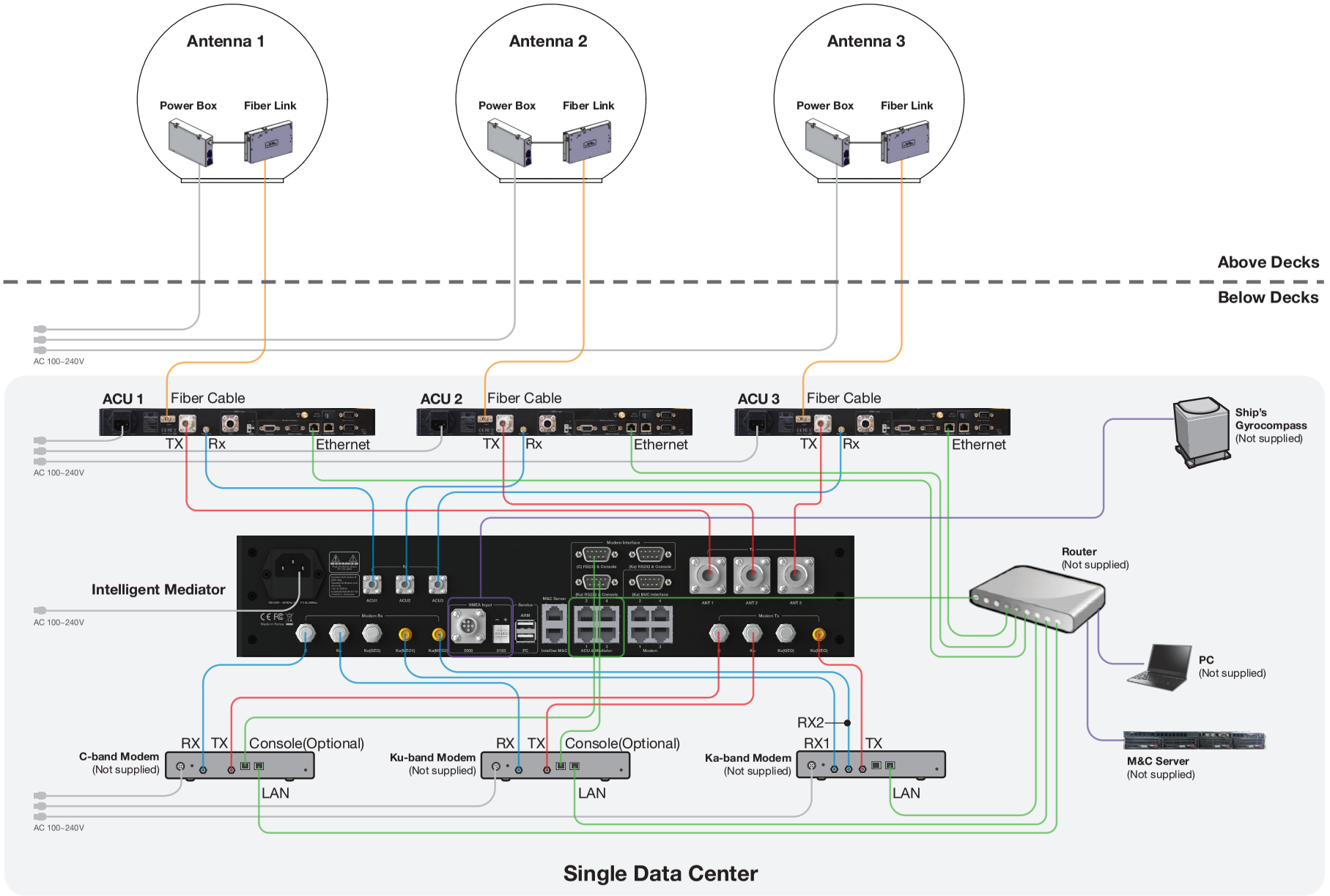
Dual Data Center System Configuration

The figure below shows the configuration of a Tri-band antenna system with a Dual Data Center which can provide high versatility in connecting to the various satellite network.
If the antenna is installed as the Single Data Center(Primary) system, the antenna needs to be installed additional one Data Center(Secondary), Fiber Link Module and IFL Switch Module to support the Dual Data Center System operation.

WARNING

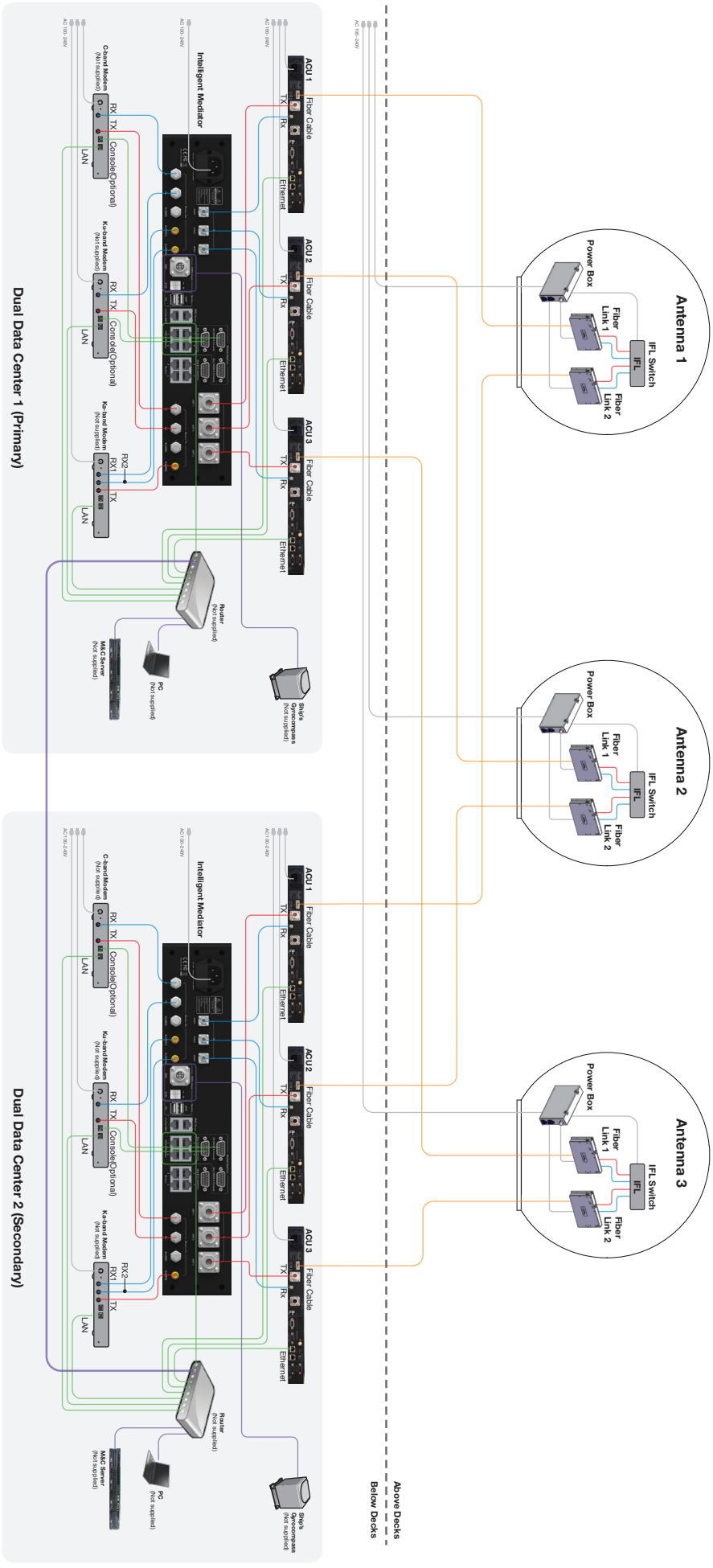
WARNING: You must use identical modules in the primary and secondary racks. If you have different models or different versions of the same model or different software, the DDC system will not function properly.

Tri-band Antenna System with Single Data Center



Single Data Center

Tri-band Antenna System with Dual Data Center

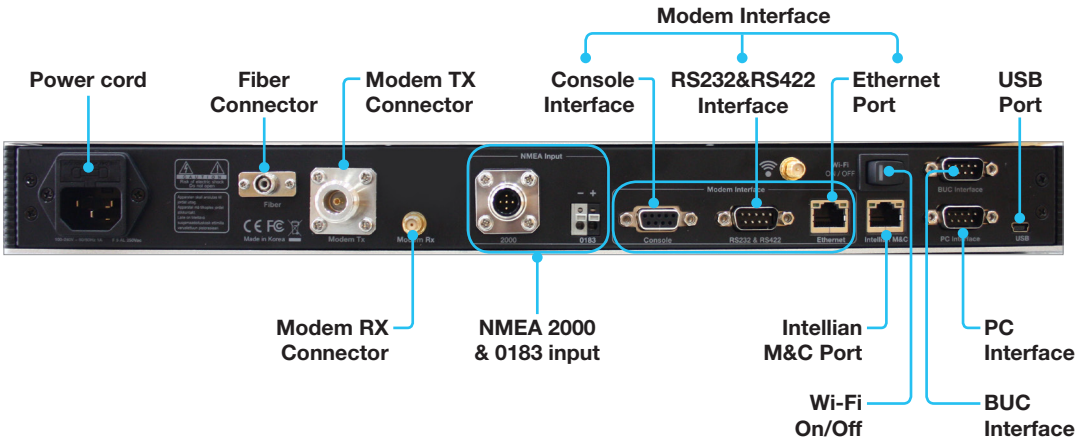


ACU Cable Connection

Name of Rear Panel

The following figure shows the ACU's rear panel.

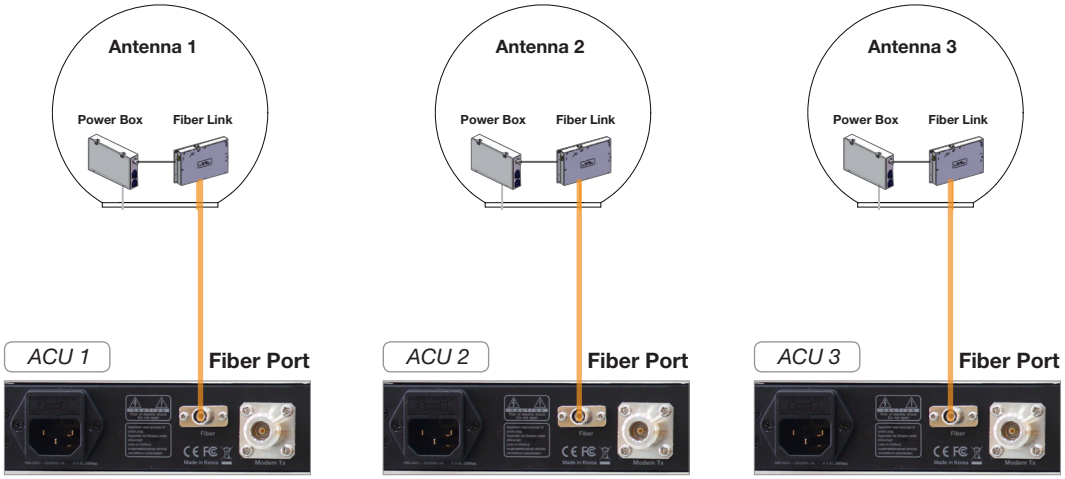
Antenna Control Unit(ACU): FO-1V50



Connecting to the Antenna

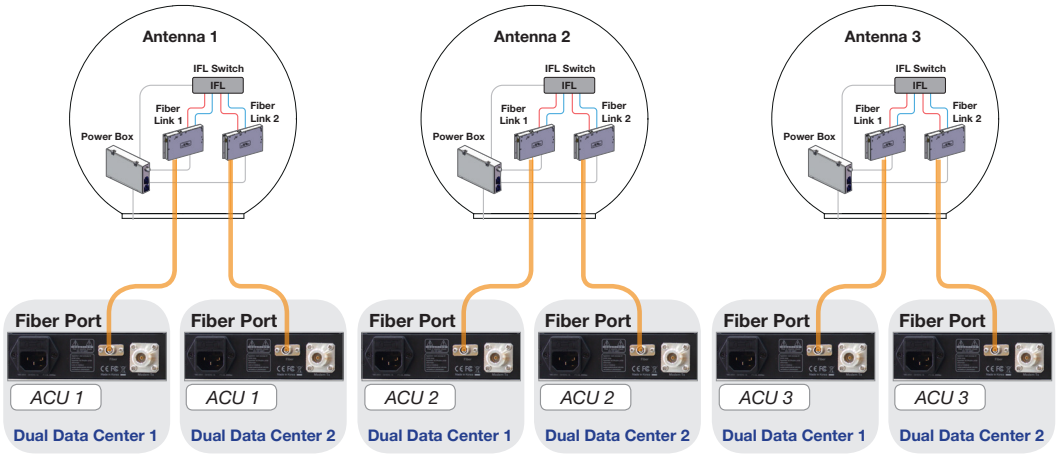
Single Data Center System Connection(Basic System)

Connect the "Fiber Optic Cable (not supplied by Intellian)" from the "Fiber" Ports on the rear of the ACUs to the Fiber ports on the "Fiber Link module" inside Radome. (3 Antennas & 3 ACUs needed)

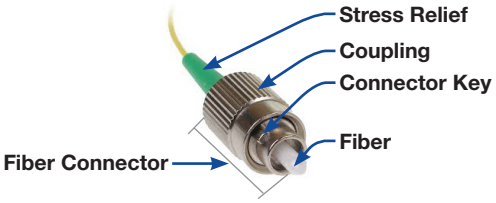


Dual Data Center System Connection

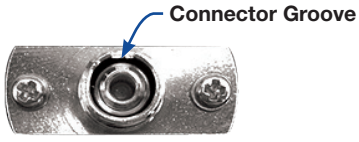
If using Dual Data Center(DDC) system, connect the each "Fiber Optic Cable (not supplied by Intellian)" from the both "Fiber" Ports on the rear of the ACUs to each Fiber ports on the "Fiber Link module" inside Radome. (6 Antennas & 6 ACUs needed)



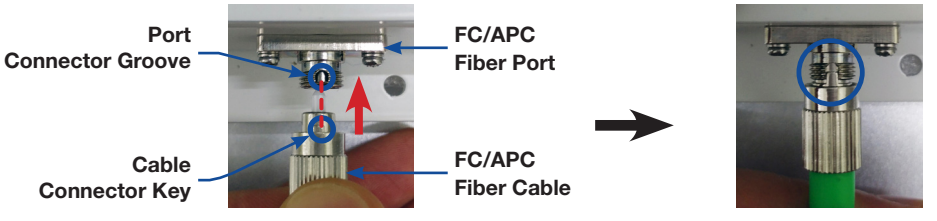
See the pictures of the FC/APC fiber connector and the port below for user's reference.



FC/APC Fiber Connector



FC/APC Fiber Port



Insert the FC/APC Fiber Cable

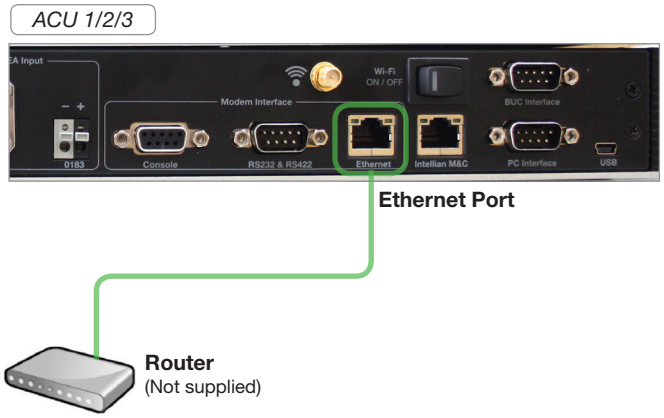
Connected FC/APC Fiber Cable

CAUTION

CAUTION: Take care of the cable connector key's direction. The cable connector key and port connector groove must be in in a line. If the cable is not correctly connected it may cause the system to be inoperative.

Connecting to the Router

Connect the "Ethernet cable" from the "Ethernet" Port on the rear of the ACU to the port on the Router.



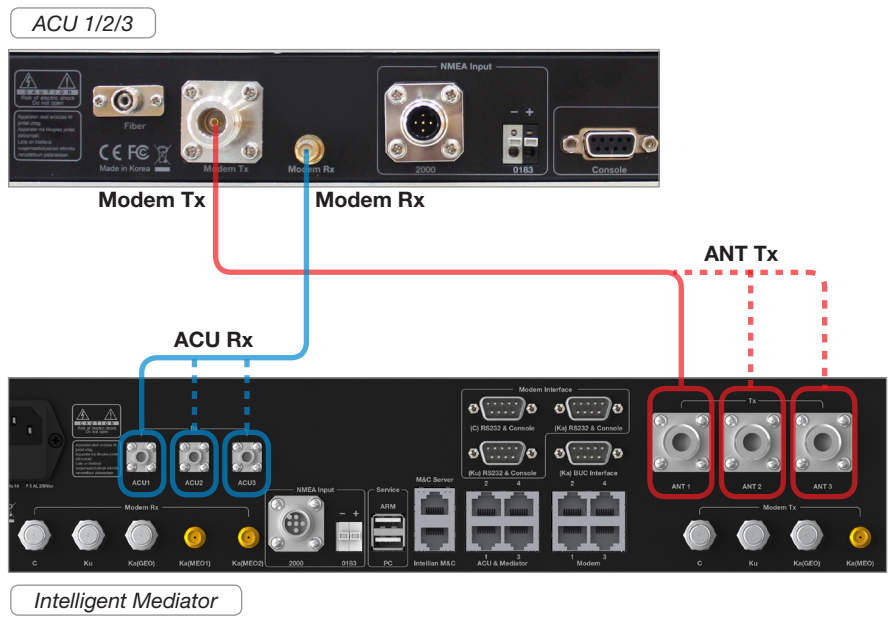
Connecting to the Mediator

Connect the "N to N Cable" from "Modem Tx" connector on the rear of the ACU 1/2/3 to the "ANT 1/2/3 Tx" connector on the rear of the Intelligent Mediator.
Connect the "SMA to SMA Cable" from "Modem Rx" connector on the rear of the ACU 1/2/3 to the "ACU 1/2/3 Rx" connector on the rear of the Intelligent Mediator.

NOTE

NOTE

When tightening the SMA cable connector, using a 0.56 Nm torque value is recommended.

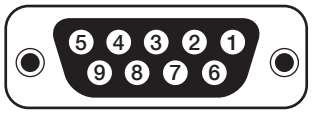


ACU Connector Pinouts Guide

The ACU connector pins and their corresponding descriptions are shown in the figure and table.

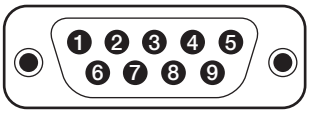
Console Connector(Modem Interface)

Antenna Control Unit (ACU):



D-Sub 9 Pin-Console
(Female Connector Type)

Cable Connector:

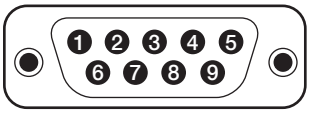


D-Sub 9 Pin-Console
(Male Connector Type)

Pin	Signal
1	GND
2	GPS OUT +
3	MODEM_LOCK
4	MODEM_CTRL1 (TX MUTE)
5	GPS IN +
6	GPS OUT -
7	MODEM_SIGNAL_IN
8	MODEM_CTRL2
9	GPS IN -

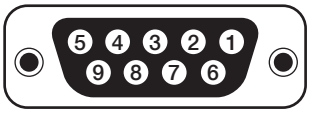
RS232 Connector (BUC Interface)

Antenna Control Unit (ACU):



D-Sub 9 Pin-RS232
(Male Connector Type)

Cable Connector:

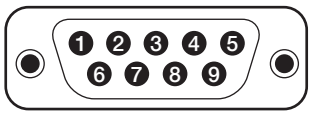


D-Sub 9 Pin-RS232
(Female Connector Type)

Pin	Signal	Pin	Signal
1	-	6	-
2	RXD	7	-
3	TXD	8	-
4	-	9	-
5	GND		

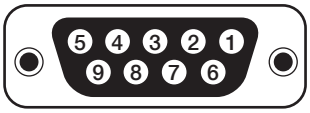
RS232 Connector (Modem & Mediator Interface)

Antenna Control Unit (ACU):



D-Sub 9 Pin-RS232
(Male Connector Type)

Cable Connector:

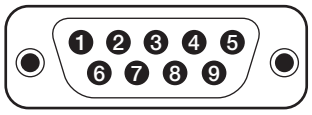


D-Sub 9 Pin-RS232
(Female Connector Type)

Pin	Signal	Pin	Signal
1	-	6	-
2	RXD	7	-
3	TXD	8	-
4	-	9	-
5	GND		

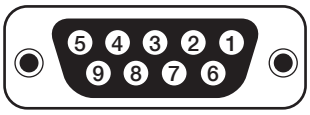
RS422 Connector (Modem & Mediator Interface)

Antenna Control Unit (ACU):



D-Sub 9 Pin-RS422
(Male Connector Type)

Cable Connector:

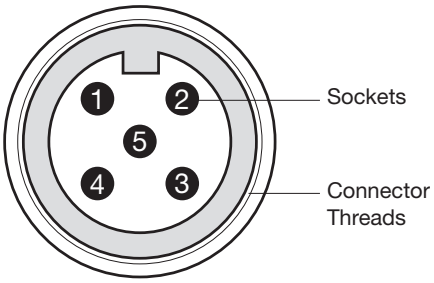


D-Sub 9 Pin-RS422
(Female Connector Type)

Pin	Signal	Pin	Signal
1	-	6	-
2	RXD +	7	RXD -
3	TXD +	8	TXD -
4	-	9	-
5	GND		

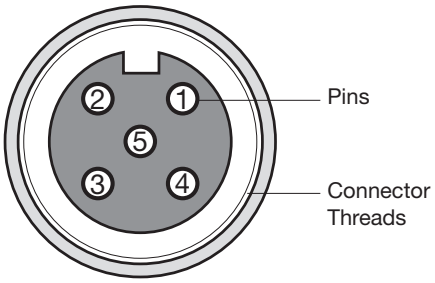
NMEA 2000 Connector

Antenna Control Unit (ACU):



NMEA 2000 Connector
(Male Connector Type)

Cable Connector:



NMEA 2000 Connector
(Female Connector Type)

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

PC to ACU Communication Setup

You can establish data communication between a PC and the ACU using one of the following methods.

TCP/IP Connection

Connection through Front Panel Management Port
This method is most recommended. The network is automatically configured by DHCP without the need for 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 PC.
2. The network connection is established.
3. Use the following IP address to access Intellian Aptus or Aptus Web page.

- **192.168.2.1 (Default)**

ACU - Front Panel

Front Panel Management LAN Port

Connection through Rear Panel Ethernet Port
This method requires separate IP configuration on a PC.

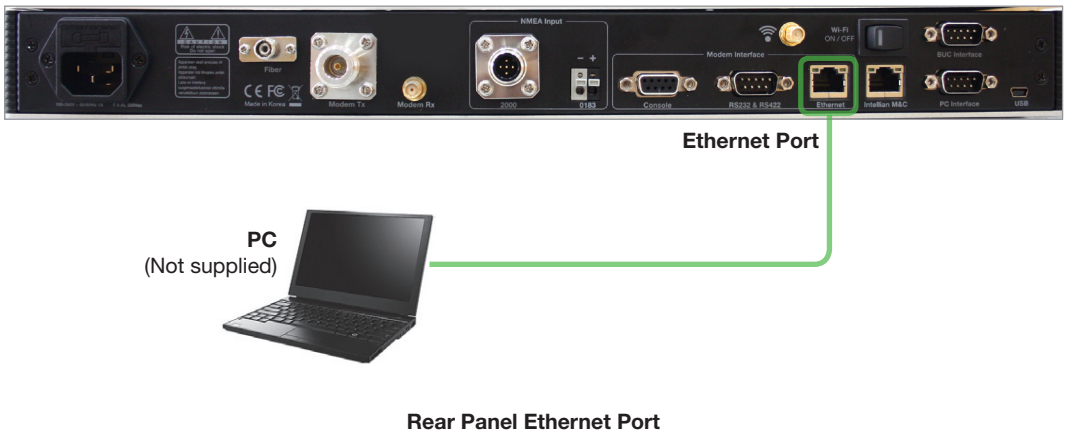
1. Connect an Ethernet cable from the Ethernet Port on the front of the ACU to the LAN port of PC.
2. Go to Control Panel > Network and Sharing Center > Change Adapter Settings and right-click on the Local Area Connection then click Properties
3. Select TCP/IPv4, then click Properties.

- Change the network settings on a PC. **(Example)**
- **IP: 192.168. 0.222 (Secondary: 10.10.1.2)**
- **Subnet Mask: 255.255.255.0**

4. Use the following IP address to access Intellian Aptus or Aptus Web page.

- **Default: 192.168.0.223 (Secondary: 10.10.1.1)**

ACU - Rear Panel



Rear Panel Ethernet Port

USB Connection

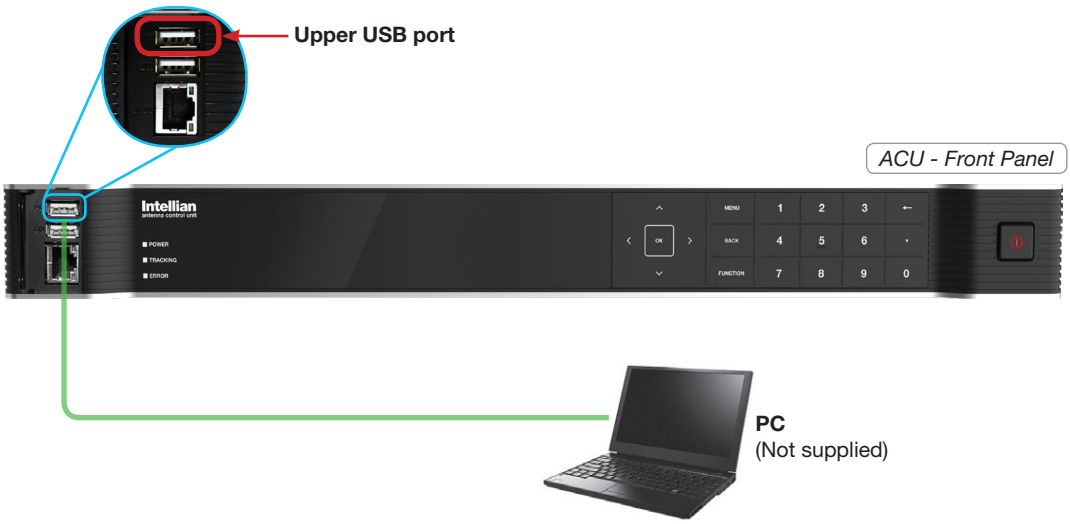
There are two USB ports are available on the ACU. One is on the front and the other is on the rear.

Connection through Front Panel Upper USB Port

Connect a USB cable from the upper USB port on the front of the ACU to a USB port on your PC.

CAUTION

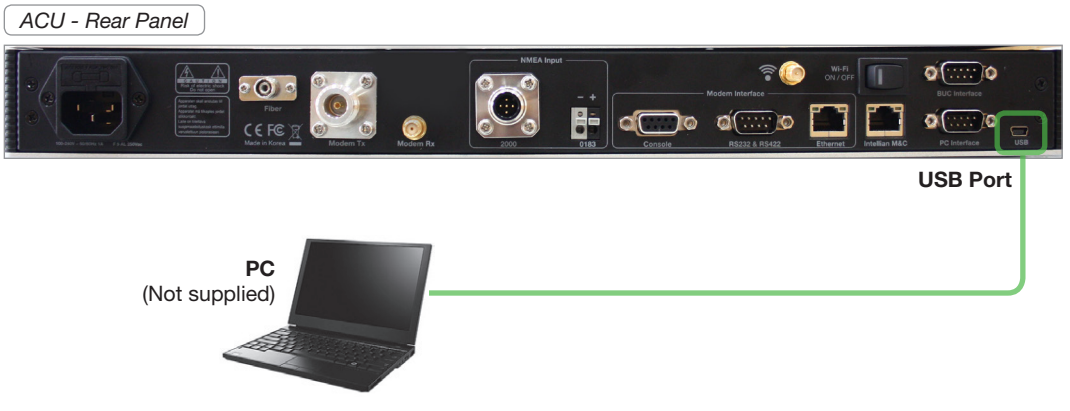
CAUTION: Use the front panel USB port for PC connection. The upper USB port is the PC interface. Do not use the lower USB port as it is not available to use in this model.



Front Panel Upper USB Port

Connection through Rear Panel USB Port

Connect a USB cable from the USB port on on the rear of the ACU to a USB port on your PC.



Rear Panel USB Port

Wi-Fi Connection

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

1. Turn on the Wi-Fi power switch located on the rear of the ACU. After 30 seconds, confirm that a red light appears on the switch.
2. Use the following IP address to access Intellian Aptus or Aptus Web page.

- **192.168.2.1 (Default)**

ACU - Rear Panel

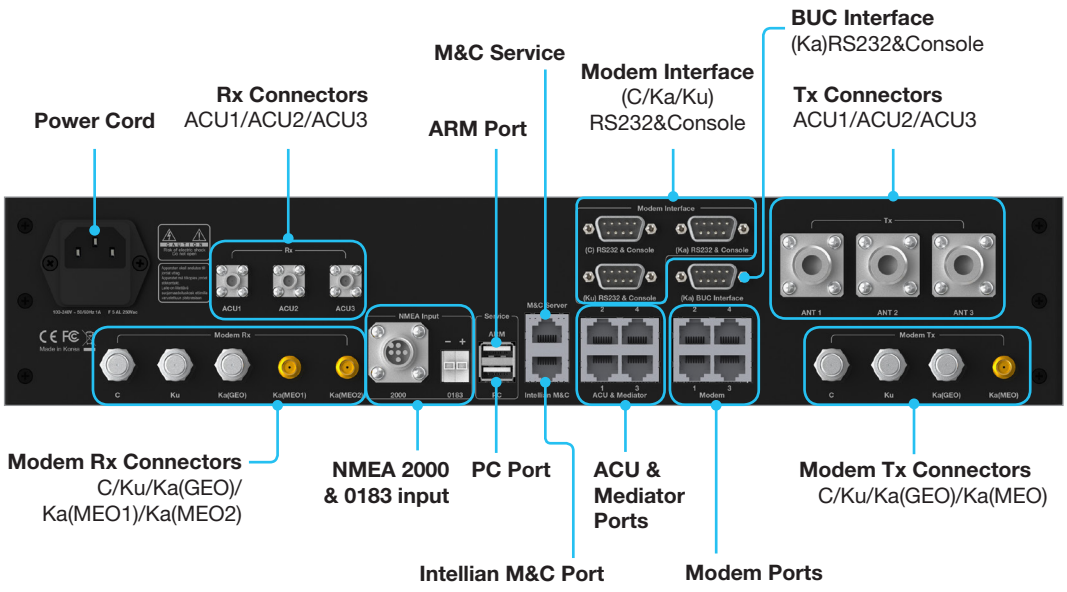
Wi-Fi On/Off Switch

Mediator Cable Connection

Name of Rear Panel

The following figure shows the Mediator's rear panel.

Intelligent Mediator Unit: M3-TB03

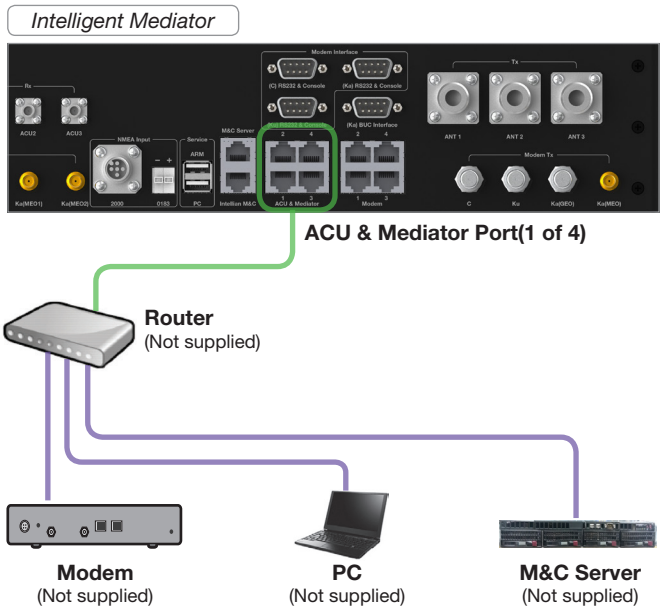


Connecting to the Router

Connect the "Ethernet cable" from a "ACU & Mediator Port(1 of 4)" on the rear of the Intelligent Mediator to the port on the Router.

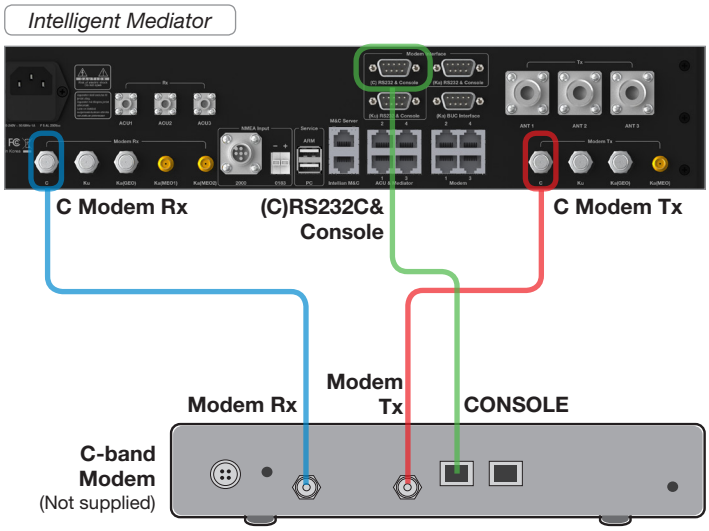
Each modem(C-band, Ku-band, and/or Ka-band), PC, and M&C Server are connected from mediator through the Router.

Intelligent Mediator



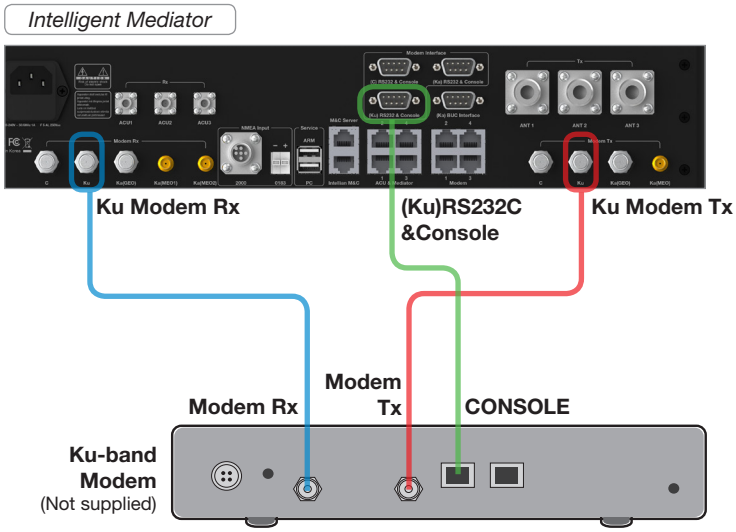
Connecting to C-band Modem

Connect the "RG6 cable" from the "C Modem Rx" connector on the rear of the Intelligent Mediator to the Rx connector on the C-band modem.
Connect the "RG6 cable" from the "C Modem Tx" connector on the rear of the Intelligent Mediator to the Tx connector on the C-band modem.
When using the I/O console system, connect the modem interface cable from the "(C) RS232&Console" connector on the rear of the Intelligent Mediator to the CONSOLE connector on the C-band modem.



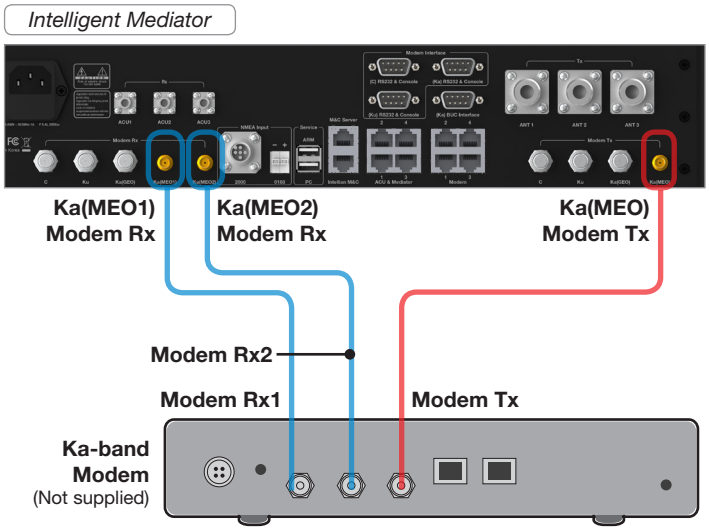
Connecting to Ku-band Modem

Connect the "RG6 cable" from the "Ku Modem Rx" connector on the rear of the Intelligent Mediator to the Rx connector on the Ku-band modem.
Connect the "RG6 cable" from the "Ku Modem TX" connector on the rear of the Intelligent Mediator to the Tx connector on the Ku-band modem.
When using the I/O console system, connect the modem interface cable from the "(Ku) RS232&Console" connector on the rear of the Intelligent Mediator to the CONSOLE connector on the Ku-band modem.



Connecting to Ka-band Modem

Connect the "SMA to SMA Cable" from the "Ka(MEO1) Modem Rx" connector on the rear of the Intelligent Mediator to the Rx1 connector on the Ka-band modem.
Connect the "SMA to SMA Cable" from the "Ka(MEO2) Modem RX" connector on the rear of the Intelligent Mediator to the Rx2 connector on the Ka-band modem.
Connect the "SMA to SMA Cable" from the "Ka(MEO) Modem Tx" connector on the rear of the Intelligent Mediator to the Tx connector on the Ka-band modem.



NOTE

NOTE

When tightening the SMA cable connector, using a 0.56 Nm torque value is recommended.

Connecting the System with a Ship's Gyrocompass

It is required to connect the ship gyro to the mediator through the "NMEA" connector on the rear of the mediator. Intelligent Mediator supports the gyro compasses in the "NMEA0183" and "NMEA2000" standards. For other gyro types (i.e., Step-by-Step/Synchro), a gyro converter is required to be connected inbetween from ship gyro to Intelligent Mediator, which converts ship gyro signal into NMEA type.

For satellite tracking, you must connect a ship's gyrocompass to the antenna system through the gyrocompass interface on the rear of the ACU. Intellian's ACU supports NMEA 0183 and NMEA 2000 gyrocompass inputs. If the ship's gyrocompass output uses a different standard, a compass converter should be installed to supply the required NMEA input.

- Gyrocompass Interface Cable(Customer Supplied) Information

	NMEA 0183	NMEA 2000
Connector Type	2 Conductors	Mini-C 5 pin
Heading Sentence	xx HDT (4800 Baud, 8, N, 1). *If there is no HDT sentence then use HDM sentence instead.*	PGN Number = 127250 (Vessel Heading)

NOTE

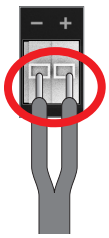
NOTE

If the ship gyro is connected to the Mediator, a separate gyrocompass connection to the ACU is not required.

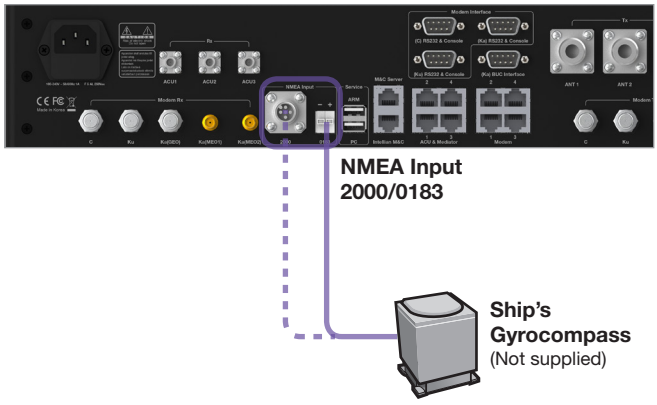
NOTE

NOTE

When connecting the NMEA 0183 gyrocompass input, strip the cable for 5 mm (0.2"). Do not solder the cable.



Intelligent Mediator



NMEA Input 2000/0183

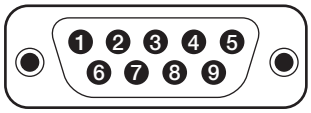
Ship's Gyrocompass (Not supplied)

Mediator Connector Pinouts Guide

The Mediator connector pins and their corresponding descriptions are shown in the figure and table.

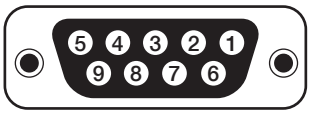
Console Connector (C/Ku/Ka Modem Interface)

Intelligent Mediator:



D-Sub 9 Pin-Console
(Male Connector Type)

Cable Connector:

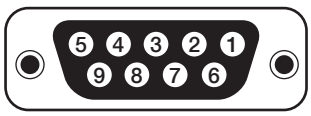


D-Sub 9 Pin-Console
(Female Connector Type)

Pin	Signal
1	GPS_OUT+
2	Mediator_RX
3	Mediator_TX
4	GPS_OUT-
5	GND
6	MUTE
7	LOCK
8	GND
9	N.C

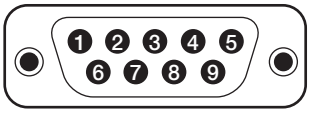
Console Connector (Comtech Modem Interface)

Intelligent Mediator:



D-Sub 9 Pin-Console
(Female Connector Type)

Cable Connector:

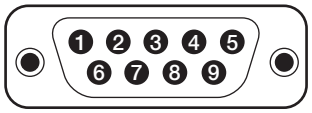


D-Sub 9 Pin-Console
(Male Connector Type)

Pin	Signal
1	N.C
2	N.C
3	N.C
4	N.C
5	GND
6	MUTE
7	LOCK
8	N.C
9	N.C

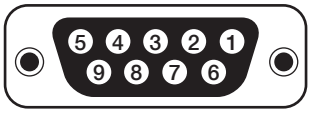
Console Connector (Ka BUC Interface)

Intelligent Mediator:



D-Sub 9 Pin-Console
(Male Connector Type)

Cable Connector:

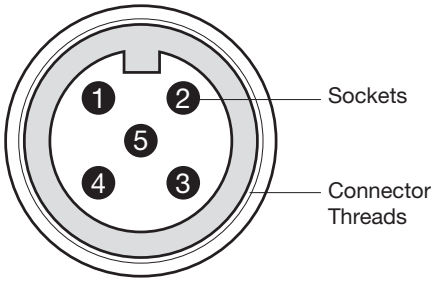


D-Sub 9 Pin-Console
(Female Connector Type)

Pin	Signal	Pin	Signal
1	MAX422_RXD+	**6**	MAX422_TXD-
2	MAX422_RXD-	**7**	KEYLINE_RXD+
3	MAX422_TXD+	**8**	KEYLINE_RXD-
4	GND	**9**	N.C
5	GND		

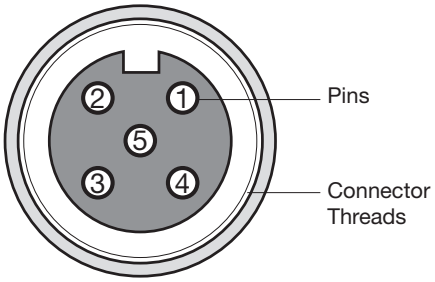
NMEA 2000 Connector

Intelligent Mediator:



NMEA 2000 Connector
(Male Connector Type)

Cable Connector:



NMEA 2000 Connector
(Female Connector Type)

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

PC to Mediator Communication Setup

You can establish data communication between a PC and the Intelligent Mediator using one of the following methods.

TCP/IP Connection

Connection through Front Panel M&C Port
The network is automatically configured by DHCP without the need of additional PC IP configuration.

1. Connect an Ethernet cable from the M&C port on the front of the Intelligent Mediator to the LAN port of PC.
2. The network connection is established.
3. Use the following IP address to access Aptus Web page.

- **192.168.2.1 (Default)**

Intelligent Mediator - Front Panel

Front Panel M&C Port

Operating the ACU

Introduction

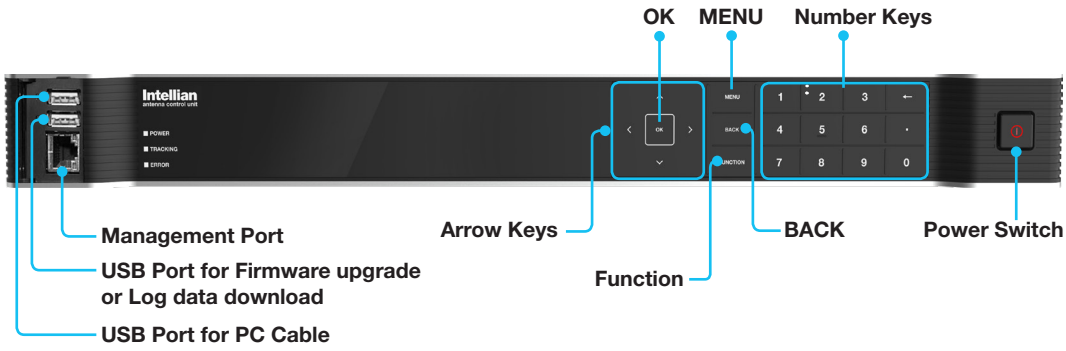
Antenna Control Unit (ACU)

The Antenna Control Unit (ACU) controls the various settings of the antenna. The functions of the ACU are as follows:

- Monitors the antenna status.
- Changes the target satellite.
- Sets up the user environment.
- Sets the current GPS information.
- Moves the antenna manually
- Built-in real-time diagnostics function and event log recorder
- Sets up the interface with a PC.
- Supports Wi-Fi operation.
- Logs data and firmware upgrade through USB
- Built-in web-based remote control management

ACU Front Panel

The following figure shows the ACU's front panel.



The following table shows the function of each touch key.

Touch key	Function
OK KEY	Enter next step or menu.
MENU	Enter SETUP mode
BACK	In SETUP mode, returns to previous menu or option, or saves the adjusted settings. In NORMAL mode, returns to the first page of the antenna's current status.
ARROW KEYS	Moves cursor to an alternative option to select, or increase and decrease the selected character to the desired value.
FUNCTION	Saves the adjusted settings.
NUMBER KEYS	Inputs numbers.

Normal Mode

Startup

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

Startup

1. The data communication is being established between the antenna and the ACU.

Initialize antenna info

2. The ACU receives antenna information.

Initialize elevation & cross-level angle

3. The elevation angle and cross-level angle are initialized.

Initialize azimuth angle

4. The azimuth angle is initialized.

Initialize target satellite position

5. The antenna returns to the target satellite position.

Search status

6. The antenna is searching for the target satellite.

Tracking status

7. The antenna has locked onto the satellite.

Monitoring the Antenna's Current Status

When the ACU power is on, it displays the status of the antenna. The current status of the antenna is displayed as shown below.

Current search status

1. The antenna is searching for the target satellite.

Current tracking status

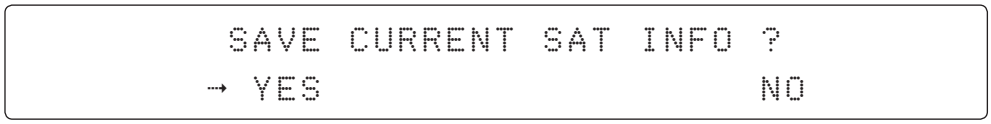
2. The antenna has locked onto the target satellite.
The current IF signal level (SIG/AGC) is displayed. SIG is displayed when the NarrowBand Detection (NBD) mode for TRACKING SIGNAL is selected. AGC is displayed when the DVB mode for TRACKING SIGNAL is selected.

The symbol "▦" is only displayed when the satellite signal is strong enough to generate a lock.

The C/ Ku / Ka indicator changes depending on the satellite being tracked.

The true azimuth [181.7] position of the antenna is the sum of ships heading 000.0 [HDG] and antenna relative [181.7].

Save current satellite info

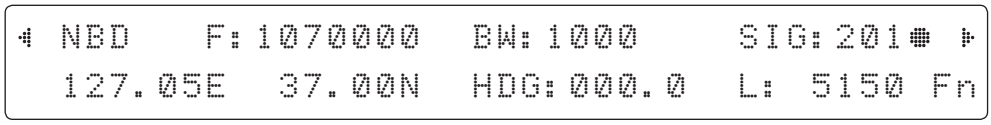


3. Press the FUNCTION key to save the current BOW OFFSET information or abort and return to the main display. "Fn" will be displayed only if the antenna is in tracking mode.

Current tracking status

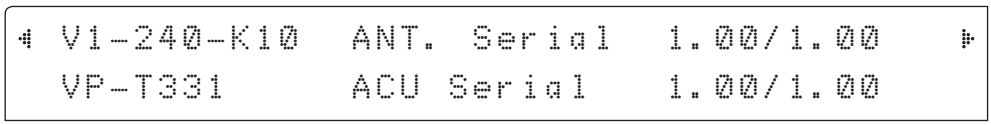
4. Press the RIGHT arrow key to display NBD, GPS and ship's heading information.

Tracking & Heading information



5. NBD, GPS and ship's heading information are shown.
- NBD (NarrowBand Detection) IF tracking frequency: 1070000 KHz
- Detected Band Width: 1000 kSps
- SIG (Signal Level): 201
- W (West) / E (East) Longitude: 127.05 ° E
- N (North) / S (South) Latitude: 37.00° N
- HDG (Ship's Heading): 000.0 degree
- LNB local oscillator(LO) frequency: 5150 MHz (C band)

Antenna & ACU versions



6. Press the RIGHT arrow key to display the information below.
- Antenna part number, Antenna serial number and PCU / Stabilizer firmware version.
- ACU part number, ACU serial number, ACU / Pol. Controller firmware version.
- Part number & serial number are displayed depending on each product.

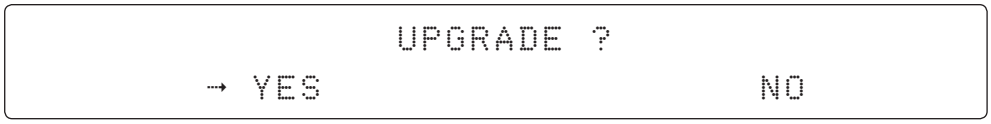
Press the BACK Key to return to the first page of the antenna's current status.

Select USB functions

7. Press the RIGHT arrow key to display the USB FUNCTION.
When a USB Memory Stick is connected to the USB port, the above screen will be displayed. With FWP file stored in the USB Memory folder, the ACU upgrades itself once the USB drive is inserted into the port.

- **UPGRADE FIRMWARE:** ACU is upgraded with the FWP file in designated folder of a USB memory stick
- **COPY LOG DATA:** Copies all data logs to the USB memory stick

Upgrade the system



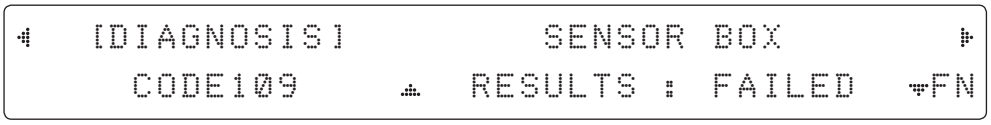
8. Press the OK key to upgrade firmware.

Firmware Error Messages:

- **UPGRADE FIRMWARE**
  FIRMWARE FILE NOT FOUND: No FWP file on the USB memory stick
  INVALID FIRMWARE : FWP file is broken or an invalid file
  MORE THAN 2 FILES EXIST : There are more than 2 FWP files
  CHECK USB CONNECTION : The USB memory stick is not connected

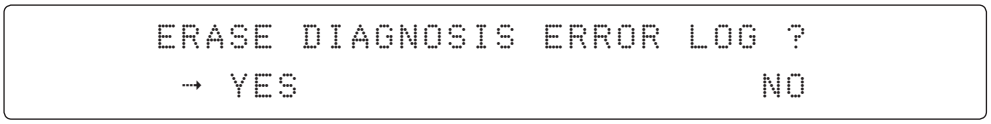
- **COPY LOG DATA**
  COPY LOG DATA TO USB[30%]: Display the status of data copying
  NO ENOUGH SPACE IN USB : There is too little space on the USB memory stick
  CHECK USB CONNECTION : The USB memory stick is not connected

Real-time diagnostic result



9. Press the RIGHT arrow key to display the real-time diagnosis result.
REALTIME DIAGNOSIS RESULT
It shows the ERROR status after the power is turned ON.
If there is no ERROR, this page will not be shown.

Erase Error message



10. Press the FUNCTION key to erase diagnosis error messages.

Setup Mode

To enter SETUP mode simply follow the instructions below.

Searching / Tracking mode

```
◂ TRACKING 125.0E ASIA6AH  SIG:201▪  C ▸
  AZ:183.7( 183.7) EL: 47.3 SK:  02.0 Fn
```

1. While the antenna is in SEARCHING / TRACKING mode, press the MENU key to enter SETUP mode. * indicates the keypad lock function is on (Refer to KEY LOCK menu to set up the keypad lock function). When the keypad lock function is activated press the MENU key or when the "Fn" menu is activated press the FUNCTION key. Then the ENTER PASSWORD menu will be displayed.

Enter password

```
          ENTER PASSWORD
              _ _ _ _
```

2. If the keypad lock function is on, enter the password before accessing SETUP mode. If the keypad lock function is off, access SETUP mode directly by following Step 3.

Setup mode

```
          SETUP MODE ?
      → YES          NO
```

3. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode or press the RIGHT arrow key to move the cursor to NO and press the OK key to abort and return to the main display.

Exit setup mode

```
        EXIT SETUP MODE ?
      → YES          NO
```

4. While the antenna is in SETUP mode, press the FUNCTION key as a shortcut key to exit SETUP mode.

Antenna Settings

Manual Search

Search for the desired satellite manually.

Setup mode

```
                SETUP MODE ?
          → YES                    NO
```

1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

Antenna MODE

```
   →+ANTENNA              +SATELLITE
    +SYSTEM
```

2. Press the OK key to enter the ANTENNA menu.

Manual search MODE

```
◂  →+MANUAL SEARCH      +SET POL ANGLE  ▸
    +SEARCH PARAM       +SET PARAMETERS
```

3. Press the OK key to enter the MANUAL SEARCH menu.

Antenna movement

```
STEP SIZE  AZIMUTH   ELEVATION   AGC
# 00.2 #   ◂ 231.7 ▸   ▵ 48.3 ▿  301   Fn
```

4. Current IF tracking signal level (AGC) / (SIG) is displayed to assist you in manually peaking the AZIMUTH (0°-360°) and ELEVATION (0°-90°) angles for the best signal level.
Press the NUMBER key to change the STEP SIZE (Range: 0.1~99.9).
Press the LEFT and RIGHT arrow keys to increase or decrease the azimuth angles. Press the UP and DOWN arrow keys to increase or decrease the elevation angles. Press the FUNCTION key to save the current settings or abort and return to the main display.

Save

```
          SAVE CURRENT SAT INFO?
        → YES                  NO
```

5. If the current settings are able to locate the satellite, press the FUNCTION key to save "current satellite information". This will help to reduce the satellite acquisition time after restarting the system. Press the LEFT arrow key to move the cursor to YES and press the OK key to save the settings.

NOTE

NOTE: If the gyrocompass type is not NMEA or the gyrocompass is not connected to the ACU, the information cannot be saved.

Setup Antenna LNB pol Angle

Setup mode

```
                SETUP MODE ?
          → YES                    NO
```

1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

Antenna MODE

```
   →+ANTENNA              +SATELLITE
    +SYSTEM
```

2. Press the OK key to enter the ANTENNA menu.

Set pol angle MODE

```
◂   +MANUAL SEARCH     →+SET POL ANGLE  ▸
    +SEARCH PARAM       +SET PARAMETERS
```

3. Press the RIGHT arrow key to move the cursor to the SET POL ANGLE menu and press the OK key to enter it.

LNB pol angle type

```
      SELECT LNB POL.ANGLE MENU
  ▲          CALIBRATION            ▼
```

4. Press the UP and DOWN arrow keys to select the LNB pol angle menu and press the OK key to run the selected operation 'CALIBRATION', 'MANUAL ADJUST C/KU/KA POL', or 'RESET MECHANICAL OFFSET'.
Select MANUAL ADJUST C/KU/KA POL to control the LNB pol angle manually. If the control board, skew potentiometer or belt is replaced, select CALIBRATION to calibrate the LNB pol angle.

LNB pol angle Signal

KU/KA

```
   LNB POL ANGLE              SIGNAL:180
   ▲    20.5    ▼
```

C

```
   LNB POL ANGLE   POLARITY  SIGNAL:180
   ▲    10.0    ▼  ◂ LINEAR ▸
```

5. Press the UP and DOWN arrow keys to increase or decrease the LNB pol angle manually and the correspondent SIGNAL level will be displayed next to it.
If the tracking satellite is a C-band satellite, the POLARITY item is shown as above.
If the tracking satellite is a Ku/Ka-band satellite, the POLARITY item is not shown.
Polarity is changeable to "LINEAR", "RHCP", and "LHCP" with the LEFT/RIGHT key.

Press the BACK key to return to the main display.

NOTE

NOTE: LNB POL ANGLE menu will be displayed only if MANUAL ADJUST is selected.

Search Parameters

Setup mode

```
                SETUP MODE ?
          → YES                    NO
```

1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

Antenna MODE

```
    →+ANTENNA              +SATELLITE
     +SYSTEM
```

2. Press the OK key to enter the ANTENNA menu.

Manual search MODE

```
◀    +MANUAL SEARCH       +SET POL ANGLE  ▶
    →+SEARCH PARAM        +SET PARAMETERS
```

3. Press the DOWN arrow keys to move the cursor to SEARCH PARAM and press the OK key to select it.

Search param

```
    SEARCH WAIT TIME    INCREMENT STEP
    ▲     030       ▼       0.50
```

4. Set the SEARCH WAIT TIME and INCREMENT STEP
Set the time-out for automatic initiation of a search after the signal level drops below the predefined threshold value (Range: 1 - 120 sec)and set the increment step size (Range: 0.01 – 5.00 sec).

Search 1 range

```
      SEARCH1 AZ          SEARCH1 EL
    ▲     400       ▼         06
```

Search 3 range

```
      SEARCH3 AZ          SEARCH3 EL
    ▲     003       ▼         04
```

5. Set the SEARCH 1 and 3 AZ (Azimuth) range and EL (Elevation) range.
SEARCH 2 is reserved for future use.

Save

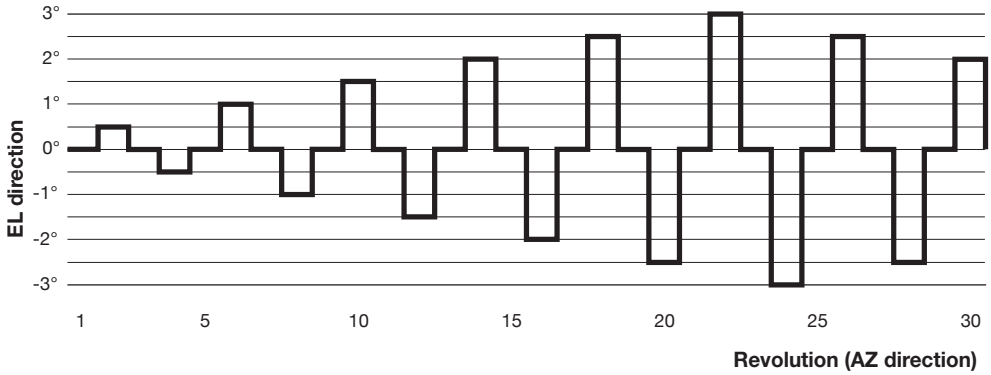
```
                SAVE ?
          → YES                    NO
```

6. Press the LEFT arrow key to move the cursor to YES and press the OK key to save and execute the current settings. Or press the RIGHT arrow key to move the cursor to NO and press the OK key to abort and return to the main display.

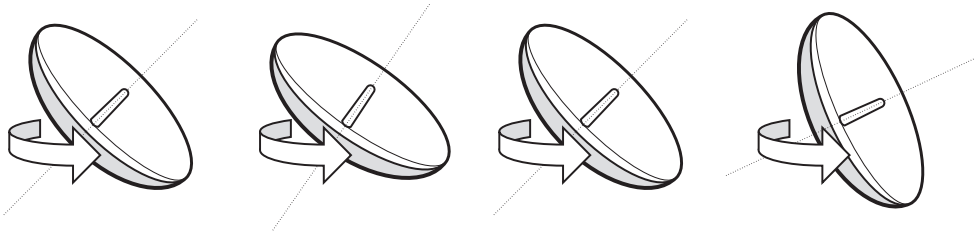
A search pattern 1 or 3 initiates according to the existence of a gyrocompass input and which GYRO TYPE is selected.

Search 1: a search pattern 1 automatically initiates when the ship's heading input does not exist/fails.The antenna will go to the relative azimuth position 0°at the calculated elevation and search in the azimuth CCW direction and search up + 0.5° & down -0.5° with a total 6 (±3°) in elevation. The search cycle will repeat until the antenna receives a lock signal from the modem or the DVB transponder of the target satellite is decoded by the antenna. If the desired signal is found and is higher than the predefined detect level, the ACU will then initiate Search 3. However, although ACU initiates Search 3 with the detection of the desired signal, the antenna will not initiate Search 3 pattern but go into TRACKING mode immediately. If the detected signal is below the predefined tracking threshold level, the search 1 will repeat and start 3° away from the current position.

Search1 (Gyro-Free Search Pattern)



Search 1 antenna motion



Target EL Angle 0°
Turn 1

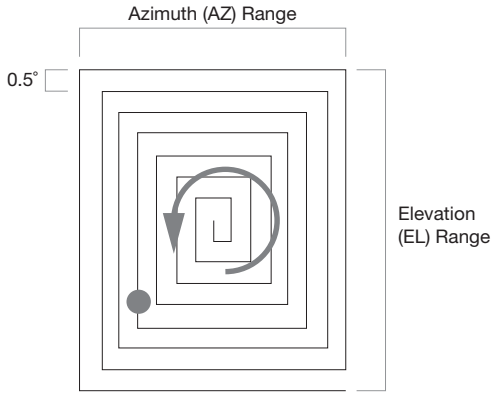
Target EL Angle + 0.5°
Turn 2

Target EL Angle 0°
Turn 3

Target EL Angle - 0.5°
Turn 4

Search 3: a search pattern 3 automatically initiates when the AGC / SIG falls below the current tracking level threshold value. If the desired signal is found and above the predefined tracking level, the ACU will terminate Search 3 and go into TRACKING mode.

A search pattern automatically initiates when the AGC/SIG falls below the current threshold setting (indicates that satellite signal has been lost). Search is conducted in a two-axis pattern consisting of alternate movements in azimuth (AZ) and elevation (EL), forming expanding square, demonstrated in the diagram below.



Setting Search Parameters

Setup mode

```
SETUP MODE ?
→ YES                NO
```

1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

Antenna menu

```
→+ANTENNA            +SATELLITE
 +SYSTEM
```

2. Press the OK key to enter the ANTENNA menu.

Set parameters menu

```
+MANUAL SEARCH      +SET POL ANGLE
+SEARCH PARAM      →+SET PARAMETERS
```

3. Press the arrow keys to move the cursor to the SET PARAMETERS menu and press the OK key to enter it.

Password

```
ENTER PASSWORD
_ _ _ _
```

4. Enter the 4 digit password to enter the SET PARAMETERS MODE (1590).
Setup parameters are only required for installation or repairs of your antenna system.

These parameters should only be changed by an authorized service technician.
Improper setting of these parameters will render your system inoperable.

Set detect & tracking DVB

```
KA DETECT DVB      KU TRACKING DVB
 ▲   040   ▼            020
```

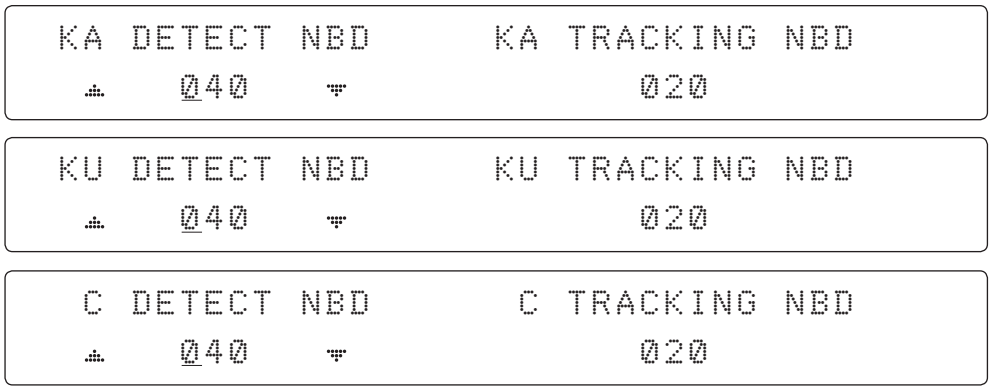
```
KU DETECT DVB      KU TRACKING DVB
 ▲   040   ▼            020
```

```
 C DETECT DVB       C TRACKING DVB
 ▲   040   ▼            020
```

5. Set DETECT DVB and TRACKING DVB when the DVB mode of TRACKING SIGNAL is being used (Range: 1-200). DETECT DVB is to set the satellite signal detection level and TRACKING DVB is to set the satellite signal tracking level.

Press the LEFT and RIGHT arrow keys until the desired character is underscored (selected). Press the UP and DOWN arrow keys to increase and decrease the selected character. Or press the NUMBER keys to set the desired value directly. Press the OK key to set the parameter. Press the BACK key to select the parameter you wish to edit and press the BACK key again to save or abort and return to the main display.

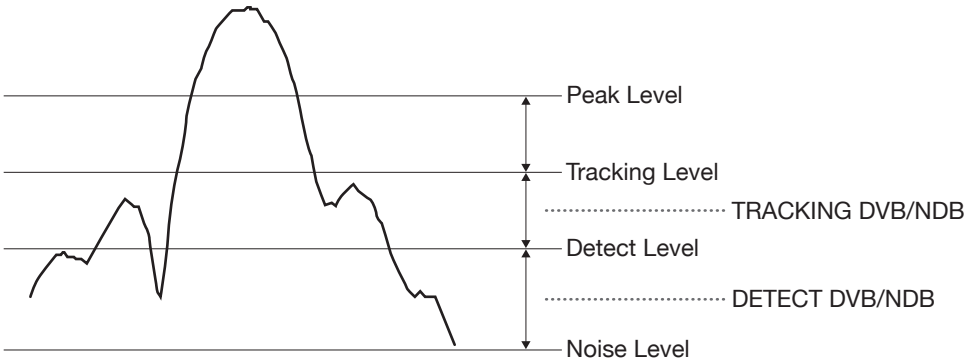
Set detect & tracking NBD



6. Set DETECT NBD and TRACKING NBD when the NBD (NarrowBand Detection) mode of TRACKING SIGNAL is used (Range: 1-200). DETECT NBD sets the satellite signal detection level and TRACKING NBD sets the satellite signal tracking level.

Press the LEFT and RIGHT arrow keys until the desired character is underscored (selected). Press the UP and DOWN arrow keys to increase and decrease the selected character. Or press the NUMBER keys to set the desired value directly. Press the OK key to set the parameter. Press the BACK key to select the parameter you wish to edit and press the BACK key again to save or abort and return to the main display.

Detect & tracking level



BOW & EL adjust

7. Set the BOW OFFSET and EL. ADJUST
The BOW OFFSET function offsets the angle difference between the antenna's bow and the ship's bow (Range: 0 – 360°). The EL. ADJUST function offsets the angle difference between the mechanical elevation angle and actual elevation angle (Range: ± 5°).

Press the LEFT and RIGHT arrow keys until the desired character is underscored (selected).
Press the UP and DOWN arrow keys to increase and decrease the selected character.
Or press the NUMBER keys to set the desired value directly. Press the OK key to set the parameter. Press the BACK key to select the parameter you wish to edit and press the BACK key again to save or abort and return to the main display.

8. Set OPERATION
Press the UP and DOWN arrow keys to select OPERATION items.

OPERATION*
- SAVE
- IDLE ON / OFF
- REBOOT

- **SAVE**: save and execute the current settings.
- The antenna is balanced at the factory. However, after disassembly for shipping, maintenance or parts replacements, antenna balance adjustment may be required. The elevation and cross-level motors have a brake mechanism integrated into them, therefore the antenna power and IDLE MODE must be ON to release the motor brakes. Balancing is achieved by adding or removing weight blocks at strategic locations to keep the antenna balanced.
- **REBOOT ANTENNA**: The antenna will restart automatically if REBOOT ANTENNA is ON.

Setup Block Zone

Up to 5 block or radiation hazard zones can be programmed with relative azimuth and elevation sectors.

Setup mode

```
                SETUP MODE ?
          → YES                    NO
```

1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

Antenna MODE

```
   →+ANTENNA              +SATELLITE
    +SYSTEM
```

2. Press the OK key to enter the ANTENNA menu.

Block zone MODE

```
◂   →+BLOCK ZONE          +DIAGNOSIS    ▸
```

3. Press the RIGHT arrow key to move the cursor to BLOCK ZONE and press the OK key to enter it. Up to 5 block zones are allowed to be programmed.

Block zone 1

```
   ZONE 1 BLOCK
   ▵     ON      ▿
```

Block zone range

```
◂   →AZ.1 START   AZ.1 END    EL.1 LIMIT▸
      000           000          90
```

4. Set ZONE 1 BLOCK
Press the UP and DOWN arrow keys to select "ON" to set up the block zone for ZONE 1.
Press the OK key to use ZONE 1 BLOCK and set the zone 1 block range.
Press the BACK key to select the parameter you wish to edit and press the BACK key again to save or abort and return to the main display.

Set the AZ.1 START, AZ.1 END and EL.1 LIMIT while ZONE 1 BLOCK is ON.
This is clockwise of the two points. AZ.1 START is where the relative azimuth starts and AZ.1 END is where the relative azimuth ends (Range: 0- 360°). The EL.1 Limit is where the elevation starts (Range 0- 90°).

Press the LEFT and RIGHT arrow keys until the desired character is underscored (selected).
Press the UP and DOWN arrow keys to increase and decrease the selected character.
Or Press the NUMBER keys to set the desired value directly. Press the OK key to set the parameter. Press the BACK key to select the parameter you wish to edit and press the BACK key again to save or abort and return to the main display.

Block zone 2

5. ZONE 2 to ZONE 5 BLOCK setting is same as ZONE 1 BLOCK.
Press the OK key to set ZONE 2 BLOCK and set the next parameter.

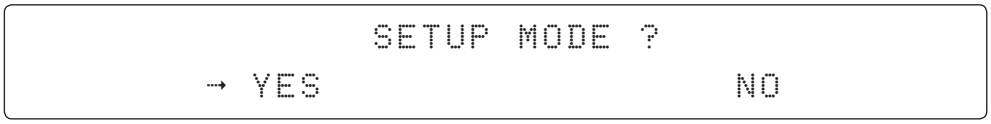
Save

6. Press the LEFT arrow key to move the cursor to YES and press the OK key to save and execute the current settings. Or press the RIGHT arrow key to move the cursor to NO and press the OK key to abort and return to the main display.

Diagnosis Procedures

Refer to the diagnosis codes for the test results.

Setup mode



1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

Antenna MODE

2. Press the OK key to enter ANTENNA menu.

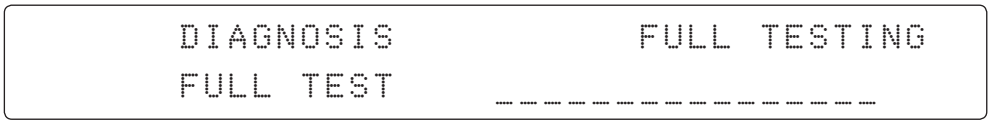
Diagnosis MODE

3. Press the arrow keys to move the cursor to DIAGNOSIS and press the OK key to enter it.

Select diagnosis

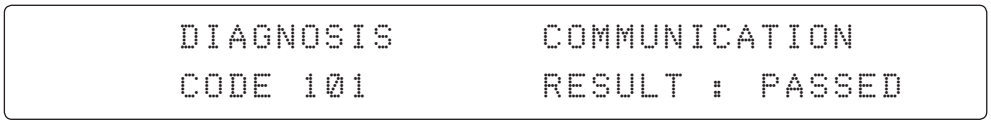
4. Press the UP and DOWN arrow keys to select a full diagnostic test or single diagnostic Test and press the OK key to execute the selected diagnostic test. Refer to the following Diagnosis Code list.

Full diagnostic test result



5. A full diagnostic is successfully completed.

Single diagnostic test result



6. A single diagnostic test is successfully completed.

Diagnosis Code:

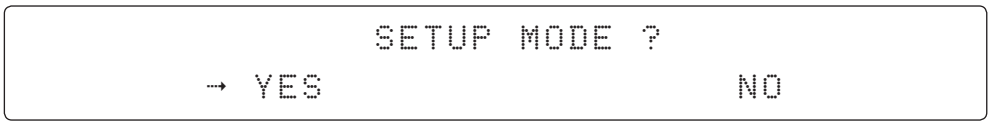
CODE 101: The data communication between the antenna and the ACU is tested.
CODE 102: The azimuth motor is tested.
CODE 103: The elevation motor is tested.
CODE 104: The cross-level motor is tested.
CODE 105: The azimuth encoder is tested.
CODE 106: The cross-level encoder is tested. (Skip for v240MT)
CODE 107: The rate sensor is tested.
CODE 108: The tilt sensor is tested.
CODE 109: The sensor box motor is tested.
CODE 110: The LNB/NBD is tested.
CODE 111: The LNB pol motor is tested.
CODE 112: The sub-reflector is tested. (Skip for v-series communication products)
CODE 113: The antenna power is tested.
CODE 114: The ACU power is tested.
CODE 115: The receiver power is tested. (Skip for v-series communication products)
CODE 116: The home sensor is tested.

An example of test result: •2•••••••••-••-•
●: The test has passed.
2: The test has failed. (CODE102)
–: The test is skipped. (Only for TVRO products)
?: The test is in process.

Satellite Settings

Load Satellite

Setup mode



1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

Satellite MODE

2. Press the RIGHT arrow key to move the cursor to SATELLITE and press the OK key to enter it.

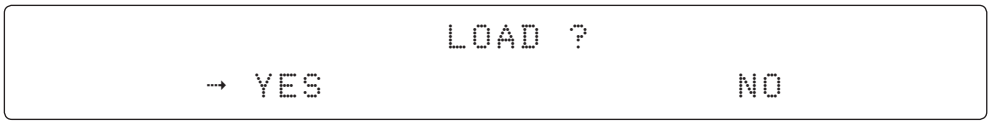
Load sat MODE

3. Press the OK key to enter the LOAD SAT. menu.

Load satellite

4. Press the UP and DOWN arrow keys to the select satellite that you wish to track. Press the OK key to load the selected satellite.

Load

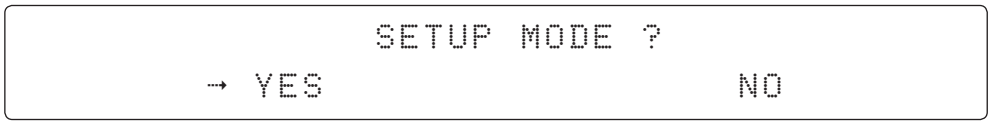


5. Press the LEFT arrow key to move the cursor to YES and press the OK key to load the selected satellite and execute the current settings. Or press the RIGHT arrow key to move the cursor to NO and press the OK key to abort and return to the main display.

System Settings

Setting local

Setup mode

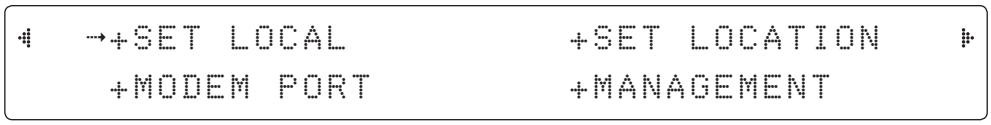


1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

System MODE

2. Press the DOWN arrow key to move the cursor to SYSTEM and press the OK key to enter it.

Set local frequency MODE



3. Press the OK key to enter the SET LOCAL menu to set the LNB local frequency.

LNB info

4. Set the LNB local oscillator frequency for each correspondent voltage power. (13V+0KHz, 18V+0KHz, 13V+22KHz, 18V+22KHz) The local frequency of C-band is fixed as 5150MHz.

Press the BACK key and press the LEFT and RIGHT arrow keys to select the parameter you wish to edit. Press the OK key to edit parameter. Or press the BACK key again to return to the main display.

LNB LOCAL: the selectable LNB frequencies are depending on the installed LNB type.

Save

5. Press the LEFT arrow key to move the cursor to YES and press the OK key to save the current settings. Or move the cursor to NO and press the OK key to abort and return to the main display.

Setting Location

Setup mode

```
SETUP MODE ?
→ YES                    NO
```

1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

System MODE

```
  +ANTENNA              +SATELLITE
→+SYSTEM
```

2. Press the DOWN arrow key to move the cursor to SYSTEM and press the OK key to enter it.

Set location MODE

```
  +SET LOCAL          →+SET LOCATION
  +MODEM PORT          +MANAGEMENT
```

3. Press the RIGHT arrow key to move the cursor to SET LOCATION and press the OK key to enter it.

Gyrocompass type and Baud rate

```
GYRO TYPE          BAUD RATE
 NMEA               ▲ 4800 ▼
```

4. Set the ship's **GYRO TYPE*** and BAUD RATE
A search pattern 1 or 3 will initiate according to which GYRO TYPE is selected and the existence of the gyrocompass input. Set the BAUD RATE as 4800, 9600, 19200 or 38400 according to your device.

A search pattern 1 will initiate automatically if the gyrocompass input does not exist and the gyrocompass type is to any setting other than GROUND TEST.

NOTE

NOTE: The bow offset will not be saved automatically if a Search 1 pattern is initiated. In this case, the antenna will need to retarget the desired satellite using Search 1 every time if the antenna restarts.

Gyrocompass search type

	Setting of Heading Device		
Existence of Heading Data	**No Device**	**NMEA NMEA 2000**	**Ground Test**
With Heading Data	Search 1	Search 3	Search 3
Without Heading Data	Search 1	Search 1	Search 3

GYRO TYPE*
- NO DEVICE
- NMEA
- NMEA 2000
- GROUND TEST

Latitude & longitude

5. Set the current LATITUDE and LONGITUDE
Press the LEFT and RIGHT arrow keys until the desired character is underscored (selected). Press the UP and DOWN arrow keys to increase or decrease the value. Or press the NUMBER keys to set the desired value directly. Press the the OK key to set the parameter.

Heading

6. Entry of the ship's heading is not required when your system is connected to the NMEA(0183) or NMEA2000 Heading Gyrocompass output. Ensure that the supported gyrocompass type is set correctly. For the v240MT, if the ship's gyrocompass output is Step-by-Step (SBS) or Synchro, the separate purchase of a gyrocompass converter is required.

Save

7. Press the LEFT arrow key to move the cursor to YES and press the OK key to save the current settings. Or move the cursor to NO and press the OK key to abort and return to the main display.

Setting Modem Port

Setup mode

```
SETUP MODE ?
→ YES                    NO
```

1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

System MODE

```
  +ANTENNA              +SATELLITE
→+SYSTEM
```

2. Press the DOWN arrow key to move the cursor to SYSTEM and press the OK key to enter it.

Modem port MODE

```
  +SET LOCAL            +SET LOCATION
→+MODEM PORT            +MANAGEMENT
```

3. Press the DOWN arrow keys to move the cursor to COM. PORT and press the OK key to enter it.

Set Mediator & modem type

```
USE MEDIATOR            MODEM TYPE
   NO                   IDIRECT-I/O
```

4. The USE MEDIATOR function enables the usage of the Mediator in dual antenna configurations.


NOTE

NOTE: USE MEDIATOR must be disabled if there is no MEDIATOR connected to the ACU. Improper setting of this parameter will cause your ACU's modem interface to work incorrectly.

- **MEDIATOR-ANT : DUAL ANTENNA - ONE MODEM**
- **MEDIATOR-MODEM: ONE ANTENNA - DUAL MODEM**
- **MEDIATOR-ALL : DUAL ANTENNA - DUAL MODEM**

The MODEM TYPE* function selects a proper data communication port and protocol on the ACU to interface with the satellite modem.

USE MEDIATOR*
- NO
- MEDIATOR-ANT
- MEDIATOR-MODEM
- MEDIATOR-ALL

USE MEDIATOR*
- USER SETTING
- IDIRECT-I/O
- IDIRECT-AMIP
- COMTECH-I/O
- COMTECH-ROSS
- HUGHES
- SATLINK-SERIAL
- SATLINK-VACP
- ELEKTRIKOM-AMIP
- GILAT-SE-II
- IPSTAR-SOTM
- INMARSAT-G5

If you select a pre-defined modem, the modem setting is done automatically.
If you want to use a modem not listed in the extensive preset library, choose "USER SETTING" to configure your own modem.

The next display will be shown only when you select "USER SETTING".

Set modem protocol

5. The **MODEM PORT*** function selects a proper data communication port on the ACU to interface with the modem.

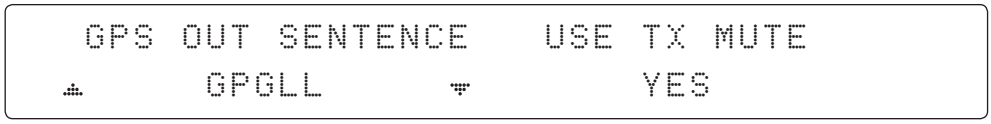
MODEM PORT*
- ETHERNET
- RS422
- RS232

The **PROTOCOL*** function selects a proper communication protocol on the ACU to interface with the modem.

PROTOCOL*
- **I/O CONSOLE:** is a protocol for exchanging of information (GPS Out, TX mute, and modem lock) between the ACU (through Console port) and a modem.
- **OPEN AMIP:** is an ASCII based protocol developed by iDirect for exchanging of information between the ACU and a modem. OpenAMIP is not intended for any purpose except to allow the ACU and a modem to perform synchronized automatic beam switching (ABS).
- **SERIAL GPS*:** is a protocol for sending GPS Out information from the ACU (through RS232/422 port) to a modem.
- **ROSS:** the ROSS Open Antenna Management (ROAM) protocol was developed by the Comtech EF Data Corporation to offer a common management interface for Comtech EF Data's Roaming Oceanic Satellite Server (ROSS) and the ACU.
- **VCAP:** is the interface between the SatLink mobile VSAT IDU and the Intellian antenna controllers for Intellian mobile antennas.
- **ELELKTRIKOM-AMIP:** is an OPEN AMIP based protocol.
- **GILAT:** Is the NMEA0183 based protocol to monitor the status of the antenna and the modem. It is passed through the Gilat SkyEdgeII modem RS232 serial port.
- **SOTM:** Is a protocol interface between the ACU and the IPSTAR modem's beam switching controller to perform automatic beam switching (ABS).

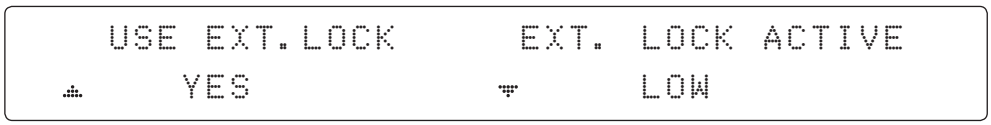
6. The **GPS OUT SENTENCE*** function selects the **GPS OUT SENTENCE** type. The **USE TX MUTE*** enables or disables the TX MUTE function from the satellite modem. A transmit inhibit output from the ACU will disable/mute the modem transmit via a voltage whenever the antenna is blocked, searching, or is mis-pointed 0.5 degrees from the peak satellite position.

Use TX mute



GPS OUT SENTENCE*
- GPGLL
- GPGGA
- SIMPLE GPGGA

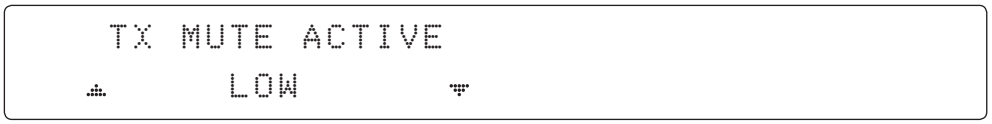
Use EXT.LOCK



7. **USE EXT. LOCK** selects whether or not to use an external lock signal from the satellite modem. The **USE EXT. LOCK** item will only be activated when the PROTOCOL is set to I/O CONSOLE.

The **EXT. LOCK ACTIVE** parameter indicates that the modem lock signal is being received by the ACU. This is provided by a logical input via a 5V (HIGH) or 0V (LOW) current being sent to the ACU when the modem is locked on the correct satellite carrier. **EXT. LOCK ACTIVE** is only active when the PROTOCOL is set to I/O CONSOLE.

TX mute activation



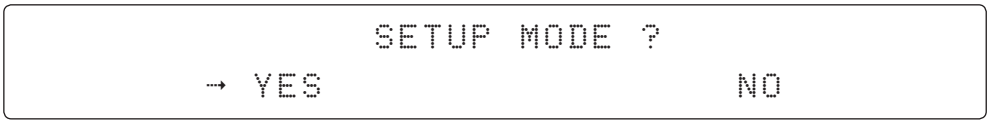
8. **TX MUTE ACTIVE** is a transmit inhibit output from the ACU to disable/mute the modem transmit through a 5 V (HIGH) or 0 V (LOW) current whenever the antenna is blocked, searching, or is mis-pointed more than 0.5° from peak satellite position. The **TX MUTE ACTIVE** item will only be activated when the PROTOCOL is set to I/O CONSOLE.

Save

9. Press the LEFT arrow key to move the cursor to YES and press the OK key to save the current settings. Or move the cursor to NO and press the OK key to abort and return to the main display.

System Management

Setup mode



1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

System MODE

2. Press the DOWN arrow key to move the cursor to SYSTEM and press the OK key to enter it.

BACKup and restore MODE

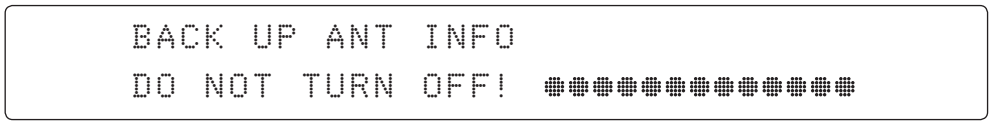
3. Press the arrow keys to move the cursor to BACKUP & RESTORE MODE and press the OK key to enter it.

Select process type

4. Press the UP and DOWN arrow keys to **SELECT PROCESS TYPE***
Press the OK key to set the parameter and the processing message will be displayed.

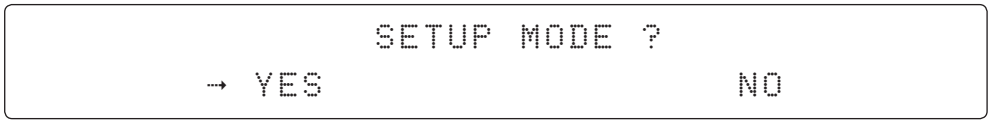
SELECT PROCESS TYPE*

- **BACKUP USER DATA:** Backs up the antenna's user settings.
- **RESTORE USER DATA:** Restores the user settings to the antenna.
- **DEFAULT ACU-REMOTE P/W**: To change the web server module's password to default.



Key Lock (Password Management)

Setup mode

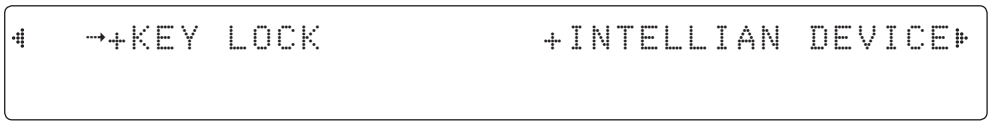


1. Press the LEFT arrow key to move the cursor to YES and press the OK key to enter SETUP mode.

System MODE

2. Press the DOWN arrow key to move the cursor to SYSTEM MODE and press the OK key to enter it.

Key lock MODE



3. Press the arrow keys to move the cursor to KEY LOCK and press the OK key to enter it. The menu INTELLIAN DEVICE is not available for v240MT.

Set key lock and password

4. Press the UP and DOWN arrow keys to choose whether or not to use the keypad lock function when entering SETUP mode or saving the satellite information. Setup the password for disabling the keypad lock. The factory default is **1590**.

Check key lock activation

When KEY LOCK function is activated, the " ✱ "mark is displayed.

Operating the Mediator

Introduction

Intelligent Mediator Unit

Mediator Front Panel

Introduction

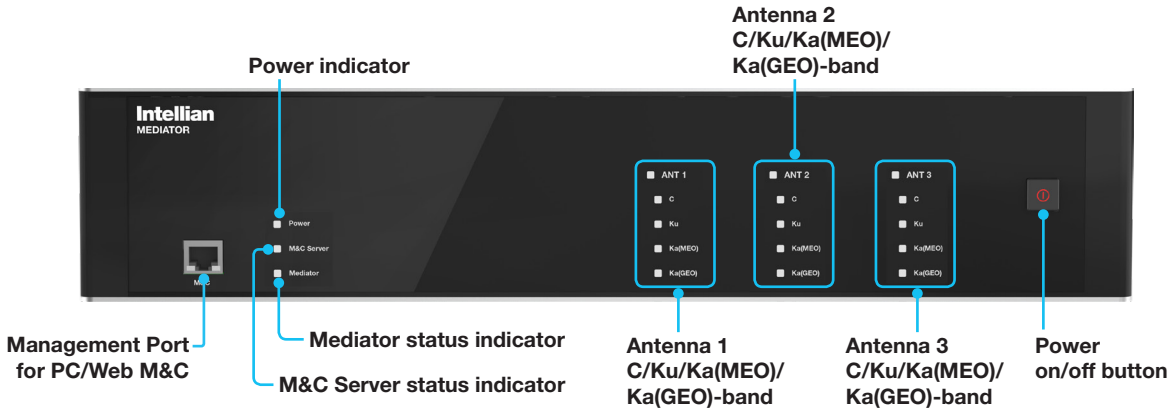
Intelligent Mediator Unit

The Intelligent Mediator controls the various settings of the antenna. The functions of the Intelligent Mediator are as follows:

- RF Switch Enabled Modem Mediator
- Redundant Modem Support
- Simple and Easy Installation
- Support Various Modem Interfaces
- Intellian Network Device Monitoring
- Automatic Switchover Between 3 VSAT Antenna Systems
- Redundant Antenna Systems

Mediator Front Panel

The following figure shows the mediator's front panel.



The following table shows status indicators on the face of each mediator module.

LED Display	Color	Description
Power	Steady Green	The mediator is powered on.
	Off	The mediator is powered off.
M&C Server	Green	The M&C Server is connected.
	Off	The M&C Server is not connected.
Mediator (In Single Data Center(SDC)System)	This function is not supported in SDC System.	
Mediator (In Dual Data Center(DDC)System)	Steady Green	Data Center is connected as Primary.
	Steady Yellow	Data Center is connected as Secondary.
	Off	Data Center is not connected.
Antenna 1(ANT1) Antenna 2(ANT2) Antenna 3(ANT3)	Steady White	Antenna modules are communicating.
	Off	Antenna modules are not communicating.
C-band Ku-band Ka-band(GEO) Ka-band(MEO)	Steady Green	The Hot Standby state is primary, and Tx/Rx services are active.
	Steady Yellow	The Hot Standby state is secondary or backup, and Rx service is active only. The module is ready to assume Primary Role if needed.
	Off	All services are not active.

Aptus®

Introduction

Intellian's new GUI Antenna PC Controller Software, Aptus® is a next-generation graphically based antenna remote control software. It is designed in the MS.NET programming environment with an additional Software Development Kit (SDK). The SDK allows the NOC or service center to integrate antenna monitoring and control into existing network management systems in an easier, more user-friendly, and convenient manner.

Compatibility

Aptus® is compatible with Intellian's TVRO and VSAT antenna systems.

Requirements

Below is a list of the minimum PC hardware and software requirements to install and run Aptus®.

Hardware

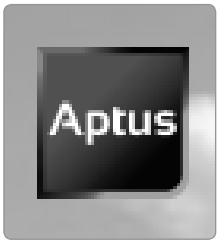
Hardware	Requirements
CPU	Intel® Pentium® 4 or higher
Memory	512MB or higher
Video Card	DirectX9.0 or higher supported
	H/W acceleration supported
	Video Memory 128MB or higher
HDD	1GB or higher

Operating System and Software

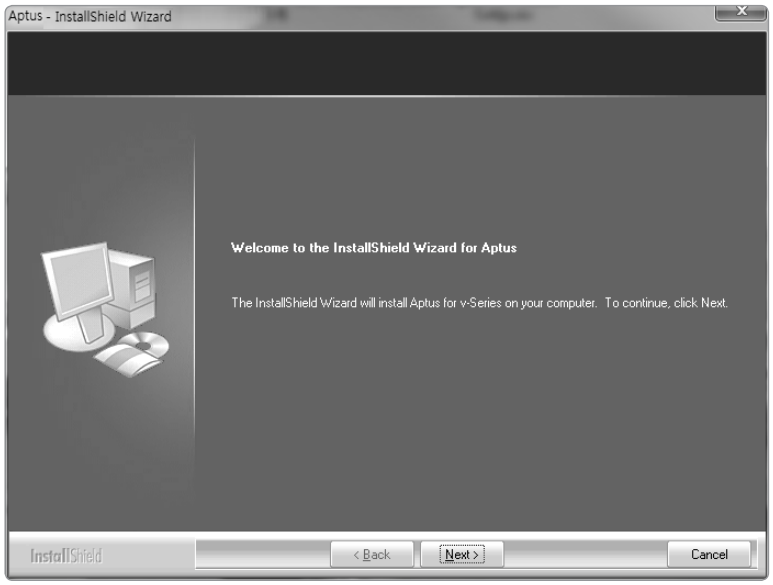
Software	Requirements
Operating System	Windows XP SP or higher
Framework	Microsoft.Net Framework 3.5 Service Pack 1 or higher

Software Installation

Double click the Install Icon to install Aptus® directly onto your computer/ laptop. The InstallShield Wizard will guide you through the program setup process. The installation routine provides an icon on the desktop that can be clicked to start the software. In addition, Intellian also provides patch files for software upgrades.



Aptus Install Icon



InstallShield Wizard

Aptus Desktop Icon

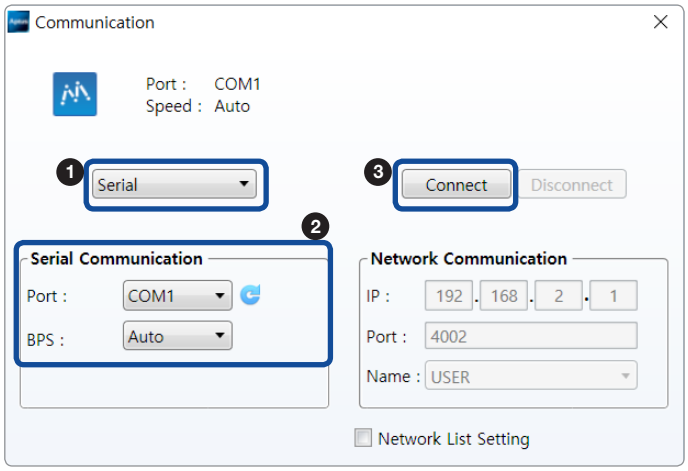
PC to ACU Communication Setup

Starting Aptus

By double-clicking the Aptus® desktop icon, the Communication Window where you can establish the data communication between your PC and the ACU will appear. You are given the options of accessing your ACU through the Serial Port Communication or through the Network Communication (TCP/IP).

Access ACU through Serial Communication

1. Connect a 9 pin serial cable from the PC INTERFACE connector on the ACU to the 9-pin serial port on the PC. If there is not a 9-pin serial port on the PC, use a USB-Serial adapter.
2. Select "**Serial**" in the communication type combo-box.
3. Select a COM port which is not occupied by other devices.
4. The baud rate of the ACU is automatically configured.
5. Click the "Connect" button.

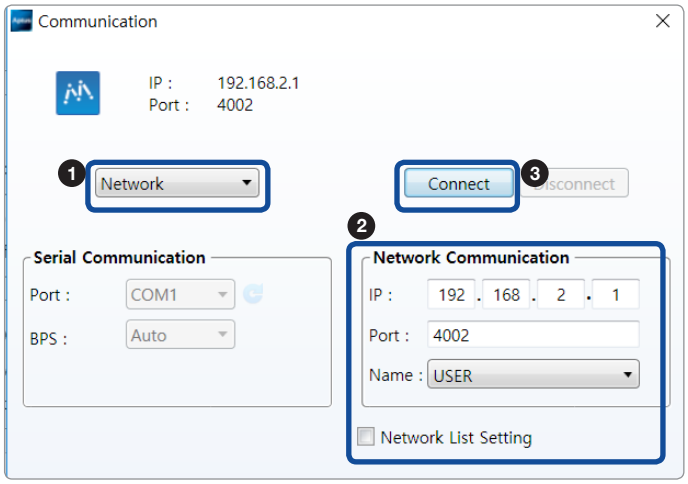


Serial Communication

Access ACU through Network Communication (TCP/IP)

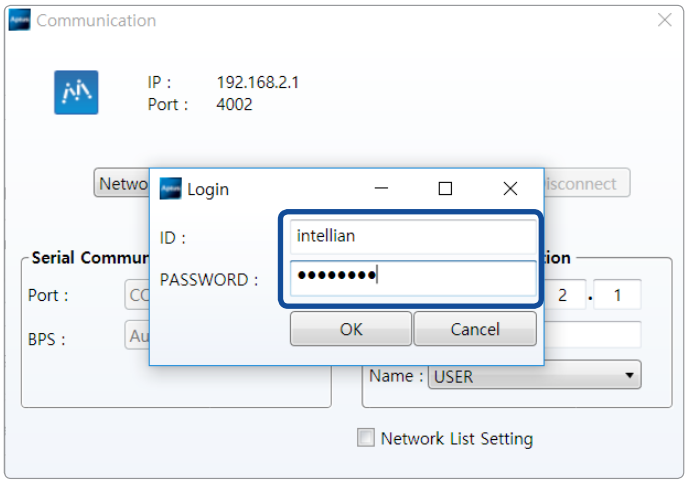
1. Turn off the wireless connection on your ACU while using this method, as the Ethernet port on the ACU front panel is disabled when the Wi-Fi function is active.
2. Select "**Network**" in the communication type combo-box.
3. Enter the ACU's IP address. (**Factory default: 192.168.2.1**)
4. Enter the ACU's port number. (**Factory default: 4002**)

   The IP address and port number can be customized by enabling the Network List Setting option. The user network setting list can be editable through the ADD, MODIFY and DELETE options. Once added to the list, you can select the desired network list in the Network Communication's Name combo-box.
5. Click the "Connect" button.



Network Communication

6. The Authentication window will appear.
7. Log in by using the username and password below:
   - **Username: intellian (Factory default)**
   - **Password: 12345678 (Factory default)**



Authentication Window

WARNING: The amount of data will increase rapidly if Network Communication is in use. Intellian recommends using Remote Web Access to access the ACU.

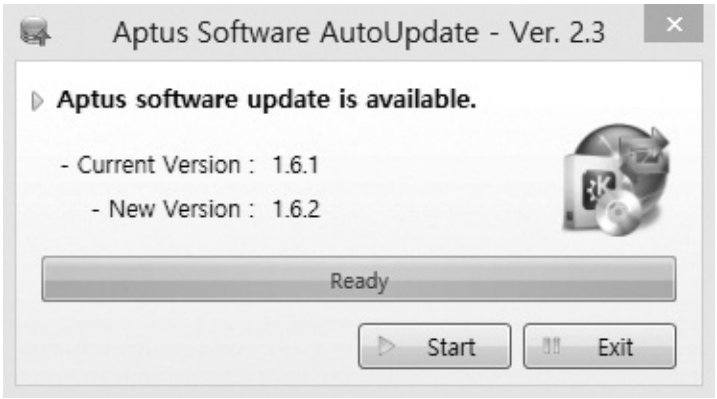
NOTE

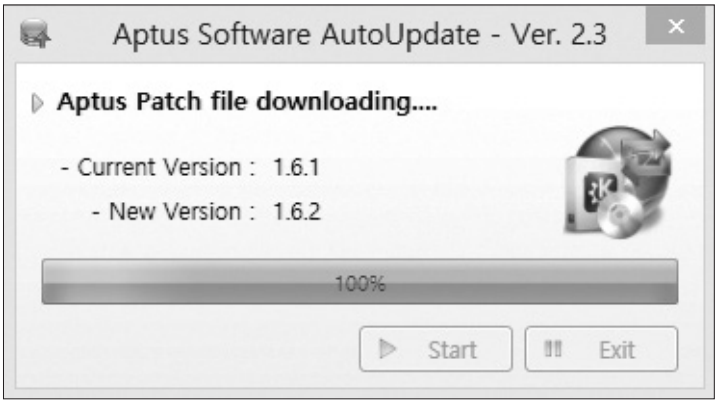
After entering with the default password, the user must change the default password to a new password for security. Changing password is only possible via the Aptus web page.

AutoUpdate

Intellian Aptus® checks and notifies the latest version when it is started to maintain up to date software version by its AutoUpdate function.

1. When Aptus® is started, it automatically checks the latest software version from the server and runs AutoUpdate which will display the current software version and if a new version is available.
2. When a new software version is available, click the "Start" button and "File downloading..." message will be displayed while the files are downloaded from the server. When file downloading is finished, "installing…" message is displayed and Aptus patch runs and the installation starts by InstallShield.

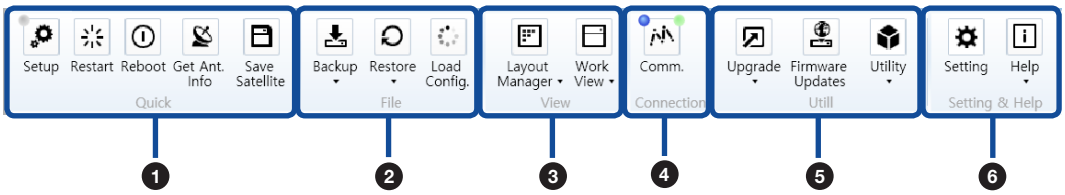




3. Click the "Finish" button when InstallShield installation is finished, then "Run the Aptus" message is displayed and Aptus runs and AutoUpdate is automatically finished.

Toolbar Menu

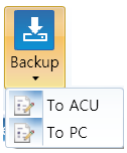
With the Toolbar menu, users can quickly and easily access the most commonly used functions of Aptus® through the toolbars and icons at the top of the screen.



❶ Quick

	**Setup**: enters Setup mode.
	**Restart**: exits Setup mode and restarts the antenna.
	**Reboot**: reboots the antenna.
	**Get Ant. Info**: obtains the information stored in the antenna.
	**Save Satellite**: saves the current bow offset only if the antenna is tracking onto the satellite. The satellite acquisition time can be reduced significantly after the antenna is restarted.

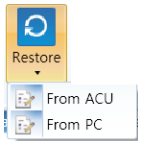
❷ Files



Backup: backups the antenna information to ACU or PC.

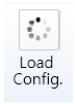
- Select 'To ACU' to back up the antenna information to ACU. The backup file (file format: *.ibf) will be stored on the ACU.
- Select 'To PC' to back up the antenna information to PC. The backup files (file format: *.rpt and *.ibf) will be generated on the PC.

NOTE: Both *.rpt and *.ibf files contain antenna information. However, while *.ibf file can be used for restoring antenna information, *.rpt file is stored as plain-text for viewing purpose only. Users can open the *.rpt using text editors such as notepad software.



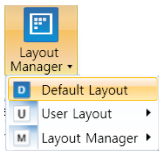
Restore: restores the antenna by using the stored information on ACU or PC.

- Select 'From ACU' to restore the antenna by using the stored information on ACU.
- Select 'From PC' to restore the antenna by using the stored information on PC (file format: *.ibf).



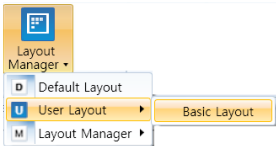
Load Config.: loads the antenna configuration file (file format: *.cfg).
The configuration file includes the antenna control parameters which are pre-loaded at the factory and should only be changed by an authorized service technician. Improper setting of these parameters will cause your system to perform improperly.

❸ View

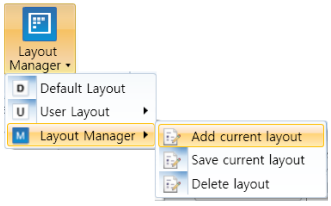


Layout Manager: displays and sets the layout.

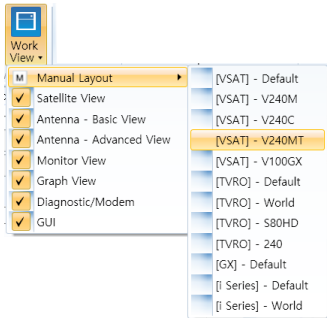
- **Default Layout**: returns the current layout to the default layout.



- **User Layout**: displays the layout list that the user has previously stored by using Layout Manager. If you select a layout in this list, the selected layout will be constructed on Work View screen. The 'Basic layout' is provided by default.



- **Layout Manager**: provides the user with add, delete, and save functionalities in order to manage the user's layouts.
  - Selecting 'Add current layout' opens a pop-up window. Type in the desired name of current layout and click Add, then the new name of the current layout will be saved to the list under User Layout menu.
  - When changes are made to the current layout, select 'Save current layout' option. The current layout will be saved with changes.
  - To remove a layout, select 'Delete layout' option. Select the desired layout to remove on the pop-up window, then click 'Delete'. Close the window by clicking on 'Close'. The selected layout is removed from the User Layout list.

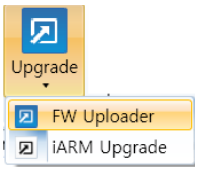


Work View: displays a list of seven pre-constructed Work View Tabs (Satellite View, Antenna Basic View, Antenna Advanced View, Monitor View, Graph View, Diagnostic/ Modem View and GUI View) and also provides the Activate / Close functionalities for each view tab. Activate the work view tab by ticking the checkbox next to it.

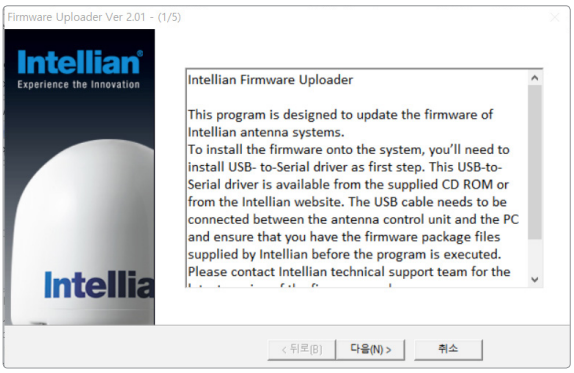
❹ Connection

Comm.: At any time, a data communication channel can be reestablished between Antenna and ACU via a Serial or Network connection. Selecting Comm. Button will display the Communication Window to connect to the ACU via Serial or Network communication.

❺ Utill



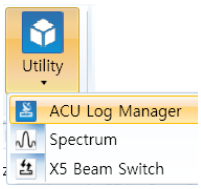
- **Firmware Uploader**: launches firmware upload wizard to upgrade Antenna and ACU firmware from a PC. Ensure the USB cable is connected between the 'USB port' on the PC to the 'PC port' on the ACU. Then follow instructions on the Wizard until the firmware upgrade is complete.



Firmware Uploader Wizard

- **iARM Upgrade**: Upgrade the firmware of iARM module.

Firmware Updates: provides the user with the latest firmware version and updates firmware by simple steps.

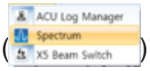


- **ACU Log Manager**: displays the antenna log data in calendar view which is downloadable directly to the desired path.
- **Spectrum**: displays current spectrum graph and allows to set spectrum data view options.
- **X5 Beam Switch**: Switch the iDirect X5 Beams and receive the beam list using the connected LAN cable to the iDirect X5 modem directly.

How to set up Spectrum Analyzer

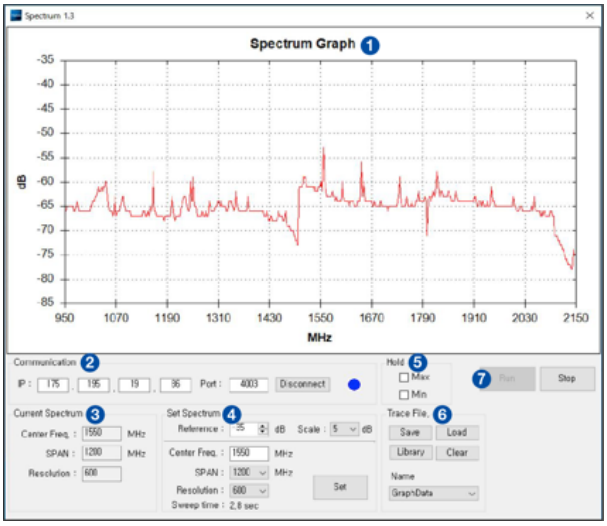
1. Spectrum Analyzer Function
   - Display that a spectrum analyzer measures an input Rx signal frequency within the full frequency range and sets spectrum data view.
   - The disconnect fault can be checked and solved through spectrum analyzer results.
2. Access Spectrum Analyzer

   On the Aptus PC, select "**Utility** (

) ➔ **Spectrum** (

)"on the toolbar menus to display current spectrum graph and allow to set spectrum data view options.
3. Spectrum Graph / Data View

   After clicking the Spectrum menu button, the spectrum analyzer will be popped up. To perform the Spectrum Analyzer function, check the following information.



Spectrum Analyzer Main Menu

1) Graph

   Displays measurement results. The display of a spectrum analyzer has the frequency on the horizontal axis and the amplitude displayed on the vertical axis.

2) Communication

   Access the Spectrum Analyzer entering the ACU's IP address and Port number. Then click the Connect button. When Aptus has connected Ethernet, Spectrum Analyzer will connect automatically.

   The connection status is displayed on the right LEDs. The blue is in connection status and the gray is disconnection status.

3) Current Spectrum

   Display the current Spectrum settings.

4) Set Spectrum

- **Reference/Scale**: Set Amplitude Reference Level and Scale. Press the Reference Level submenu key and use the arrow keys, or the keypad to change the reference level (2000 to -2000). Select the Scale number (1, 2, 5, or 10 dB) in the drop-down list to enter the desired scale.
- **Center Freq.**: Enter the desired center frequency using the keypad then click the Set button to apply the adjusted value. The adjusted value is shown at the Current Spectrum part.
- **Span**: To quickly move the span value up or down, select the span number (6, 60, 300, or 1200 MHz) in the drop-down list. These numbers facilitate a zoom-in, zoom-out feature. Then click the Set button to apply the adjusted value. The adjusted value is shown at the Current Spectrum part.
- **Resolution**: To quickly adjust the resolution value up or down, select the resolution number (100, 200, 300, or 600) in the drop-down list. These numbers facilitate a zoom-in, zoom-out feature. Then click the Set button to apply the adjusted value. The adjusted value is shown at the Current Spectrum part.
- **Sweep Time**: Display the elapsed time all data received during the start to sop testing interval.

5) Hold

- **Max**: Set the desired maximum display range value by clicking the check button. Then click the Set button to change the max level.
- **Min**: Set the desired minimum display range value by clicking the check button. Then click the Set button to change the min level.

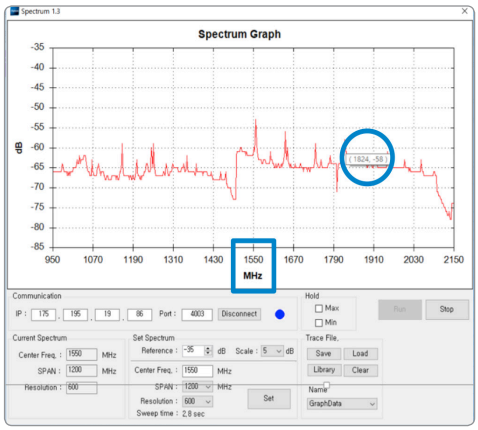
6) Trace File

- **Save**: Save current Spectrum setting values and data.
- **Load**: Load the Trace file and display the data on the spectrum graph.
- **Library**: Create the new Trace file. After saving the file, it will show in the Name list.
- **Clear**: Remove the spectrum data displayed on the graph.
- **Name**: Show the Trace file which it was created at Library in the drop-down list.

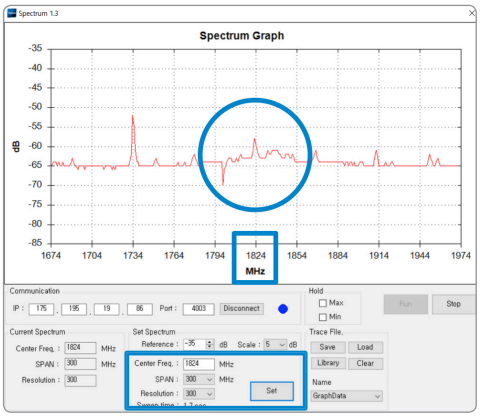
7) Run/Stop

- **Run**: Request the spectrum data to antenna continuously and update graph data in real-time.
- **Stop**: Stop requesting the spectrum data. (The graph cannot be updated.)

4. Change Zoom in Spectrum Graph (Example)
   For example, **1550 MHz** is the default frequency in the spectrum graph. If you wish to base the spectrum graph on **1824 MHz,** follow these steps:
   1) Adjust **Center Freq.** to the desired value. (e.g. 1824 MHz)
   2) Adjust **Span value** to the desired value. (e.g. 300 MHz)
   3) Adjust **Resolution** to the desired value. (e.g. 300)
   4) Click the **Set** button to apply the adjusted values. Verify the spectrum graph is now displayed using the desired values.



Spectrum Analyzer Graph using Defaults



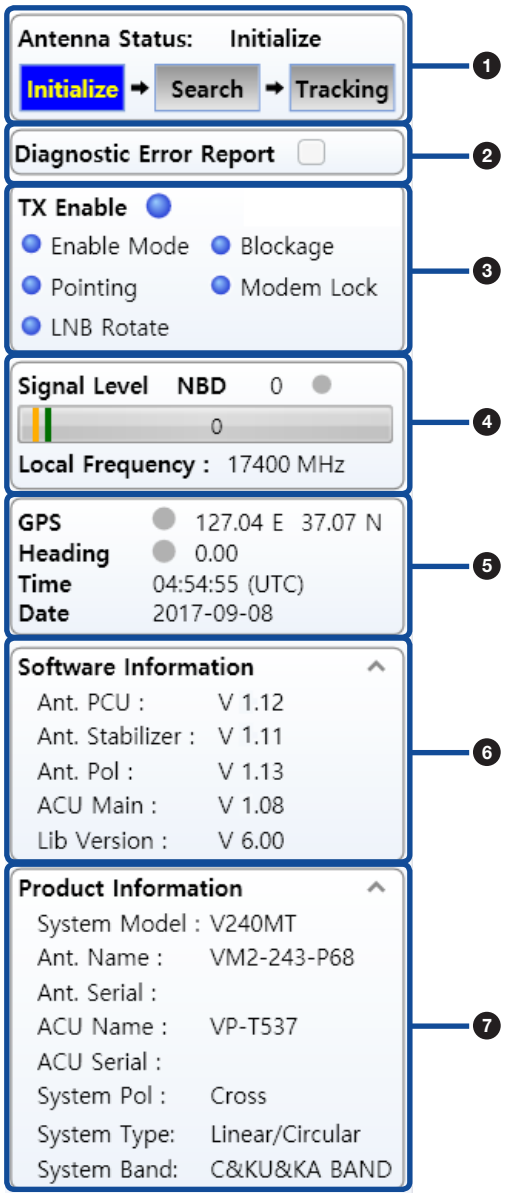
Zoom in Spectrum Analyzer Graph

❻ Setting & Help

	• **Auto Update:** When Aptus PC has started, you can turn auto update on or off. If you click the auto update check button, Aptus PC will check and update, if there is a new version available for download on the server. • **Network Communication:** Set up the timeout to display the message box which appears when the TCP is not connected to the antenna.
	• **Report**: provides e-mail contact to Intellian technical support team to let the user report problems at any time. • **Information**: displays the information of current Aptus® software version.

System Property Status Dashboard

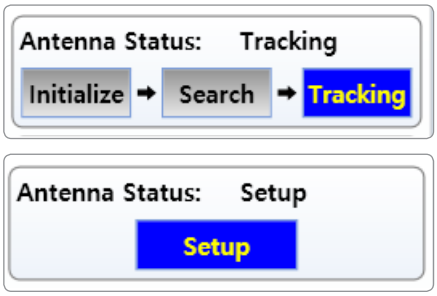
Users can monitor the antenna status, the availability of TX transmission, signal level, GPS and heading status, software information, product information and error status quickly through the property status dashboard on the left side of the screen.



System Property Status Dashboard

❶ Antenna Status

Displays the status of the current mode of the antenna.



Antenna Status View

- **Search**: The Antenna is searching for the target satellite signal. The search will automatically be initiated when the ship's heading input does not exist or if it fails. The search cycle will repeat until the antenna receives the lock signal from the modem or until the DVB transponder of the target satellite is decoded by the antenna. The search will also automatically be initiated when the AGC (NBD mode is in use) or SIG (DVB mode is in use) falls below the current tracking level threshold value. Once the desired signal is found and is above the predefined tracking threshold, the ACU will enter tracking mode.

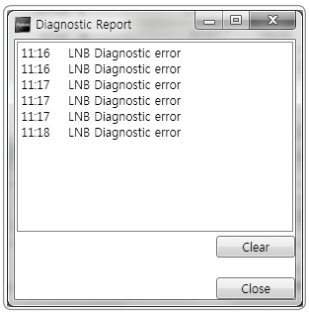
- **Search 1**: A Search 1 pattern will automatically be initiated when the ship's heading input does not exist or if it fails. The search cycle will repeat until the antenna receives the lock signal from the modem or until the DVB transponder of the target satellite is decoded by the antenna.
- **Search 2**: Search 2 is reserved for future use.
- **Search 3**: Search 3 pattern will automatically be initiated when AGC (DVB mode is in use) or SIG/dB (NBD mode is in use) falls below the current tracking level threshold value. Once the desired signal is found and above the predefined tracking threshold, the ACU will enter to tracking mode.

- **Tracking**: The Antenna is tracking the target satellite.
- **Initialize**: The Antenna or ACU is initializing.
- **Setup**: The Antenna is in SETUP mode.

❷ Diagnostic Error Report

The square button next to the Diagnostic Error Report turns red when the system receives an error. Click the button to see a Diagnostic Report.

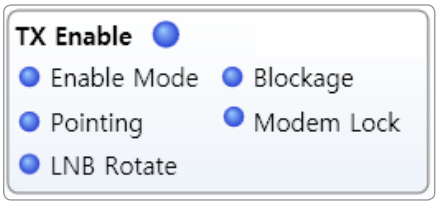
Diagnostic Error View



Diagnostic Report

❸ TX Enable

Displays the status of the TX transmit function. If the circle next to **TX Enable** shows "Blue", it means the antenna TX function is enabled. If the circle shows "Red", it means the antenna TX function is disabled. The TX function will be enabled only if all five factors (Enable Mode, Blockage, Pointing, Modem Lock, and LNB Rotate) listed below show a "Blue" circle next to each of them. However, if the "Use TX Mute" function in the ACU System Work Tab is disabled, the TX function will be enabled regardless the above factors.



TX Enable Status View

- **Enable Mode**: displays whether or not the antenna is in SETUP mode. If the antenna is in Setup mode, the circle next to the Enable Mode will show "Gray".
- **Blockage**: displays whether or not the antenna is pointing to a predefined block zone(s). If the antenna is pointing to the blockage zone, the circle next to the Blockage will show "Gray". If the antenna pointed outside the blockage zone, the circle next to the Blockage will show "Blue".
- **Pointing**: displays whether or not the antenna is pointing to the target satellite. If the antenna is miss-pointing to the target satellite, the circle next to the Pointing will show "Gray". If the antenna is pointing to the target satellite, the circle next to the Pointing will show "Blue".
- **Modem Lock**: displays whether or not the antenna is tracking onto the correct satellite by receiving a confirmation signal from the satellite modem. If the antenna is tracking on the wrong satellite, the circle next to the Modem Lock will show "Gray". If the antenna is tracking on the correct satellite, the circle next to the Modem Lock will show "Blue".

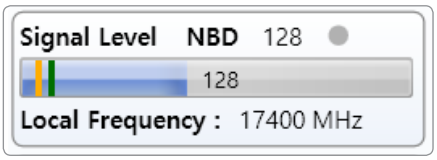
NOTE

NOTE: If the Modem Lock shows "Gray", check the cable connection between the antenna system and the satellite modem as well as settings on the modem.

- **LNB Rotate**: displays whether or not the LNB is rotating. If the LNB is rotating, the circle next to the LNB Rotate will show "Gray". If the LNB is not rotating, the circle next to the LNB Rotate will show "Blue".

❹ Signal Level

Shows "DVB" when DVB signal tracking mode is in use and "NBD" when NBD signal tracking mode is in use. The "Red" line indicates the signal "Detect Level Threshold" and the "Orange" line indicates the signal "Tracking Level Threshold". If the signal level is higher than the tracking level threshold, the signal level bar will display "Blue" color. If the signal level is lower than the tracking level threshold, the signal level bar will display "Orange" color and the antenna will stay in searching mode.



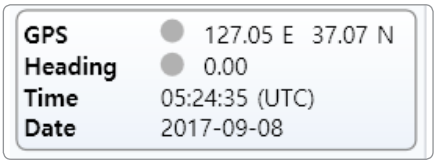
Signal Level View

NOTE

NOTE: If the signal level is not higher than the tracking threshold, decrease the detection and tracking level.

❺ GPS and Heading

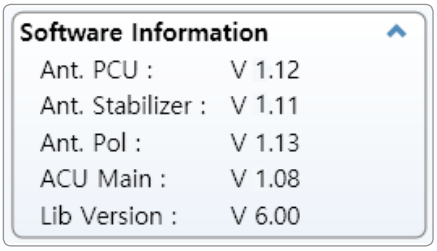
Displays the current GPS location from the Antenna and Ship's heading information. The status light flashes green if the system receives a correct input of the GPS and Ship's heading. Displays UTC time and date.



GPS and Heading Information View

❻ Software Information

Displays the antenna, ACU, and library version. Please note that the display may be different in accordance with the model.



Software Information View

❼ Product Information

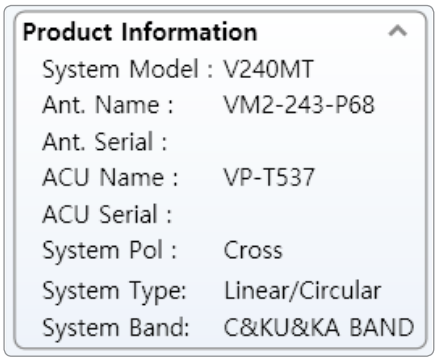
Displays the antenna and ACU serial numbers, the model, antenna, and ACU name.

The System Pol is displayed depends on the band type as shown below.

- Ku/Ka-band: Co/Cross
- C-band: Cross

The System Type is displayed depends on the band type as shown below.

- Ku-band: Linear
- C-band: Linear/Circular
- Ka-band: Circular



Product Information View

Work View Tabs

Aptus® provides seven Work View Tabs (Antenna Basic View, Antenna Advanced View, Satellite View, Graph View, Monitor View, Diagnostic/Modem View, and GUI View) to manage the Antenna and the Satellite configuration. Tick the checkbox next to the Set button to modify the settings. After the desired value is entered, press the Set button to save the settings

Enter Setup mode to modify following settings:

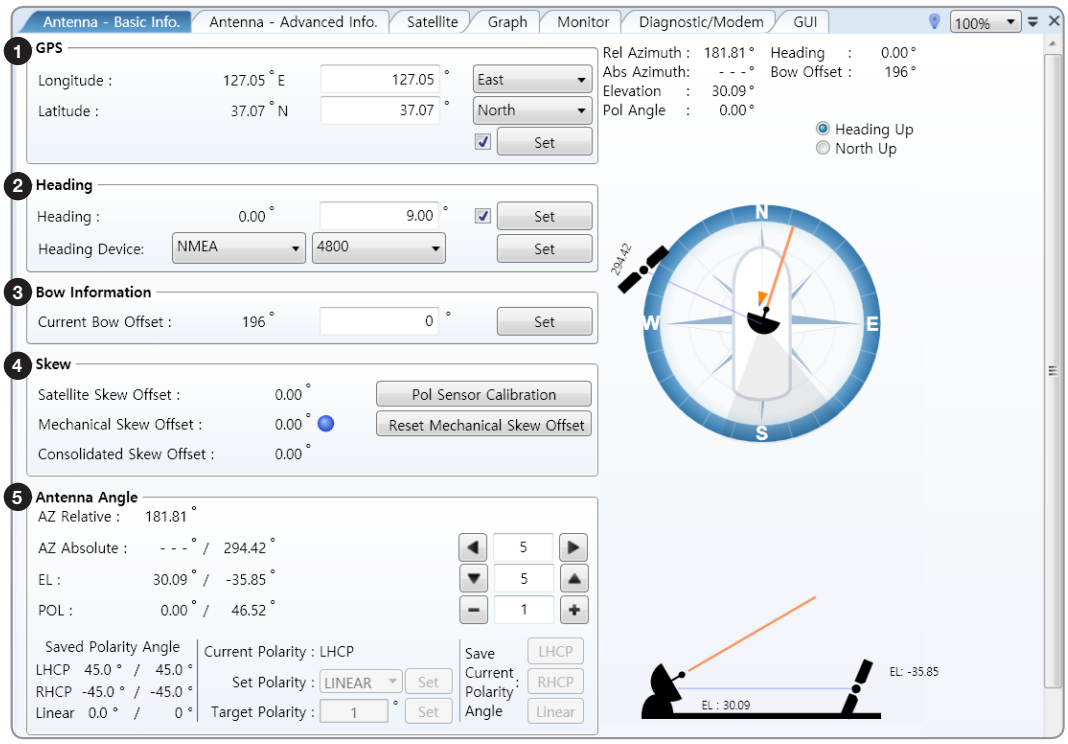
- Antenna Angle
- Tilt Sensor Bias
- Rate Sensor Bias

Following settings can be modified both in Setup mode and Operation mode:

- Heading and Heading device
- Current satellite information
- Bow Information
- Conical Range
- EL Adjust
- Search Parameters
- Threshold Setting
- TX Enable threshold
- Blockage

Antenna – Basic Info.

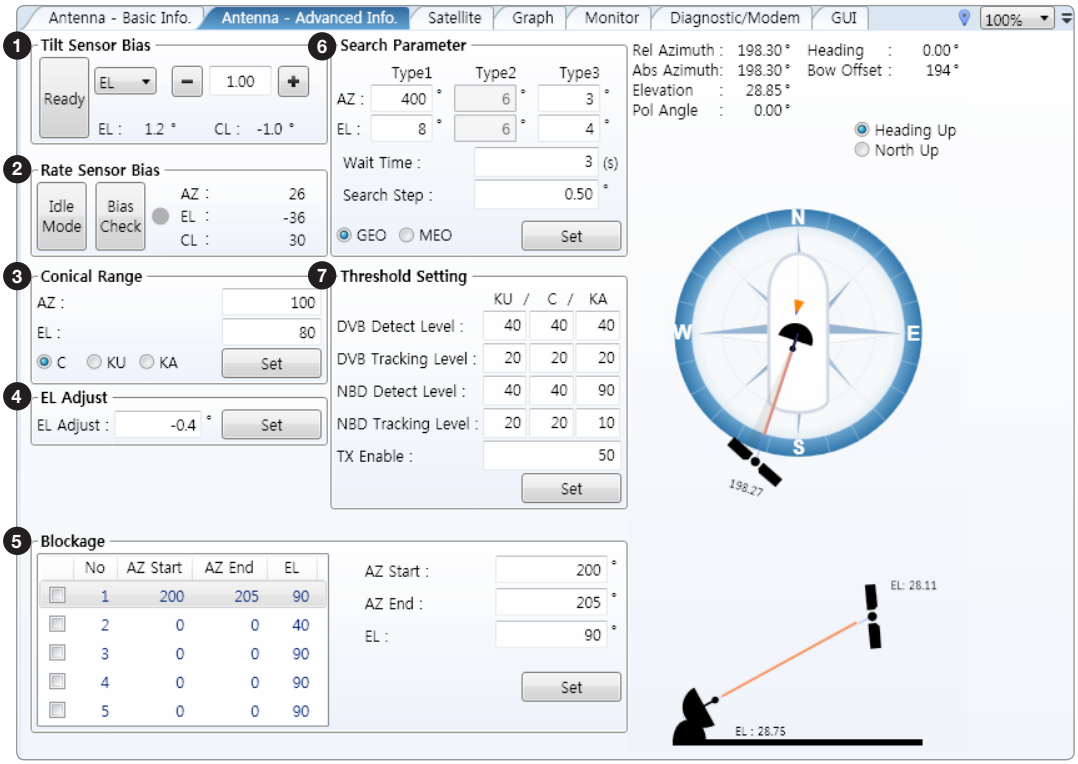
This view tab provides information on the GPS location, Heading Device, Bow Information, Skew Information, and the Antenna's Angle. This view tab uses the Antenna's AZ and EL information as well as the Ship's Heading information in order to provide a dynamic graphic user interface (UI).



No.	Item	Description
①	GPS	displays and sets the antenna's current GPS.
②	Heading	displays and sets the ship's current heading information. - Heading Device: None / NMEA/ NMEA 2000/Ground Test. **NOTE**: Some options may not be available depending on the model. The baud rate (4800/ 9600/ 19200/ 38400) must be set if NMEA is selected.
③	Bow Information	displays and sets the antenna's current bow.
④	Skew	displays the antenna's current skew and skew offset. - Pol Sensor Calibration: calibrates the sensor (potentiometer). - Reset Mechanical Skew Offset: the mechanical skew offset is present in the factory with a default value (0, 1, or 2) depending on the assembly status. Resetting of the mechanical skew offset may be required when the satellite skew offset is unknown (Consolidated Skew Offset = satellite skew offset + mechanical skew offset). Due to each satellite having its own skew offset, Intellian recommends you check with your service provider or satellite operator to get the satellite skew offset value and input it in Satellite Work Tab rather than resetting the mechanical skew offset directly.
⑤	Antenna Angle	displays and sets the antenna's current absolute and relative AZ (azimuth) position, EL (elevation) position and LNB Pol angle. You can move the antenna's azimuth and elevation position and LNB Pol angle by using the arrows or inputting a value to find the desired satellite manually.

Antenna – Advanced Info.

This view provides information on the Tilt Sensor Bias, Rate Sensor, Conical Range, EL Adjust, Search Parameter, Threshold Setting and Blockage.



No.	Item	Description
①	Tilt Sensor Bias	this maintains the elevation and the cross-level axes in order to keep the pedestal parallel to the horizon. Adjust the two solid-state tilt sensors to provide absolute cross-level tilt of the antenna and elevation feedback to eliminate long-term pointing drift (error). Tilt bias must be adjusted when the antenna control board or sensor box is replaced. If the bubble on the button level located on the sensor box is not centered, please follow the following steps to adjust the tilt sensor bias. - Step 1. Enter Setup mode and press the "Ready" button to bring the elevation and cross-level to 0°. - Step 2. Select "EL" from the drop-down list and press the Up and Down arrow keys to adjust the bubble until it is located on the centering of the button level. - Step 3. Select "CL" from the drop-down list and press the Up and Down arrow keys to adjust the bubble until it is located on the center ring of the button level. - Step 4. Press the Restart button to reboot the antenna.

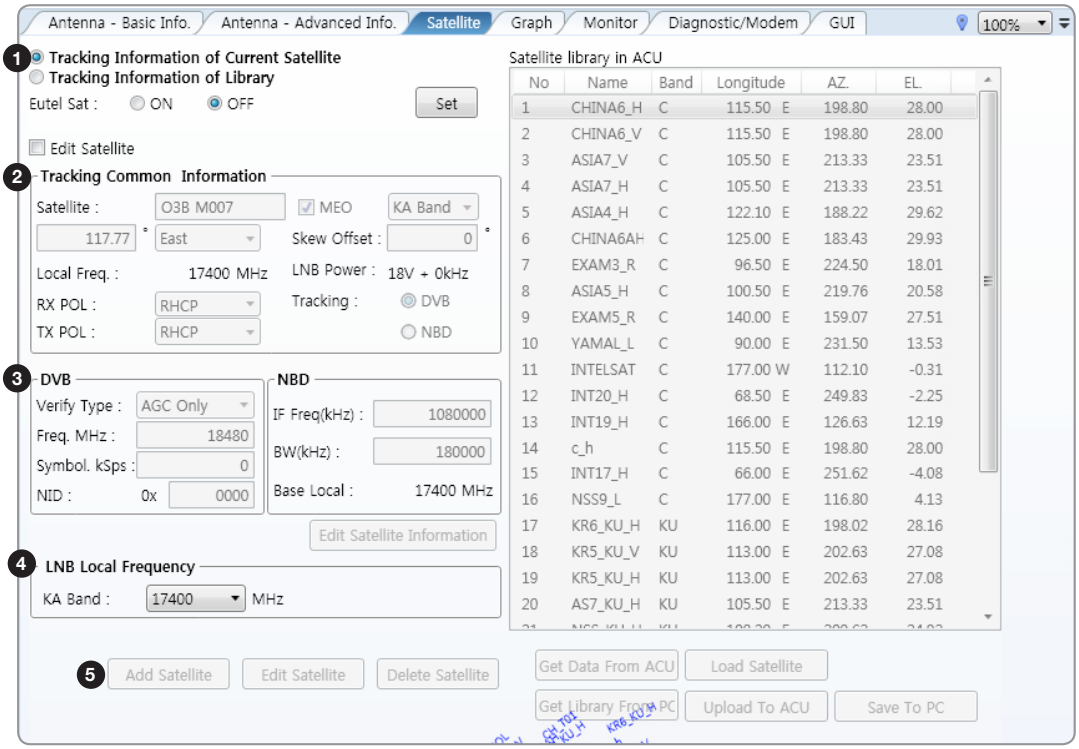
No.	Item	Description
②	Rate Sensor	is used to calibrate the DC voltage output from the three rate sensors (azimuth, elevation, and cross-level). These are used to sense antenna motion that corresponds to the ship's motion (roll, pitch, and yaw) for stabilizing the pedestal. The DC voltage output from each of the rate sensors may vary by an amount which is directly proportional to the direction and rate of motion induced on it. Before calibrating the rate sensors located on the Sensor box, make sure that the antenna is placed on a rigid and flat platform. During the calibration process, any motion of the antenna should be avoided as it can affect the antenna's performance. Proceed with the following steps to perform the calibration. - Step 1. Enter Setup mode. - Step 2. Press the Idle Mode button to release the elevation and cross-level motor brakes while the antenna is in Setup mode. - Step 3. Check whether or not the bubble is located at the center of the button level. If not, move it to the center (Refer to the previous instruction of Tilt Sensor Bias adjustment). - Step 4. Press the Bias Check button to calibrate the rate sensor. A blue circle will be displayed next to the Bias Check button if the calibration is completed. A red circle will be displayed if calibration failed. A green circle will be displayed during the calibration process.
③	Conical Range	the relative force of the motors controlling azimuth and elevation. Set the conical range while the antenna is in tracking mode.
④	EL Adjust	the elevation adjustment is to offset the angle difference between the mechanical elevation angle and actual elevation angle. If this value is not properly adjusted, the antenna may take longer time for satellite search or tracking.
⑤	Blockage	displays current blockage zones by azimuth and elevation sectors. Up to 5 blockage zones can be programmed. A blue shading area in the Antenna UI view at the right will be displayed once the blockage zone is created.
⑥	Search Parameter	- Wait time: sets the time-out for automatic initiation of a search after the signal level drops below the pre-defined threshold value. - Search Step: sets increment step size. - Type 1 & Type 3 (Search 1 & 3) Range: this parameter may not be available dependent on model (ex. i-series). Sets Search 1 & 3 search range. Search 3 is conducted in a two-axis pattern consisting of alternate movements in azimuth and elevation as it forms an expanding square. - Type 2 (Search 2) Range: is reserved for future use.
⑦	Threshold Setting	set options below to each band in use. - DVB Detect Level: displays and sets signal detection threshold level when DVB tracking mode is in use. - DVB Tracking Level: displays and sets signal tracking threshold level when DVB tracking mode is in use. - NBD Detect Level: displays and sets signal detection threshold level when NBD tracking mode is in use. - NBD Tracking Level: displays and sets signal tracking threshold level when NBD tracking mode is in use. - TX Enable Threshold: displays and sets TX enable threshold.

Satellite View

This view provides information on the Satellite's Information, Common Tracking, Information, DVB and NBD Tracking Transponder, LNB Local Frequency, and the Satellite Library. Some settings can be varied by the model defendant on specific functions of the antennas. This view shows a graphic UI of the current satellite at which the antenna is pointing and the satellites that are located at a 180° arc on the horizon with reference to the current position.

NOTE

NOTE: Based on the satellite EIRP footprint and the size of the antenna, you may not be able to track all the satellites visible in 180° arc.

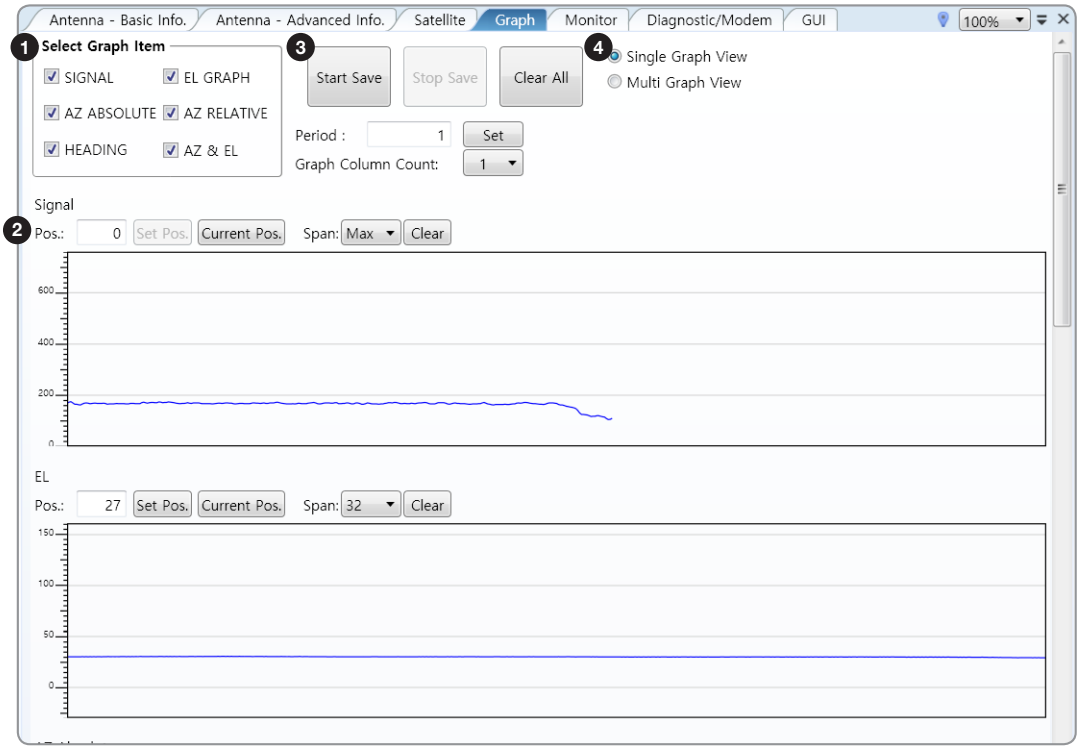


No.	Item	Description
①	Tracking Information of Current Satellite	displays the current satellite's name, longitude position, and satellite skew of the satellite in the library. - Eutel Sat: Select 'ON' when the antenna is tracking the Eutelsat satellite. With this option enabled, a defined skew angle for each Eutelsat satellite is automatically applied without allowing a manual modification to the skew offset value.
②	Tracking Common Information	displays the current LNB local oscillator frequency that is in use and the corresponding voltage supplied. Selects the tracking mode (DVB / NBD) to be used and sets polarization (Horizontal / Vertical) for the RX pol and the TX pol.
③	DVB/NBD	sets tracking transponder information for either DVB tracking mode (Verification Type, Frequency, Symbol rate, and NID) or NBD tracking mode (Frequency and bandwidth). **NOTE**: DVB and NBD parameter settings should only be changed by an authorized service technician. Improper setting of these parameters will render your system inoperable. Consult Intellian for changing antenna parameters.

No.	Item	Description
④	LNB Local Frequency	displays or sets LNB local frequency and its corresponding LNB voltage supplied. You may select pre-programmed LNB LO settings from the drop-down list. This procedure is same for both the Intellian Global VSAT PLL LNB and any other LNB.
⑤	Bottom Buttons	- Tracking Information of Library: Selecting this option enables "Add Satellite", "Edit Satellite" and "Delete Satellite" buttons as shown at bottom of window. - Add Satellite: adds the satellite information as defined in the current settings. - Edit Satellite: edits the satellite information of the selected satellite. - Delete Satellite: deletes the selected satellite from the library. - Get Data From ACU: pulls the satellite information from the ACU. - Load Satellite: uploads the satellite information to the ACU. - Get library from PC: opens the satellite library file (File format: *.ilf) from the supplied CD or from the external hard drive/PC. - Upload To ACU: uploads the satellite library to ACU. - Save To PC: saves the current library settings to PC. **NOTE**: It is required to click the "Save to PC" button after "Edit Satellite", "Add Satellite", or "Delete Satellite" button is clicked.

Graphic View

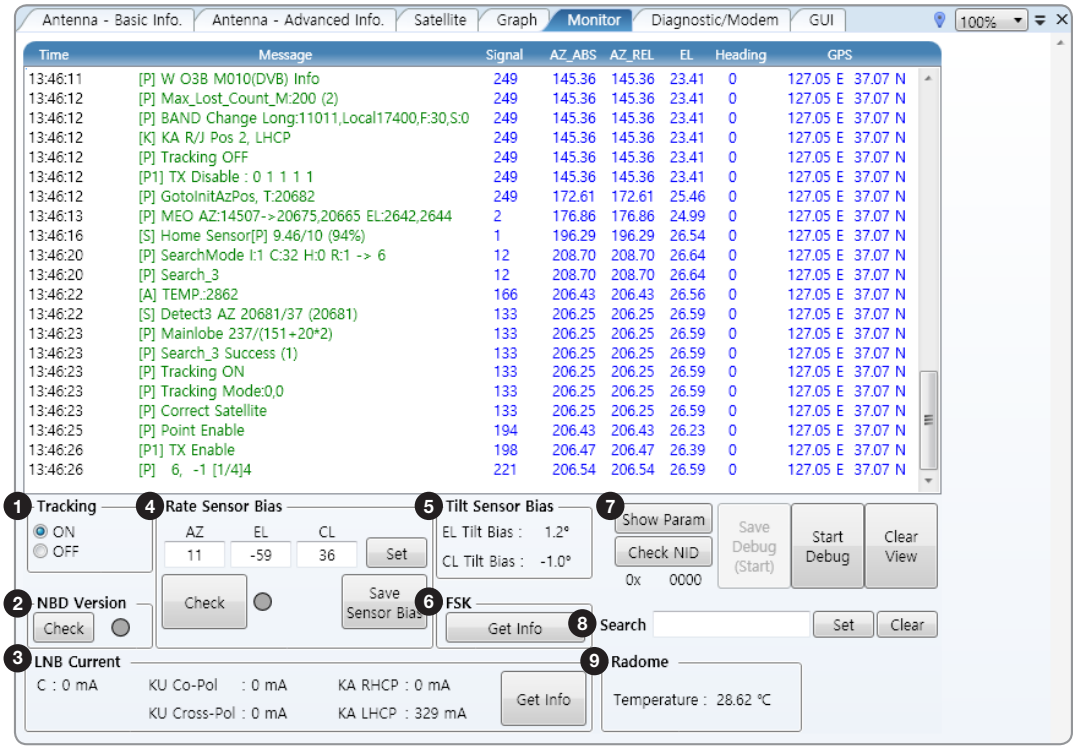
This view provides information on Signal, Elevation (EL), Absolute AZ (Azimuth), Relative AZ, Heading, AZ and EL in Single or Multi graph formats.



No.	Item	Description
①	Select Graph Item	shows the graphs of only the checked item(s) in a Single or Multi Graph View.
②	Setting Buttons	- Set Pos.: sets the current position as center value of each Graph Item. - Current Pos.: moves to the location according to values of each Graph Item. - Span: sets the Display Range(s) of the corresponding Graph Item.
③	Setting Buttons	- Start/Stop Save: the chosen item is saved in the data log. The data log which stores the information displayed in the graphs can be later used for a service technician to find out a cause of any possible problem with the antenna. - Clear All: clears everything drawn on the Graph View window. - Period: displays and sets the signal sampling rate. - Graph Column Count: makes all Graph Views show in either a one or two-column format.
④	Single/Multi Graph View	- Single Graph View: supports multiple Graph Items in one large Graph View. / shows Graph Views per each single Graph Item selected in 'Select Graph Item'. - Multi Graph View: supports the Graph Item(s) chosen in each Graph View. / shows one large integrated Graph View of multiple Graph Items selected in 'Select Graph Item'.

Monitor

This view provides a UI which can monitor all data that has been received from the ACU.

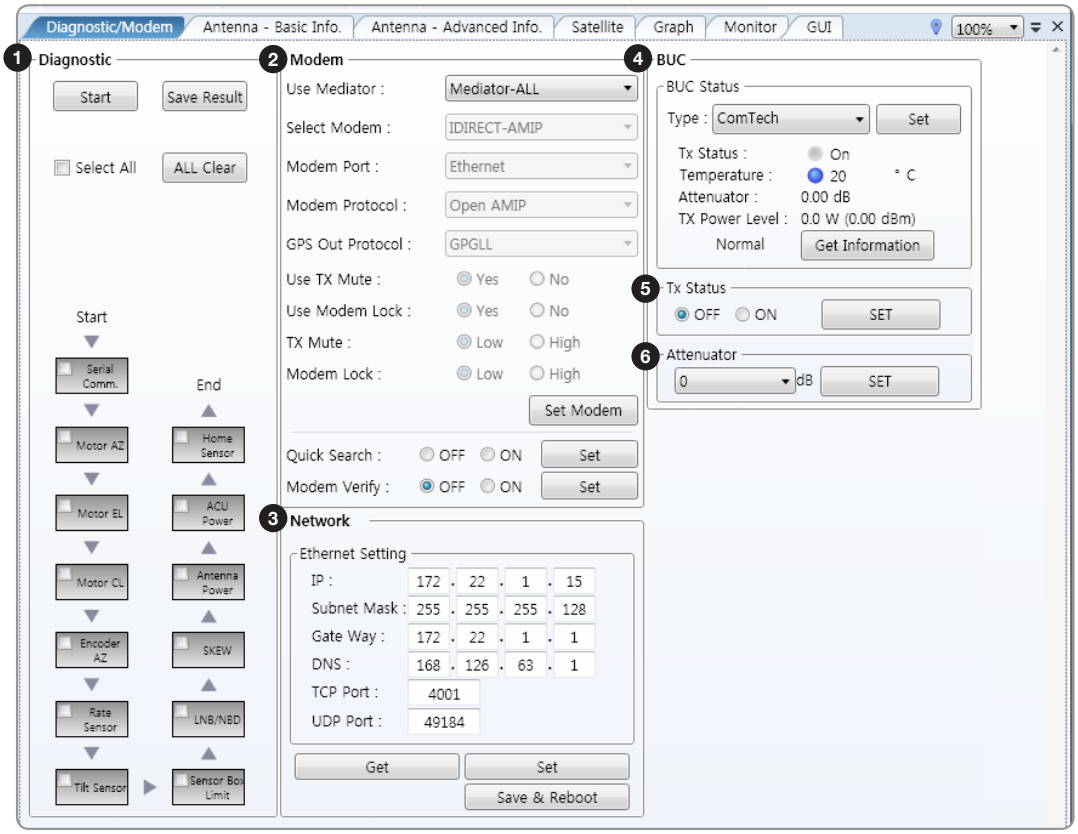


No.	Item	Description
①	Tracking	turns on or off the dish scan function. If the dish scan function is disabled, the antenna will stop adjusting the antenna pointing angle in order to optimize the receive signal level.
②	NBD Version	displays NBD current version by clicking the Check button.
③	LNB Current	displays the current voltage of the active LNB by clicking Get Info button.
④	Rate Sensor Bias	is used to calibrate the DC voltage output from the three rate sensors (azimuth, elevation, and cross-level). These are used to sense antenna motion that corresponds to the ship's motion (roll, pitch, and yaw) for stabilizing the pedestal. You can find the same function in Antenna-Advanced View Tab.
⑤	Tilt Sensor Bias	displays the EL and CL Tilt Bias between the antenna and the sensor.
⑥	FSK	check the current FSK version and the signal level and verify the signal level through the result value. (Good, Bad, Worst, N/A)

No.	Item	Description
⑦	Setting Buttons	- Show Param: shows the current antenna parameters. - Check NID: verifies the NID (network ID) of the current tracking transponder. Press the NID button to obtain the NID only if the antenna is locked onto the desired satellite. - Save Debug (Start): saves the debug messages and the log messages of the antenna simultaneously into a *.txt file once pressed. - Save Debug (Stop): stops saving the debug messages and the log messages of the antenna once pressed. - Start Debug: starts the debug log of the antenna. The debug message will be displayed once the debug button is pressed. - Stop Debug: stops debug logging of the antenna. - Clear View: clears the debug message or log data in monitoring window.
⑧	Search	searches for a specific word in the monitor information list.
⑨	Radome	displays the temperature of the radome every 3 minutes.

Diagnostic/Modem

This view provides Antenna Diagnostic Testing and also provides functions to set up the interface between the ACU and the Intelligent Mediator or the satellite modem.



No.	Item	Description
①	Diagnostic	select to run a full diagnostic test or single diagnostic test. "Green" indicator is displayed for the test under progress. "Blue" indicates the test result as Pass while "Red" indicates the result as Fail. "Yellow" indicates the test has been skipped. - Serial Comm.: tests the data communication between the antenna and the ACU. - Motor AZ: tests the azimuth motor. - Motor EL: tests the elevation motor. - Motor CL: tests the cross-level motor. - Encoder AZ: tests the azimuth encoder. - Rate sensor: tests the rate sensor. - Tilt Sensor: tests the tilt sensor. - Home sensor: tests the home sensor. - ACU power: tests the ACU power to see whether or not it is within the nominal operating range. - Antenna power: tests the antenna power to see whether or not it is within the nominal operating range. - Skew: tests the LNB skew motor. - LNB/ NBD: tests the LNB and NBD(NarrowBand Detection). - Sensor Box Limit: tests the sensor box motor.

No.	Item	Description
②	Modem	set interface between the ACU and the Intelligent Mediator or the satellite modem. **NOTE**: Before setting this function, make sure connection of the RJ45 cable from the Ethernet connector on the ACU to the modem or connect a 9 pin serial cable from the RS232/422 connector on the ACU to the modem. - Use Mediator: enables the use of the Intelligent Mediator. Use Mediator must be set to "NO" if there is no MEDIATOR connected to the ACU. Improper setting of this parameter will cause your ACU's modem interface to not work correctly. - Select Modem: selects your modem type for loading pre-configuration settings. If the ABS (auto beam switching) function is in use, select either IDIRECT-AMIP or COMTECH-ROSS depending on which type of modem is used. - Modem Port: select the proper data communications port (RS232/ 422/ Ethernet) to interface with the modem. - Modem Protocol: selects a proper communications protocol on the ACU to interface with the modem (I/O Console/ Open AMIP/ Serial GPS/ ROSS/ VCAP/ ELEKTRIKOM AMIP/ GILAT-SE-II). - GPS Out Protocol: selects GPS Out Sentence type (GPGLL/ GPGGA/ Simple GPGGA). - Use TX Mute: selects whether or not to use the "TX Mute" function from the satellite modem. A transmit inhibit output from the ACU will disable/ mute the modem transmit via a voltage change whenever the antenna is blocked, searching, or pointed 0.5 degrees off from the peak satellite position. - Use Modem Lock: selects whether or not to use external lock signal from the modem. "Use Modem Lock" will only be activated when the modem protocol is set to I/O Console. - TX Mute: TX Mute is a transmit inhibit output from the ACU to disable /mute the modem transmit through a 5 V (HIGH) or 0 V (LOW) current whenever the antenna is blocked, searching, or pointed 0.5 degrees off from peak satellite position. TX Mute will only be activated when modem protocol is set to I/O console. - Modem Lock: is the modem lock output from the modem. It provides a logic input through a 5V (HIGH) or 0 V (LOW) current to the ACU to identify when the system is on the correct satellite. "Modem Lock" will only be activated when modem protocol is set to I/O Console. - Quick Search: When a Quick Search set to ON, the antenna go to tracking mode quickly. (When the satellite signal is enough to higher than threshold level, the antenna go to tracking mode immediately). If a Quick Search set to OFF, the antenna compare the full signal pattern during the search3, then go to tracking mode. So, you can see that the antenna is moving back a little when it goes to tracking mode. - Modem Verify: When a Modem Verify set to ON, the antenna go to tracking mode only in case of Modem Lock On. The modem dependency is increased. If it is OFF, the antenna can go to tracking mode in case of Modem Lock On or Off.

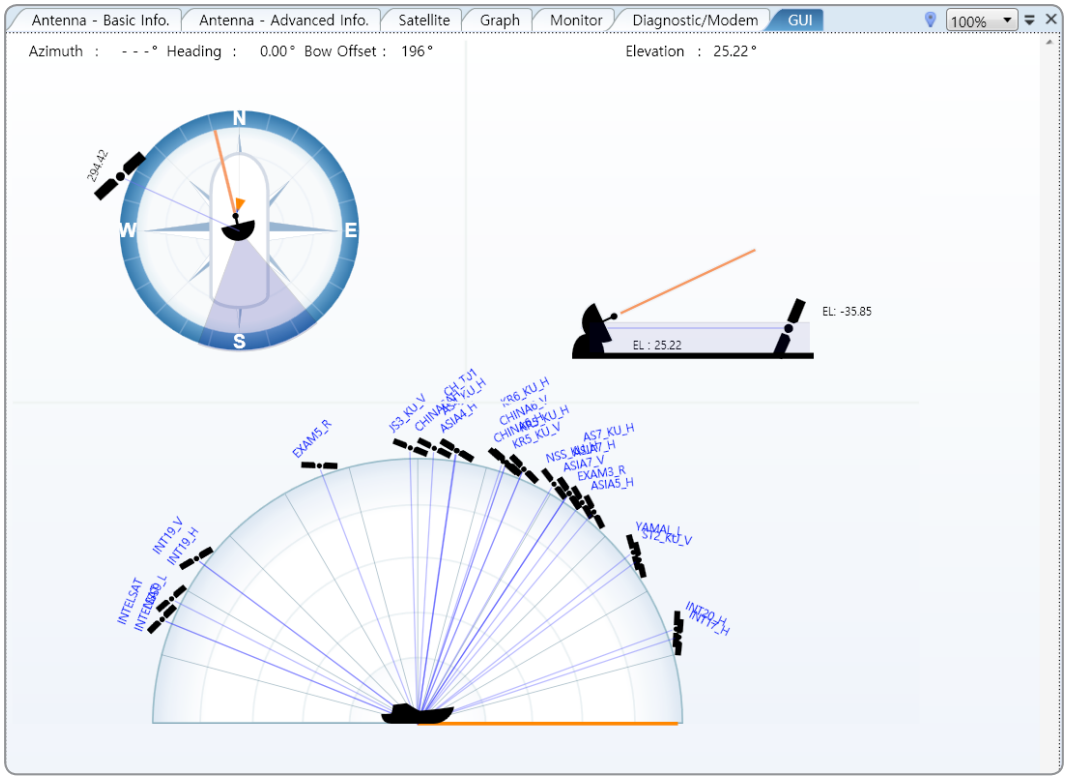
No.	Item	Description
③	Network	displays the ACU's Internal IP addresses and ports. To modify the ACU's Internal IP addresses and ports, press the "Set" button. When changes are complete, press "Save & Reboot" button and wait for several seconds. Then press "Get" button to validate the changes. - IP: Factory default (Primary:192.168.0.223)/(Secondary:10.10.1.1). - Subnet Mask: Factory default (255.255.255.0). - Gate way: Factory default (192.168.1.1). - DNS: Current default DNS Address is assigned to. - TCP Port: TCP port number for modem protocols using TCP as transport. - UDP Port: UDP port number for modem protocols using UDP as transport.
④	BUC	sets the BUC options. - BUC Status: Displays BUC information(BUC Type, BUC S/W, Tx Status, Temperature, Checksum, Attenuator and Tx Power Level).
⑤	Tx Status	selects TX Status(ON or OFF).
⑥	Attenuator	sets attenuation value.

GUI

This view shows a graphical representation of the current antenna position which allows you to easily identify whether or not the antenna is aligned properly to the target satellite or is in a block zone. In addition, this view shows the current satellite that the antenna is pointed towards and the satellites that are located in the 180° arc on the horizon, according to the current position.

NOTE

NOTE: Based on the satellite EIRP footprint and the size of the antenna, you may not be able to track all the satellites visible in 180° arc.

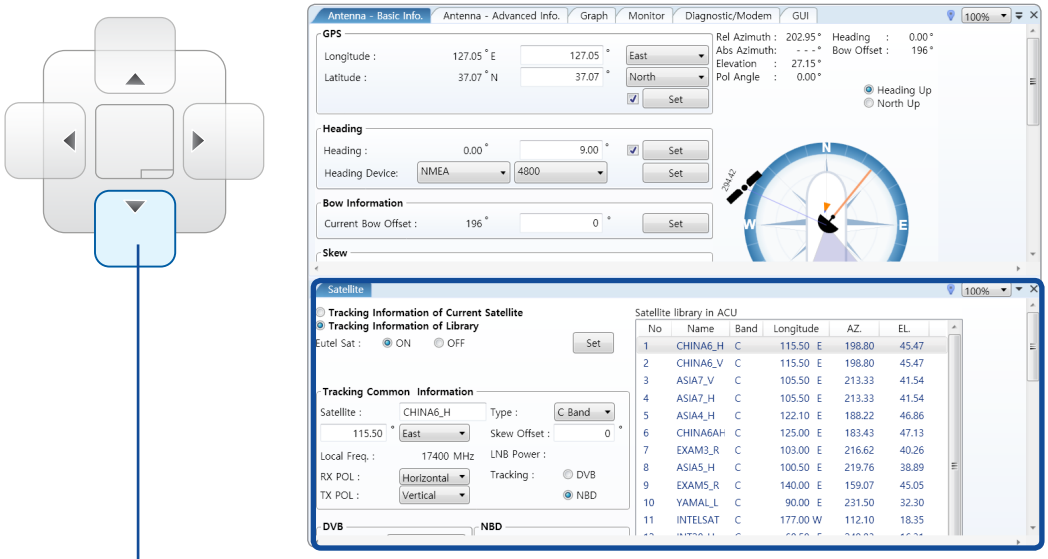


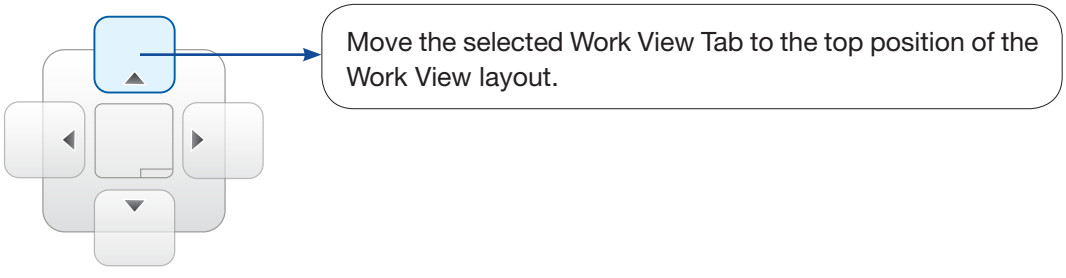
Work View Functions

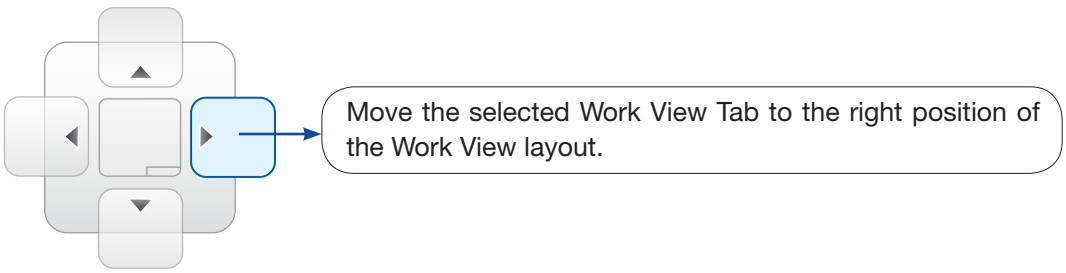
The seven Work View Tabs displayed in the Work View can be arranged in customized layouts.

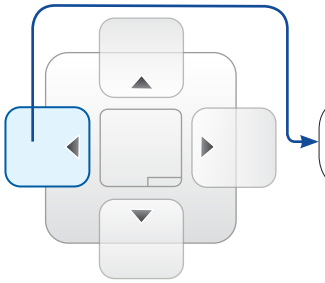
Layout Formatting

Each of the Work View Tab can be separated from the rest Tabs. Click and hold the left mouse button on the Work View Tab's header and then drag the desired Tab out. When a Work View Tab is separated from the rest of your Work View Tabs, again click and hold the left mouse button on the Work View Tab's header to display a cross-shaped Navigator icon. While holding the mouse button, bring the selected Work View Tab closer to the Navigator icon and release the mouse button at your desired position (top, left, right or bottom arrow). This time, the selected Tab will be moved to the desired position.

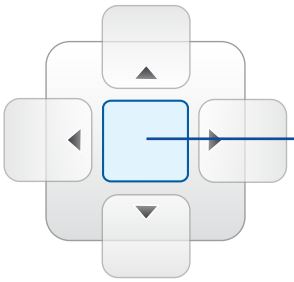






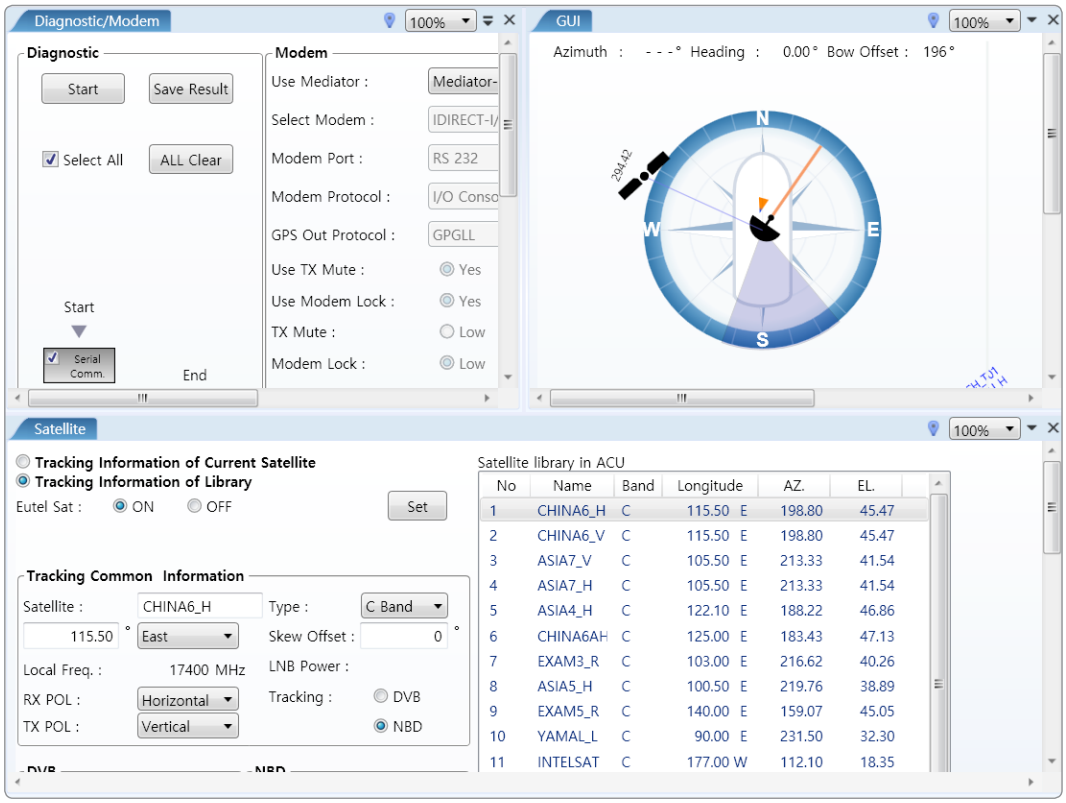


Move the selected Work View Tab to the left position of the Work View layout.



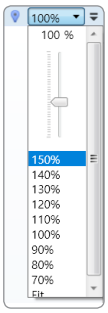
Move the selected Work View Tab to the center position of the Work View layout.

You can also drag multiple Work View Tabs into a customized layout in the same manner. Click and hold left mouse button on each Work View Tab's header and drag it onto the desired arrow on the Navigator icon. Then each Work View Tab can be placed in the desired positions as shown in the figure below.



The Navigator will appear in each area your mouse pointer is located. To return to the default layout, select the Default Layout under View>Layout Manager in the toolbar menu.

- **Horizontal or Vertical Tab Group**
  The Work View Tabs can be also aligned horizontally or vertically. Without dragging them out, right-click the mouse button on the desired Tab header and select 'New Horizontal Tab Group' or 'New Vertical Tab Group' option. Selecting 'New Horizontal Tab Group' will separate a selected Tab from the rest of other Tabs then arrange it in a horizontal format. Likewise, selecting 'New Vertical Tab Group' will separate a selected Tab from the rest of other Tabs then arrange it in a vertical format.
- **Closing the Work View Tab**
  To close the Work View Tab, right-click the mouse button on the desired Tab header and select 'Close' option in the drop-down list. To close all Work View Tabs except for the selected Tab, select 'Close All But This' option in the drop-down list.
- **Zoom Tool**
  Using the Zoom tool, you can easily select the magnification you want by using Zoom In and Zoom Out bar, and Fit in Work View button.

	**Fit Work View Button**: fits the current view to the Work View window size. The button toggles between the fit view and the previous view.
	**Zoom In and Zoom Out Bar**: zooms in and out to expand and reduce the View to the desired size. (The zoom changes in 10% increments.)
	**View Switch Button**: displays a list of the current views in a list. Choosing one of these views will display the selected view in the Work View window.
	**View Name Button**: displays the current Work View name.
	**Close View Button**: closes the current view.

Aptus Web for the ACU

Introduction

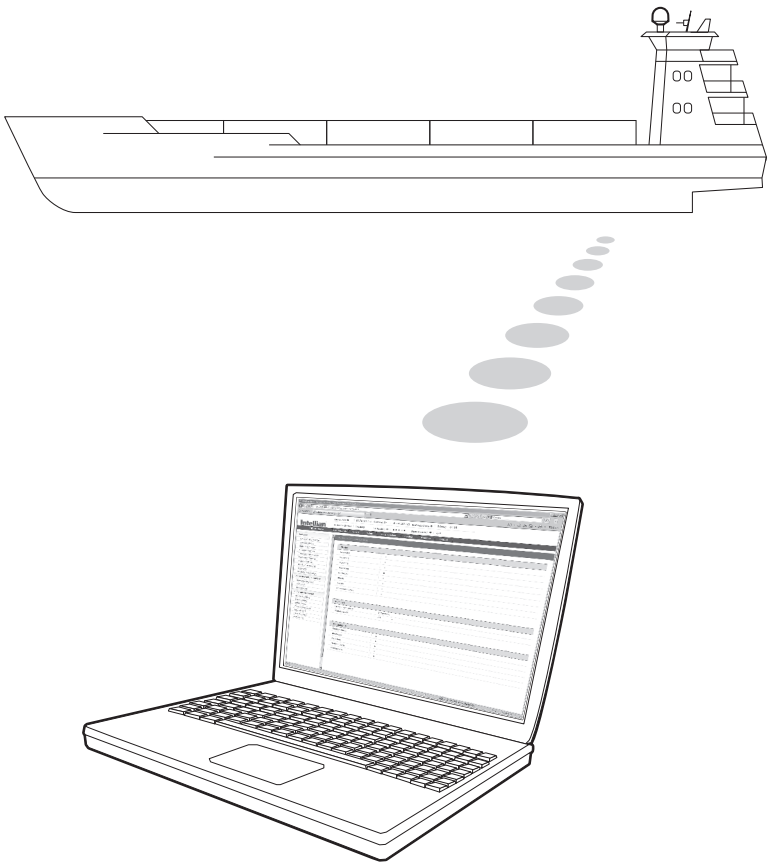
With embedded Aptus Web software, the v-Series can be monitored, controlled, and diagnosed remotely from anywhere, anytime through the TCP/IP protocol. This not only can save time but also save the cost generated from the hundreds of routine maintenance activities such as operating firmware upgrades, tracking parameters resets, and system diagnostic.

How to access Aptus Web for ACU

1. Connect an Ethernet cable from the Management LAN port on the front of the ACU to the LAN port of PC. This method is most recommended.
2. Enter the ACU's IP address (**192.168.2.1**) into your web browser's address bar to login into the ACU's internal HTML page, if this system has not been changed from the ACU's factory default. You'll be able to access this page within about 30 sec after the Mediator power is on.

NOTE

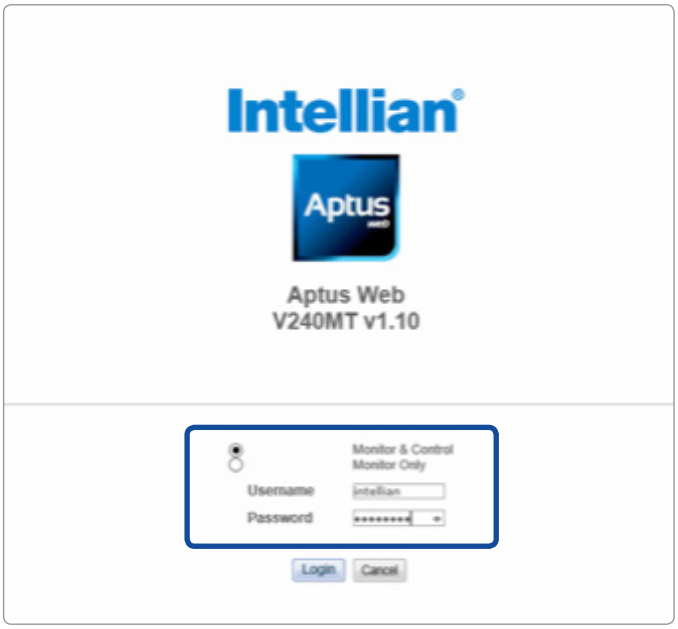
NOTE: Aptus Web can be displayed on the Internet Explorer 8 or later and is also compatible with Firefox and Chrome web browsers.



Main Page

Page Login

1. Choose either to Control & Monitor the ACU (Control & Monitoring) or Only Monitor the ACU (Monitoring Only).
2. Log into the ACU by typing in User Name and Password information. If this system has not been changed from the factory default:
   - **User Name: intellian**
   - **Password: 12345678**



WARNING

WARNING: The Control & Monitoring Mode will be switched to the Monitoring Only Mode in the following cases;

- If PC Software (Aptus) is connected using TCP/IP Communication while Aptus Web Control is in use.
- If Control & Monitoring Mode is accessed while PC Software is running via TCP/IP Communication. In this case, the web page will display a pop-up message asking if you want to disconnect the PC Software network connection. If you select 'No', the Control & Monitoring Mode will be switched to the Monitoring Only Mode.

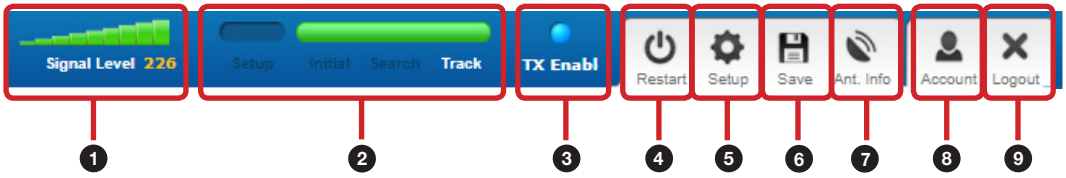
NOTE

NOTE

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

Top Menus

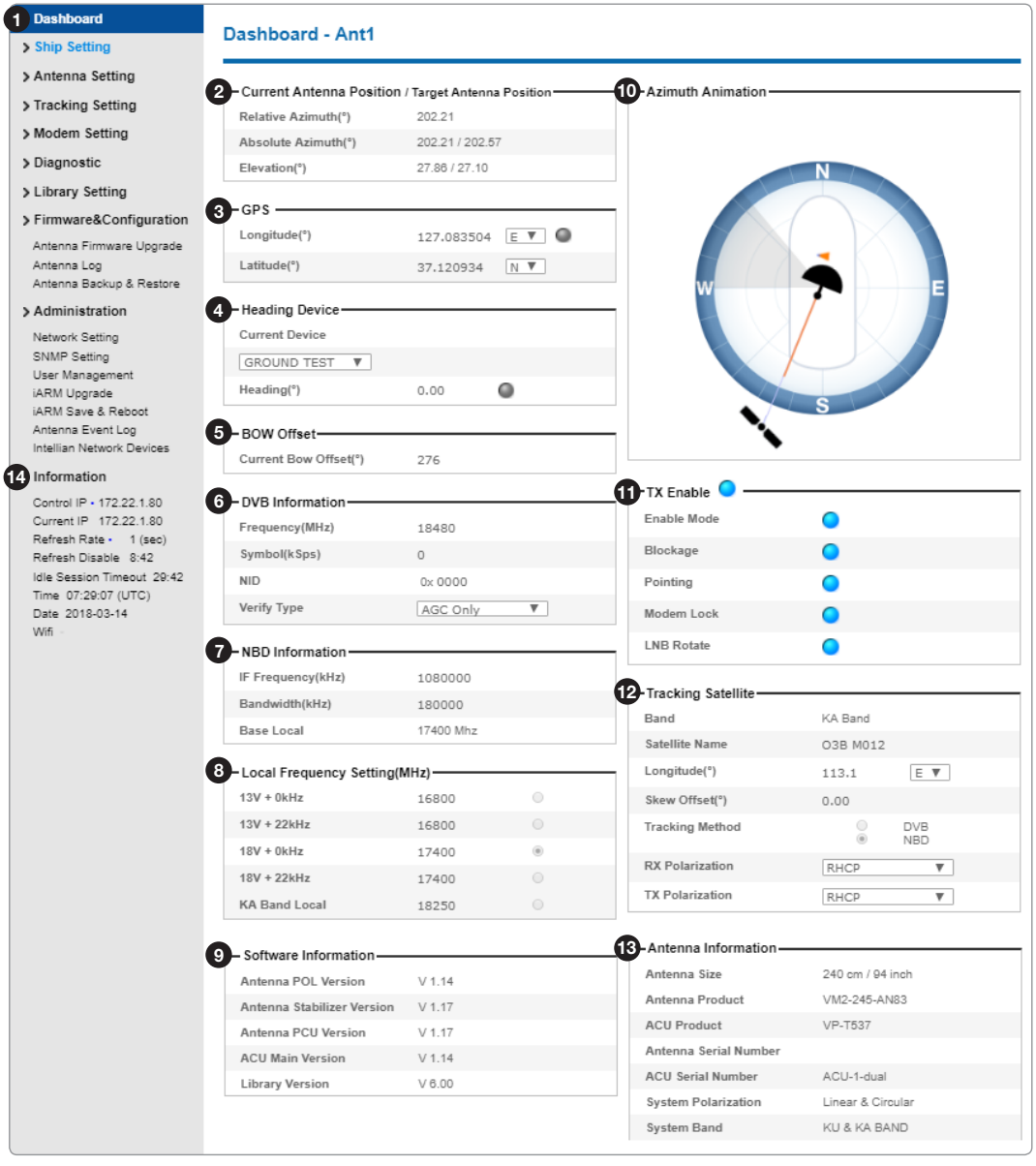
Once you log in, the following information and menus are displayed.



No.	Item	Description
①	Signal Level	Display current signal level.
②	Antenna status	- Setup: Displays whether or not the antenna is in SETUP mode. The indicator shows "Blue" in the SETUP mode. - Initial: Antenna or ACU is initialized. - Search: Antenna is searching a target satellite. - Track: Antenna is tracking the target satellite.
③	TX Enable/ TX Disable	Displays whether or not the antenna is able to transmit the data
④	Restart	Restart the antenna system.
⑤	Setup	Enter SETUP mode.
⑥	Save	Save current satellite settings. Bow offset will be adjusted and saved automatically.
⑦	Ant. Info	Obtain current antenna information.
⑧	Account	Shortcut to User Management menu. Change login ID and Password.
⑨	Logout	Logout the ACU's web page.

Dashboard & Information

On the left side of the page, the Dashboard and Information menus are displayed as below to provide quick monitoring of the antenna status and settings. Other menus are displayed only in the Control & Monitoring mode and their functions will be described in the next sections.



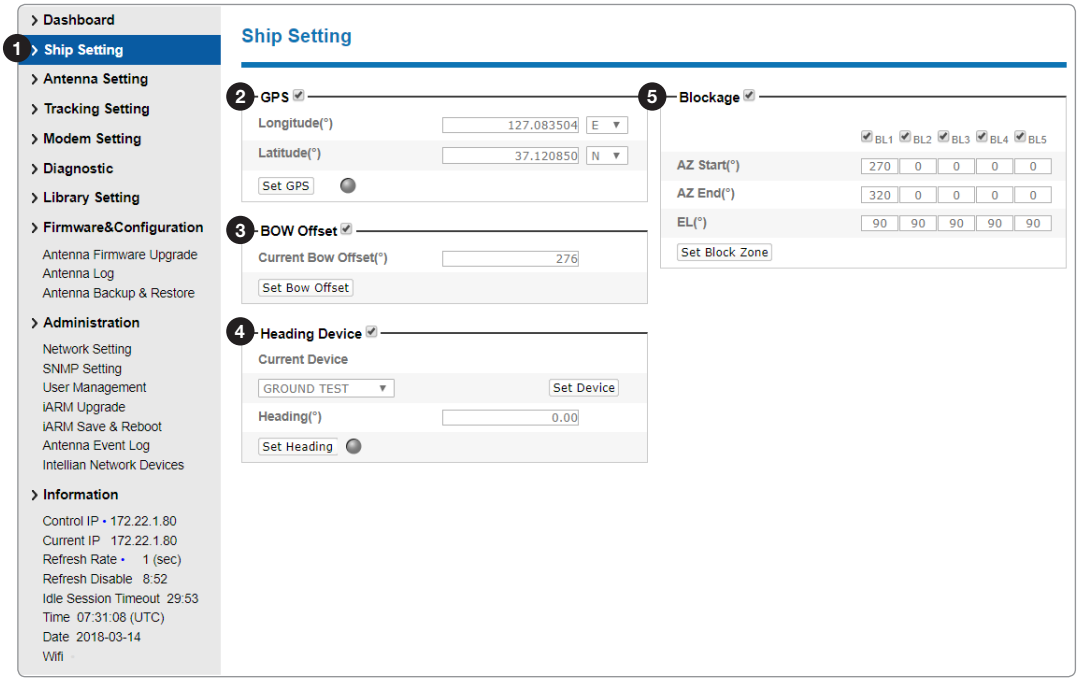
No.	Item	Description
①	Dashboard	Displays current antenna status to be quickly monitored.
②	Current Antenna Position / Target Antenna Position	Displays current antenna position. - Relative Azimuth: displays antenna relative AZ angle. - Absolute Azimuth: displays antenna absolute AZ angle. - Elevation: displays antenna elevation angle.

No.	Item	Description
③	GPS	Displays current GPS information. - Longitude (East / West) - Latitude (North / South)
④	Heading Device	Displays current Heading Device: NONE, NMEA, NMEA 2000, GROUND Test If the ship's gyrocompass input is other than NMEA separate purchase of NMEA Converter is required. - Heading: displays ship's heading information.
⑤	BOW Offset	Displays current bow offset
⑥	DVB Information	Displays DVB tracking mode's current tracking information. - Frequency: displays tracking frequency. - Symbol rate: displays symbol rate. - NID: displays network ID. - Verify type: displays verification type (AGC, DVB, DVB Decode, DSS Decode)
⑦	NBD Information	Displays NBD tracking mode's current tracking information. - IF Frequency: displays tracking IF frequency. - Bandwidth: displays detection bandwidth. - Base Local: displays base local frequency.
⑧	Local Frequency Setting (MHz)	Displays current LNB's local frequency and voltage
⑨	Software Information	Displays current Antenna and ACU firmware versions and Satellite Library version installed in the system. - Antenna POL Version: displays the antenna POL version. - Antenna Stabilizer Version: displays the antenna stabilizer version. - Antenna PCU Version: displays the antenna PCU version. - ACU Main Version: displays the ACU Main version. - Library Version: displays the Library version.
⑩	Azimuth Animation	Shows a graphical representation of the current antenna position to identify whether or not the antenna is aligned properly to the target satellite or is in a block zone.
⑪	TX Enable	Displays whether or not the antenna is able to transmit the data. The TX function will be enabled (shows BLUE dot) only if all of the factors listed below show "BLUE" dot. (Exception: If "Use TX Mute" is set to "NO", the TX function will be enabled regardless of which factor listed below shows a"gray" dot or "red" dot.) The function below will be enabled with a BLUE dot displayed as listed below: - Enable Mode: the antenna is not in SETUP mode. - Blockage: the antenna is not facing the predefined block zone(s). - Pointing: the antenna is pointing to the target satellite. - Modem Lock: the satellite modem is sending a logic input to the ACU to identify when the antenna tracks on the correct satellite. - LNB Rotate: the LNB is not rotating.

No.	Item	Description
⑫	Tracking Satellite	Displays current tracking mode. - Satellite: displays satellite name. - Longitude: displays satellite orbit position. - Skew Offset: displays Skew offset. - Tracking Method: displays current tracking mode (DVB/ NBD). - RX Polarization: displays current RX polarization. - TX Polarization displays current TX polarization.
⑬	Antenna Information	Displays the antenna product information. - Antenna Size: displays the antenna size. - Antenna Product: displays the antenna product name. - ACU Product: displays the ACU product name. - Antenna Serial Number: displays the antenna serial number. - ACU Serial Number: displays the ACU serial number. - System Polarization: displays the system polarization. - System Band: displays the system band.
⑭	Information	- Control IP: Displays current IP that controls the ACU. - Current IP: Displays current IP address. - Refresh Rate: Displays screen refresh rate (default: 1 sec.) - Refresh Disable: Displays time out. The screen will not refresh once the time-out shows 0:00. (Exception: If the Refresh Disable Time is set to "OFF" in the Network Setting page, then the clock will show "--:--" and the system will keep monitoring all activities regardless of the timeout.) - Time: Displays UTC time. - Date: Displays UTC date. - Wifi: Displays Wifi on/off switch.

Antenna Settings

Ship Setting

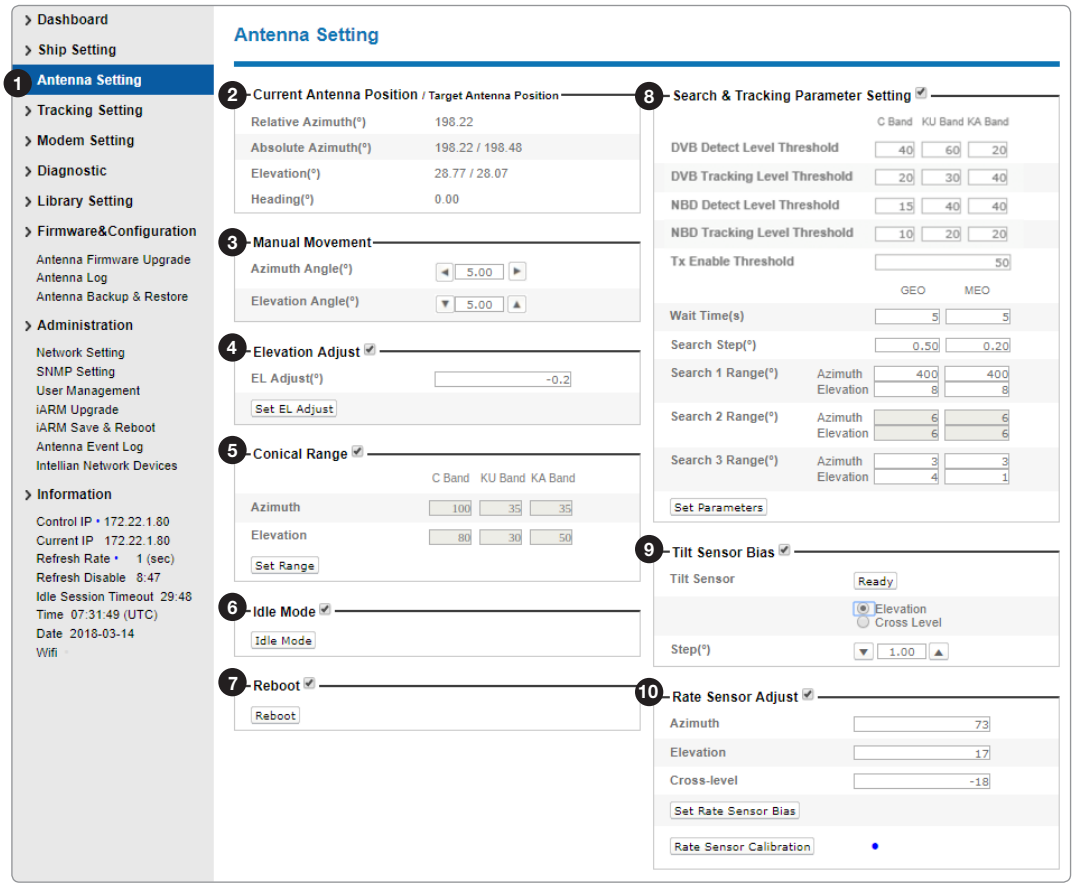


No.	Item	Description
①	Ship Setting	Set the ship information and block zone.
②	GPS	Set GPS information. - Longitude (East/West) - Latitude (North/South)
③	Bow Offset	Set Bow Offset if needed.
④	Heading Device	Set ship's heading device (NONE, NMEA, NMEA2000, GROUND Test) and ship's heading information.
⑤	Blockage	Set up to five antenna block zones by azimuth and elevation sectors. The AZ. START is where the relative azimuth starts and AZ. END is where the relative azimuth ends (Range: 0 - 360°). EL is where the elevation blockage starts (Range 0 - 90°).

NOTE

NOTE: Tick the checkbox before modifying the settings. After configuration, click 'Set ...' button to submit the settings.

Antenna Setting



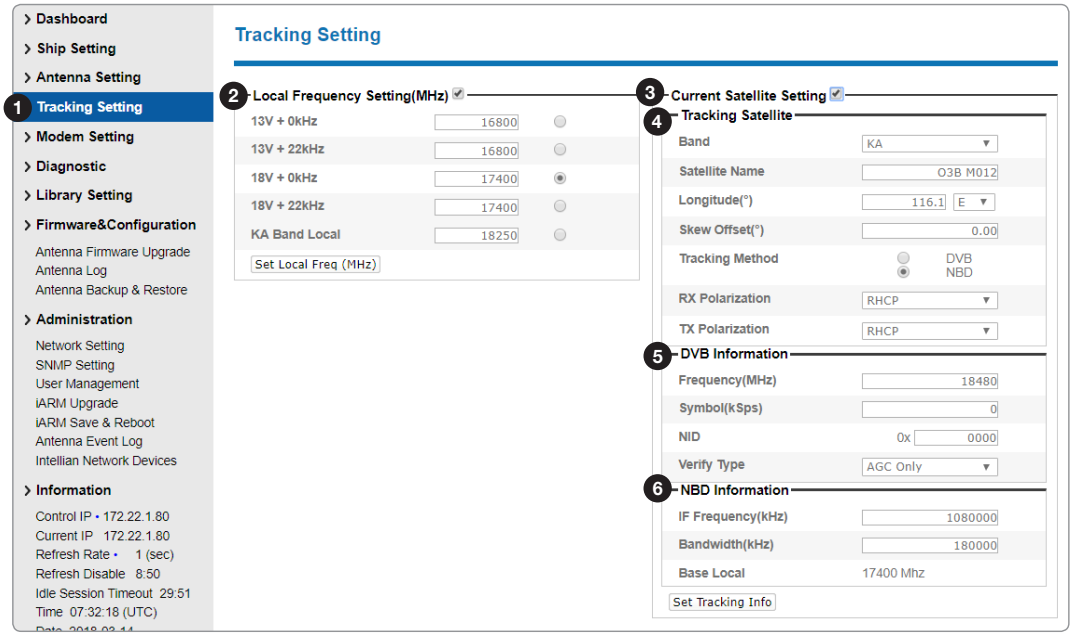
No.	Item	Description
①	Antenna Setting	Set current antenna position and Search and Tracking parameters. These parameters should only be changed by an authorized service technician. Improper setting of these parameters will render your system inoperable.
②	Current Antenna Position/ Target Antenna Position	Display current antenna position. - Relative Azimuth: display antenna relative AZ angle. - Absolute Azimuth: display antenna absolute AZ angle. - Elevation: display antenna elevation angle. - Heading: display ship's heading information.
③	Manual Movement	Move antenna azimuth and elevation angles.
④	Elevation Adjust	Adjust the elevation to offset the angle difference between the mechanical elevation angle and actual elevation angle.
⑤	Conical Range	The relative force of the motors controlling azimuth and elevation.

No.	Item	Description
⑥	Idle Mode	Release the elevation and cross-level motor brakes while the antenna is in SETUP mode. The antenna can be moved manually during the mode.
⑦	Reboot	Reboot the system.
⑧	Search & Tracking Parameter Setting	Set options below to each band in use. - DVB Detect and Tracking Level Threshold: display / set current detect level threshold and tracking level threshold when DVB tracking mode is chosen to be used. - NBD Detect and Tracking Level Threshold: display / set current detect level threshold and tracking level threshold when NBD tracking mode is chosen to be used. - TX Enable Threshold: displays/sets the enabled TX threshold. Set options below to each satellite(GEO/MEO) in use. - Wait time: set the time-out for automatic initiation of a search after the signal level drops below the pre-defined threshold value. - Search Step: set increment step size. - Search 1 & 3 Range: set Search 1 & 3 search range. Search is conducted in a two-axis pattern consisting of alternate movements in azimuth and elevation as forming an expanding square. - Search 2 Range: is reserved for future use.
⑨	Tilt Sensor Bias	Adjust the two solid-state tilt sensors used to provide absolute cross-level tilt of the antenna and elevation feedback to eliminate long-term pointing drift (error). Tilt bias is required to be adjusted when the antenna control board or sensor box is replaced. Check to see whether or not the bubble is located at the center of the level vial.
⑩	Rate Sensor Adjust	Calibrate DC voltage output from the three rate sensors used to sense antenna motion in azimuth, elevation and cross-level axes. During the calibration process, the antenna should avoid any motion as it can affect the antenna's performance.


NOTE

NOTE: Tick the checkbox before modifying the settings. After configuration, click 'set...' button to submit the settings.

Tracking Setting

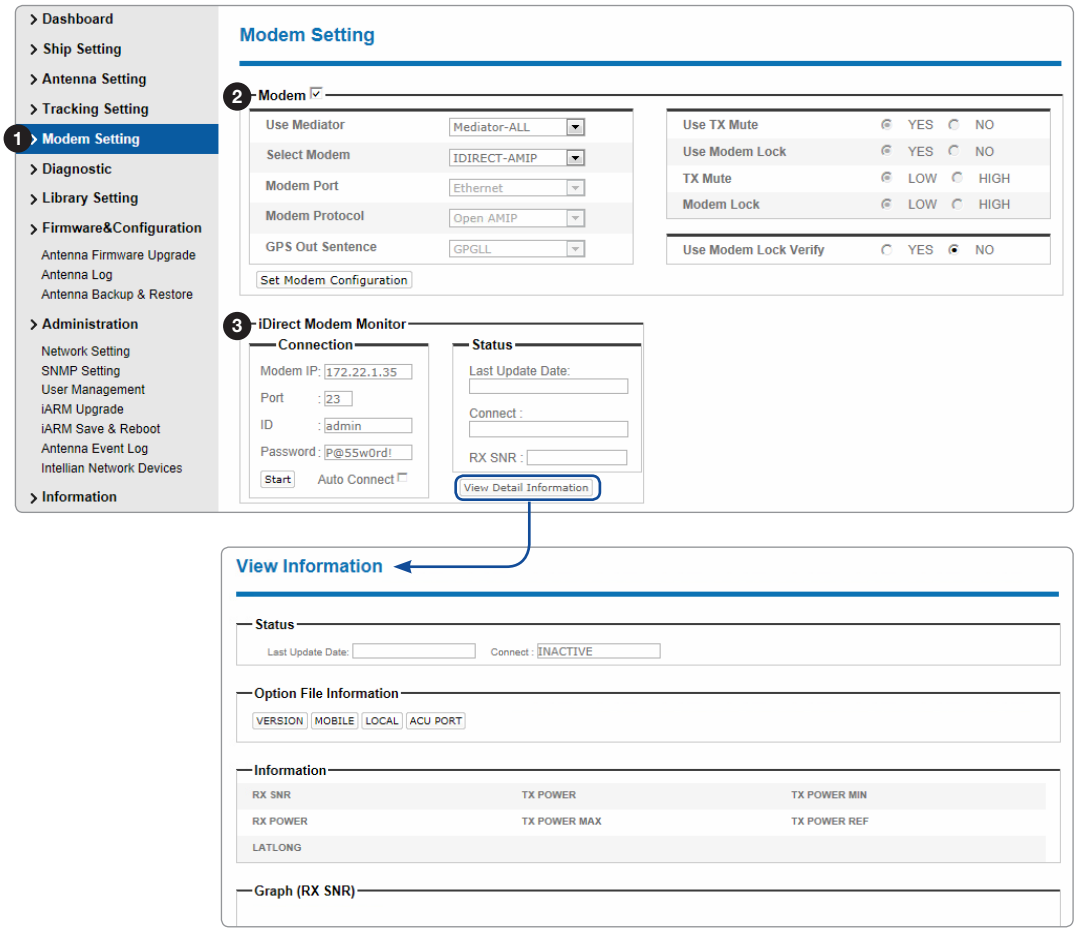


No.	Item	Description
①	Tracking Setting	Display or set current tracking mode and tracking frequency of the target satellite.
②	Local Frequency Setting(MHz)	Display and set LNB's local frequencies. Display current LNB local frequency and band which are in use and voltage.
③	Current Satellite Setting	Display and set current satellite setting.
④	Tracking Satellite	Display and set current tracking mode. - Band: display and set band (C-band, Ku-band and Ka-band) - Satellite: display and set satellite name. - Longitude: display and set satellite orbit position. - Skew Offset: display and set the skew offset. - Tracking Method: display and set current tracking mode (DVB/ NBD). - RX Polarization: display and set current RX polarization. - TX Polarization display and set current TX polarization.
⑤	DVB Information	Display and set DVB tracking mode's tracking information. - Frequency: display and set tracking frequency. - Symbol rate: display and set symbol rate. - NID: display and set network ID. - Verify type: display and set verification type (AGC, DVB, DVB Decode, DSS Decode)
⑥	NBD Information	Display and set NBD tracking mode's tracking information. - IF Frequency: display and set tracking IF frequency. - Bandwidth: display and set detection bandwidth. - Base Local: displays base local frequency.

NOTE

NOTE: Tick the checkbox before modifying the settings. After configuration, click 'set...' button to submit the settings.

Modem Setting



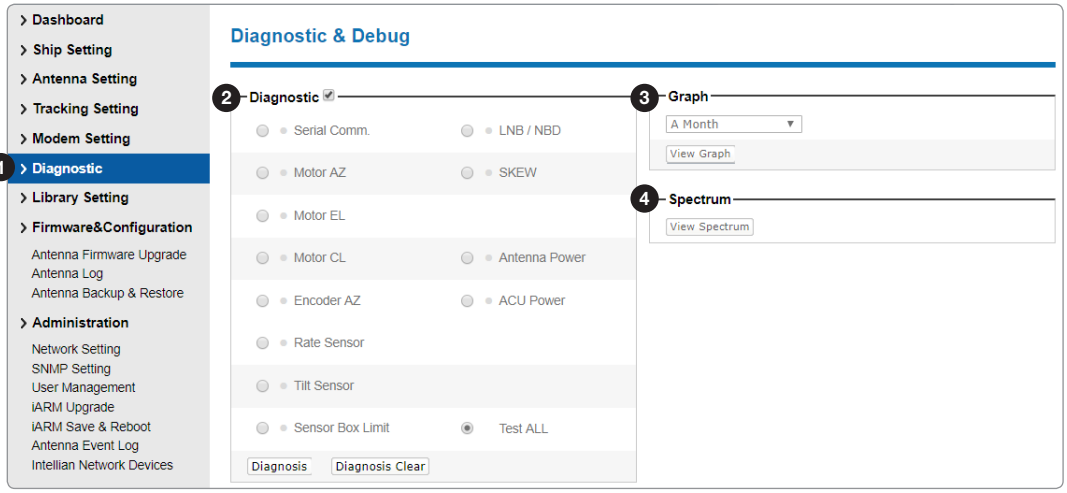
No.	Item	Description
①	Modem Setting	Set the modem interface.
②	Modem	- Use Mediator: enable the usage of Mediator if the antenna is connected to the Intelligent Mediator. Select a mediator type. (NO, Mediator-ANT, Mediator-Modem, Mediator-ALL) **NOTE**: When using multi-band mediator, select the Mediator-ALL type. - Select Modem: is to select a proper data communication port and protocol on the ACU to interface with the satellite modem. The settings related to the modem interface will be set automatically once the modem type is selected (USER SETTING, IPSTAR_SOTM, INMARSAT G5). However, if USER SETTING is selected, it is required to set the related settings separately. - Modem Port: is to select a proper data communication port on the ACU to interface with the satellite modem (RS232/RS422/ Ethernet). - Modem Protocol: is to select a proper communication protocol on the ACU to interface with the modem (I/O Console, OpenAMIP, Serial GPS, ROSS, VACP, ELEKTRIKOM AMIP, GILAT, SOTM, G5). - GPS Out Sentence: is to select the GPS out sentence type (GPGLL/GPGGA/Simple GPGGA). - USE TX Mute: is to select whether or not to use TX mute function from the satellite modem.

No.	Item	Description
②	Modem	- USE Modem Lock: is to select whether or not to use external lock signal from the satellite modem. - TX Mute: is a transmit inhibit output from the ACU to disable/ mute the modem transmit through a 5V (High) or 0V(LOW) current whenever the antenna is blocked, searching, or is 0.5° off from peak satellite position. - Modem Lock: is the modem lock output from the modem which provides a logic input through a 5V (High) or 0V(LOW) current to the ACU to identify when it is on the correct satellite. - Use Modem Lock Verify: Verify the target satellite using the modem lock signal. **NOTE**: TX Mute and Modem Lock items will only be activated when the modem protocol is set to I/O Console.
③	iDirect Modem Monitor (OpenAMIP Modem Only)	Displays iDirect Modem status and control connection. This menu appears only when IDIRECT-AMIP protocol is selected at Modem Setting page. - Connection: control modem connection. • Modem IP: iDirect modem IP. • Port: Connection Port number. • ID: Connection ID for telnet. • Password: Connection password for telnet. • Start(Stop): Connect to telnet or disconnect. • Auto Connect: Enabling Auto Connect and rebooting the ACU will save connection data and will auto connect once ACU is powered on next time. - Status: Displays iDirect modem status. • Last Update Date: Displays last updated data and time of the iDirect modem data. • Connect: Displays connection status (INACTIVE, CONNECTING, LOGGEDIN, Black data indicates being INACTIVE). • RX SNR: Displays RX SNR data. • View Detail Information: When clicking the button, the "View Information" window will appear. You can view detail information as below. ▪ Status: Displays last update date and connection status. ▪ Option File Information: Displays information about VERSION, MOBILE, LOCAL and ACU PORT. ▪ Information: Displays RX SNR, TX POWER, TX POWER MIN, RX POWER, TX POWER MAX, TX POWER REF and LATLONG. ▪ Graph (RX SNR): Displays RX SNR Graph.


NOTE

NOTE: Ensure to tick the checkbox before modifying the settings. Select 'Set Modem Configuration' to confirm the settings configured.

Diagnostic

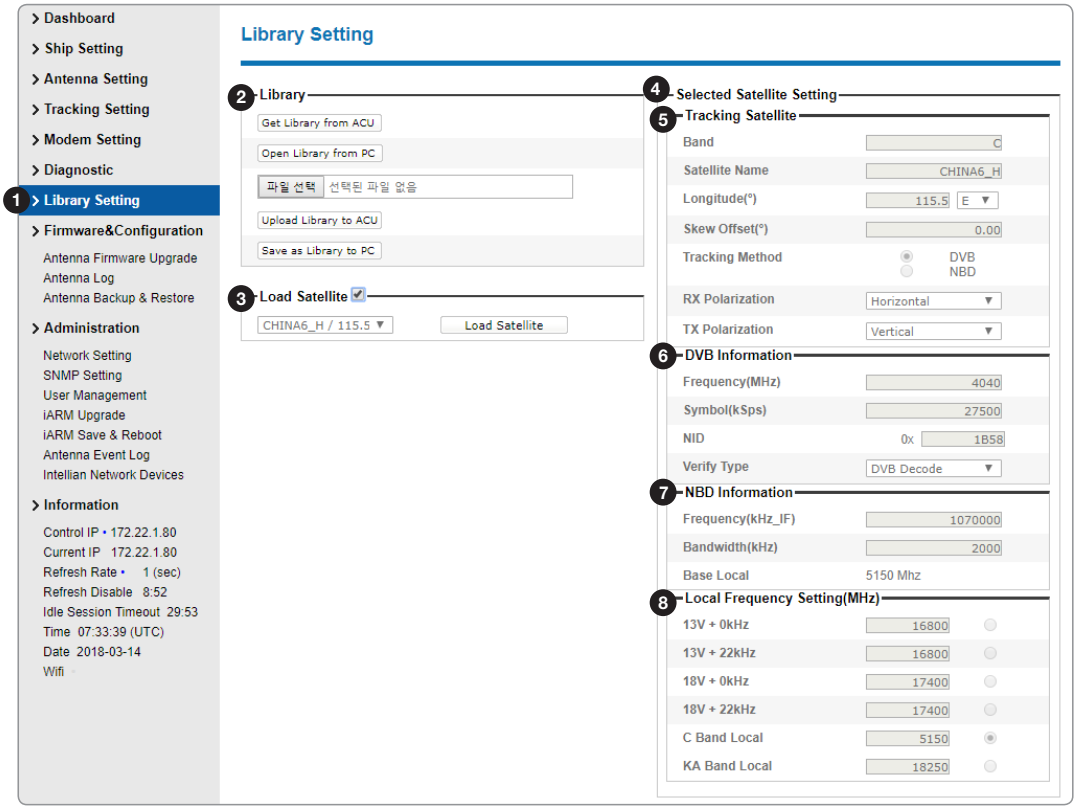


No.	Item	Description
①	Diagnostic	Execute antenna diagnostic test.
②	Diagnostic	Select to run a full diagnostic test or single diagnostic test. - Serial Comm.: test the data communication between the antenna and the ACU. - Motor AZ: test the azimuth motor. - Motor EL: test the elevation motor. - Motor CL: test the cross-level motor. - Encoder AZ: test the azimuth encoder. - Rate Senor: test the rate sensor. - Tilt Sensor: test the tilt sensor. - Sensor Box Limit: test the sensor box motor. - LNB/NBD: test the LNB. - SKEW: test the LNB pol motor. - Antenna Power: test the antenna power. - ACU Power: test the ACU power. - Test ALL: test all devices.
③	Graph	Select to view a graph of AZ Absolute, AZ Relative, EL and Heading data of the antenna. - A Month: display all data within a month - A Week: display all data within a week - A Day: display all data in a day - Real-time: display data in real-time. Press F5 button to refresh. - View Graph: select to view the data graph.
④	Spectrum	Select to view a current spectrum graph and to set the spectrum display options.

NOTE

NOTE: Click the checkbox before modifying the settings. Click Diagnosis button to execute the diagnostic test. To clear previous diagnosis result, click Diagnosis Clear button.

Library Setting

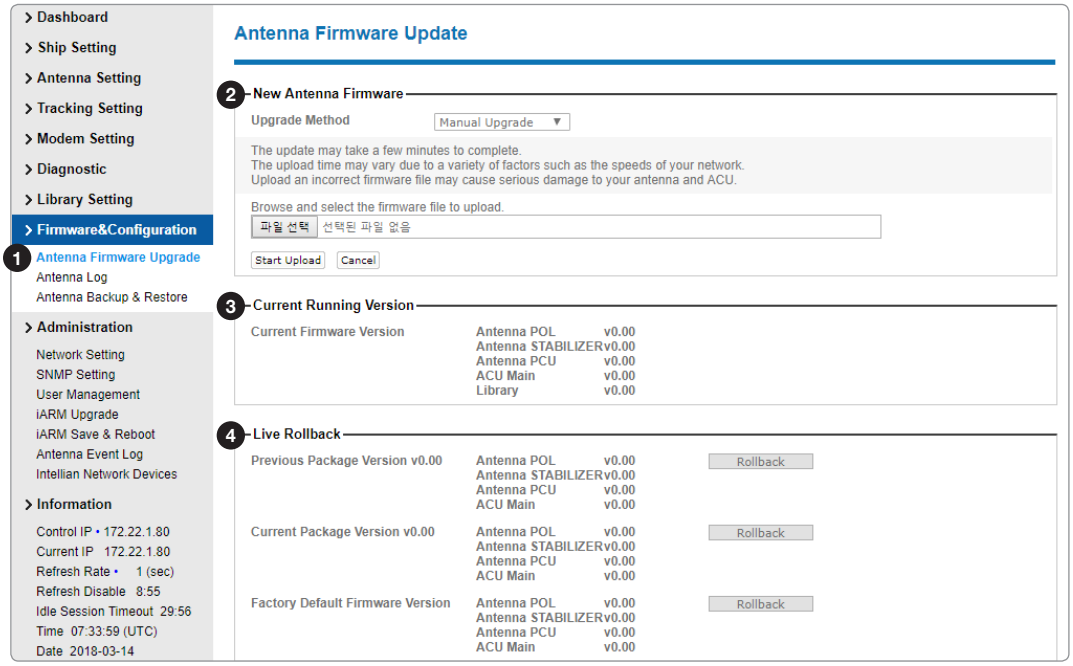


No.	Item	Description
①	Library Setting	Display and set the satellite library information.
②	Library	- Get Library from ACU: Obtain satellite information installed in the ACU. - Open Library from PC: open the satellite library file from the supplied Intellian CD or from the external hard drive/PC. (File format: *.ilf) - Upload Library to ACU: upload the satellite library file to ACU. - Save as Library to PC: save the current library setting to the PC.
③	Load Satellite	Select the satellite that you wish to track and press Load Satellite button to load the selected satellite.
④	Selected Satellite Setting	Displays selected satellite information.
⑤	Tracking Satellite	- Band: displays current band. - Satellite: displays satellite name. - Longitude: displays satellite orbit position. - Skew offset: displays Skew offset. - Tracking method: displays current tracking mode (DVB/NBD). - RX polarization: displays current RX polarization. - TX polarization: displays current TX polarization.
⑥	DVB Information	- Displays DVB tracking mode's tracking information. - Frequency: displays tracking frequency. - Symbol rate: displays symbol rate. - NID: displays network ID. - Verify type: displays verification type (AGC only, DVB lock, DVB decode, DSS decode).

No.	Item	Description
⑦	NBD Information	Displays NBD tracking mode's tracking information. - IF Frequency: displays tracking frequency. - Bandwidth: displays detection bandwidth. - Base Local: displays base local frequency.
⑧	Local Frequency Setting (MHz)	Displays LNB local frequency (MHz) and voltage.

Firmware & Configuration

Antenna Firmware Upgrade



No.	Item	Description
①	Antenna Firmware Upgrade	Select to update antenna firmware.
②	New Antenna Firmware	Select Upgrade Method between "Manual Upgrade" or "Auto Upgrade". With "Auto Upgrade" option selected, click "Check" button to check automatically if there is new firmware available from the server. With "Manual Upgrade" option selected, browse and select the firmware package file to upload and click "Start Upload" button. **NOTE**: When using the "Manual Upgrade" method, refer to the following "Antenna Firmware Update(Manual Upgrade method) procedures" page for more details.
③	Current Running Version	Displays current firmware versions (Antenna POL, Antenna STABILIZER, Antenna PCU, ACU Main, Library).
④	Live Rollback	Display Previous/Latest Package version and Factory Default Version. (Antenna POL, Antenna STABILIZER, Antenna PCU, ACU Main). When clicking the Rollback button, the system will be upgraded. Other functions cannot be operated while rollback is in progress.

Antenna Firmware Upgrade(Manual Upgrade method) procedures:

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

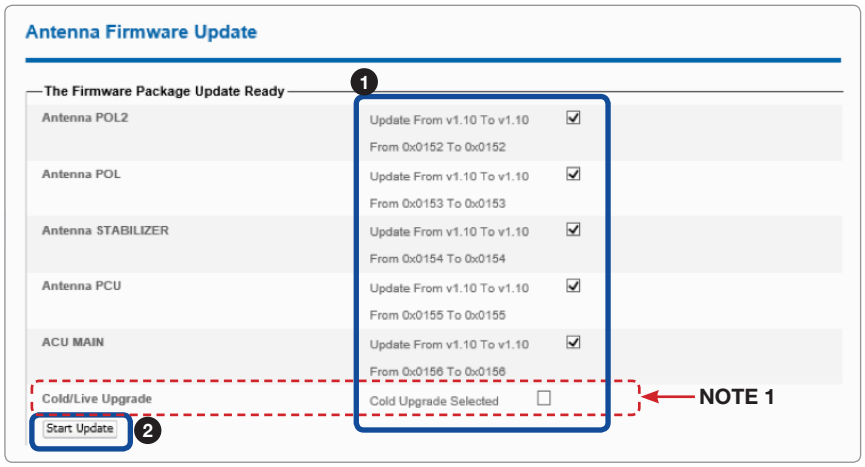
2. After the package file is transferred, it will show "upgrade from vx.xx Version to vx.xx Version". Enable the checkbox to select the firmware file that you wish to upgrade. After selecting the firmware files, click on the "Start Upgrade" button.

NOTE

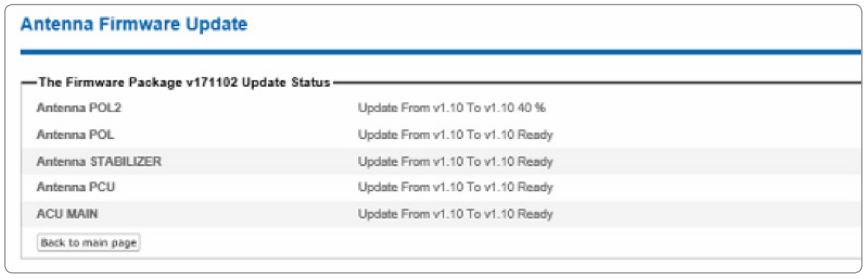
NOTE:

You can select either "Cold Upgrade" or "Live Upgrade" by ticking the checkbox on "Cold/Live Upgrade" list.

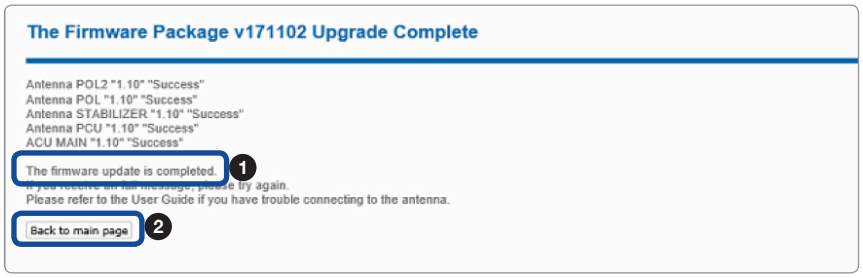
1. In case of "Live Upgrade", the Firmware will be upgraded while the antenna is operating. This option is the default and recommended.
2. In case of "Cold Upgrade", the Firmware will be upgraded when the antenna is not operating. The "Antenna POL2" and the "Antenna POL" are appeared only in "Cold Upgrade" option.



3. During the upgrade process, the window will display process status.



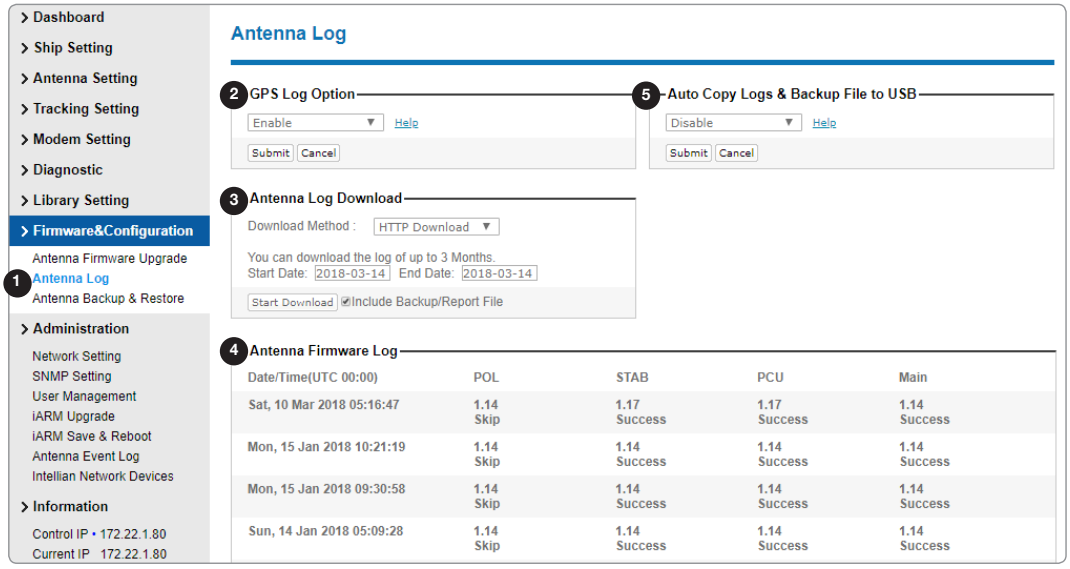
4. If the firmware is successfully upgraded, it will display "The firmware update is completed." Click on "Back to main page" to go out of the screen. To verify the upgraded firmware version, go to Dashboard > Software Information.



NOTE

NOTE: To roll back to the previous firmware package version or latest package version, select Live Rollback Upgrade menu on the Antenna Firmware Upgrade page.

Antenna Log

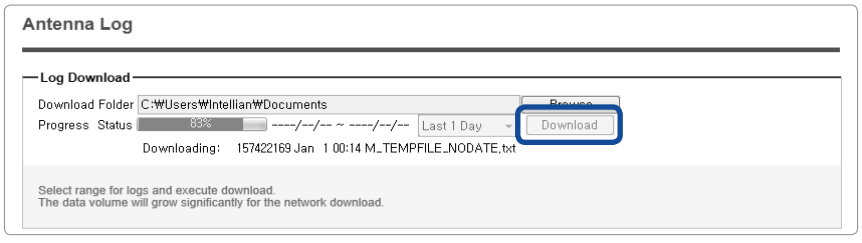


No.	Item	Description
①	Antenna Event Log	Displays the antenna log data
②	GPS Log Option	Disable/Enable to save GPS information in the antenna log file.
③	Antenna Log Download	Select file transfer protocol "HTTP Download" method. Any log data within 3 months can be downloaded with HTTP Download option selected. Select the start and end date by manual input or mouse scrolling on the calendar view. **NOTE**: When using the "FTP Download" method, refer to the following "Log Download procedures" page for more details. - Start Download: Select the Start Download button to download the antenna log file. Download the Back up/Report file by clicking the "Include Backup/Restore File" check box.
④	Antenna Firmware Log	Display log information of firmware upgrade.
⑤	Auto Copy Logs & Backup File to USB	Disable/Enable to copy antenna Logs & Backup File to the USB storage device automatically.

Log Download procedures(using FTP Protocol):
In case of using the FTP protocol and attempting to download the log for the first time, Java applications should be installed in your PC/laptop. Following explains log download procedures using the FTP protocol.

1. Select file transfer protocol "FTP Download" method.
2. Click the 'Start Download' button.
3. To run Java applications you must have Java Runtime Environment(JRE) version 6.0 and above installed on your PC/laptop when you access the antenna log page for the first time. Click the "Run" button on the popup message "The application's digital signature cannot be verified. Do you want to run the application?" to install the Applet. Refer to the Appendix for Java Installation Instructions if the system does not display the popup message.

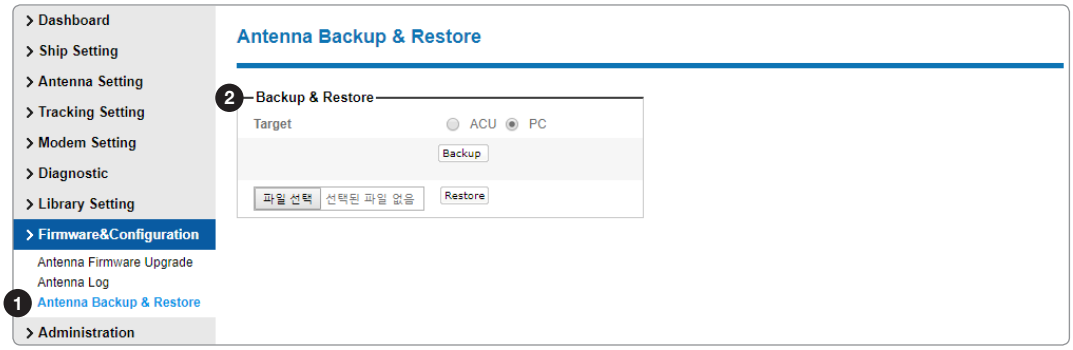
4. Select the 'Browse' button to browse the target directory of the antenna log file.
5. Select the log period for file download.
   - Last 3 Months: download the antenna log information for the past three months.
   - Last 1 Month: download the antenna log informaiton for the past one month.
   - Last 1 week: download the antenna log information for the past one week.
   - Last 1 Day: download the antenna log information for the past one day.
6. Select 'Download'to download the log file to the target directory according to the selected log period.



NOTE

NOTE: You can choose to Enable or Disable the GPS tracking function. Liability for information that is disclosed when GPS is enabled is solely the operator's responsibility and it is up to the operator on whether or not to provide their GPS information to third parties. Any issues regarding safety and privacy when turning on the GPS function is solely up to the user. Intellian is not responsible for information that is disclosed when the GPS function is enabled.

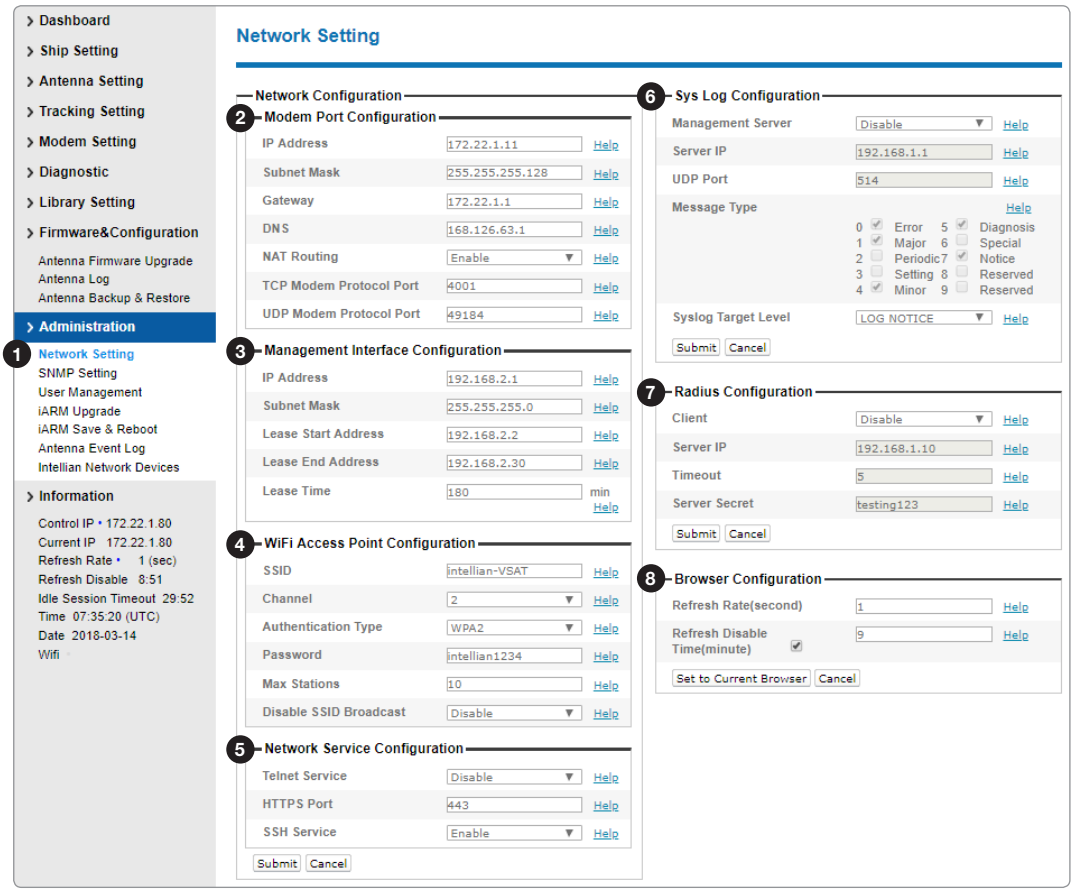
Antenna Backup & Restore



No.	Item	Description
①	Antenna Backup & Restore	Enter Backup & Restore page (Setup mode is required).
②	Backup & Restore	- Target : Backup antenna information to ACU/PC or restore antenna by using the saved information from ACU/PC. - Backup: Backup antenna information. - Restore: Restore antenna information.

Administration

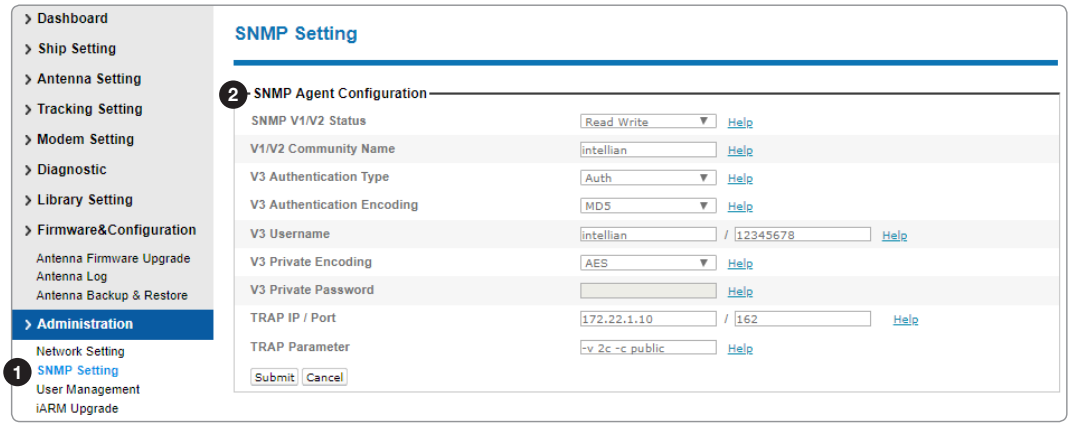
Network Setting



No.	Item	Description
①	Network Setting	Enter network setting page.
②	Modem Port Configuration	Modify ACU's Internal IP addresses, routing, and ports. When complete, press "Submit" button at bottom of page. Go to "Save & Reboot" page and press "Save & Reboot" button to validate the changes. - IP Address: Factory default (Primary:192.168.0.223)/ (Secondary:10.10.1.1). - Subnet Mask: Factory default (255.255.255.0). - Gateway: Factory default (192.168.0.254). - DNS: Current default DNS Address is assigned to. - NAT Routing: Enable/Disable NAT routing. - TCP Modem Protocol Port: TCP port number for modem protocols using TCP as transport. - UDP Modem Protocol Port: UDP port number for modem protocols using UDP as transport.

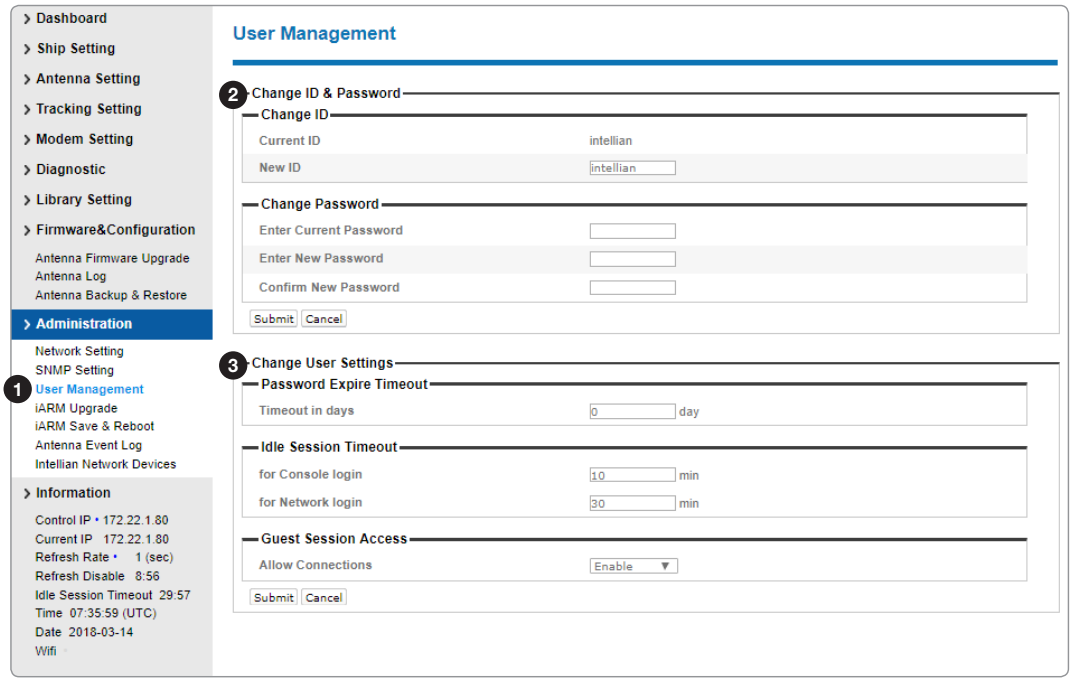
No.	Item	Description
③	Management Interface Configuration	Modify the Management Port's network configuration and press "Submit" button at bottom of window. Go to "Save & Reboot" page and press "Save & Reboot" button to validate the changes. - IP Address: ACU front network port /Factory default (192.168.2.1). - Subnet Mask: Factory default (255.255.255.0). - Lease Start Address: Lease IP address start range. - Lease End Address: Lease IP address end range. - Lease Time: Lease IP address update time.
④	WiFi Access Point Configuration	- SSID: The SSID is the network name shared among all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 alphanumeric characters, which may be any keyboard character. Make sure this setting is the same for all devices in your wireless network. - Channel: Select an appropriate channel from the list provided to correspond with your network settings. All devices in your wireless network must use the same channel in order to function correctly. Try to avoid conflicts with other wireless networks by choosing a channel where the upper and lower three channels are not in use. - Authentication Type: Module supports an authentication mode that the 802.11 device uses when it authenticates and associates with an access point or IBSS cell. - Password: WiFi access password. - Disable SSID Broadcast: Enable or Disable the WIFI SSID function. - Max Stations: Setting max stations.
⑤	Network Service Configuration	- Telnet Service: Enable or disable telnet login support. - HTTPS Port: HTTPS port number. - SSH Service: Enable or Disable the CLI access through the SSH protocol.
⑥	Sys Log Configuration	Set the system log configuration. Antenna sends log messages according to the emergency level. Enabling this function sends the message to your management server. - Management Server: Sys log function enable/disable. - Server IP: Management server IP address. - UDP Port: Management port. - Message Type: Select message type (Intellian message level) to send to the management server (Lower number indicates higher emergency). - Syslog Target Level: If you select this target level, the management server receives log message equal to or less than this level.
⑦	Radius Configuration	This menu is used when network administrator needs to authorize user connections via Web, SSH, PC Port, Telnet, or Console using RADIUS server. - Client: Select to enable RADIUS authentication. - Server IP: RADIUS server IP Address. - Timeout: Timeout value in seconds for the authentication process. - Server Secret: Pass-Phase. This should be matched between server and ACU.
⑧	Browser Configuration	Setting refresh rate and refresh disable time. - Refresh Rate: Set the browser refresh rate (Default 1 seconds. Range 1~99). - Refresh Disable Time: Set the browser idle timeout (Default:9 minutes. Range 0~9). To use this function, check the checkbox.

SNMP Setting



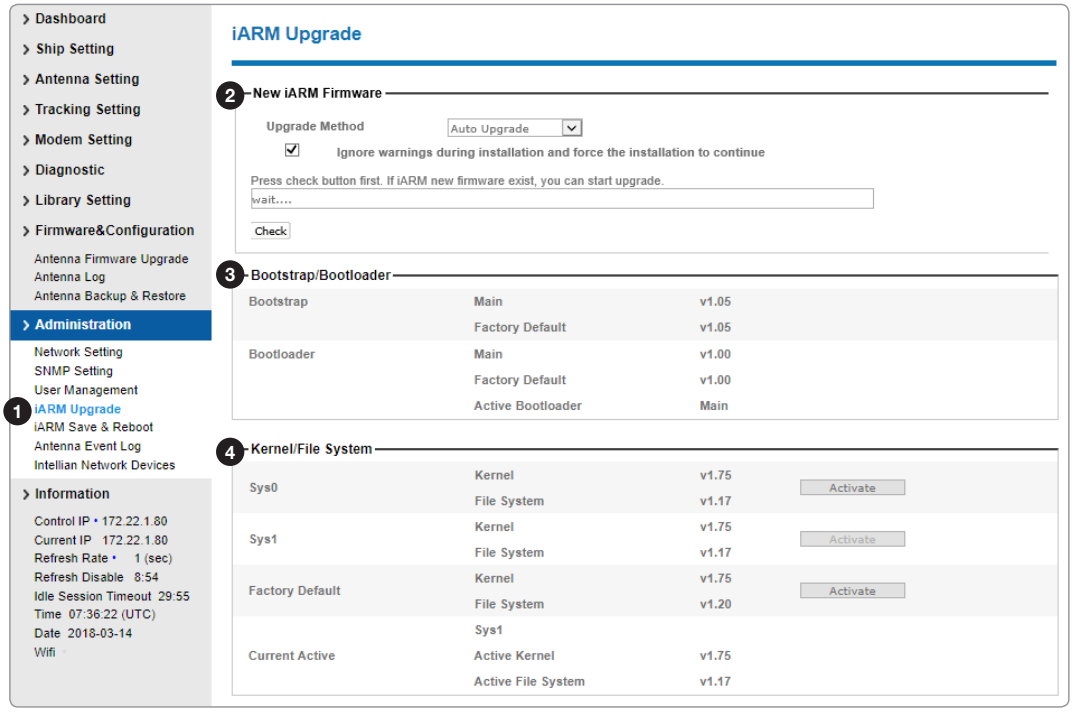
No.	Item	Description
①	SNMP Setting	Display and Set SNMP configuration.
②	SNMP Agent Setting	Set the SNMP configuration. - SNMP V1/V2 Status: Set SNMP mode (Use Attribution Disable, Read Only or Read Write). - V1/V2 Community Name: Set SNMP V2 community name. - V3 Authentication Type: Set SNMP V3 authentication mode. - V3 Authentication Encoding: Set SNMP V3 authentication encoding. - V3 Username: Set the V3 username and password of the SNMP Agent. The password must be at least 8 character string. - V3 Private Encoding: Set SNMP V3 Private Encoding. - V3 Private Password: Set the V3 password of the SNMP Agent. The Password is must be at least 8 character string. - TRAP IP/Port: Set the V3 password of the SNMP Agent. The Password must be at least 8 character string. - TRAP Parameter: Set the SNMP trap specific parameter.

User Management



No.	Item	Description
①	User Management	Change login ID and Password to access the Aptus Web. This setting can be also accessed by 'Account' icon on the top menu.
②	Change ID & Password	Change your login ID (username) and password. - Change ID: Enter your current login ID (username) and new login ID. Click the Submit button to validate the changes that are made to the login ID. - Change Password: Enter your current login password and new login password. Click the Submit button to validate the changes that are made to the login password.
③	Change User Settings	Change User Password Expire in days and Idle session timeout. - Password Expire Timeout: Set password expire within days. - Idle Session Timeout: Set for Console and for Network Timeout. - Guest Session Access: Set up the guest access option.

iARM Upgrade



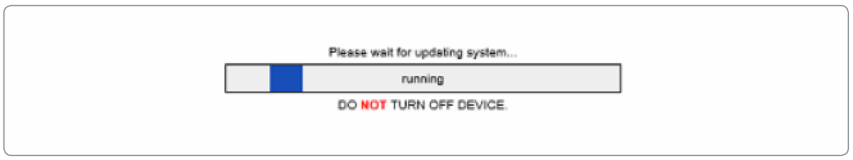
No.	Item	Description
①	iARM Upgrade	Upgrade the firmware of iARM module.
②	New iARM Firmware	Select Upgrade Method between Manual Upgrade or Auto Upgrade. With Auto Upgrade option selected, click Check button to check automatically if there is new firmware available from the server. With Manual Upgrade option selected, browse and select the firmware file to upload and click Start Upgrade button. **NOTE**: When using the "Manual Upgrade" method, refer to the following "iARM Upgrade(Manual Upgrade method) procedures" page for more details.
③	Bootstrap /Bootloader	Displays current bootstrap and bootloader version.
④	Kernel /File System	ACU has 4 storage parts sys0, sys1, Factory Default, and Current Active. Display kernel and file system version and current activated part Information. When clicking the "Activate" button, the system will be performed.

iARM Upgrade(Manual Upgrade method) procedures:

1. Choose "Manual Upgrade" from the pull-down menu of Upgrade Method. Browse and select the iARM firmware file(.tgz) that you wish to upgrade. Click on "Start Update" button to update the iARM firmware. Wait until the page is loaded.

NOTE

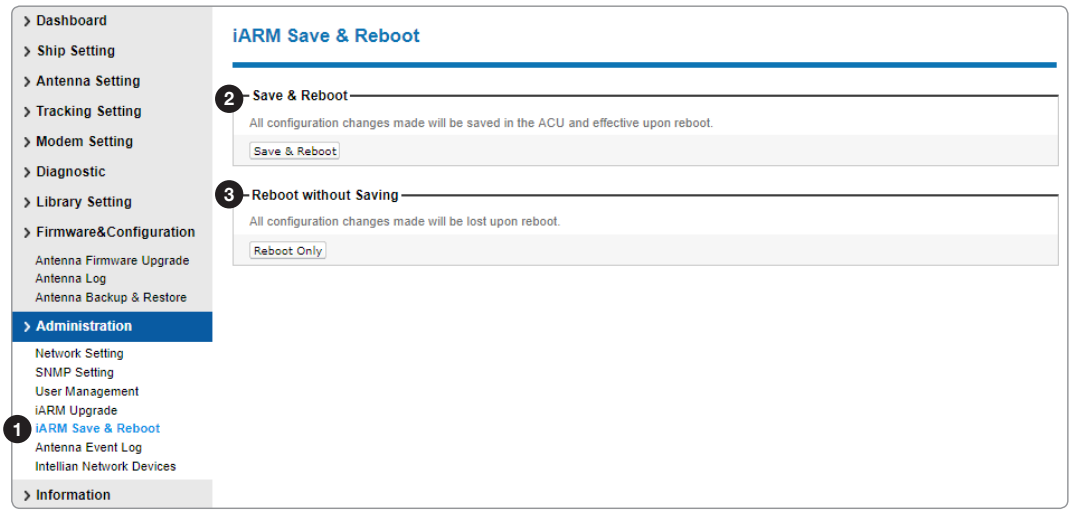
NOTE: When checking the box "Ignore warnings during installation and force the installation to continue" before performing the upgrade, the warning messages do not appear during the upgrade.



2. Once update starts, a page will indicate upgrade status. Do not turn off the device power if the firmware upgrade page is displayed. It should take around 2 minutes to complete the firmware upgrade.

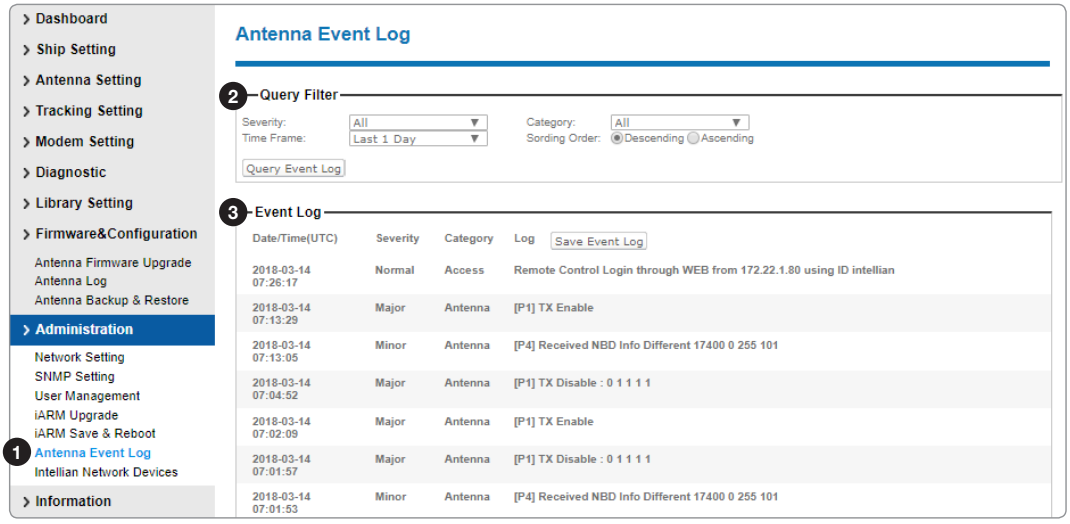
3. Once the upgrade is completed, the system will reboot automatically.

iARM Save & Reboot



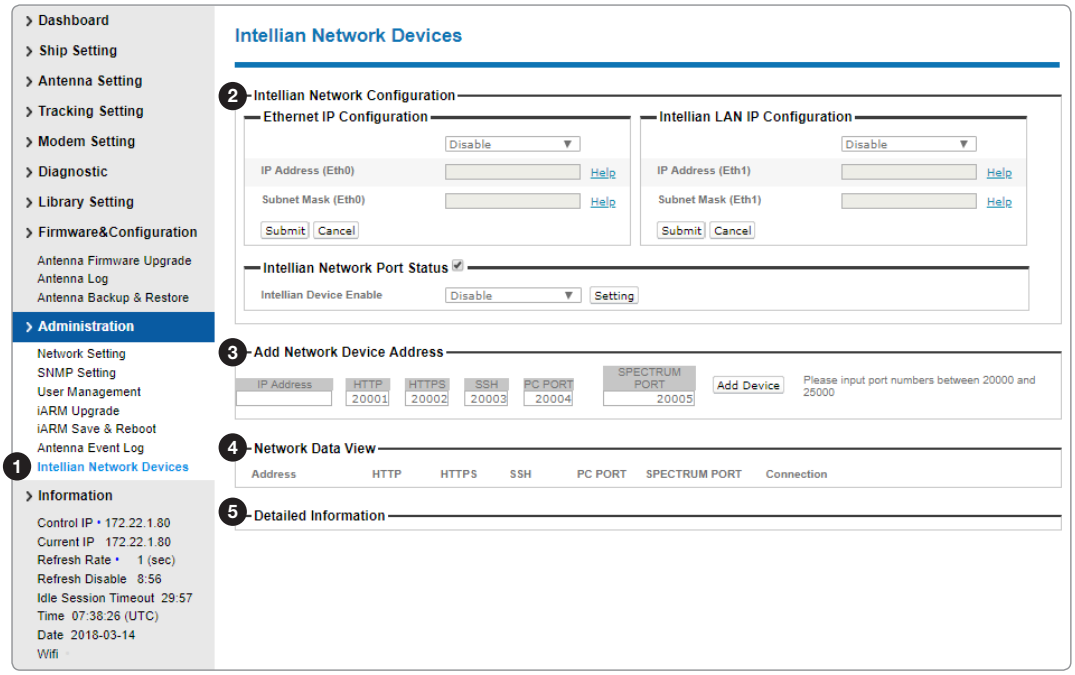
No.	Item	Description
①	iARM Save & Reboot	Save settings to the ACU and reboot or reboot the system without saving.
②	Save & Reboot	Save the modified settings and reboot the system. Click Save & Reboot button.
③	Reboot without Saving	Reboot the system without saving the modified settings. Click the "Reboot Only" button.

Antenna Event Log



No.	Item	Description
①	Antenna Event Log	Displays the antenna system and user log information by setting urgency level.
②	Query Filter	Set the Log message option. - Severity: Sets the urgency level. - Category: Sets the target that caused the message. - Time Frame: Sets the time limit that you want to show. - Sorting Order: Sorting based on date (descending or ascending).
③	Event Log	Displays log information (Date/Time, Severity, Category, Log). - Save Event Log: Save log message to your PC.

Intellian Network Devices



No.	Item	Description
①	Intellian Network Devices	Add up to 8 network devices and enable to monitor real-time information of the connected devices.
②	Intellian Network Configuration	Set each Ethernet IP Configuration and Intellian LAN IP Configuration. - Eth0 IP Configuration: ACU network Eth0 IP and subnet mask setting. - Eth1 IP Configuration: ACU network Eth1 IP and subnet mask setting. - Intellian Network Port Status: select to enable or disable this function. Not used on t-series models.
③	Add Network Device Address	Add Intellian network devices, then you can browse the various information about the device. - IP Address: IP address of the device to be monitored. - HTTP, HTTPS, SSH: Set port number (These port numbers will be matched the http, https or SSH port number of each device).
④	Network Data View	Displays the setting information of the added device (IP address, http, https, SSH port number, current connection). If you click the http/https port number of each device, then you can connect to the device's web page. If you click Delete Device button, then you can't see its information.
⑤	Detailed Information	Displays the information of each device (Updated every 3 seconds).

NOTE

NOTE: More information about the Intellian Network Devices are introduced in the Intellian supplied documents.

Aptus Web for the Mediator

Introduction

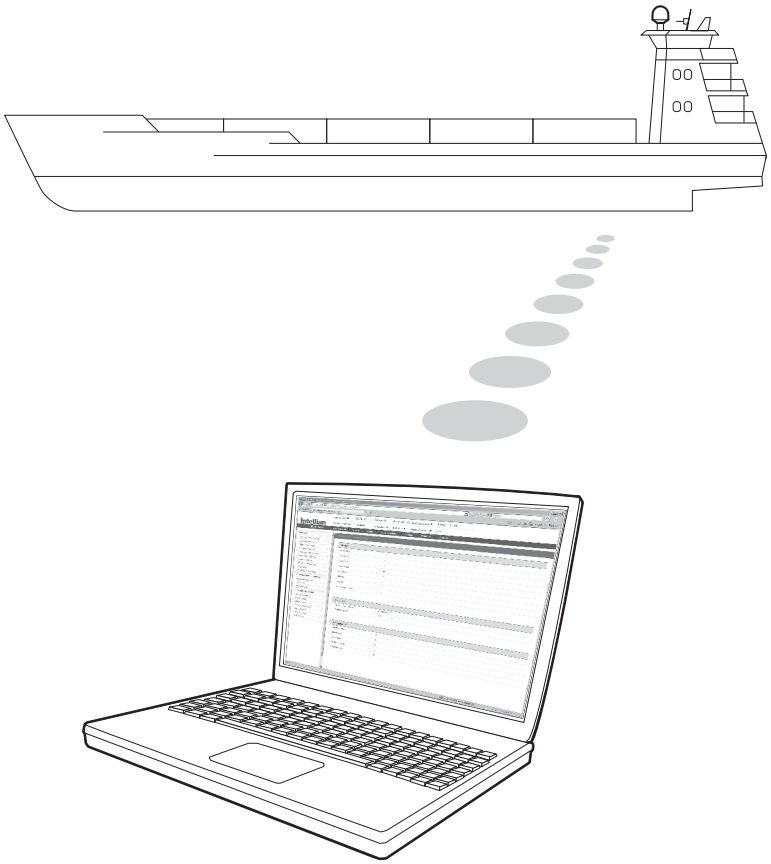
With embedded Aptus Web software, the Mediator can be monitored and controlled remotely through the TCP/IP protocol.

How to access Aptus Web for the Mediator

1. Connect an Ethernet cable from the M&C port on the front of the Intelligent Mediator to the LAN port of PC. This method is most recommended.
2. Enter the Mediator's IP address (**192.168.2.1**) into your web browser's address bar to login into the Mediator's internal HTML page, if this system has not been changed from the Mediator's factory default. You'll be able to access this page within about 1 min after the Mediator power is on.

NOTE

NOTE: Aptus Web can be displayed on the Internet Explorer 8 or later and is also compatible with Firefox and Chrome web browsers.



Main Page

Page Login

1. Choose either to Control & Monitor the ACU (Control & Monitoring) or Only Monitor the ACU (Monitoring Only).
2. Log into the Mediator by typing in User Name and Password information. If this system has not been changed from the factory default:
   - **User Name: intellian**
   - **Password: 12345678**

WARNING

WARNING: The Control & Monitoring Mode will be switched to the Monitoring Only Mode in the following cases;

- If PC Software (Aptus) is connected using TCP/IP Communication while Aptus Web Control is in use.
- If Control & Monitoring Mode is accessed while PC Software is running via TCP/IP Communication. In this case, the web page will display a pop-up message asking if you want to disconnect the PC Software network connection. If you select 'No', the Control & Monitoring Mode will be switched to the Monitoring Only Mode.

NOTE

NOTE

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

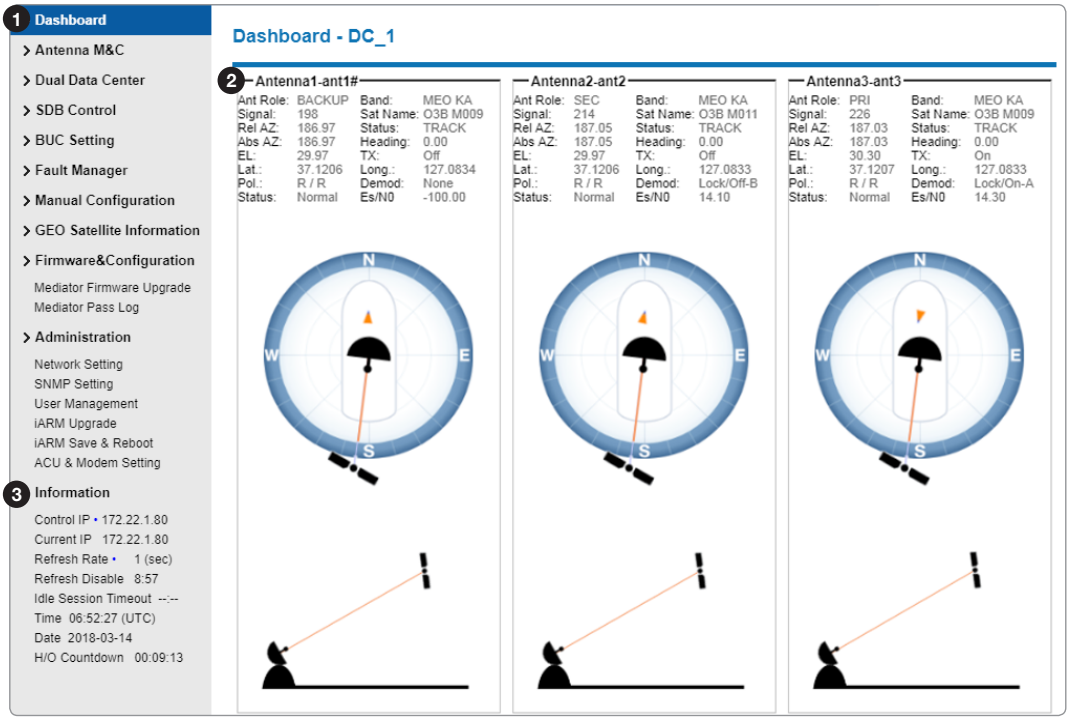
Top Menus

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

No.	Item	Description
①	H/O Countdown	Displays the time remaining until the next MEO Ka satellite is reached.
②	Mediator Mode	Displays the Mediator Mode(MEO, GEO, MG, MANUAL) for a quick monitoring. You can set mode in the “Manual Configuration-Mediator Mode" menu.
③	Demod A/ Demod B	The symbols only appear in MEO Ka-band satellites. It displays lock status of the modem(Lock or Unlock). The following five status are displayed in colors as below. - Display in the Gray Color • Fault: The modem demodulation is unsuccessful. • Unlock/Off: The modem is unlocked and Off state.(The Off means the modem is not carrying traffic.) • Lock/Off: The modem is locked and Off state. (The Off means the modem is not carrying traffic.) - Display in the Yellow Color • Unlock/On: The modem is unlocked and On state.(The On means the modem is carrying traffic.) - Display in the Green Color • Lock/On: The modem is locked and On state. (The On means the modem is carrying traffic.)
④	Ant. Info	Obtain current Mediator information.
⑤	Account	Shortcut to User Management menu. Change login ID and Password.
⑥	Logout	Logout the Mediator's web page.

Dashboard & Information

On the left side of the page, the Dashboard and Information menus are displayed as below to provide quick monitoring of the antenna status and settings. Other menus are displayed only in the Control & Monitoring mode and their functions will be described in the next sections.

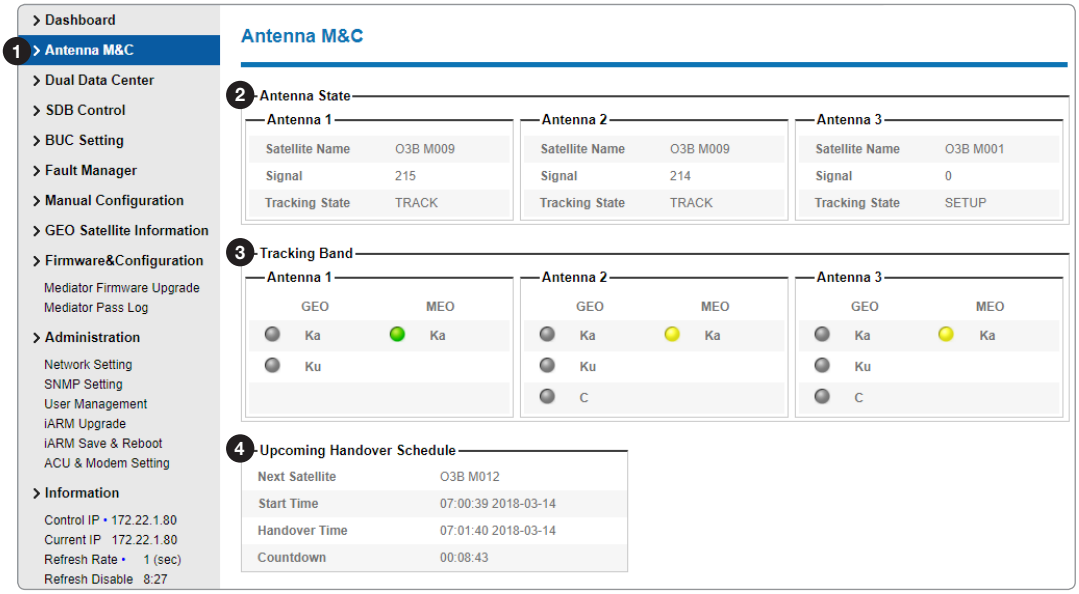


No.	Item	Description
①	Dashboard	Displays current antenna status to be quickly monitored.
②	Dashboard	Displays the antenna name as Antenna1/2/3-XX (XX is ACU's description). Set the description in the "Administration-ACU & Modem Setting" menu. Shows a graphical representation of the current antenna position and information to be quickly monitored. - Ant Role: Displays the antenna Role status.(PRI(Primary), SEC(Secondary), Back(Backup)) The currently active antenna is displayed as PRI(Primary) Role. For MEO Ka-band satellites, the antenna in the SEC(Secondary) status is switched to the PRI(Primary) status after the handover. - Band: Displays band of the current tracking satellite(NONE, C, KU, KA(GEO KA), MEO KA). The KA(GEO KA) is not supported yet. - Signal: Displays antenna signal level. - Sat Name: Displays the current tracking satellite name. - Rel AZ: Displays antenna relative azimuth angle. - Status: Displays status of the currently active antenna(Setup, Search, Tracking, etc.). - Abs AZ(Absolute Azimuth): displays antenna absolute AZ angle. - Heading: Displays ship's heading information. - EL: Displays antenna relative elevation angle. - TX: Displays transmit status(On or Off). - Lat: Displays GPS latitude. - Long: Displays GPS Longitude. - Pol: Displays Rx/Tx Polarization.

No.	Item	Description
②	Dashboard	- Demod: Displays lock status of the modem as Lock, Unlock in GEO satellite. When using MEO Ka-band satellite, the "Unlock/Off, Unlock/On, Lock/Off, Lock/On" options are displayed. The following five options are displayed as “option name-X”(X is A or B). • Fault: The modem demodulation is unsuccessful. • Unlock/Off: The modem is unlocked and Off state.(The Off means the modem is not carrying traffic.) • Lock/Off: The modem is locked and Off state. • Unlock/On: The modem is unlocked and On state.(The On means the modem is carrying traffic.) • Lock/On: The modem is locked and On state. **NOTE**: This function is also displayed in the Top Menu for a quick monitoring. - Status: Displays antenna's status. (Normal or Fault) - Es/N0: Displays energy per symbol to noise power spectral density.
③	Information	- Control IP: Displays current IP that controls the Mediator. - Current IP: Displays current IP address. - Refresh Rate: Displays screen refresh rate (default: 1 sec.) - Refresh Disable: Displays time out. The screen will not refresh once the time-out shows 0:00. (Exception: If the Refresh Disable Time is set to "OFF" in the Network Setting page, then the clock will show "--:--" and the system will keep monitoring all activities regardless of the timeout.) - Time: Displays UTC time. - Date: Displays UTC date. - H/O Countdown: Displays the time remaining until the next satellite is reached.

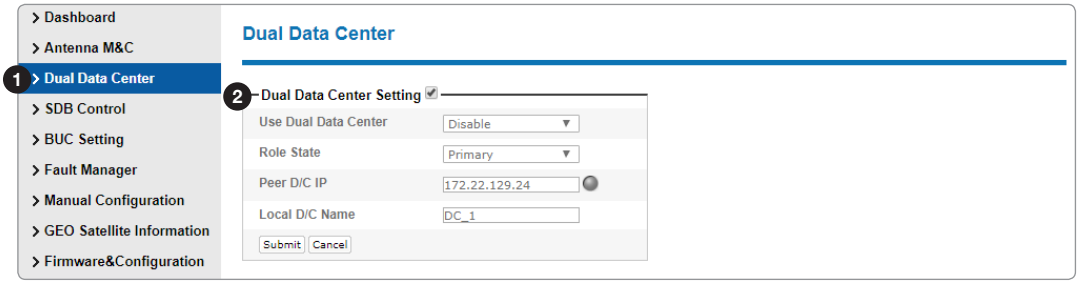
Antenna Settings

Antenna M&C



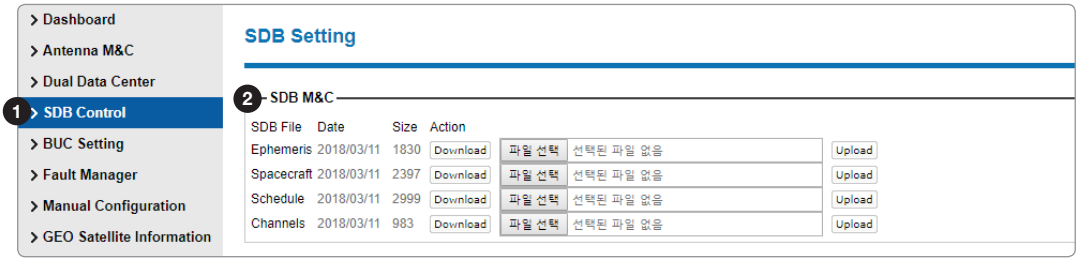
No.	Item	Description
①	Antenna M&C	Display antenna state, tracking band status and handover information.
②	Antenna State	Display each antenna state information. - Satellite Name: Displays the current tracking satellite name. - Signal: Displays Signal Level - Tracking State: Displays antenna status in use(Setup, Search, Tracking, etc.)
③	Tracking Band	Display each antenna's tracking band status and sets the tracking band. The status light flashes yellow when Tx signal is Off. The status light flashes green when Tx signal is On.
④	Upcoming Handover Schedule	Display upcoming handover information of MEO Ka satellite. Typically the MEO Ka satellites move into non geostationary orbit. The orbital period of MEO satellite is about 40 minutes. The antenna starts tracking a satellite(Current Satellite) and then searches another satellite(Rising Satellite) within 40 minutes. - Next Satellite: Displays Rising Satellite name. - Start Time: Displays antenna(Secondary and/or Backup role)'s start time to move to the position of the Rising Satellite when two or more antennas are tracking MEO Ka satellites. - Handover Time: Displays antenna(Primary and Secondary role)'s handover start time. At this time, two antennas track and transmit a signal to each satellite(Current Satellite and Rising Satellite). - Countdown: Displays the time remaining until the next satellite is reached.

Dual Data Center



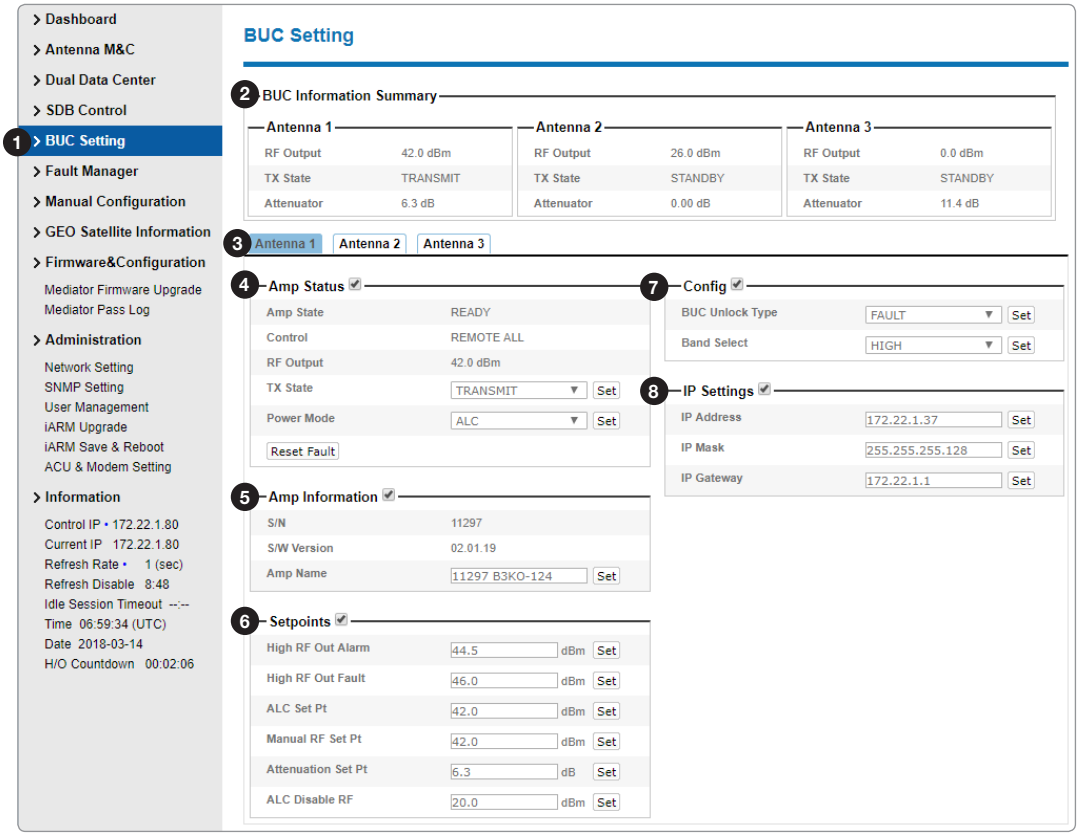
No.	Item	Description
①	Dual Data Center	The Dual Data Center (DDC) system provides the interface(IFL Switch) that supports the selective connection between one antenna(ADE) and two data centers(BDE). When one of the data centers fails due to unfavorable environmental conditions, power outages, technical issues or blocked by obstacles, the DDC system can be easily switched to the other data center by using the Intelligent Mediator to maintain the antenna operation and the network continuously. For DDC system to function, your equipment must meet the requirements in basic configuration. See "Installing the ACU/ Mediator" section for more details. **WARNING**: You must use identical modules in the primary and secondary racks. If you have different models or different versions of the same model or different software, the DDC system will not function properly.
②	Dual Data Center Setting	- Use Dual Data Center: Enable or Disable the DDC system. - Role State: Set Role State for both Data Center. • Primary: Active Data Center(Communicating Tx/Rx) • Secondary: Standby Data Center(Not communicating Tx/Rx) - Peer D/C IP: Sets the Target Data Center's IP address. - Local D/C Name: Sets the Data Center's Description.

SDB Control



No.	Item	Description
①	SDB Control	Ingest and process SDB(System Data Broadcast) files to track MEO satellites. **WARNING**: Make sure that upload the correct file. If the wrong file is uploaded, the antenna can not track the MEO satellite.
②	SDB M&C	- SDB File: The SDB contains information needed to track MEO satellite. • Ephemeris: The Ephemeris File provides the orbit propagation information for MEO satellite. • Spacecraft: The Spacecraft File provides the frequency and polarization of the Telemetry (TLM) beacon MEO satellite. • Schedule: The Schedule file provides the Prepass, Start, Stop, and Handover times which the scheduler will use to plan the ground resources during a satellite pass. • Channels: The Channel Plan provides the RF characteristics for the OTA links. (RF information, Satellite Frequency, IF Frequency, Polarization, and Symbol rate etc. for tracking satellites) - Date: Shows the renewal date. - Size: Shows the file size. - Action • Download: Download the SDB file. • Upload: Upload the SDB file.

BUC Setting for MEO(Ka-band) Satellite



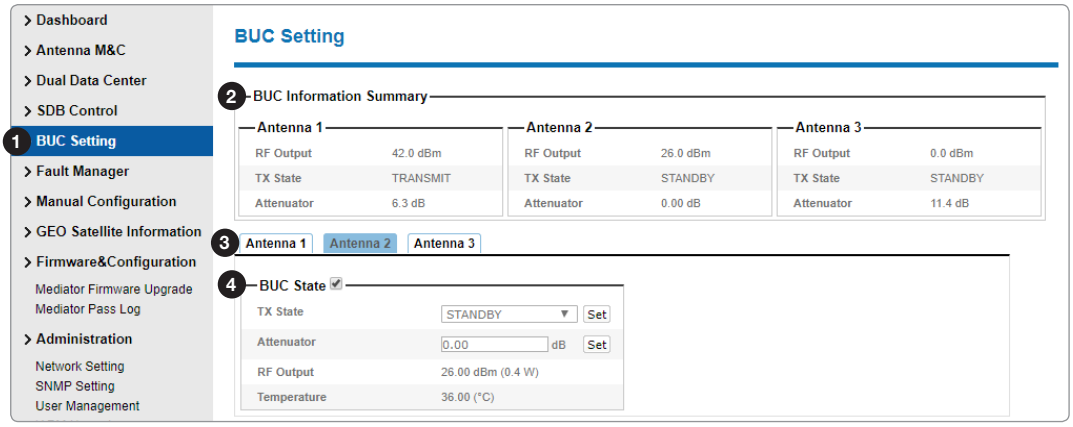
No.	Item	Description
①	BUC Setting	Set BUC options for the each antenna.
②	BUC Information Summary	Displays BUC information summary of each antenna. - RF Output: Displays RF Output level. - TX State: Displays Transmit State(STANDBY, TRANSMIT, TRANSMIT INHIBIT, WARM-UP). • STANDBY: Transmit standby state. • TRANSMIT: Transmit active state(On). • TRANSMIT INHIBIT: Transmit Inhibit state, Transmit Control I/O not active state(Off). • WARM-UP: Power is turning on. - Attenuator: Displays attenuation value.
③	Antenna 1/2/3	The Amp Status, Amp Information, Set points, Config and IP Settings can be activated by using MEO(Ka-band) Satellite.
④	Amp Status	- Amp Status: Displays Amp Status(FAULT, POWER ON. READY). • FAULT: Amp is faulty. • POWER ON: BUC power is turning on. • READY: Amp is in operation. - Control: Displays BUC control method(REMOTE ALL, REMOTE ETHERNET, REMOTE SERIAL, REMOTE WEB). • REMOTE ALL(Default): Control BUC via Remote Ethernet, Remote Serial and Web. • REMOTE ETHERNET: Control BUC via Remote Ethernet. • REMOTE SERIAL: Control BUC via Remote Serial. • REMOTE WEB: Control BUC via Remote Web.

No.	Item	Description
④	Amp Status	- RF Output: BUC Output level. - TX State: Select the Transmit State(STANDBY, TRANSMIT) in the drop-down list. • STANDBY: Transmit standby state. • TRANSMIT: Transmit active state(On). - Power Mode: Select the Power Mode to control the transmit power(MANUAL, ALC(Automatic Level Control), Reset Fault) in the drop-down list. • MANUAL: Output the power as Manual RF Set Pt. • ALC(Automatic Level Control): Output the power as modem output level(Transmit). - Reset Fault: Reset the BUC Fault state.
⑤	Amp Information	- S/N: Displays Serial Number. - S/W Version: Displays Main S/W Version. - Amp Name: Sets BUC Name.
⑥	Set points	Set the control points to BUC. - High RF Out Alarm: If the RF Output is more than the setpoint, the Alarm Error message will detect in the BUC. - High RF Out Fault: If the RF Output is more than the setpoint, the Fault Error message will detect in the BUC and the Amp state will change to the Fault state. Click the Reset Fault button in the Amp Status menu to reset the Fault status. - ALC Set Pt: Sets the Max BUC power Point. The BUC power is amplified within the Max range. The function is available when the Power Mode sets ALC(Automatic Level Control) in the Amp state menu. - Manual RF Set Pt: Sets BUC power level. The function is available when the Power Mode sets the Manual in the Amp state menu. - Attenuation Set Pt: Sets BUC Attenuator value. BUC power is attenuated by the setpoint. - ALC Disable RF: Sets Limits the use of the ALC function. If the RF Output is less than the setpoint, the ALC function will be deactivated.
⑦	Config (Configuration)	- BUC Unlock Type: Select the BUC Unlock type. • ALARM: When BUC is in unlock state, the Alarm error message will detect in the BUC. • FAULT: When BUC is in unlock state, the Fault error message will detect in the BUC. - Band Select: Select the BUC Band type. • LOW: Sets BUC Local as Low Band(26.6GHz). • HIGH: Sets BUC Local as High Band(27.2GHz).
⑧	IP Settings	- IP Address: Sets BUC IP Address. - IP Mask: Sets BUC Netmask. - IP Gateway: Sets BUC Gateway.

NOTE

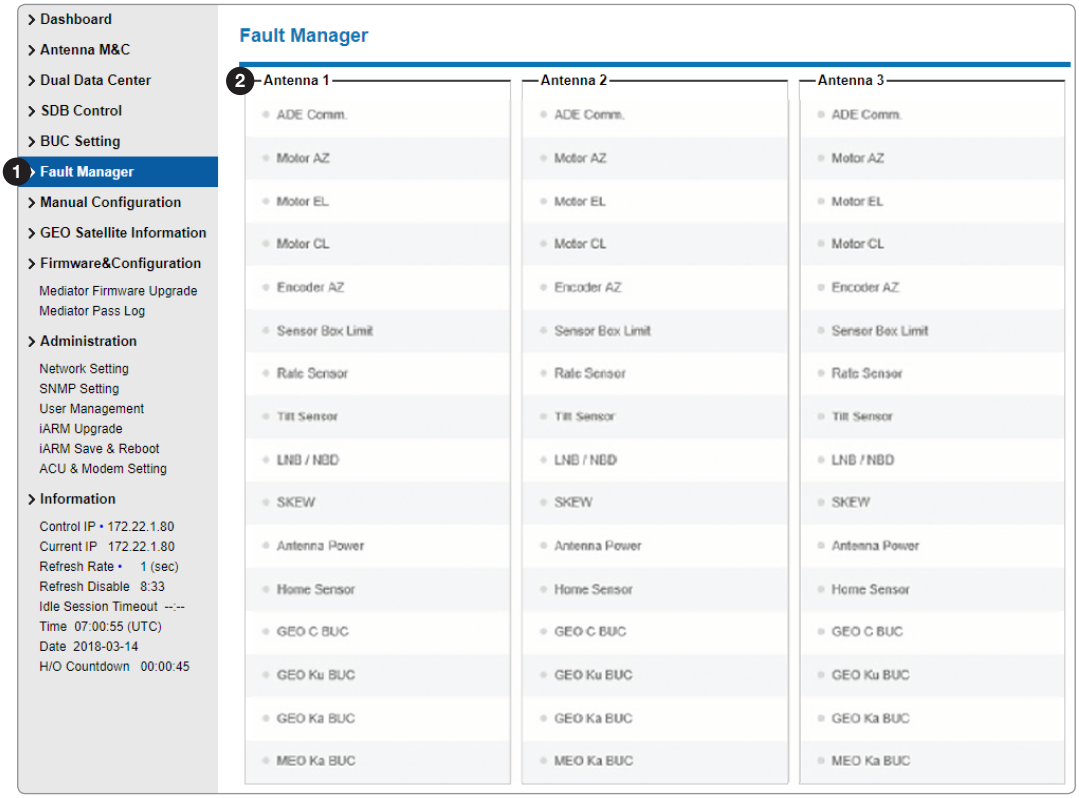
NOTE: Ensure to tick the checkbox before modifying the settings. Select 'Set' button to submit the settings.

BUC Setting for GEO(C, Ku, Ka-band) Satellite



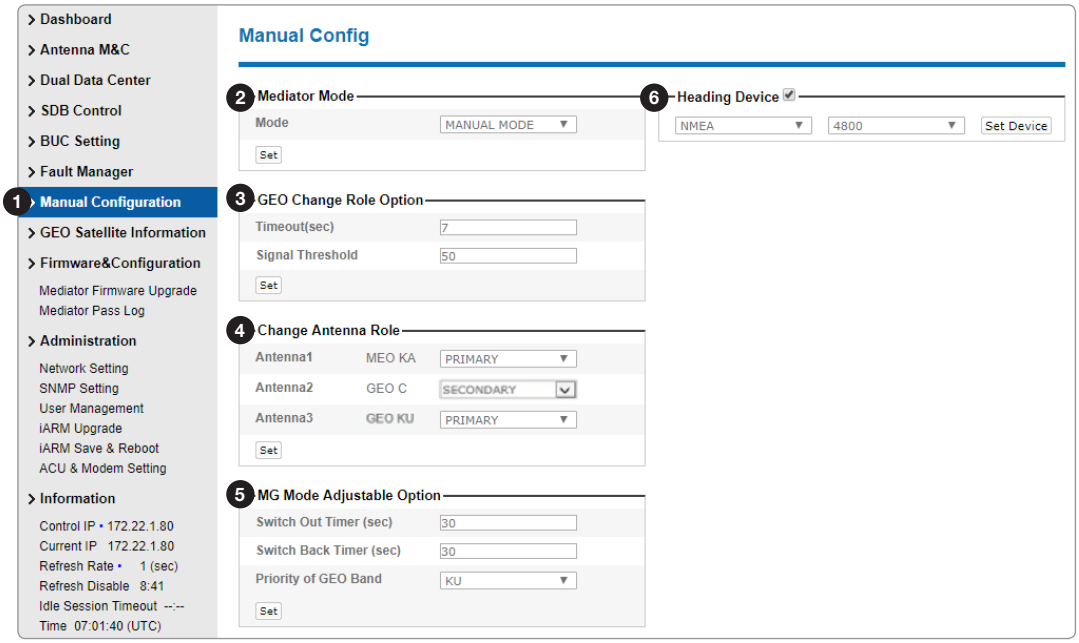
No.	Item	Description
①	BUC Setting	Set BUC options for the each antenna.
②	BUC Information Summary	Displays BUC information summary of each antenna. - RF Output: Displays RF Output level. - TX State: Displays Transmit State(STANDBY, TRANSMIT). • OFF: BUC is in Idle status. • STANDBY: Transmit standby state. • TRANSMIT: Transmit active state(On). - Attenuator: Displays attenuation value.
③	Antenna 1/2/3	The BUC State can be activated by using GEO(C, Ku, Ka-band) Satellite.
④	BUC State	- TX State: Select the Transmit State(OFF, STANDBY, TRANSMIT) in the drop-down list. • OFF: BUC is in Idle status. • STANDBY: Transmit standby state. • TRANSMIT: Transmit active state(On). - Attenuator: Sets BUC Attenuator. - RF Output: Displays RF output power of the current BUC in use. - Temperature: Displays temperature of the current BUC in use.

Fault Manager



No.	Item	Description
①	Fault Manager	Display the diagnostic results of each antenna.
②	Fault Manager	The "Green" indicator is displayed for the test under progress. "Blue" indicates the test result as Pass while "Red" indicates the result as Fail. "Yellow" indicates the test has been skipped. - ADE Comm.: Displays the data communication state between the antenna and mediator. - Motor AZ: Displays the azimuth motor state. - Motor EL: Displays the elevation motor state. - Motor CL: Displays the cross-level motor state. - Encoder AZ: Displays the azimuth encoder state. - Rate Senor: Displays the rate sensor state. - Tilt Sensor: Displays the tilt sensor state. - Sensor Box Limit: Displays the sensor box motor state. - LNB/NBD: Displays the LNB/NBD state. - SKEW: Displays the LNB pol motor state. - Antenna Power: Displays the antenna power state. - ACU Power: Displays the ACU power state. - GEO C BUC: Displays GEO C BUC state. - GEO KU BUC: Displays GEO Ku BUC state. - GEO Ka BUC: GEO Ka BUC state. (Not supported yet) - MEO Ka BUC: Displays CPI MEO Ka BUC state.

Manual Configuration



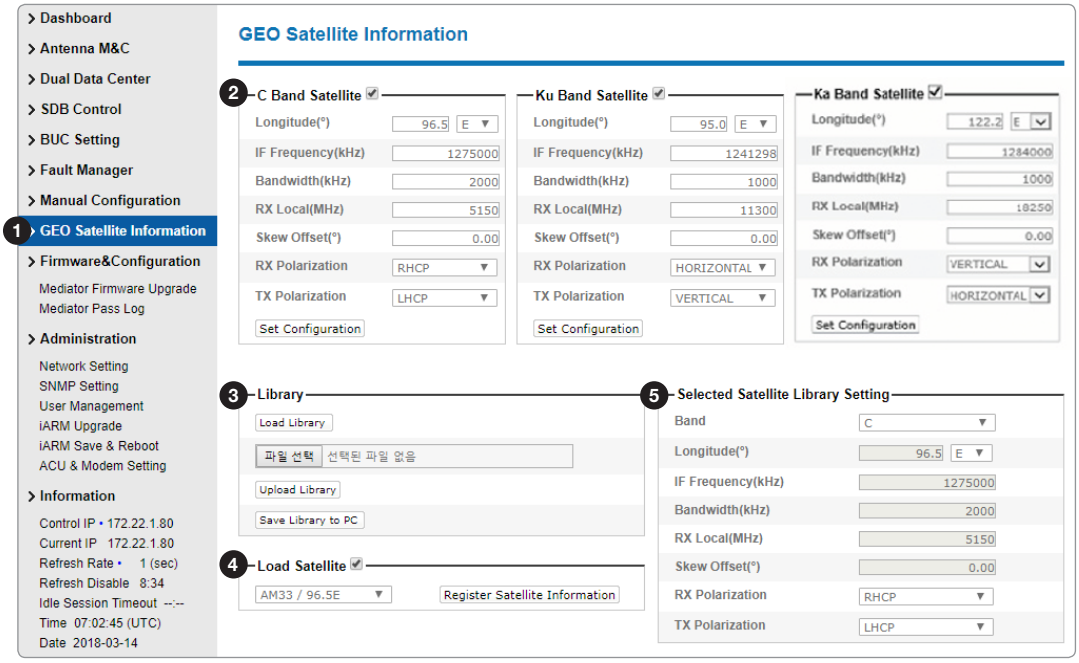
No.	Item	Description
①	Manual Configuration	Set the mediator mode, role option, antenna role, mediator Rx/Tx and heading device.
②	Mediator Mode	Selects a proper mediator mode to interface with the connected antenna satellite. - MODE • MEO MODE: Antenna tracks MEO(Ka-band) satellite. • GEO MODE: Antenna tracks GEO(C/Ku/Ka-band) satellite. • MG MODE: Antenna tracks between MEO(Ka-band) and GEO(C/Ku/Ka-band) satellite. (The antenna automatically switches to MEO/GEO depending on the situation such as Fault, Blockage, etc.) • MANUAL MODE: Antenna tracks between MEO(Ka-band) and GEO(C/Ku/Ka-band) satellite (There is no automatic switching function.) **NOTE**: This function is also displayed in the Top Menu for a quick monitoring.
③	GEO Change Role Option	Sets the role options to change Primary/Secondary antenna automatically. - Timeout: Sets the Timeout(a second). If the Fault event occurs within the set timeout period, the Role switches automatically. - Signal Threshold: Sets the Signal Threshold. If the signal of the secondary antenna is higher than the threshold, the Role switches automatically.
④	Change Antenna Role	Select the antenna role type(Primary/Secondary/Backup) manually. Each antenna displays the current tracking satellite information.

No.	Item	Description
⑤	MG Mode Adjustable Option	Set the timer and priority band options In MG mode. - Switch Out Timer: Sets the event standby time when the band switches from MEO to GEO. (Range: 30 sec - 20 min) - Switch Back Timer: Sets the event standby time when the band switches from GEO to MEO. (Range: 30 sec - 20 min) - Priority of GEO Band: Selects a priority band when the band switches from MEO to GEO. (C Band/Ku Band)
⑥	Heading Device	Selects a gyrocompass connected to the mediator(NMEA/ NMEA_2000).


NOTE

NOTE: Ensure to tick the checkbox before modifying the settings. Select 'Set Device' button to submit the settings.

GEO Satellite Information



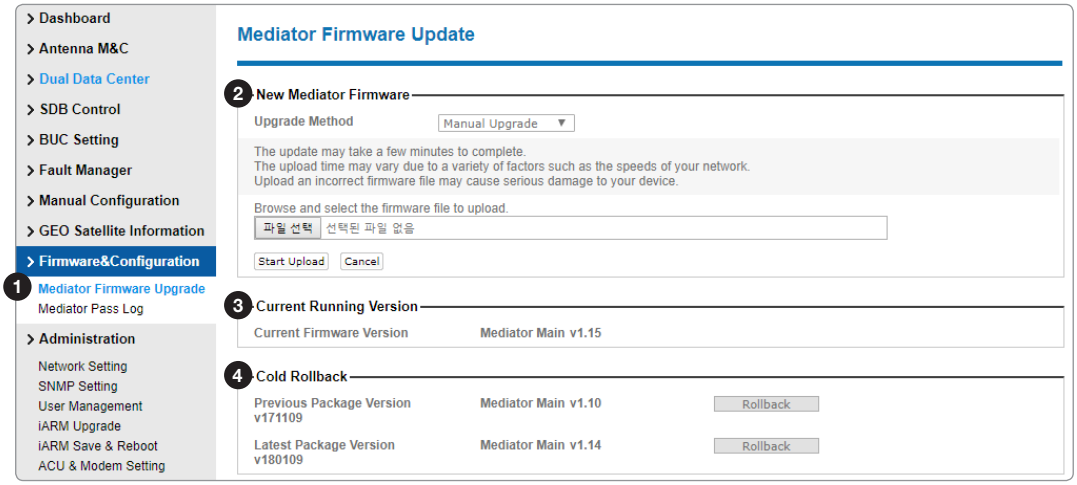
No.	Item	Description
①	GEO Satellite Information	Displays beam-switch information received from a modem. GEO Satellite information can be also edited manually or registered by a library loading or satellite loading.
②	C/Ku/Ka Band Satellite	C/Ku/Ka-band satellite information to be stored on the antenna when switching to a C/Ku/Ka-band. - Longitude: Longitude of a target satellite. - IF Frequency: Frequency of a target satellite. - Bandwidth: Bandwidth of a target satellite. - RX Local: RX Local Frequency of a target satellite. - Skew Offset: Skew offset of a target satellite. - RX Polarization: RX Pol of a target satellite. - TX Polarization: TX Pol of a target satellite.
③	Library	Browse, Upload and Load the satellite library to update the Satellite information. - Load Library: Load the uploaded library to the mediator. - Browse: Browse the satellite library from the PC. - Upload Library: Upload the selected library to the mediator. - Save Library to PC: Download the library to the PC.
④	Load Satellite	Select the desired satellite list from the dropdown menu to register satellite information.
⑤	Selected Satellite Library Setting	Displays the selected satellite library information.

NOTE

NOTE: Ensure to tick the checkbox before modifying the settings. Select 'Set Configuration' button to submit the settings.

Firmware & Configuration

Mediator Firmware Upgrade

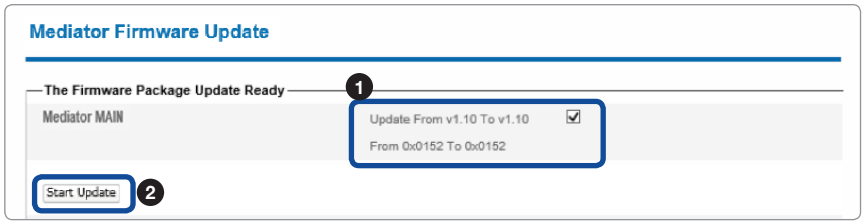


No.	Item	Description
①	Mediator Firmware Upgrade	Can upgrade the mediator firmware.
②	New Mediator Firmware	Select Upgrade Method between "Manual Upgrade" or "Auto Upgrade". With "Auto Upgrade" option selected, click "Check" button to check automatically if there is new firmware available from the server. With "Manual Upgrade" option selected, browse and select the firmware package file to upload and click "Start Upload" button. **NOTE**: When using the "Manual Upgrade" method, refer to the following "Mediator Firmware Update(Manual Upgrade method) procedures" page for more details.
③	Current Running Version	Displays current firmware versions.
④	Cold Rollback	Display Previous/Latest Package version. When clicking the Rollback button, the system will be upgraded. Other functions cannot be operated while rollback is in progress.

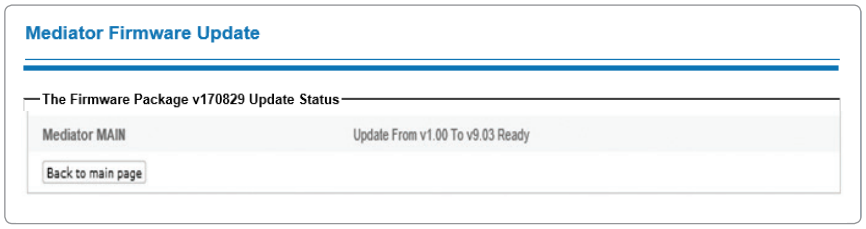
Mediator Firmware Upgrade(Manual Upgrade method) procedures:

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

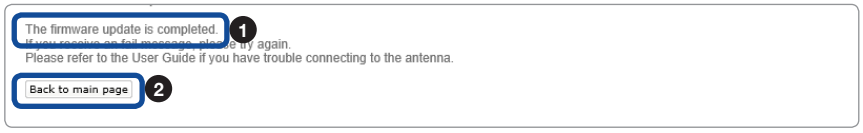
2. After the package file is transferred, it will show "upgrade from vx.xx Version to vx.xx Version". Enable the checkbox to select the firmware file that you wish to upgrade. After selecting the firmware files, click on the "Start Upgrade" button.



3. During the upgrade process, the window will display process status.



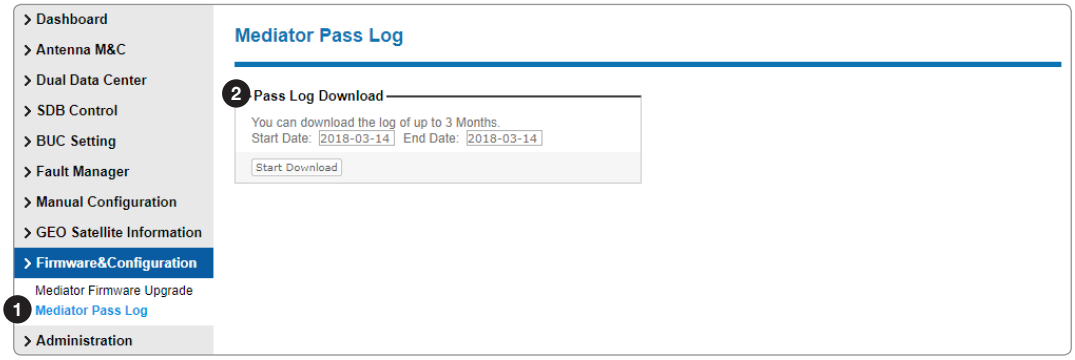
4. If the firmware is successfully upgraded, it will display "The firmware update is completed." Click on "Back to main page" to go out of the screen. To verify the upgraded firmware version, go to Dashboard > Mediator Information.



NOTE

NOTE: To roll back to the previous firmware package version or latest package version, select Cold Rollback Upgrade menu on the Mediator Firmware Upgrade page.

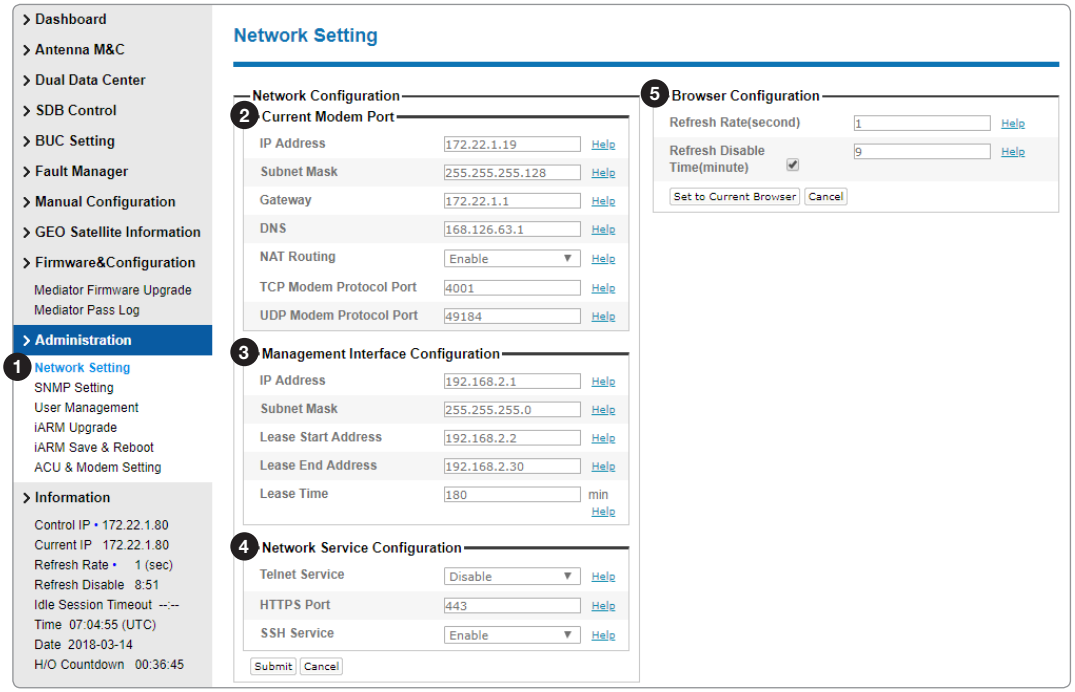
Mediator Pass Log



No.	Item	Description
①	Mediator Pass Log	The mediator log stored can be downloaded onto a PC.
②	Pass Log Download	Can download the mediator log. Select the start and end date by manual input or mouse-scrolling on the calendar view. Any log data within 3 months can be downloaded.

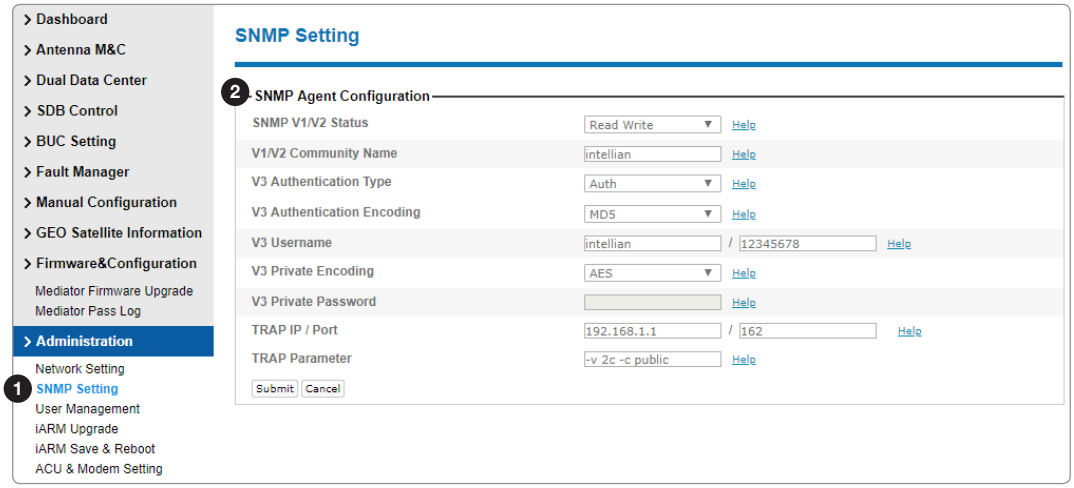
Administration

Network Setting



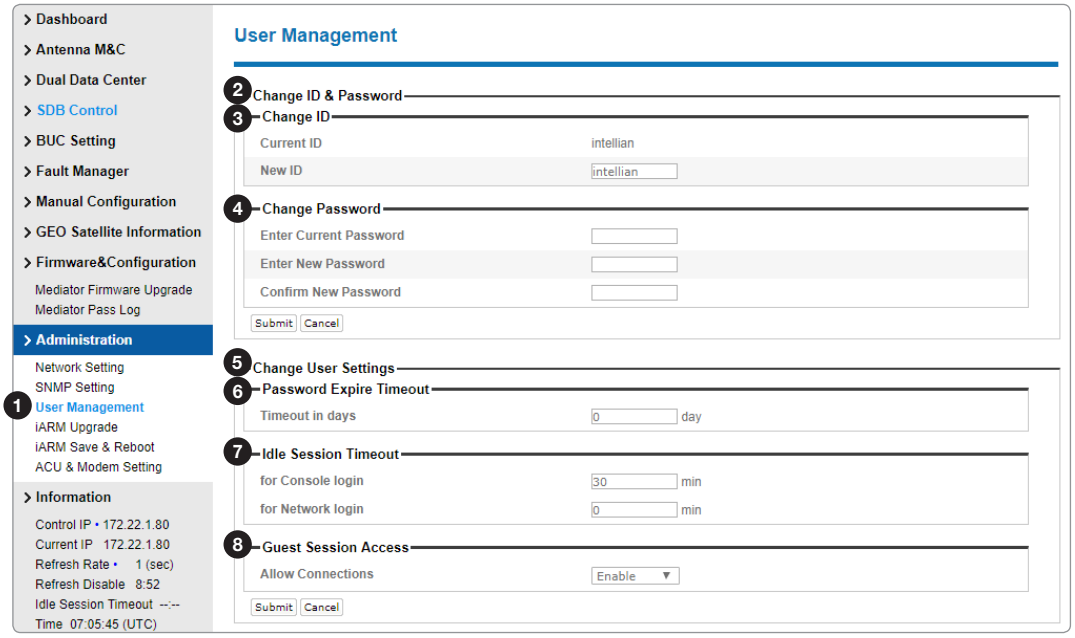
No.	Item	Description
①	Network Setting	Enter the mediator's network setting page.
②	Current Modem Port	Displays the mediator's internal IP address. - IP Address: Factory default(Primary:192.168.0.223)/ (Secondary:10.10.1.1). - Subnet Mask: Factory default(255.255.255.0). - Gateway: Factory default(192.168.0.1). - DNS: Current default DNS Address is assigned to. - NAT Routing: Enable/Disable NAT routing. - TCP Modem Protocol Port: This function is not available. - UDP Modem Protocol Port: This function is not available.
③	Management Interface Configuration	Displays Management Port's network configuration. - IP Address: Mediator's front network port /Factory default(192.168.2.1). - Subnet Mask: Factory default(255.255.255.0). - Lease Start Address: Lease IP address start range. - Lease End Address: Lease IP address end range. - Lease Time: Lease IP address update time.
④	Network Service Configuration	Displays Management Service configuration. - Telnet Service: Enable or disable telnet login support. - HTTPS Port: HTTPS port number. - SSH Service: Enable or disable CLI connection via SSH service.
⑤	Browser Configuration	Set refresh rate and refresh disable time. - Refresh Rate: Set the browser refresh rate (Default 1 seconds. Range 1~99). - Refresh Disable Time: Set the browser idle timeout (Default:9 minutes. Range 0~9). To use this function, check the checkbox.

SNMP Setting



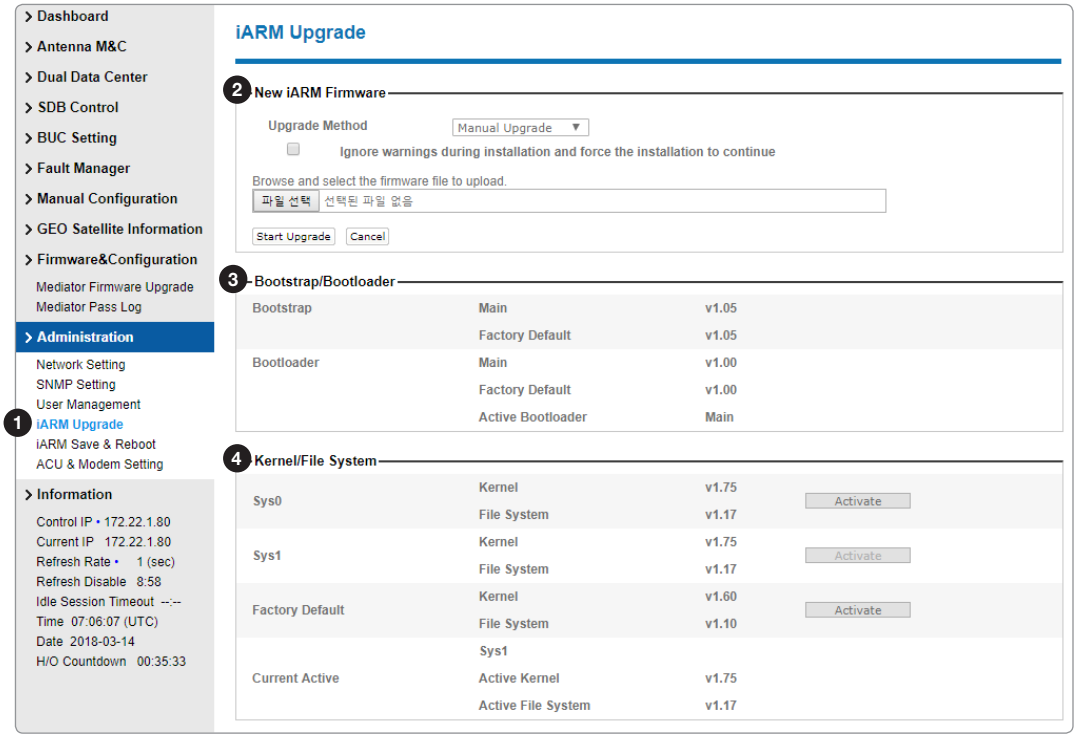
No.	Item	Description
①	SNMP Setting	Can set SNMP configuration.
②	SNMP Agent Configuration	Can retrieve data such as mediator type (Ant, Modem), current RF path, switch selection, modem type, IP information, ACU status, antenna status and switch threshold value. - SNMP V1/V2 Status: Set SNMP mode (Use Attribution Disable, Read Only or Read Write) - V1/V2 Community Name: Set SNMP V2 community name - V3 Authentication Type: Set SNMP V3 authentication mode - V3 Authentication Encoding: Set SNMP V3 authentication mode - V3 Username: Set the V3 username and password of the SNMP Agent. The password is at least 8 character string. - V3 Private Encoding: Set SNMP V3 Private Encoding - V3 Private Password: Set the V3 password of the SNMP Agent. The password is at least character string - TRAP IP/Port: Set the V3 password of the SNMP Agent. The password is at least character string. - TRAP Parameter: Set the SNMP trap specific parameter.

User Management



No.	Item	Description
①	User Management	Change login ID and Password to access the Aptus Web. This setting can be also accessed by ‘Account’ icon on the top menu.
②	Change ID & Password	Change your login ID (username) and password.
③	Change ID	Enter your current login ID (username) and new login ID. Click the Submit button to validate the changes that are made to the login ID.
④	Change Password	Enter your current login password and new login password. Click the Submit button to validate the changes that are made to the login password.
⑤	Change User Settings	Change User Password Expire in days and Idle session timeout.
⑥	Password Expire Timeout	Set password expire in days.
⑦	Idle Session Timeout	Set for Console and for Network Timeout.
⑧	Guest Session Access	Enable or disable access to Web or CLI using guest ID.

iARM Upgrade



No.	Item	Description
①	iARM Upgrade	Upgrade the firmware of iARM module.
②	New iARM Firmware	Select Upgrade Method between Manual Upgrade or Auto Upgrade. With Auto Upgrade option selected, click "Check" button to check automatically if there is new firmware available from the server. With Manual Upgrade option selected, browse and select the firmware file to upload and click "Start Upgrade" button. **NOTE**: Refer to the following "iARM firmware upgrade procedures" page for more details.
③	Bootstrap/ Bootloader	Displays current bootstrap and bootloader version.
④	Kernel/File System	The mediator has 3 storage parts sys0, sys1, Factory Default. Displays kernel and file system version and current Activated part Information.

iARM Upgrade(Manual Upgrade method) procedures:

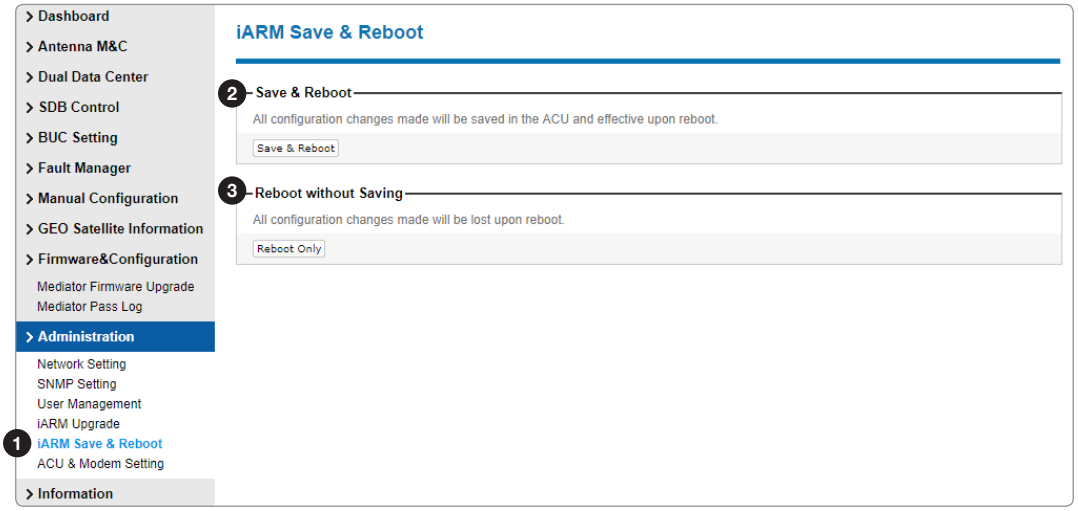
1. Choose "Manual Upgrade" from the pull-down menu of Upgrade Method.

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

NOTE

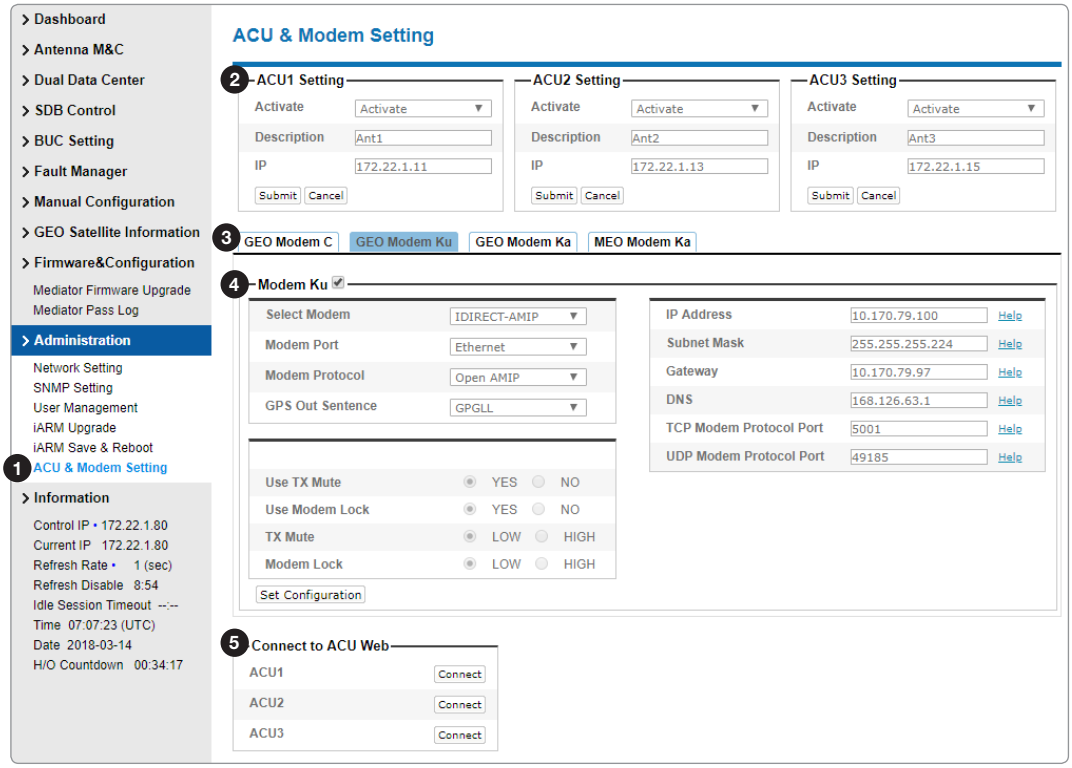
NOTE: When checking the box "Ignore warnings during installation and force the installation to continue" before performing the upgrade, the warning messages do not appear during the upgrade.

iARM Save & Reboot



No.	Item	Description
①	iARM Save & Reboot	Save settings to the mediator and reboot or reboot the system without saving.
②	Save & Reboot	Save the modified settings and reboot the system. Click Save & Reboot button.
③	Reboot without Saving	Reboot the system without saving the modified settings. Click the "Reboot Only" button.

ACU & Modem Setting



No.	Item	Description
①	ACU & Modem Setting	Set ACU & Modem options.
②	ACU1/2/3 Setting	- Set ACU options to communicate Mediator and ACU. - Activate: Activate or Inactivate the ACU communication. - Description: Sets the ACU's description. - IP: Sets the ACU IP address.
③	Modem Type	Set modem options for each band.
④	Modem(xx)	- Select Modem: Select the modem in the drop-down list. (USER SETTING, IDIRECT-I/O, IDIRECT-AMIP, COMTECH-I/O, COMTECH-ROSS, HUGHES, SATLINK_SERIAL, SATLINK_VACP, ELEKTRIKOM-AMIP, GILAT-SE-II, IPSTAR_SOTM) **NOTE**: The MEO(Ka-band) can use COMTECH and VIASAT modem only. - Modem Port: Select the Modem Port in the drop-down list.(RS232, RS422, Ethernet) - Modem Protocol: Select the Modem Protocol in the drop-down list. (I/O Console, Open AMIP, Serial, GPS, ROSS VACP, ELEKTRIKOM-AMIP, GILAT, SOTM) - GPS Out Sentence: Select the GPS Out Sentence in the drop-down list.(GPGLL, GPGGA, Simple GPGGA) - Use TX Mute: Select using TX Mute function. (YES or NO) - Use Modem Lock: Select using Modem Lock function. (YES or NO) - TX Mute: Select the TX Mute type. (LOW or HIGH) - Modem Lock: Select the Modem Lock type. (LOW or HIGH)

No.	Item	Description
④	Modem(xx)	- IP Address: Sets the IP address to Interface with Modem. - Subnet Mask: Sets the Subnet of IP address to Interface with Modem. - Gateway: Sets the Gateway IP. - DNS: Current default DNS Address is assigned to. - TCP Modem Protocol Port: TCP port number for modem protocols using TCP as transport. - UDP Modem Protocol Port: UDP port number for modem protocols using UDP as transport.
⑤	Connect to ACU Web	Connect to ACU 1/2/3 Web page directly using redirect button.


NOTE

NOTE: Ensure to tick the checkbox before modifying the settings. Select 'Set Configuration' button to submit the settings.

Technical Specification

Dimensions		
Satellite Antenna Unit (with Base Frame)	154" : 390cm x 430cm(153.5" x 169.3") 168" : 426cm x 423cm(167.7" x 166.5")	
Antenna Dish Diameter	240cm (94.5")	
	Height	**Diameter**
Radome (168") (with Base Frame)	4,357mm(171.5") (without Base Frame: 4,229mm(166.5"))	Ø4,267mm(168")
Radome (154") (with Base Frame)	4,307 mm (169.5") (without Base Frame: 3,762 mm(148")	Ø3,912mm (154")
Antenna Control Unit	431mm x 380mm x 44.4mm (16.96" x 14.96" x 1.74")	
Intelligent Mediator Unit	431mm X 381mm X 89mm (17" X 15" X 3.5")	

Weight		
	Dual-band	**Tri-band**
Satellite Antenna Unit	480 kg	510 kg
Radome (168") (with base & Air conditioner Frame)	555 kg	554 kg
Radome (154") (with base & Air conditioner Frame)	460 kg	460 kg
Antenna Control Unit	4kg (8.82 lbs)	
Intelligent Mediator Unit	4.5Kg (9.9 lbs)	

Antenna System Performance		
Platform	Three Axis: Azimuth, Elevation, Cross-level	
Positioning	3-axis Velocity Mode Servo Control: Azimuth, Elevation, Cross-Level	
Pedestal Motion Range	Azimuth	Unlimited
	Elevation	-15° to +120°
	Cross-Level	Up to ± 30°
Ship Motions	Roll	± 20° at 8 ~ 12 second
	Pitch	± 10° at 6~ 12 second
	Yaw	± 8° at 15 ~ 30 second
	Turning Rate	Up to 12° /sec & 5°/sec2
Time for Cold Start	Less than 2 minutes	
Tracking Error	±0.2° for Ku-band 0.7 ~1.0 dB RMS (Under ship motion) for MEO satellite	
Power Source	AC 100 ~ 240V, 50/60Hz. The system can operate from both 115VAC or 220VAC (auto switched).	

Power Source	100~240 V AC, 50~60 Hz, 11A The system can operate from both 115VAC or 220VAC (auto switched).	
Ka-Band	BUC	CPI
	BUC Output Power	40W
	LNB	XMW
C-Band	BUC	Comtech
	BUC Output Power	250 W
	LNB	Intellian C-band LNB
Ku-Band	BUC	Comtech
	BUC Output Power	125 W
	LNB	Intellian I-PLL LNB

RF Specification			
		Dual-band	**Tri-band**
Ka-Band	Rx Frequency	17.7 ~ 20.2 GHz	
	Rx Gain	49.2 dBi @ 18.7 GHz	48.2 dBi @ 18.7 GHz
	Tx Frequency	27.5 ~ 30.0 GHz	
	Tx Gain	51.7 dBi @ 28.5 GHz	50.7 dBi @ 28.5 GHz
	G/T over Rx Range at elevation angle > 10 deg.	> 25 dB/K @ 18.7GH (EL deg. = 10º)	> 24 dB/K @ 18.7GH (EL deg. = 10º)
	L-band IF Operation	950-2150MHz	
	EIRP	66.2 dBW @ 28.5GHz (40W BUC : 16dBW Waveguide loss: 1.5dB)	65.2 dBW @ 28.5GHz (40W BUC : 16dBW Waveguide loss: 1.5dB
	G/T over Rx Range at elevation angle > 10 deg.	> 25.1 dB/K @ 18.7GH (EL deg. = 10º)	> 24.1 dB/K @ 18.7GH (EL deg. = 10º)
	CPI (on Axis)	Rx : 18 dB , Tx : 20 dB	
	Polarization	Circular Dual (co & Cross) Pol support • TX-RHCP AND RX-RHCP • TX-LHCP AND Rx-LHCP • TX- RHCP and RX-LHCP • TX- LHCP and RX-LHCP	
	Tx to Rx Isolation	90dBc	
	Off axis EIRP	FCC 25.138	

C-Band	Rx Frequency	N/A	3.625 ~ 4.2 GHz
	Rx Gain	N/A	37.1 dBi @ 3.91 GHz
	Tx Frequency	N/A	5.85~ 6.425 GHz
	Tx Gain	N/A	40.8 dBi @ 6.14 GHz
	G/T over Rx Range at elevation angle > 30 deg.	> 17.9 dB/K @ 3.91 GHz with LNB N.F of 0.3dB measured at the elevation angle of 30deg including the radome.	
	EIRP	shall be at least > 63.6 dBW with a BUC of 250W including the radome.	
	CPI (dB, on Axis)	Rx : 18 dBc , Tx : 21 dBc	
	Polarization	Circular (Rx: LHCP, Tx: RHCP) • TX-RHCP AND RX-LHCP • TX-LHCP AND RX-RHCP	
	Tx to Rx Isolation	80dBc	
	Off-axis EIRP	FCC 25.221	
Ku-Band		**Dual-band & Tri-band**	
	Rx Frequency	10.7 ~ 12.75 GHz	
	Rx Gain	46.5 dBi @ 11.85 GHz	
	Tx Frequency	13.75~ 14.5 GHz	
	Tx Gain	47.9 dBi @ 14.25 GHz	
	L-band IF Operation	950-2150MHz	
	EIRP	shall be at least > 66.86 dBW with a BUC of 125W including the radome.	
	CPI (dB, on Axis)	Rx : 28 dBc , Tx : 27 dBc	
	G/T over Rx Range at elevation angle > 30 deg.	> 27.3 dB/K @ 12.75 GHz with LNB N.F of 0.55dB measured at elevation angle of 30deg including the radome.	
	Polarization	Linear(Co & X-pol) • TX-V AND RX-H • TX-H AND RX-V	
	Tx to Rx Isolation	80dBc	
	Radar rejection	DC to 10 GHz 80dB min	
	Off axis EIRP	FCC 25.222	

Antenna Control Unit (FO-1V50)	
Display	2 Line 40 Character Graphic VFD
Key	Touch Keys
LED Indicator	3 LEDs for Power, Tracking, Error
USB Port	PC Connection Firmware Upgrade Logs Download
Ship's Gyrocompass Interface	NMEA2000 / NMEA0183
GPS	NMEA In/ NMEA Out

PC Serial Interface	RS232 (57600bps, 8, N, 1)
Ethernet Port	RJ45, TCP/ IP connection Support Wi-Fi Connection Support Web M&C Port
Communication with ADU	FSK (400 & 433 MHz)
RF Interface	Fiber Optic (ACU Built-in)
Power Source	100~240V AC, 50~60Hz, 1A

Intelligent Mediator Unit (M3-TB03)		
LED Indicator	3LEDs for Power, Mediator and M&C Server 3LEDs for Antenna 1, Antenna 2 and Antenna 3 12LEDs for Antenna bands	
Ethernet Port	Front Panel	RJ45, TCP/IP connection, Support Web & M&C port
	Rear Panel	Support Web & M&C port, RJ45(8-Ports)
USB Port	Upper Port	i-ARM Connection, Main Connection, Logs Download & Update
	Lower Port	PC or Management Device(57600bps)
Ship's Gyrocompass Interface	NMEA2000 / NMEA0183	
Modem Interface	RS-232C / I/O ports / Ethernet	
BUC Interface	RS232 / I/O PORTS	
PC Serial Interface	RS232 (19200bps, 8, N, 1)	
Channel	• TX: 4X3 Matrix Switch • RX: 3X5 Matrix Switch	
Gain	• TX: 0dB typ. • RX: 10dB typ.	
Gain Control Range(RX Only)	30dB (0.5dB Step)	
Port Isolation	• TX: 45dB typ. • RX: 50dB typ.	
Impedance	• 50ohm: SMA, N-Type • 75ohm: F-Type	
Connectors	• 50ohm: SMA-Type(Female), N-Type(Female) • 75ohm: F-Type(Female)	
Frequency Range	950MHz ~ 2150MHz (Reference Signal: 10MHz, 50MHz)	
Power Source	100 ~ 240 V AC, 50 ~ 60Hz, 1A	
Power Consumption	20W Typ.	

Environmental Specification

Test	Intellian Standard		
Vibration	• MIL-STD-167A-1 • IEC 60945		
Shock	According to MIL-STD-810 and IEC 60068-2-27 (10g/ 11ms, 20g/ 7ms)		
Temperature	Operational	Survival	Storage
	-25 °C ~ + 55 °C	-40 °C ~ + 85 °C	-40 °C ~ +85 °C
Damp Heat	• Preconditioning (3 hours (± 30 min.)) - Temp.: 25 °C ± 3 °C - Humidity: more than 95 % • 9 hours (± 30 min.) at 55 °C ± 2 °C/ 93 % ± 3 % (humidity) 3 to 6 hours temperature fall • 9 to 6 hours at 25 °C ± 3 °C/ more than 95 % (humidity) 2 cycles		
Salt Mist	• Number of spraying: 4 • Storage period in damp chamber: 7days after each spraying, 28 days total • Spraying duration: 2 Hour • Temperature: 25 °C ±10°C • Saline solution: 5%NaCl, PH6.5 to 7.2 at 20°C ± 2°C • Storage temperature: 40 °C ±2°C • Humidity in chamber during storage: 93% +2%/-3% • IEC-60068-2-52		
Cold Test	2 hours at -40 °C ± 2 °C		
Solar Radiation	Operational at +32 ˚C ambient air temperature with the addition of 670 Watt/m^2 of solar radiation per IEC 60945-Annex B.		
Humidity	Operational per IEC 60068-2-30, Test Db, Variant 1		
Altitude	In a stowed configuration for shipping, shall survive without damage when exposed to altitudes to 15,000 feet or 4572 meters.		
Dry Heat	• Relative Humidity: Max. 55 % • 16 hours at 55 °C + 2 hours at 70 °C • Tolerances: Temp.: ± 2 °C • Humidity: ± 10 %		
Waterproof	Resistant to water penetration sprayed from any direction Standard: IPX6		
Wind Speed	125 mph		
Packaging	Comply with ISTA 3. Additionally, packaging shall be designed with proper mechanical bracing to prevent Terminal equipment damage from shipment per ISTA 3.		
MTBF	At least 40,000 hours		

Warranty

This product is warranted by Intellian Technologies Inc., to be free from defects in materials and workmanship for a period of THREE (3) YEARS on parts and TWO (2) YEARS on labor performed at Intellian Technologies, Inc. service center from the purchased date of the product.

Intellian Technologies, Inc. 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.

It is required to present a copy of the purchase receipt issued by Intellian Technologies, Inc. that indicates the date of purchase for after-sales service under the warranty period. In case of failure to present the purchase receipt, the warranty period will begin 30 days after the manufacturing production date of the product purchased.

Any product which is proven to be defective in materials or workmanship, Intellian Technologies, Inc. will (at its sole option) repair or replace during the warranty period in accordance with this warranty. All products returned to Intellian Technologies, Inc. under the warranty period must be accompanied by a return material authorization (RMA) number issued by the dealer/distributor from Intellian Technologies, Inc. and a copy of the purchase receipt as a proof of purchased date, prior to shipment. Alternatively, you may bring the product to an authorized Intellian Technologies, Inc. dealer/distributor for repair.

Appendix A: Power Box Connection

Connect the power cable to the power box and connect the other end into a power supply rated at 100-240V.