Intellian

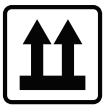
v100Ka

Installation and Operation Manual

Marine Satellite Communication Antenna System

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 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 and be damaged.
	KEEP DRY • Always make sure the antenna is stored on a dried floor. • The antenna can withstand ordinary rain. However it water resistance cannot be guaranteed if submerged. • Keep the antenna in dried place for sufficient ventilation. Do not store the antenna wrapped in a tarp, tent, vinyl, and others.

Serial number of the product

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

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CERTIFICATIONS

C-Tick Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-862, Korea, declare that the product described below to which this declaration relates is in conformity with the requirement of the *Radio communications (Electromagnetic Compatibility) Standard 2008*.

Product Information:

Product Name:	Intellian v100Ka, 1m Ka-band Maritime Stabilized Antenna System

Test Result:

Standard	**Test**	**Test Report Number**	**Result**
AS/NZS CISPR 22 CISPR 22 EN 55022	Conducted disturbance at AC main port	SKT-EET-140040	Pass
	Conducted disturbance at telecommunication port	SKT-EET-140040	Pass
	Radiated disturbance below 1GHz	SKT-EET-140040	Pass
	Radiated disturbance above 1GHz	SKT-EET-140040	Pass

Supplementary Information:

Notified Body Involved: **(Testing Organization)**	SK Tech Co., Ltd. 820-2, Wolmoon-ri, Wabu-up, Namyangju-si, Gyeonggi-do 482-905, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-862, Korea
Place and Date of issue:	Gyeonggi-do, Korea on September 1, 2014

Authority: **Kevin Eom/**
Director,
Research and Development **Signature:**

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EMI Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-862, Korea, declare that the product described below to which this declaration relates is in conformity with the *essential requirements* and *other relevant requirements* of the IEC60945 and IEC61000-4-2~6/11.

Product Information:

Product Name:	Intellian v100Ka, 1m Ka-band Maritime Stabilized Antenna System

Test Result:

Standard	**Ref. Clause**	**Test suite**	**Result**
IEC60945	9.2	Conducted Emissions at main port	Pass
	9.3	Radiated emissions below 30 MHz	Pass
	9.3	Radiated emissions below 1 GHz	Pass
	9.3	Radiated emissions above 1 GHz	Pass
IEC61000-4-2	10.9	Electrostatic discharge (ESD)	Pass
IEC61000-4-3	10.4	Radiated immunity (RS)	Pass
IEC61000-4-4	10.5	EFT/Burst on AC power ports, and signal and control ports	Pass
IEC61000-4-5	10.6	Surge immunity on AC power ports	Pass
IEC61000-4-6	10.3	Injected current (CS) on AC and DC power ports, signal and control ports	Pass
IEC61000-4-11	10.7	Power supply short term variation on AC power ports	Pass
IEC61000-4-11	10.8	Power supply failure on AC and DC power ports	Pass

Supplementary Information:

Notified Body Involved: (Testing Organization)	SK Tech Co., Ltd. 820-2, Wolmoon-ri, Wabu-up, Namyangju-si, Gyeonggi-do 482-905, Korea
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Doc Number IT14-DC0901-06

CERTIFICATIONS

FCC Part 15 Subpart B Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-862, Korea, declare that the product described below to which this declaration relates is in conformity with the requirement of the FCC Part 15 Subpart B.

Product Information:

Product Name:	Intellian v100Ka, 1m Ka-band Maritime Stabilized Antenna System

Test Result:

Standard	**Test**	**Rule section**	**Test Report Number**	**Result**
FCC Part 15 Subpart B	AC power line conducted emission	Section 15.107(a) ICES-003, Section 6.1, Table 2	SKT-EFC-140043	Pass
	Radiation emissions below 1GHz	Section 15.109(a) ICES-003, Section 6.2, Table 5	SKT-EFC-140043	Pass
	Radiation emissions above 1GHz	Section 15.109(a) ICES-003, Section 6.2.2, Table 7	SKT-EFC-140043	Pass

Supplementary Information:

Notified Body Involved: (Testing Organization)	SK Tech Co., Ltd. 820-2, Wolmoon-ri, Wabu-up, Namyangju-si, Gyeonggi-do 482-905, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-862, Korea
Place and Date of issue:	Gyeonggi-do, Korea on September 1, 2014

Authority: **Kevin Eom/**
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Date: **September 01, 2014**

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Doc Number IT14-DC0901-07

R&TTE Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-862, Korea, declare that the product(s) described in the below to which this declaration relates is in conformity with the *essential requirements* and *other relevant requirements* of the Radio and Telecommunications Terminal Equipment(R&TTE) Directive (1999/5/EC).

Product Information:

Product Name(s):	Intellian v100Ka, 1m Ka-band Maritime Stabilized Antenna System

To provide the presumption of conformity in accordance to Annex III(encompassing Annex II) of Directive 1999/5/EC, the following standards and normative documents are those to which the product's conformance is declared, and by specific reference to the essential requirements of Article 3 of the Directive 1999/5/EC.

1995/5/EC Article	**Standard(s) Applied in Full**	**Test Report Number**
SAFETY (Art 3.1.a)	IEC EN 60950-1: 2006+A11:2009+A12010+A12:2011	SKTSCE-121011-044-A1
EMC (Art. 3.1.b)	IEC EN 60945: 2002 ETSI EN 301 489-1 V1.9.2: 2011-09 ETSI EN 301 489-17 V2.2.1: 2012-09	SKT-ECE-140074 SKT-ECE-140076
SPECTRUM (Art. 3.2)	ETSI EN 301 360 V1.2.1: 2006-02 ETSI EN 301 459 V1.4.1: 2007-06 ETSI EN 303 978 V1.1.2: 2013-02	2014 03254752 ETSI1 2014 03254752 ETSI3 2014 03254752 ETSI2

Supplementary Information:

Notified Body Involved:	SIEMC 775 Montague Expressway, Milpitas, CA 95035	
Test Facility:	RF Part:	Nemko USA, Inc. 2210 Faraday Avenue, Suite 150 Carlsbad, CA 92008 USA
	EMC Part	DT&C Co., Ltd. 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935
	Safety Part:	SK Tech Co., Ltd. 88, Geulgaeul-ro 81beon-gil, Wabu-eup, Namyangju-si, Gyeonggi-do 472-905, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-862, Korea	
Place and Date of issue:	Gyeonggi-do, Korea on November 28, 2014	

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INTRODUCTION

Intellian v100Ka Introduction

Intellian v100Ka Features

System Configuration

Intellian v100Ka Introduction

Intellian v100Ka (1.03m) is a Ka-band maritime stabilized antenna, a ready-to-use system for Telenor on their Super-fast Ka Band broadband Satellite service. The v100Ka offers robust Ka-band RF performance optimized for Telenor Satellite Broadcasting's THOR 7 High Throughput Satellite (HTS) Ka-band service.

The v100Ka is built to meet or exceed the industry's most stringent standards such as FCC, ETSI, and R&TTE. With its frequency tuned radome and newly designed reflector, the v100Ka offers the maximized performance on a Ka-band broadband system. The antenna's 3-axis stabilized platform with advanced shock-resistance and vibration damping design of the Pedestal is fully optimized to withstand the demanding maritime conditions which ensures reliable broadband communications. The unlimited azimuth range ensures continuous tracking without unwrapping the cables in the antenna and the low elevation angle (-20°) supports seamless signal reception at extremely high latitudes.

Equipped with Intellian's next generation Antenna Control Software, 'Aptus®', the v100Ka antenna can be remotely accessed, monitored and controlled through serial connection or secured TCP/IP network. Its graphic-based user interface provides and easy-to-use operating environment. The v100Ka also has an embedded webserver and secured web user interface called Aptus Web for remote management of the antenna on a web browser. A Network connection can be easily setup through the front Management Ethernet Port on the ACU that supports automatic IP configuration.

Intellian v100Ka Features

Ka-band optimized reflector
The v100Ka carbon fiber reflector is designed and engineered to operate on the Ka-band while maximizing the RF performance. The reflector of the v100Ka is designed to be extremely precise and very stable in all operating conditions.

Frequency tuned radome
To ensure efficient operations for Ka-band systems, the signal loss of the radome itself is minimized and the performance maximized with an optimized radome design that enhances the Ka-band system performance.

Gyro-free satellite search capability
Intellian's new generation gyro-free satellite search function enables the v100Ka to acquire and lock onto the satellite without an input from a ship's gyrocompass.

Graphical and user-friendly antenna control software
The v100Ka provides a newly developed, graphic-based antenna remote control program with an additional Software Development Kit (SDK), allowing the NOC or service center to integrate antenna monitoring and control into its existing network management systems in an easier, user-friendly, and convenient manner.

Dedicated Management Ethernet Port
The v100Ka has a Management Ethernet Port on the front of the ACU that enables direct and simple network connection between a PC and the ACU. The Management Port allows Internet access and quick access to Intellian's remote management solution, the Aptus Web.

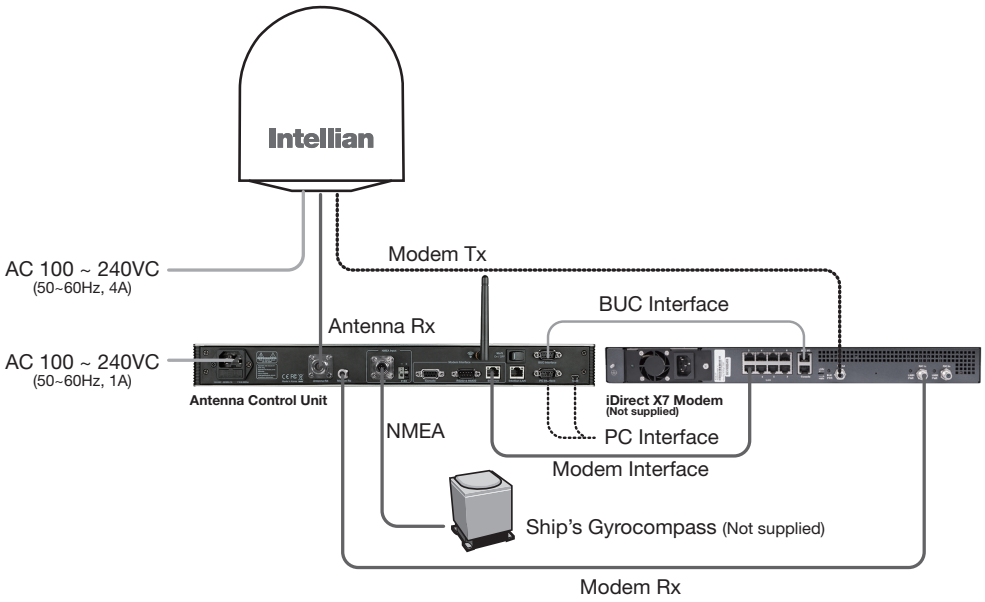
Wireless access via Wi-Fi
The built-in Wi-Fi wireless network card enables the ACU to be wirelessly connected and can be turned on and off by a switch. Wireless devices such as PCs, laptops and smartphones can be used to connect to the ACU and monitor, enabling users to control and change the settings of Intellian antenna system wirelessly.

Intelligent firmware upgrade
Intellian v100Ka provides easy and intelligent firmware upgrade methods. Firmware upgrades can be automatically initiated by plugging a firmware stored USB Memory Stick to the USB Port on the front of the ACU or by launching 'Firmware Upgrade' on the Aptus® or Aptus Web. Users can also manually select a firmware file on a local disk and complete the upgrade. The firmware can be rolled back to a previous version as the ACU's built-in memory stores the current and previous firmware files.

System Configuration

For your satellite communication system to work properly, the system will have to be connected with all of the provided components as shown in the figure below. A separate purchase of a satellite modem, ship's gyrocompass, and Intellian Dual VSAT Mediator may be required.

Basic system configuration



1) Connect an RF cable from the antenna to **Antenna RX** port at the ACU.
2) Connect an RF cable from the antenna to **Tx Out** port at the modem.
3) Connect an RF cable from **Modem Rx** port at the ACU to **Rx In** port at the modem.
4) Connect a LAN cable from Ethernet port at the ACU to RJ45 connector 1 at the modem.
5) Connect the supplied BUC interface cable (Type: D-sub to RJ45) from **BUC Interface** (D-sub) port at the ACU to BUC I/O (RJ45) port at the modem.
6) Connect a ship's gyrocompass to NMEA port at the ACU.
7) Supply ship's power to the system.

INSTALLING THE ANTENNA

System Package

Antenna Unit
ACU (Antenna Control Unit)
Installation Kit

Planning the Installation

Selection of Antenna Installation Site
Setting Block Zones
System Cables
Power Requirement
Tools Required for Installation

Antenna Installation

Unpacking the Wooden Crate
Antenna Dimensions
Antenna Mounting Templates
Position the Radome
Mount the Radome
RF Cable Connections
Secure the RF Cables

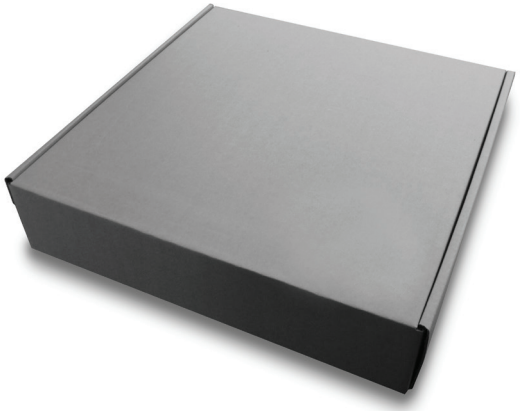
System Package

The packaged Intellian v100Ka includes the Antenna unit, lifting straps, ACU and an Installation kit box.

Antenna unit

ACU

Installation kit box



Antenna Unit

The antenna unit includes an antenna pedestal system inside of a radome. The Pedestal system consists of the satellite antenna dish and RF components mounted on a stabilised pedestal assembly. The radome protects the antenna pedestal assembly from the severe marine environment.

Antenna unit

ACU (Antenna Control Unit)

The digital VFD (Vacuum Fluorescent Display) allows for easy operation of the ACU, even in the dark.

Antenna control unit

Front panel

Rear panel

The functions of the ACU are as follows :

- Setting the satellite
- Editing satellite information
- Setting the antenna parameter
- Setting the antenna manual search
- Setting the LNB local frequency
- Setting block zones
- Setting modem connections
- Setting GPS and Gyrocompass
- Display power status
- Built-in real-time diagnostics function
- Backup and restore the system settings
- Set up the interface with a PC
- Supports Wi-Fi ACU operation
- Recording antenna activities and firmware upgrade through USB
- Built-in web-based remote control management
- Front and rear panel Management Ethernet port

Installation Kit

Contains the items required for securing the antenna unit and ACU to the vessel.

ACU box			
Description	Q'ty	Size	Remarks
Antenna Control Unit (ACU)	1	43.1 x 38 x 4.4cm (17" x 15" x 1.7")	Antenna Control Unit
RF Hazard Sticker	1		Radiation Safety Distance Label
Mounting Template	1		
Wi-Fi Antenna	1	110mm	
USB Flash Drive	1		

Components box			
Description	Q'ty	Size	Remarks
ACU Bracket (Rack)	2		ACU-19inch Rack
ACU Bracket (Table)	2		ACU-Table
RG6 Cable	1	3m	ACU to Modem
AC Power Cord (CEEE7/7)	1	1.5m	ACU Power
AC Power Cord (USA)	1	1.8m	ACU Power
AC Input Cable to Power Box	1	3m	AC Power to Antenna Power Box
PC Serial Cable	1	1.8m	ACU to PC
USB Cable (A-A)	1	1.8m	ACU to PC
Ethernet Cable (RJ45/LAN)	1	1.5m	ACU to PC
iDirect Interface Cable	1	1.5m	ACU to Modem
BUC Interface Cable(D-sub to RJ45)	1	1m	ACU to Modem
D-sub 9 pin Male Connector	1	-	ACU
N to F Adaptor	1		N(Male) to F(Female) Adaptor
Hex Bolt	5	M12 x 100L	Antenna-Deck 4 Sets : Installation 1 Set : Spare
Flat Washer	5	M12	
Spring Washer	5	M12	
Hex Nut	10	M12	
Hex Head Wrench Bolt	5	M6 x 40L	Radome (Spare Bolts)
Spring Washer and Flat Washer	5	M6	
Self-Tapping Screw	5	M4 x 16	Table Mount Bracket
Flat Head Screw	10	M4 x 12L	Rack Mount Bracket ACU
Sems Bolt	5	M3 x 12L	Table Mount Bracket ACU

Planning the Installation

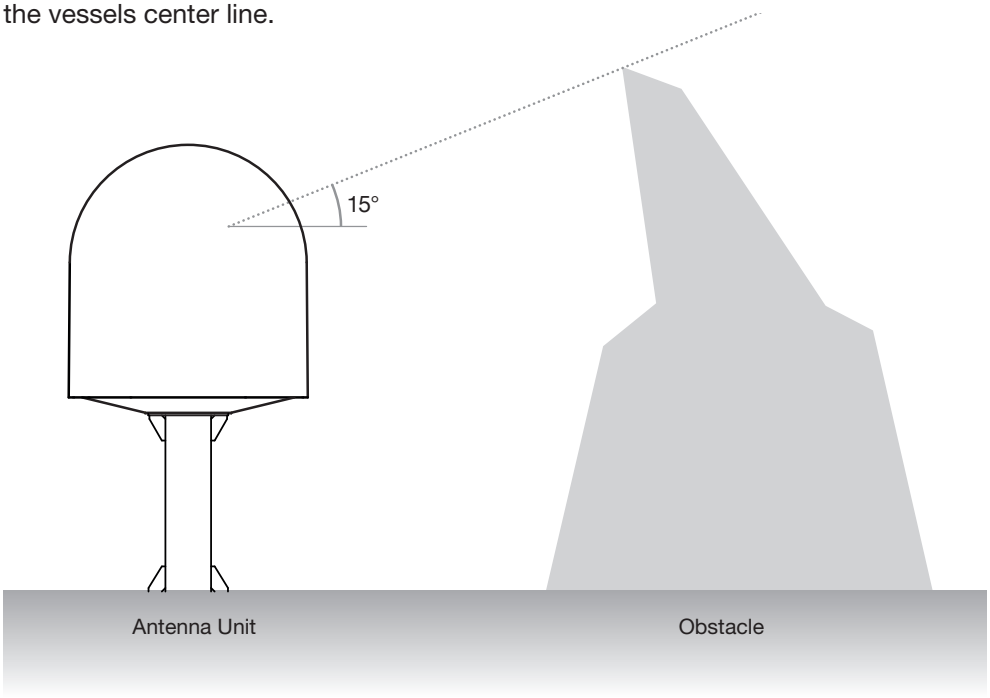
Selection of Antenna Installation Site
Install the antenna in accordance with the following procedures to insure maximum performance of the antenna.

The ideal antenna site has a clear view of the horizon or satellite all around. Please be sure there are no obstacles within 15° above the center of the antenna. Any obstacles can prevent the antenna from transmitting and receiving the satellite signal.

Do not install the antenna near the radar especially on the same plane, as its energy levels may overload the antenna front-end circuits. It is recommended to position the antenna at least 4 feet (1.2 m) above or below the level of the radar and a minimum of 15 feet (4.6 m) away from the high power short wave radars.

The mounting platform should be rigid enough and not subjected to excessive vibration. The movement of the antenna can be minimized by installing on the vessels center line. If these conditions cannot be satisfied, select the best site available minimizing the effects of obstructions, vibrations and position closest to the vessels center line.

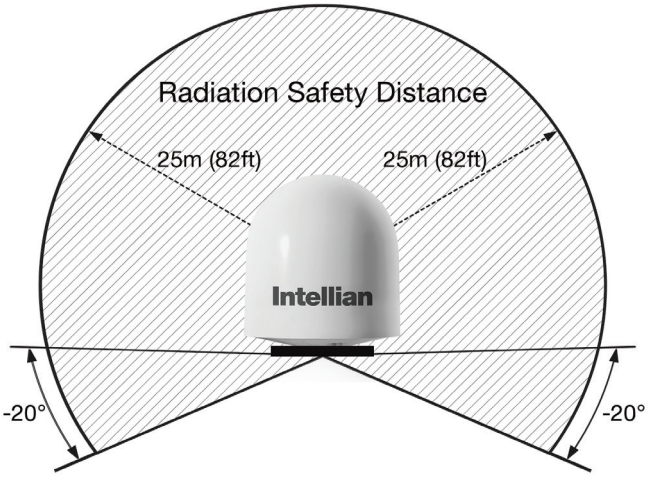
Elevation limit of obstacles



Safe access from radiation hazard

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 25m, based on a radiation level of 5mW/ cm2 that applies under occupational/controlled environment. No hazard exists >20° below the antenna's mounting plane.



Setting block zones

Vessel structures around an antenna may interfere with the reception of the satellite signal. Therefore, It is required to set a block zone which notifies users that the antenna cannot receive satellite signal due to blockages. You can create five block zones by inputting azimuth and elevation values into the ACU. When the antenna is within the block zones, the ACU works as follows.

1. "BLOCK" will be displayed on the ACU screen.

2. Tracking continues as long as the signal level is greater than the predefined threshold value. When the signal level drops below the threshold value the antenna will wait and then re-target the satellite you targeted last. The amount of time the antenna waits before entering search mode is called the "Search Wait Time" and can be adjusted in the parameters settings. The antenna will continue to re-target the satellite until the satellite is re-acquired and tracking can be resumed.

3. A transmit inhibit output from the ACU will disable/mute the modem transmission.

System Cables

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

1. **All cables must be securely correctly and protected from physical damage and exposure to heat and humidity.**
2. **Take note of bend radii of the cables, this is cable dependent and can be confirmed with the specifications of the cable manufacturer.**
3. **Where cables pass though a bulkheads, deck head, walls or other structures, correct methods of security must be followed ensuring protection from water, fire, gas or explosions that make affect the integrity of the vessels structure at this point of cable transit. This should be approved or carried out by the responsible persons on-board the vessel e.g.. the ships electrician .**

• RF Cable (Customer Furnished)

Due to signal and voltage degradation/losses along the length of RF cabling at L-Band Frequencies, Intellian recommends the following 50 ohm coax cable types for standard system installations. For cables that run longer than 200 meters, please consult Intellian Technologies.

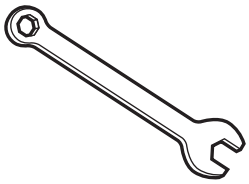
Recommended RF cables

Coaxial Cable Type	Attenuation in dB/100M	Attenuation in dB/M	Recommended Cable Length
LMR300	30.3	0.303	35M
LMR400	19.6	0.196	60M
LMR500	15.9	0.159	80M
LMR600	12.8	0.128	100M
LMR900	8.6	0.086	150M
LMR1200	6.5	0.065	200M

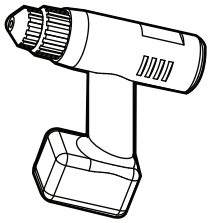
Power Requirement

Intellian v100Ka has been designed to work on a vessel's power supplies rated between 100-240V AC.

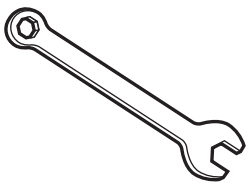
Tools Required for Installation



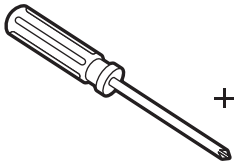
11 mm Wrench/Spanner



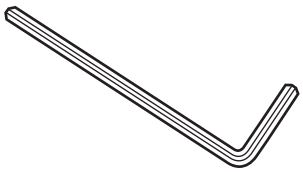
Power Drill



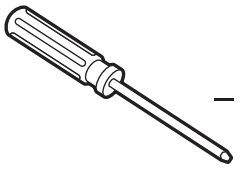
19 mm Wrench



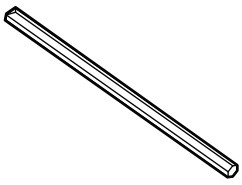
Cross head or
Phillips Screwdriver



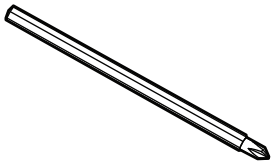
5 mm Allen/Hex key



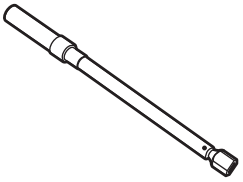
Flat Head Screwdriver



5 mm Allen/Hex key
(for Power drill)



Head Screwdriver
(for Power drill)



Torque Wrench

Antenna Installation

Unpacking the wooden crate of v100Ka

Step 1.

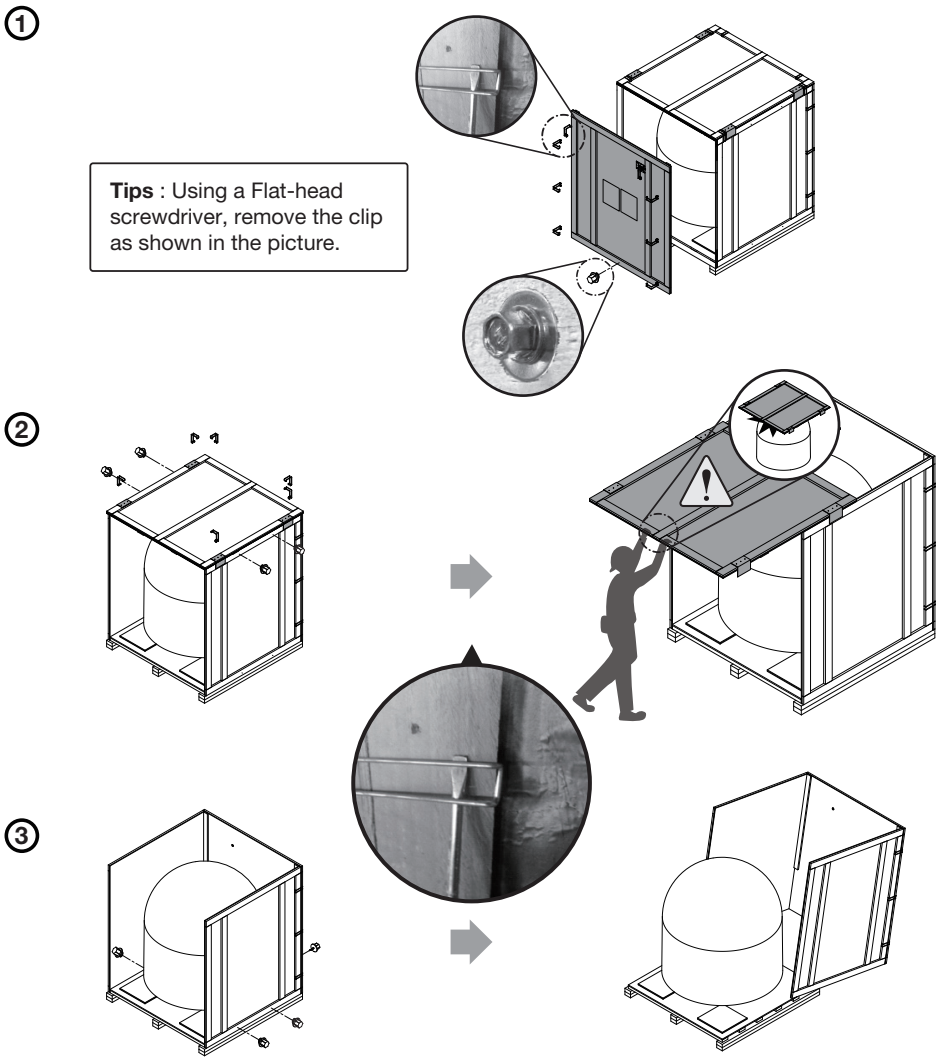
When uncrating the wooden crate, follow the procedures below.

1. Locate one of the side panels designed for fork lift. Detach this side panel by removing the fixing screw (1EA) and clips (8EA).

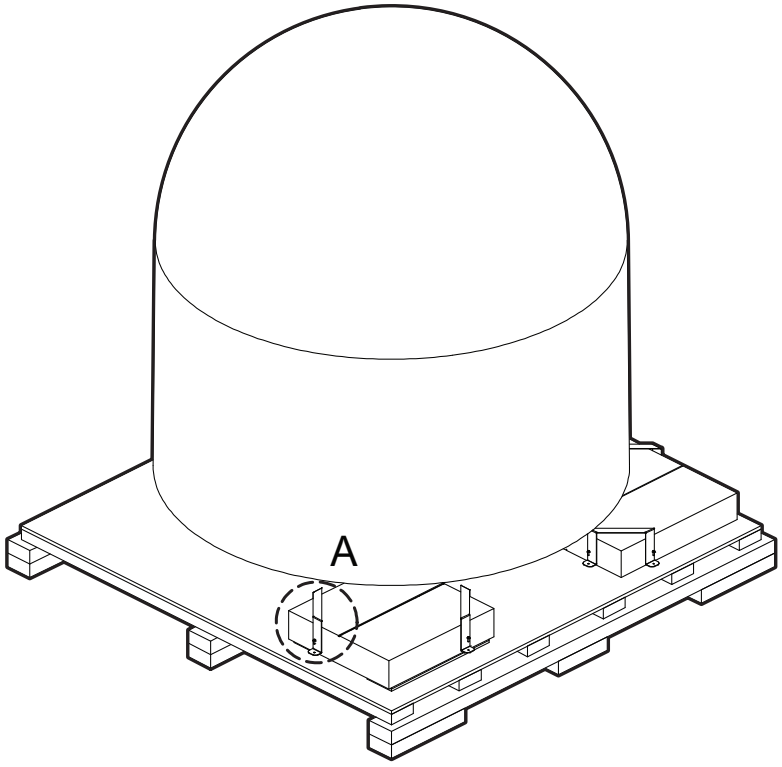
2. Remove the fixing screws (4EA) and clips (6EA) on the top panel. Detach the top panel by carefully pulling it as shown in the picture below.

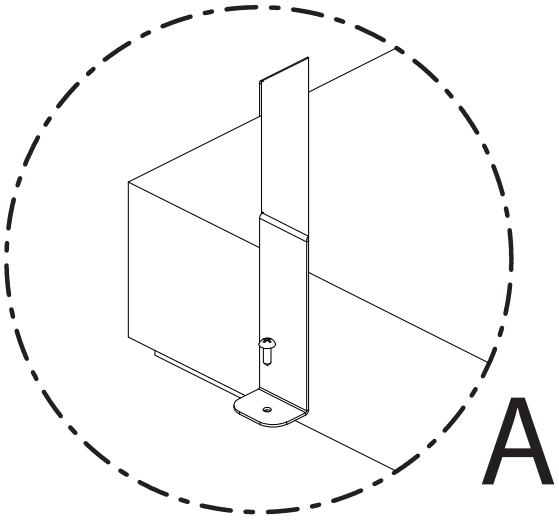
CAUTION : The side brackets at the edge of the top panel secure the side panels and top panel in position. When pulling the top panel, ensure that the top panel doesn't fall on the radome.

3. Remove the fixing screws (5EA) from the remaining side panels, then detach the side panels with clips on.

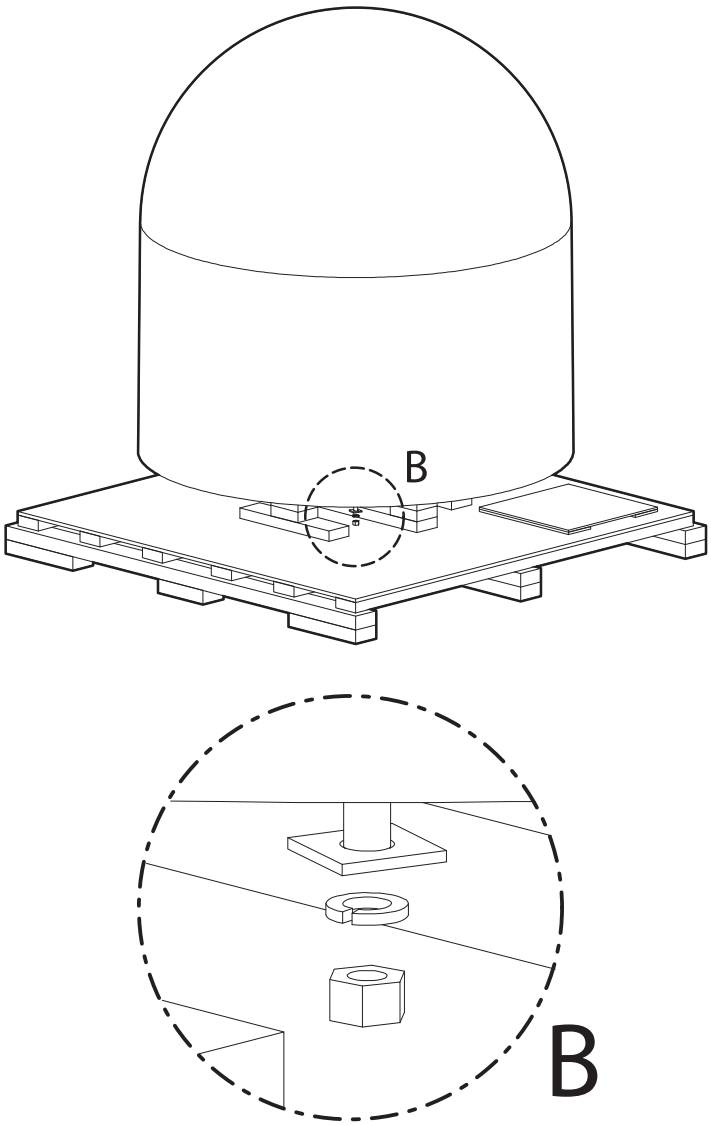


Step 2.
Remove the self tapping screws that secure bracket (A) to the pallet and then remove the ACU and Installation kit boxes.





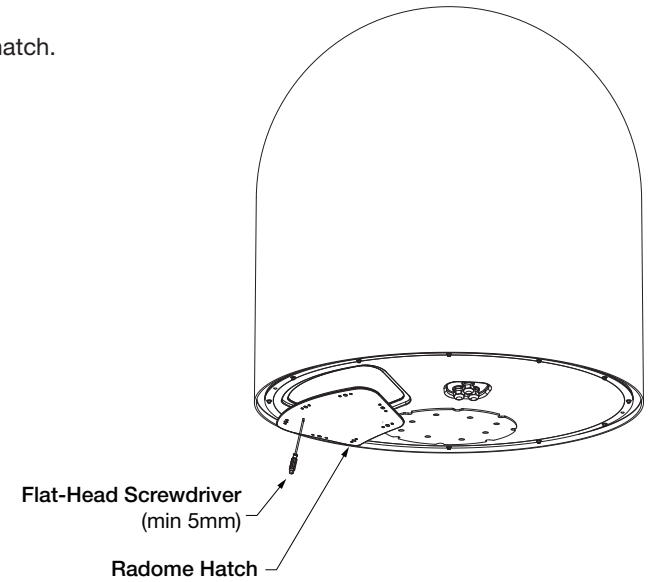
Step 3.
With a 19mm spanner, remove the 4 shipping bolts (B) that secure the radome to the pallet in transit.



WARNING

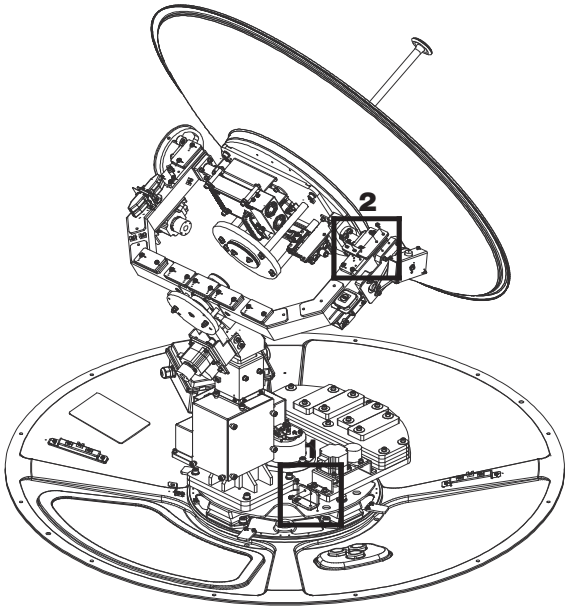
WARNING: When lifting the antenna by using the lifting strap, ensure to disassemble the antenna and the pallet.

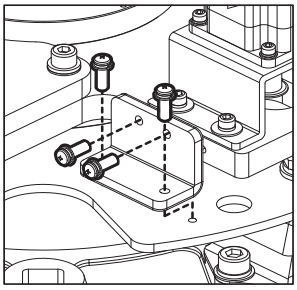
Step 4.
Open the radome hatch.



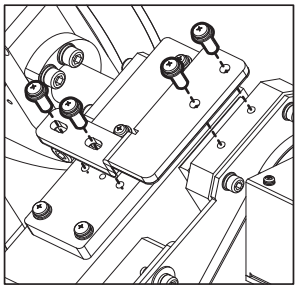
Step 5.
Remove the shipping restraints.

A. Remove the shipping brackets securing the AZ axis and EL axis.



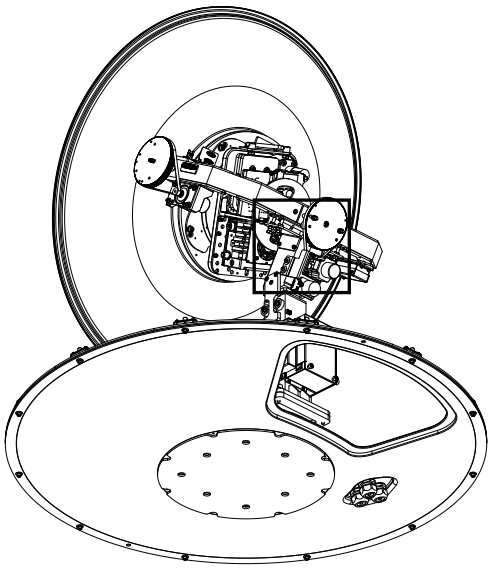


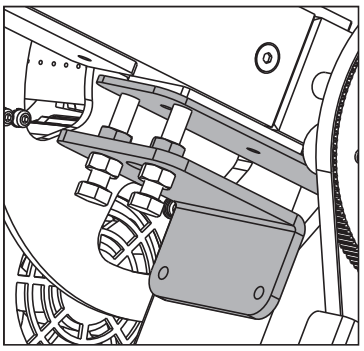
1. Remove the AZ shipping bracket



2. Remove the EL shipping bracket

B. Remove the shipping brackets securing the CL axis.





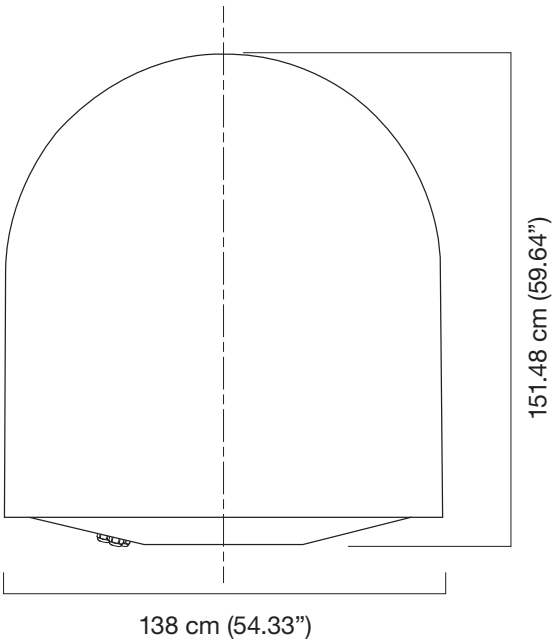
Remove the shipping brackets

C. Re-assemble the top radome and tighten the radome retention bolt (M6) to a torque setting of 3.5 N·m. To ensure security, apply Loctite #242 or equivalent.

Antenna Dimensions

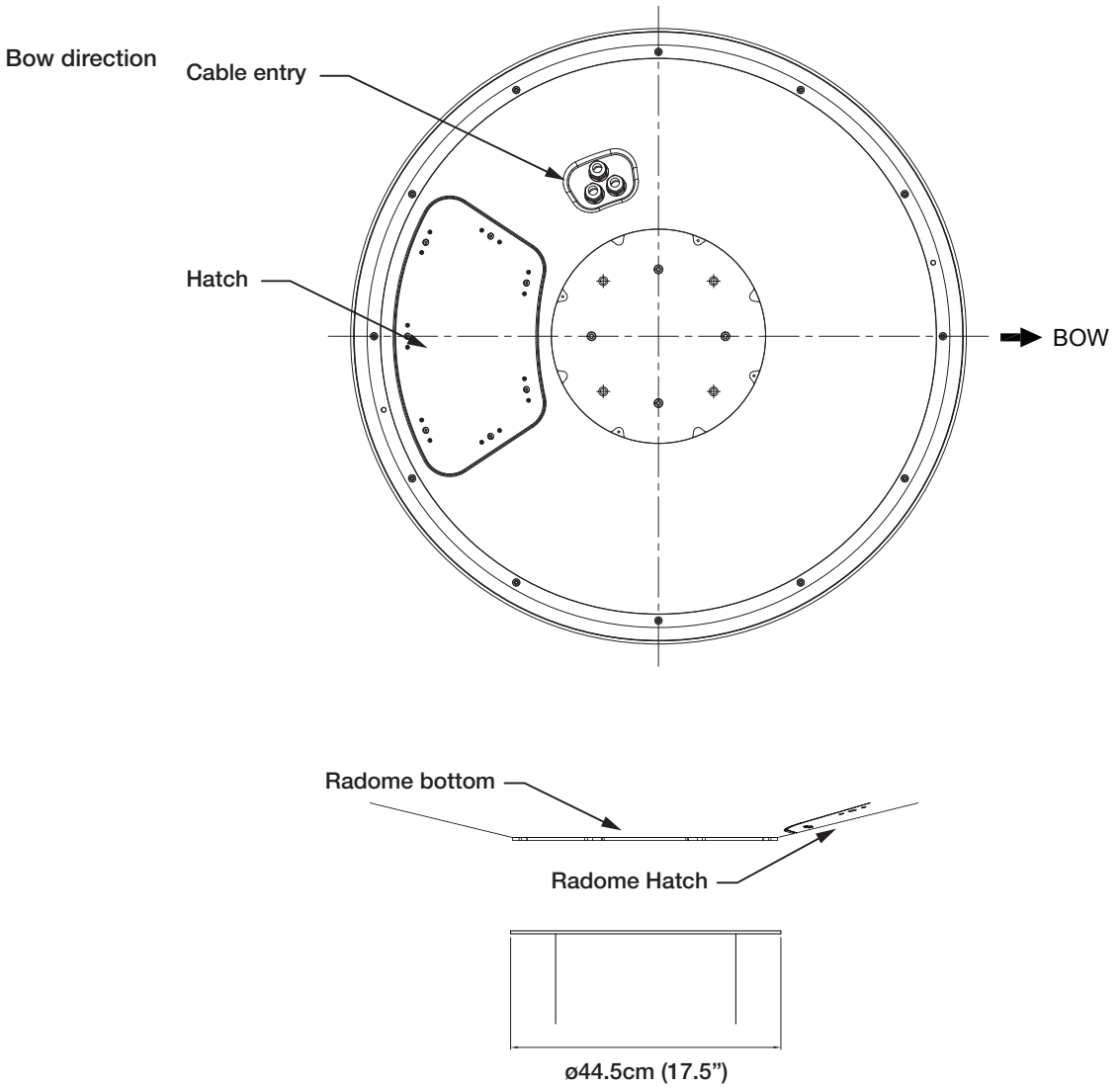
The method of installation and mounting of antenna may vary with vessel design, but the following procedures are applicable in most situations and will result in a secure and effective installation. Confirm the height and diameter of the antenna before installing it.

Radome dimensions

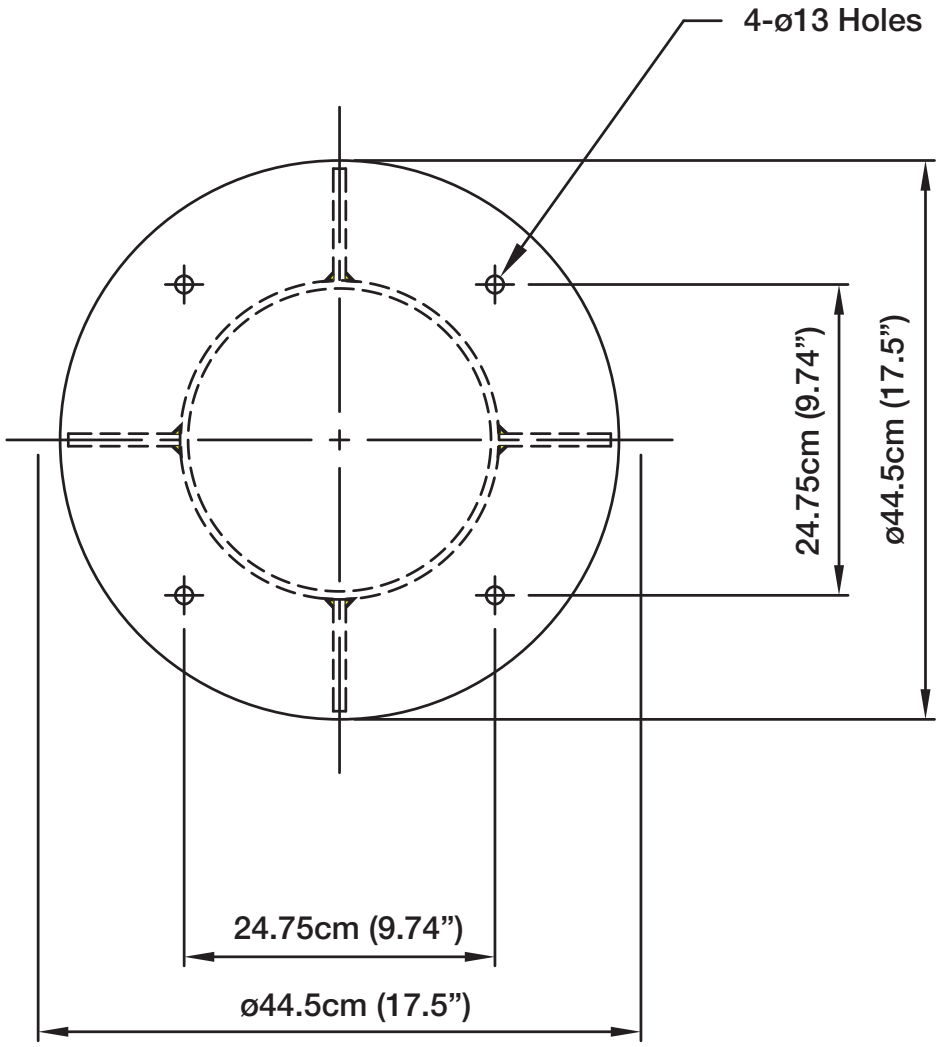


Antenna Mounting Templates

The mounting holes must be in the exact same place as shown in the diagram below.



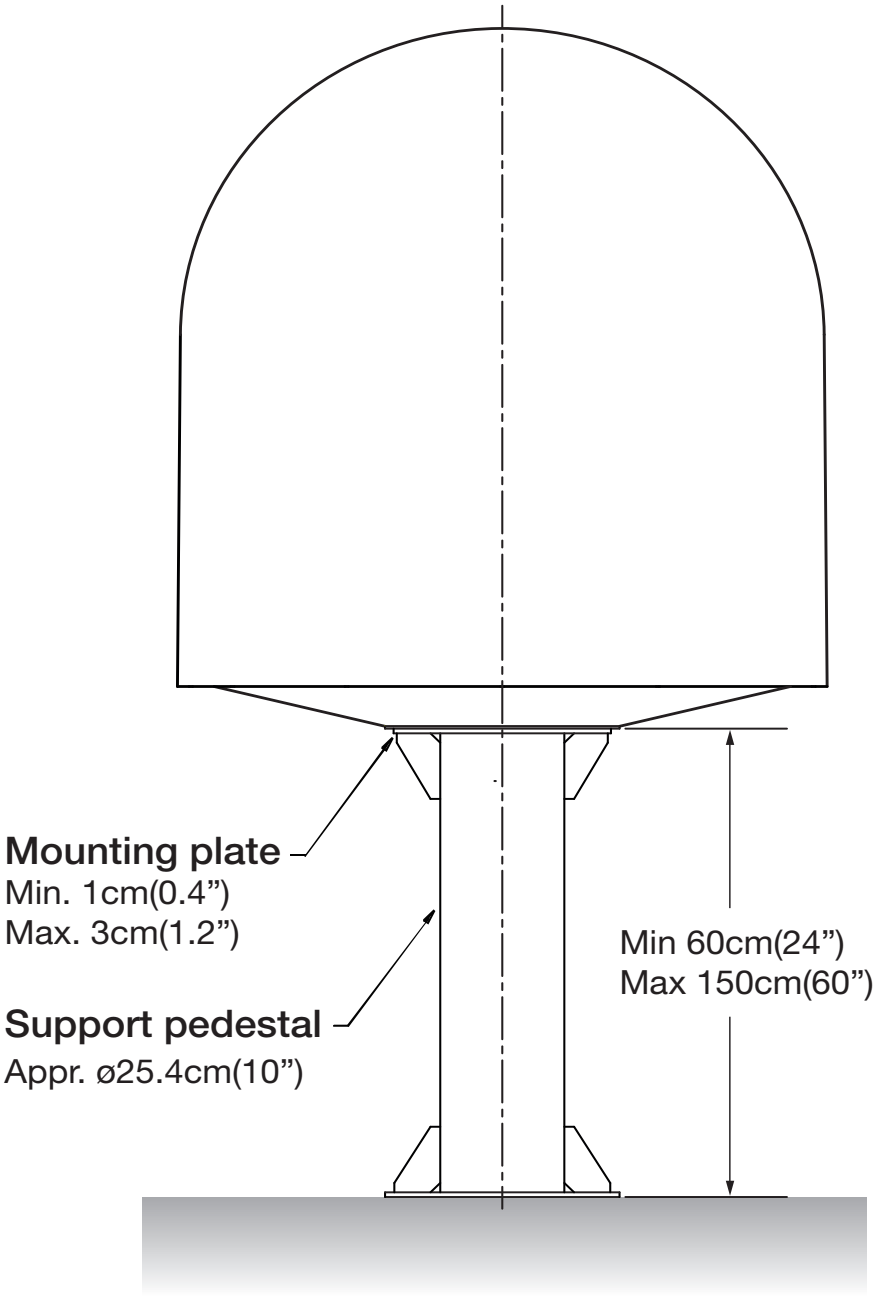
Antenna mounting hole pattern



Position the Radome

The radome should be positioned with the BOW marker aligned as closely as possible to the ship's centerline.

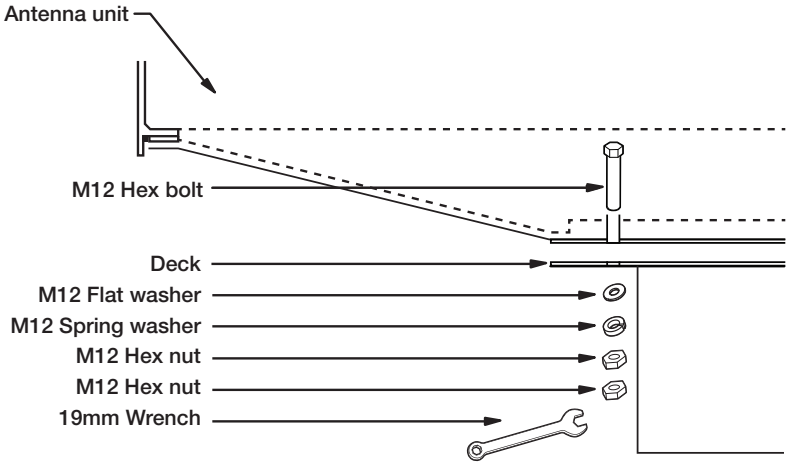
Recommended size of the support pedestal



Mounting the Radome

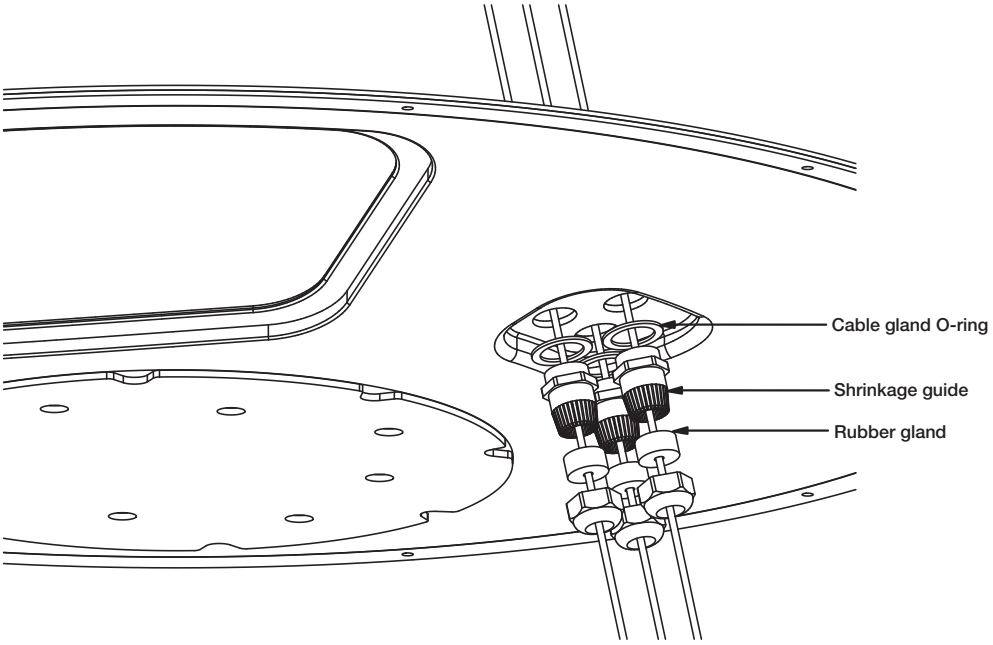
Bolt the radome base directly to the support pedestal.

> **Note:** Make sure to use the Intellian supplied bolts from the accessory box when you mount the radome. Apply Loctite #262 or equivalent to the bolt thread, and fasten it to a torque setting of 110 N·m.

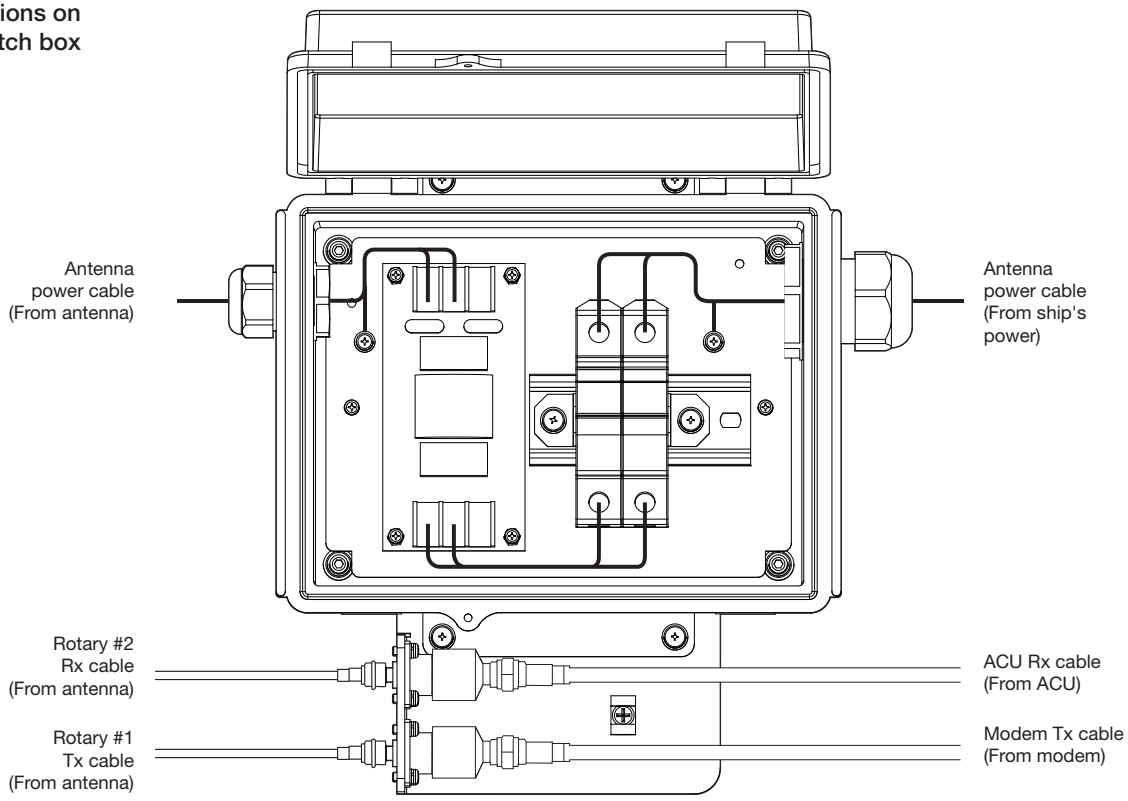


RF Cable Connections

Ensure that the switch on the power box is off during the installation period. When all the cables have been installed, turn on the switch.



Cable connections on power switch box



NOTE:

- Intellian recommends the following size of the input power cable for standard system installations.

Cable Length	Cable Cross Sectional Area	AWG (American Wire Gauge) Size
Up to 100m	2.62mm^2	13
Up to 200m	4.17mm^2	11

- After connection, seal the cable gland and tie the power cable securely in place.
- The antenna power is supplied from the power switch box equipped with the circuit breakers, and the power switch box should be installed near the antenna.

NOTE: Tightening torque

Connector Type	Tightening Torque
F Type	1.0 N-m
SMA	0.6 N-m
N Type	1.5 N-m

INSTALLING THE ACU

Mounting the ACU

19” Rack Mount Type

Table Mount Type

ACU Dimensions

Selection of ACU Installation Site

Gyrocompass Connection

Connecting the System with a Gyrocompass

Connecting the System without a Gyrocompass

PC to ACU Communication Setup

Wi-Fi Connection

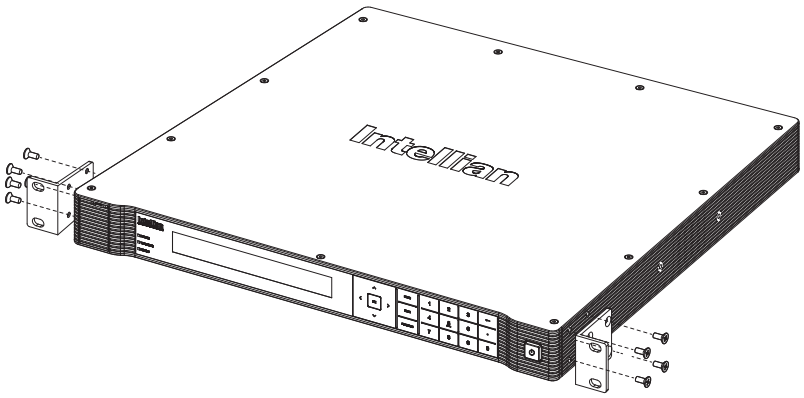
One-touch Commissioning

ACU Connector Guide

Mounting the ACU

Intellian utilizes two mounting methods for the ACU (a) 19" rack mount and (b) a table mount.

19" Rack mount type



19” Rack Mount Type

- The ACU should be installed using the two supplied Rack Mounting Brackets which allow for a side 19” rack mounting configuration.
- 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

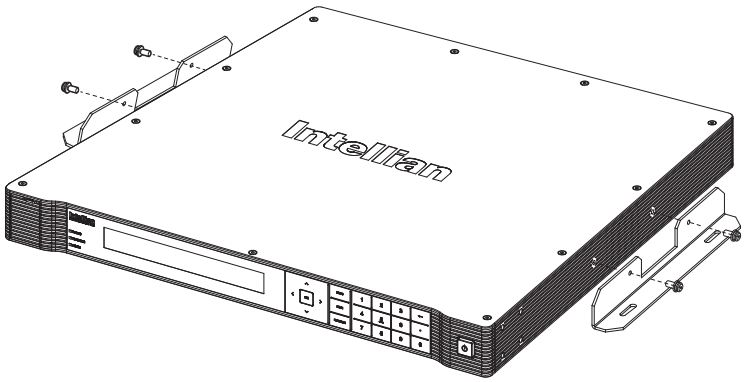


Table Mount Type

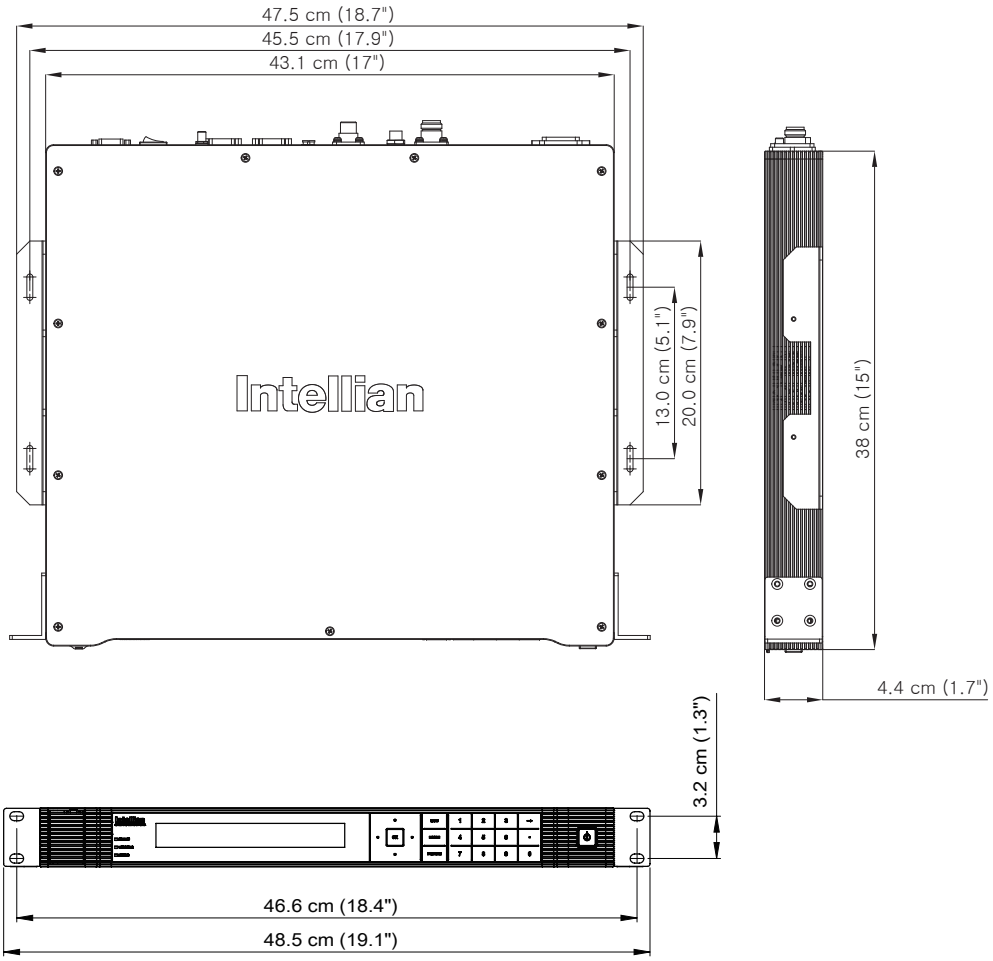
- The ACU should be installed using the two supplied Table Mounting Brackets which allow for a top or bottom mounting configuration.
- Using the Sems Bolt supplied, attach the mounting brackets to the sides of the ACU.
- Place the ACU in the location where it is going to be installed.
- Using a pencil to mark the 4 hole positions (2 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

Dimensions of the ACU



Selection of ACU Installation Site

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

- Dry, cool, and ventilated.
- Good access to the rear should be available for technical work to be carried out.

Gyrocompass Connection

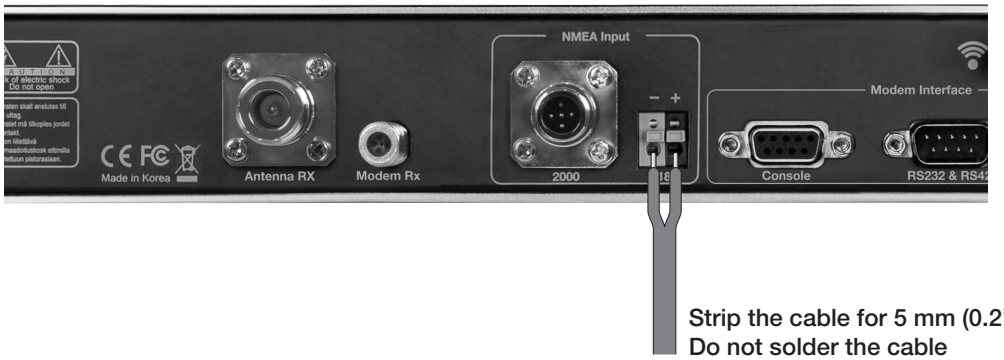
Connecting the System with a Gyrocompass

The ship's gyrocompass provides true heading input to the antenna system which allows the antenna to target and acquire the desired satellite quickly. Intellian always recommends to connect a gyrocompass to the antenna through the gyrocompass interface on the ACU. If the ship's gyrocompass output is other than NMEA 0183 and NMEA 2000, a separate purchase of an NMEA converter is required.

Recommended Cable

- NMEA 0183 / NMEA 2000 Gyrocompass Cable (Customer supplied)
- Connector Type: 2 conductors for NMEA 0183, 5 conductors for NMEA 2000
- NMEA heading sentence: xx HDT (4800 Baud, 8, N,1)
  If there is no HDT sentence, then use HDM sentence instead.
- NMEA 2000 heading PGN Number = 127250 (Vessel Heading)

Gyrocompass connection



Connecting the System without a Gyrocompass

For a vessel where the ship's gyrocompass is not installed or is difficult to be connected, the Intellian Gyro-Free satellite search function will be automatically enabled to allow the antenna to lock onto the desired satellite without requiring an external heading input.

The table below provides an example of the Gyro-Free satellite search algorithm. The Search 1 or Search 3 satellite search pattern will be triggered dependent on either there being a heading source available and the heading devices data being fed to the ACU.

Search 1: The antenna will search for the target satellite by turning its azimuth angle in a CCW (counter clockwise) direction, until the system receives from the modem a carrier lock signal or the NID is identified for a DVB transponder, dependent on the configuration of the system in use.

Search 3: The antenna will search for the target satellite by turning its azimuth angle directly to the position calculated using the ship's heading input and lock onto the satellite.

	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

PC to ACU Communication Setup

Communication with the ACU, using a PC can be established using the following methods.

TCP/IP Connection

Management ethernet port

Connection through Front Panel Management Port

To connect a PC to the ACU front panel Ethernet Management Port, the PC Ethernet port should be set to Obtain an IP address Automatically. To set up the Ethernet pot of the PC follow the steps below.

1. Connect an Ethernet cable from a PC Ethernet port to the Management Port on the front of the ACU.
2. Go to Control Panel > Network and Sharing Center > Change Adapter Settings. Right-click on the Local Area Connection and click Properties.
3. Select TCP/ IPv4, and click Properties.
4. Select the "Obtain IP address automatically" option, all the other fields of this page should then be blank. Click on OK, then close before connecting to the PC.
5. Use the following IP address to access Intellian Aptus® or Aptus Web page.
   - Default IP: 192.168.2.1

Wi-Fi Connection

Setup Wi-Fi Connection

- Setting up the ACU in order to access the system via Wi-Fi.
- Remote Access Confirmation

Setting up the ACU in order to access Wi-Fi

1. Turning on the Wi-Fi switch

Turn on the power switch next to the WI-FI antenna on the rear of the ACU, ensure the red light comes on within 30 seconds.

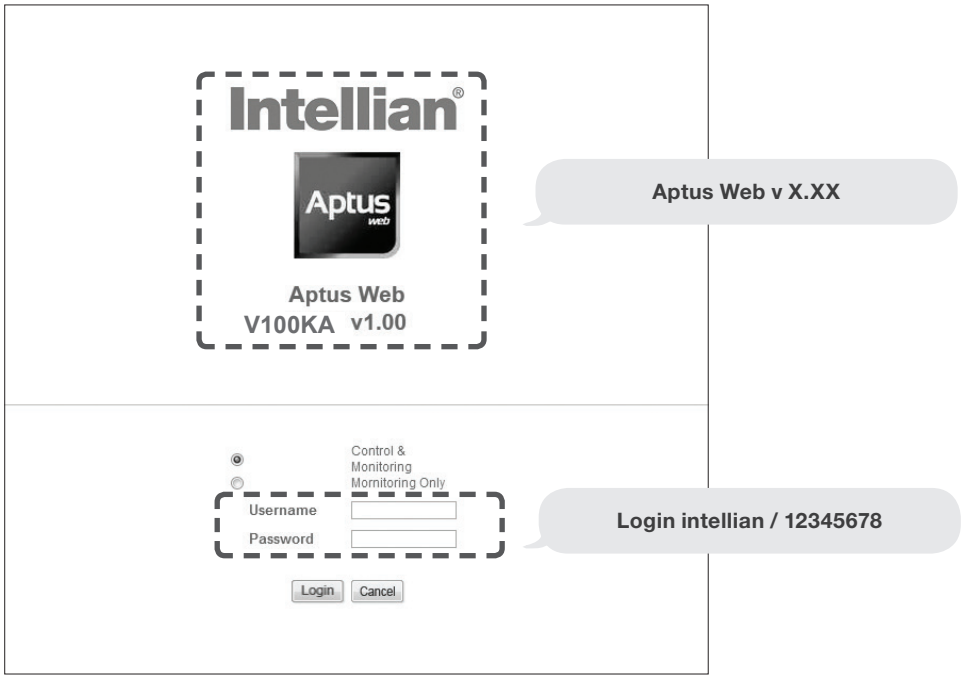
2. Connect Wi-Fi in AP mode.

After clicking on the Windows Wireless Connection icon, click on intellian-VKA (Default).

3. Enter the Network Security Key.

Key: intellian1234 (Default)

4. Through a web browser type in 192.168.2.1, and the following log in page will pop up.



Login by entering the ID / Password listed below.

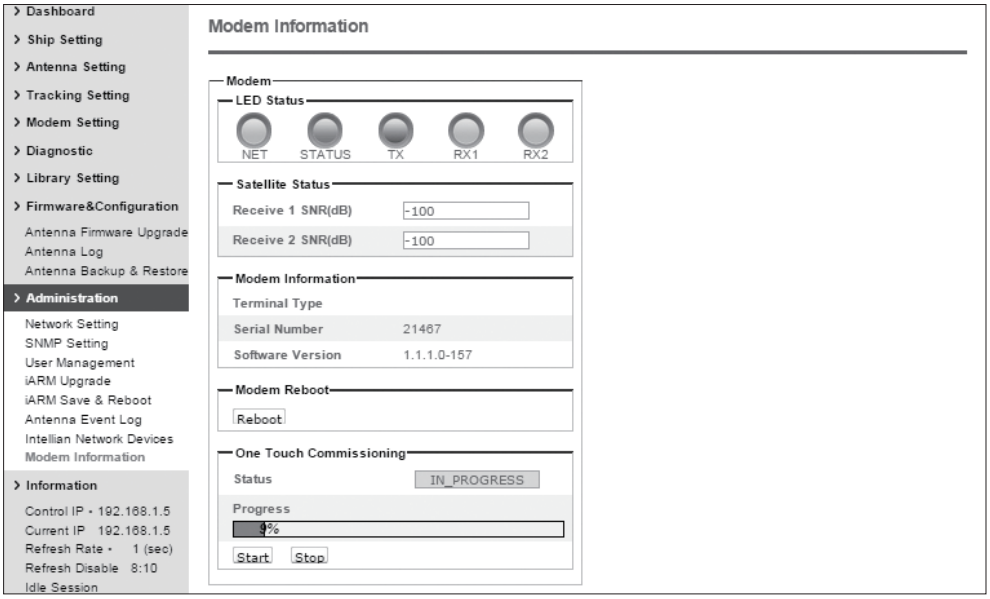
Username: intellian (Default)
Password: 12345678 (Default)

5. When you login, make sure that all the data within every page is being displayed correctly.

One-touch Commissioning

Ensure to perform One-touch Commissioning after the first-time connection of the terminal and the ACU, after cable replacement or Ku-to-Ka conversion.
Take the following steps for One-touch Commissioning.

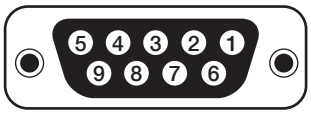
1. Connect an Ethernet cable from a PC Ethernet port to the Front Ethernet Port of the ACU. (See PC to ACU Communication Setup section for details.)
2. Open a web browser on the PC and type the default IP address (192.168.2.1) to access the Aptus web page.
3. Login by entering the ID: intellian (Default) and Password: 12345678 (Default).
4. Click "Administration" > "Modem Information" > "One Touch Commissioning".
5. Click “Start” button and monitor the progress on the web page.



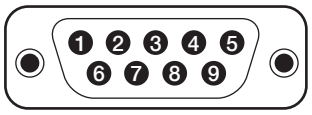
6. Check that Commissioning is complete and “Calibrated” message is displayed. Depending on the modem's version, "Calibrated" message may not be displayed and the modem may reboot.

ACU Connector Guide

• Console port



ACU Console Port
D-Sub 9 pin Female



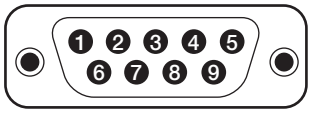
D-Sub 9 pin Male connector
Supplied Component

Pin	Signal
1	GND
2	GPS OUT +
3	MODEM_LOCK
4	MODEM_CTRL1 (TX MUTE)
5	GPS IN +

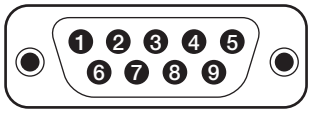
Pin	Signal
6	GPS OUT -
7	MODEM_SIGNAL_IN
8	MODEM_CTRL2
9	GPS IN -

Note: Use Cross Serial Cable for PC Interface. (Intellian supplied)

• PC Interface



D-Sub 9 pin RS232
Connector



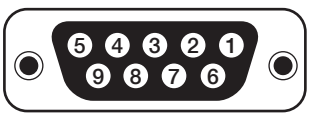
D-Sub 9 pin RS422
Connector

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

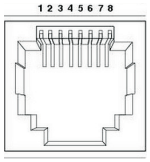
Pin	Signal	Pin	Signal
1	-	6	-
2	RXD +	7	RXD -
3	TXD +	8	TXD -
4	-	9	-
5	GND		

Note: Use Cross Serial Cable for PC Interface. (Intellian supplied)

• BUC Interface



D-Sub 9 pin RS422
Connector



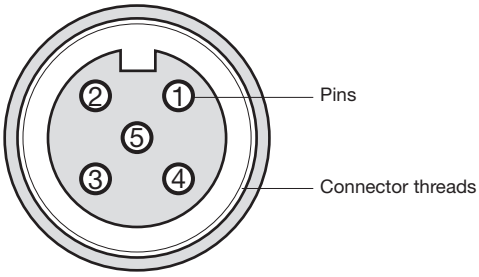
RJ45 Modem
Connector

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

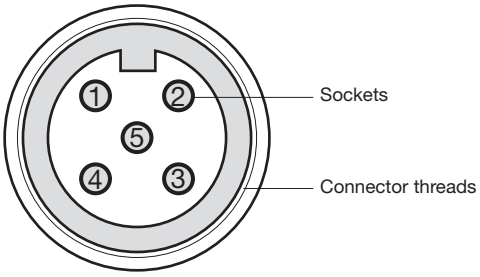
Pin	Signal	Pin	Signal
1	RXD +	6	TXD -
2	RXD -	7	KEYLINE +
3	TXD +	8	KEYLINE -
4	GND	9	-
5	GND		

Note: Use Intellian supplied BUC Interface Cable (D-Sub to RJ45) to connect between RS422 on the ACU and BUC I/O on the modem.

• **NMEA 2000**



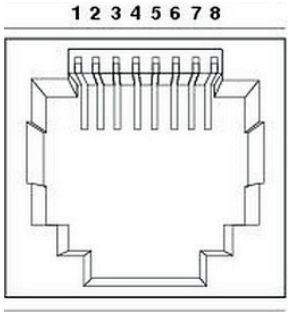
ACU NMEA 2000 port :
male



Supplied component:
female

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)

• **LAN**



ACU LAN port

Pin	Signal
1	TX+
2	TX-
3	RX+
4	NC
5	NC

Pin	Signal
6	RX-
7	NC
8	NC

OPERATING THE ACU

Introduction

Normal Mode

Startup

Monitoring Antenna Current Status

Setup Mode

Antenna Settings

Manual Search
Setup Antenna LNB pol Angle
Antenna Diagnostic Test

Satellite Settings

Load Satellite

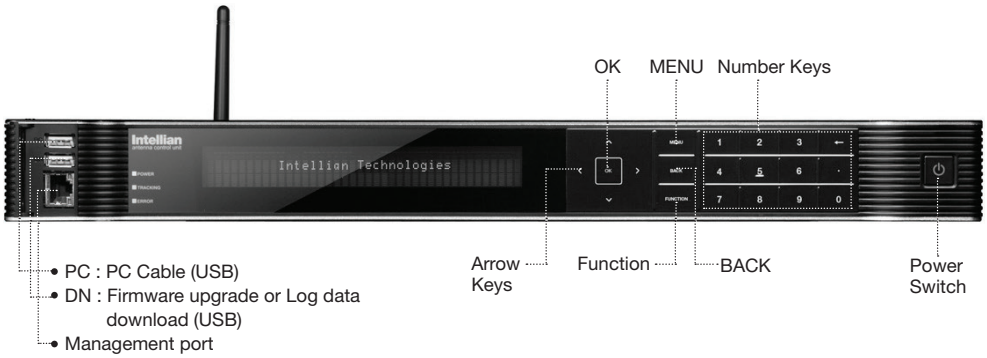
System Settings

Set Location
Management
Key Lock

Introduction

This section of the handbook describes how to setup your system after installing the ACU.

ACU front keys



Touch key functions

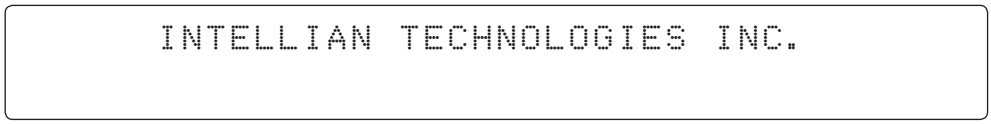
Touch key	Function
MENU	Enter SETUP mode
BACK	In SETUP mode, returns to previous menu or option or saves the adjusted settings. In Normal mode, returns to the first page of antenna current status.
FUNCTION	Saves the adjusted settings.
Arrow keys	Selects from the alternative options to increase or decrease the selected character to a desired value.
OK	Enter next step / menu
Number keys	Inputs the numbers.

Normal Mode

Startup

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

Start up



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 Current Antenna 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

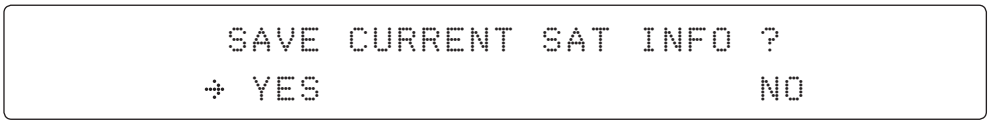
2. The antenna has locked onto the target satellite.
Current IF signal level SIG/ AGC is displayed. SIG will be displayed when NBD (Narrow band detection) mode for TRACKING SIGNAL is chosen to be used and AGC will be displayed when DVB mode of TRACKING SIGNAL is chosen to be used.

The symbol "•" will be only displayed when the satellite signal is strong enough to locked onto.

True azimuth [254.3] position of the antenna is the sum of ships heading 090.0 [HDG] and antenna relative [164.3].

NOTE: However, if the "GYRO TYPE" is set to "NONE" or "NMEA" but without receiving a proper input signal, "---.-" will be displayed at "True Azimuth"

Save current satellite info

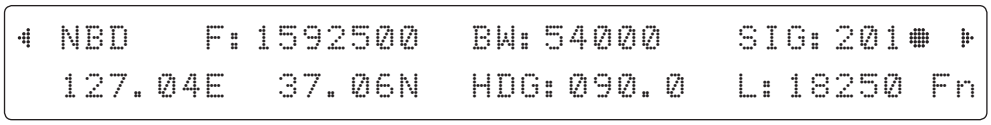


3. Press FUNCTION key to save current satellite information or abort and return to the main display. "Fn" will be displayed only if the antenna is in tracking mode.

Current tracking status

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

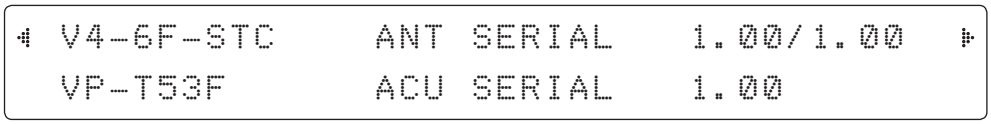
Tracking & Heading information



5. NBD, GPS and ship's heading information are shown.

- NBD (Narrow Band Detection) IF tracking frequency: 1592500 KHz
- Detected Band Width: 54000KHz
- SIG (Signal Level): 201
- W (West)/E (East) Longitude: 127.04 ° E
- N (North)/S (South) Latitude: 37.06° N
- HDG (Ship's Heading): 090.0 degree
- LNB local oscillator (LO) frequency: 18250 MHz

Antenna & ACU versions



7. Press RIGHT arrow key to display the below information.
- Antenna part number, antenna serial number and PCU and Stabilizer firmware version.
- ACU part number, ACU serial number, ACU firmware version.

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

Select USB functions

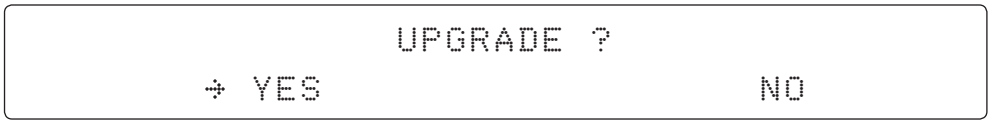
```
[USB FUNCTION]  SELECT USB FUNCTION
                UPGRADE FIRMWARE
```

8.Connect a USB device to the DN USB port on the front panel, then from the status menu pressing either the left or right arrow keys a few times until you see **USB FUNCTION*** menu.

USB FUNCTION*

- UPGRADE FIRMWARE: upgrade the system by using the firmware files (files format: *.FWP) from the specified folder in the USB flash drive.
- COPY LOG 1 WEEK: Copy the log date within a week from the system to the USB flash drive.
- COPY LOG 1 MONTH: Copy the log date within a month from the system to the USB flash drive.
- COPY LOG 3 MONTHS: Copy the log date within 3 months from the system to the USB flash drive.

Upgrade the system



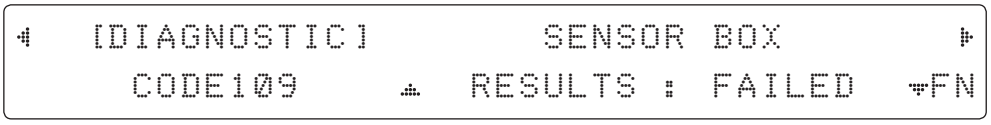
9. Press OK key to upgrade firmware.

Refer to the error messages below if any errors occur.

UPGRADE FIRMWARE
- FIRMWARE FILE NOT FOUND: the system cannot find the FWP file.
- INVALID FIRMWARE: the file is not in a recognizable FWP format.
- MORE THAN 1 FILE EXIST: there is more than 1 firmware file that exists from the specified folder in the USB flash drive.
- CHECK USB CONNECTION: the USB flash drive is not connected.

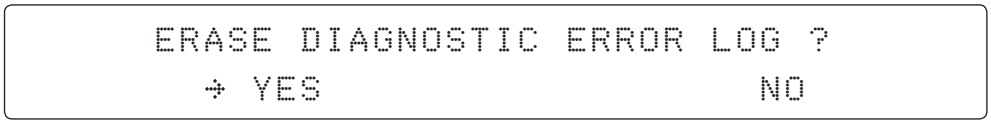
COPY LOG 1 WEEK/ COPY LOG 1 MONTH/ COPY LOG 3 MONTHS
- COPY LOG DATA TO USB [30%]: display the copy progress in percentages.
- NOT ENOUGH SPACE IN USB: USB occupies no memory space.
- CHECK USB CONNECTION: the USB flash drive is not connected.

Real-time diagnostic result



10. Press RIGHT arrow key to display the real-time diagnostic result.
The real-time diagnostics code will display automatically if an error occurs during operation. However, this will not be present if no faults are detected.

Erase error message



11. Press FUNCTION key to erase diagnostic error message.

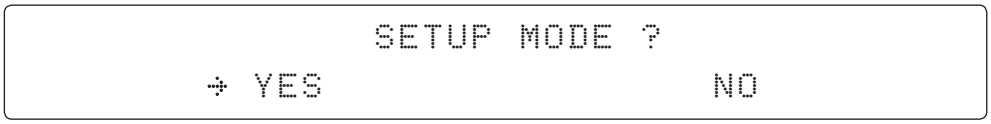
Setup Mode

Enter the SETUP mode. Simply follow the instructions below.

Searching / Tracking mode

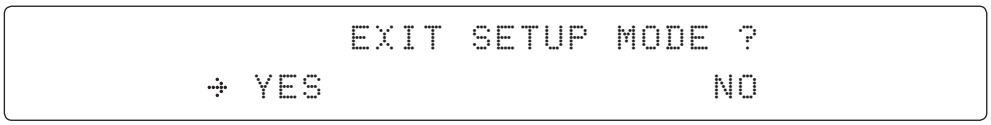
1. While the antenna is in SEARCHING/TRACKING mode, press the menu key to enter the SETUP MODE. If a * appears on the display then the key pad lock function is active (refer to the KEY LOCK menu setup for unlocking the key pad). When key pad lock function is activated Press MENU key or when “Fn” menu is activated Press FUNCTION key then ENTER PASSWORD menu will be displayed.

Setup mode



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

Exit setup mode



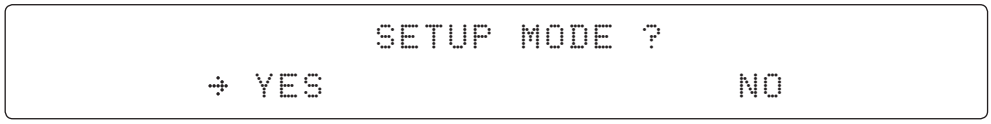
3. While the antenna is in SETUP mode, Press FUNCTION key as shortcut key to exit SETUP mode.

Antenna Settings

Manual Search

Search the desired satellite manually.

Setup mode

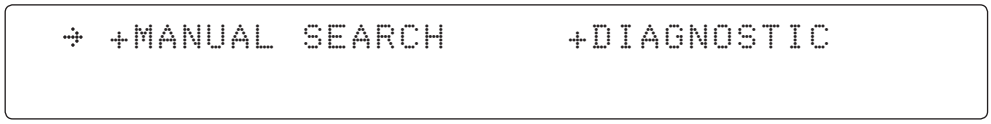


1. Press LEFT arrow key to move cursor to YES and Press OK key to enter SETUP mode.

Antenna menu

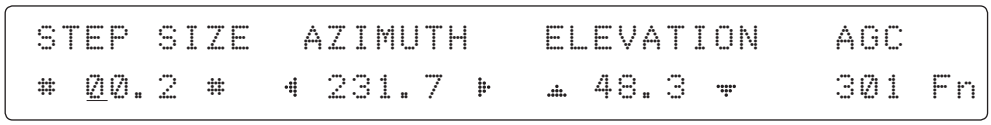
2. Press OK key to enter ANTENNA menu.

Manual search menu



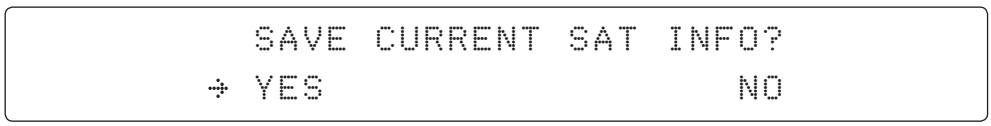
3. Press OK key to enter MANUAL SEARCH menu.

Antenna movement



4. Current IF tracking signal level (AGC)/(SIG/dB scale) is displayed to assist you in manually peaking AZIMUTH (0°-360°) and ELEVATION (0°-90°) angle for best signal level.
To set the step size, type in the value of the desired angle of movement per key stroke on an axis. Using the numerical key pad enter values of 0.1 to 99.9, e.g. 1.0 indicates a 1 degree movement.
Pressing Up and Down arrow keys drive the elevation up and down, and the Left and Right Keys drive the Azimuth clockwise or counterclockwise.Press FUNCTION key to save current settings or abort and return to the main display.

Save



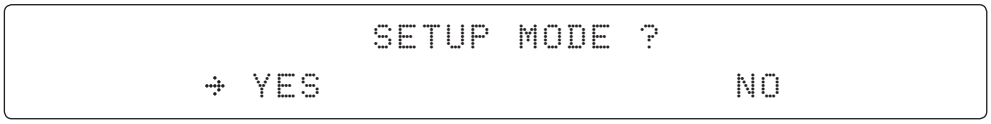
5. If the current settings are able to locate the satellite, Press FUNCTION key to save “current satellite information”. This will help to reduce the satellite acquisition time after restarting the system. Press LEFT arrow key to move cursor to YES and touch the OK key to save the settings.

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

Antenna Diagnostic Test

Refer to the diagnosis codes for the test results.

Setup mode

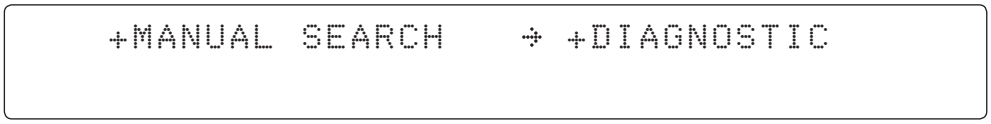


1. Press LEFT arrow key to move cursor to YES and Press OK key to enter SETUP mode.

Antenna menu

2. Press OK key to enter ANTENNA menu.

Diagnostic menu



3. Press arrow keys to move cursor to DIAGNOSTIC menu and Press OK key to enter it.

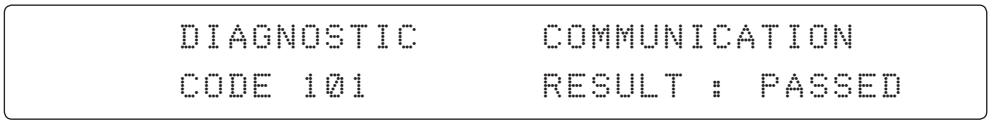
Full diagnostic test

4. Press UP and DOWN arrow keys to select a full diagnostic test or single diagnostic test and Press OK key to execute the selected diagnostic test.
Menus for DIAGNOSTIC are FULL TEST and CODE 101 ~ CODE 116.

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:

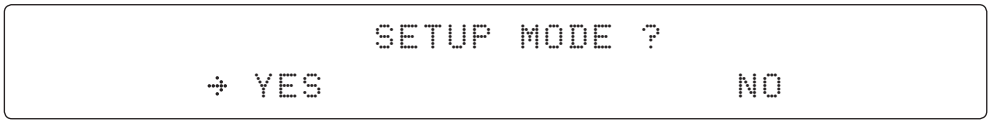
CODE 101: The data communication between the antenna and the ACU is tested.
CODE 102: The azimuth motor is tested.
CODE 103: The elevation motor is tested.
CODE 104: The cross-level motor is tested.
CODE 105: The azimuth encoder is tested.
CODE 106: The cross-level encoder is tested.
CODE 107: The rate 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●●●●●●●●●-●●-●

●: test is passed
2: test has failed (CODE102)
–: test has been skipped (TVRO products only)
?: test is in process

Satellite Settings

Load Satellite

Setup mode



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

Satellite menu

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

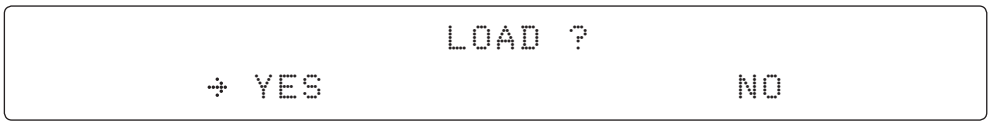
Load sat menu

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

Load satellite

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

Load

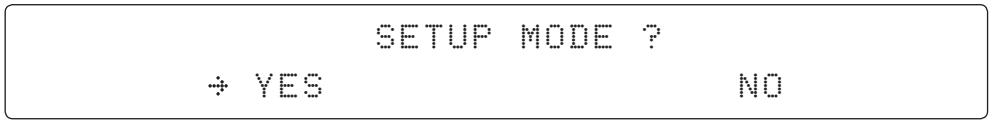


5. Press LEFT arrow key to move cursor to YES and Press OK key to load the selected satellite and execute the current settings. Or Press RIGHT arrow key to move cursor to NO and Press OK key to abort and return to the main display.

System Settings

Set Location

Setup mode



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

System menu

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

Set location menu

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

Gyro type and Baud rate

4. Set the ship's **GYRO TYPE*** and BAUD RATE
A search pattern 1 or 3 will be initiated according to which gyrocompass 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 be initiated automatically if the gyrocompass input does not exist and the gyrocompass type is selected other than GROUND TEST.

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

Gyro 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 LEFT and RIGHT arrow keys until the desired character is underscored (selected).
Press UP and DOWN arrow keys to increase or decrease the value.
Touch the OK key to set the parameter.

Heading

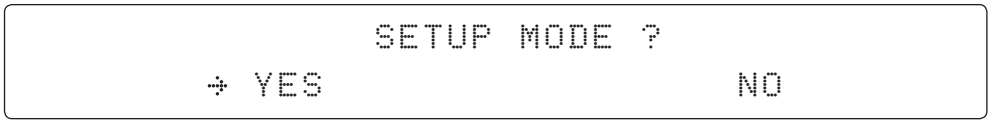
6. Entry of ship's heading is not required when your system is connected to a NMEA(0813) or NMEA2000 Heading Gyrocompass output.
Ensure that the supported gyrocompass type is set correctly. If the ship's gyrocompass output is other than NMEA and Synchro, a purchase of an NMEA converter is required.

Save

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

Management

Setup mode



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

System menu

2. Touch DOWN arrow key to move cursor to SYSTEM menu and Press OK key to enter it.

Backup and restore menu

3. Press arrow keys to move cursor to MANAGEMENT menu and Press OK key to enter it.

Select process type

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

SELECT PROCESS TYPE*

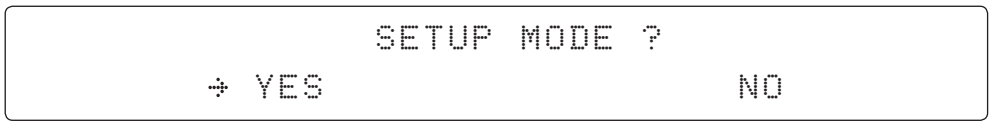
BACKUP USER DATA: To backup the antenna settings set by user to the ACU.
RESTORE USER DATA: To restore the antenna by using the backup user data stored from the ACU.
DEFAULT ACU-REMOTE P/W: to default ID and Password of the Web Server.
UPGRADE FROM USB: to upgrade the system by using the firmware files from a specified folder in the USB flash drive.
COPY LOG TO USB: to copy the antenna log data from the system to the USB flash drive.
BACKUP TO USB: To backup the antenna settings to a specified folder in the USB flash drive.
RESTORE FROM USB: To restore the antenna by using the backup user data from a specified folder in the USB flash drive.
UPGRADE ACU-REMOTE: To upgrade the system using the Remote Access firmware file (ETSW-fs-XXX.bin) from a specified folder in the USB flash drive.

NOTE: UPGRADE FROM USB, COPY LOG TO USB, BACKUP TO USB, RESTORE FROM USB and UPGRADE ACU-REMOTE options are displayed only if the USB flash drive is plugged into the USB port located in the front panel of the ACU.

Processing

Key Lock

Setup mode



1. Touch LEFT arrow key to move cursor to YES and touch OK key to enter SETUP mode.

System menu

2. Touch DOWN arrow key to move cursor to SYSTEM menu and touch OK key to enter it.

Key lock menu

3. Touch arrow keys to move cursor to KEY LOCK menu and touch OK key to enter it.

NOTE: INTELLIAN DEVICE menu is not operated in this ACU.

Set key lock and password

4. Touch UP and DOWN arrow keys to choose whether or not to use key pad lock when entering the SETUP mode or saving the satellite information. Setup the password for entering the key pad lock. The factory default is 1590.

Check key lock activation

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

Aptus®

Introduction
Requirements

Software Installation

PC to ACU Communication Setup
Starting Aptus®
Establishing a data communication

Toolbar Menus

System Property Status Dashboard

Work View Tabs
Antenna - Basic Info.
Antenna - Advanced Info.
Satellite (Satellite View)
Graph View
Monitor
Diagnostic/Modem
GUI
Work View functions

Introduction

Intellian's new VSAT Antenna PC Controller Software, Aptus® is a next-generation graphically based antenna remote control software. Aptus® allows users to easily and conveniently set up the antenna by using a personal computer.

The minimum PC hardware and software requirements to install and run Aptus® are as follows:

Requirements

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

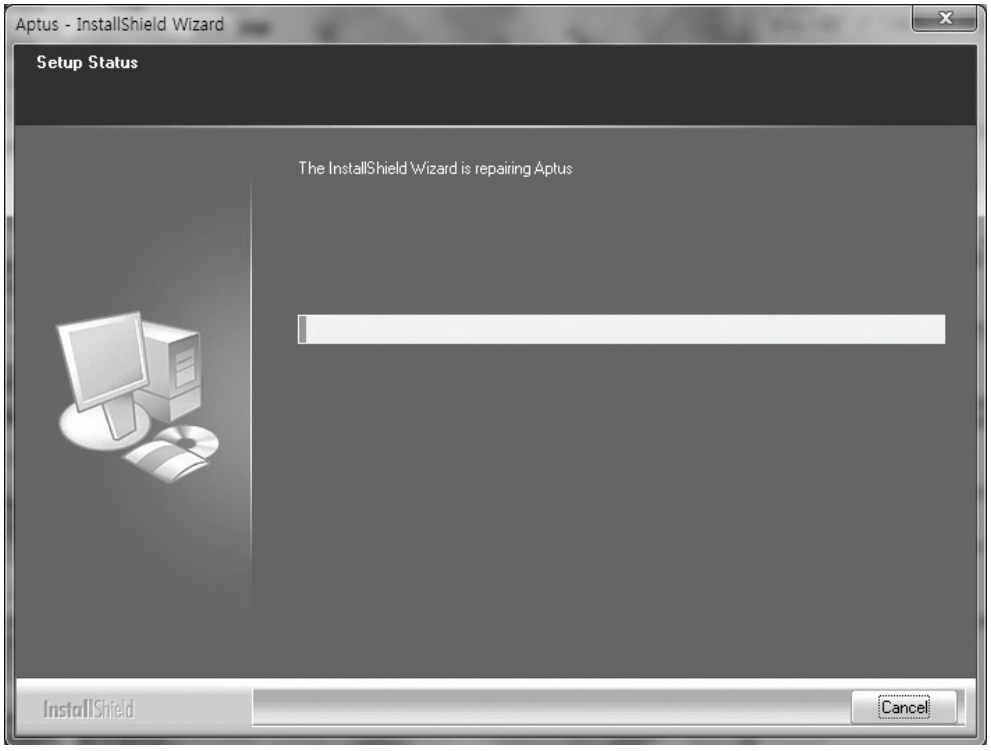
Operating System and Software

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 ‘Aptus for v-Series Setup.exe’ 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.

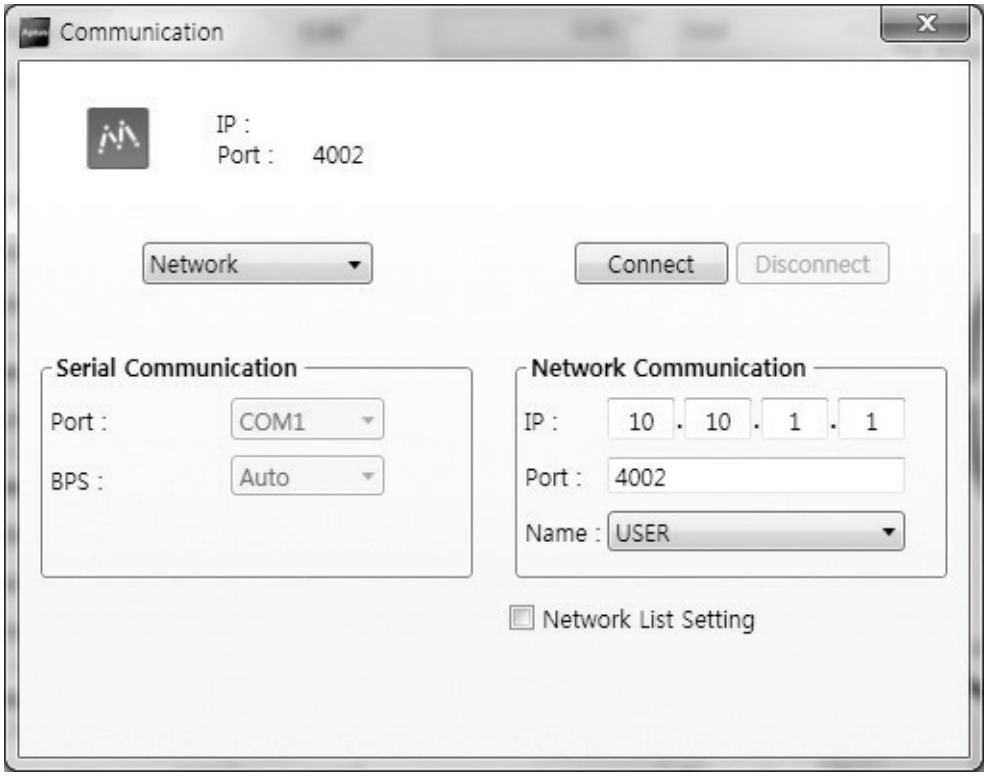


Click the icon to start the software. In addition, Intellian also provides patch files for software upgrade.

PC to ACU Communication Setup

Starting Aptus®

Double-click the Aptus® desktop icon. The Communication Window will appear to establish the data communication between your PC and the ACU. Select your choice of connection method to access your ACU through either the Serial Port Communication or the Network Communication (TCP/IP).



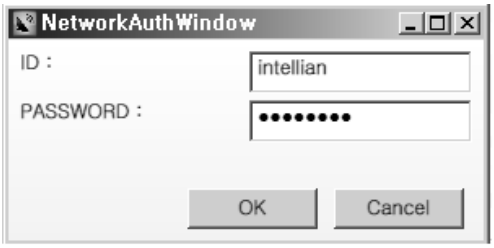
Establish a data communication

Access ACU through Serial Communication

1. Connect a 9 pin serial cable between the PC INTERFACE connector on the ACU and the 9 pin serial port on the PC. (Or you can use a USB cable to setup serial connection between a PC and the USB port on the ACU.)
2. Select serial at communication type combo-box.
3. The baud rate of the ACU is 57600.
4. Select a COM port which is not occupied by other devices.
5. Click the Connect button.

Access ACU through Network Communication (TCP/IP)

1. Turn off the wireless connection while using this method.
2. Connect your PC to the Management Port. (See 'PC to ACU Communication Setup' section for other network connection methods.)
3. Select Network at communication type selection box.
4. Enter in the ACU's IP address (Factory default : 192.168.2.1)
5. Enter in the ACU's port number (Factory default : 4002)
6. Click the Connect button then the Authentication window will appear.
7. Login by using the username and password below:
   - Username: intellian (Factory default)
   - Password: 12345678 (Factory default)



NOTE: If the remote access PC is located in the same network group with the ACU, the ACU can be accessed through the internal IP address. But, if the remote access PC is located outside of the network group, the ACU's IP address should be changed to the IP address assigned by the network service provider.

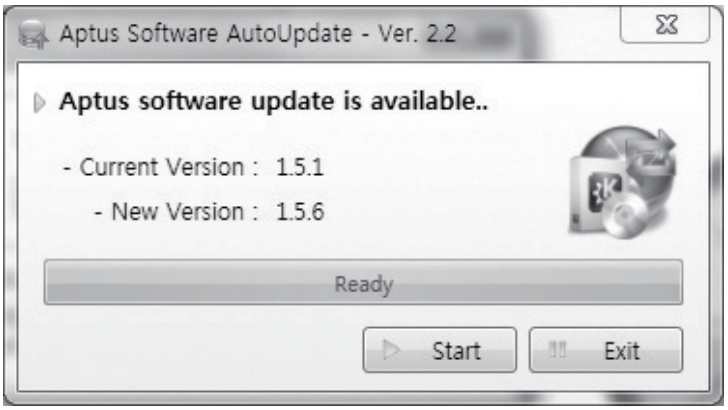
WARNING

WARNING:

- Do not plug a USB to the ACU while TCP/IP communication is in use. Doing so will disable current PC Software Control because the USB connection has higher priority than TCP/IP connection.
- The amount of data will increase rapidly if Network Communication is in use. Intellian recommends using Aptus Web.

AutoUpdate

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



1. When Aptus® is started, it automatically checks the latest software version from the server and runs AutoUpdate if new version is available.

2. Current software version information is displayed.

3. It notifies new software version information.

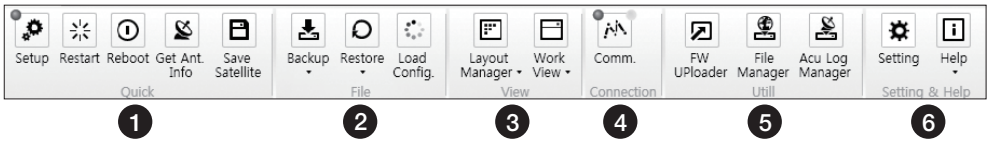
4. When you click the “start” button, “File downloading…” message is displayed while downloading files from the server.

5. When file downloading is finished, “installing…” message is displayed and Aptus patch runs. The installation starts by InstallShield.

6.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 Menus

The toolbar menus at the top of the screen display command buttons of the most commonly used functions of the Aptus®. The toolbar menus consists of four main menus: Quick (for quick launch of functions), File (for file backup, restoring and loading), View, and Connection.



① **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 the satellite. The satellite acquisition time can be reduced significantly after the antenna is restarted.

② **File**

Backup: backups the antenna information to ACU or PC.

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

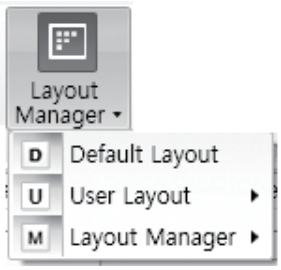
NOTE: Both *.rpt and *.ibf files contain antenna information. However, while *.ibf file can be used for restoring antenna information, *.rpt file is stored as plain-text for viewing purpose only. Users can open the *.rpt using text editors such as notepad software.

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

- Select 'From ACU' to restore the antenna by using the stored information in ACU.
- Select 'From PC' to restore the antenna by using the stored information in 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.

③ **View**



- **Layout Manager:** provides default layout, user layout and layout management options.

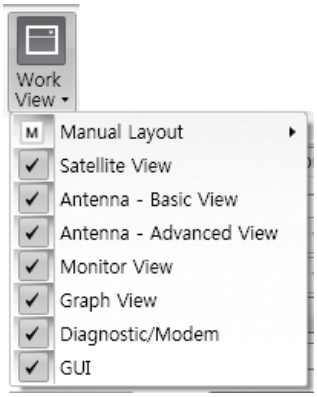
- Default layout returns the current layout to the default layout.

- User layout displays the layout list that the user previously stored using Layout Manager option. The selected layout from this list will be constructed in Work View screen. The 'Basic layout' is a default view.

- Selecting 'Layout Manager' > 'Add current layout' opens a pop up window. Type in a 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 'Layout Manager' > 'Save current layout' option. The current layout will be saved with changes.

- To remove a layout, select 'Layout Manager' > 'Delete layout' option. Select a 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. It also provides Manual Layout setting option by which the user can select a layout designed for a specific Intellian model.

④ Connection

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

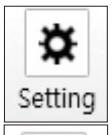
⑤ Utill

- **Firmware Uploader:** provides the user with the latest firmware version and updates firmware by simple steps.

- **File Manager:** display the latest firmware and library file available on Aptus Server. Select a desired firmware and download to the local PC. The firmware that matches to the antenna in use is highlighted.

- **ACU Log Manager:** displays the antenna log data in calendar view which is downloadable directly to a desired path.

⑥ Help

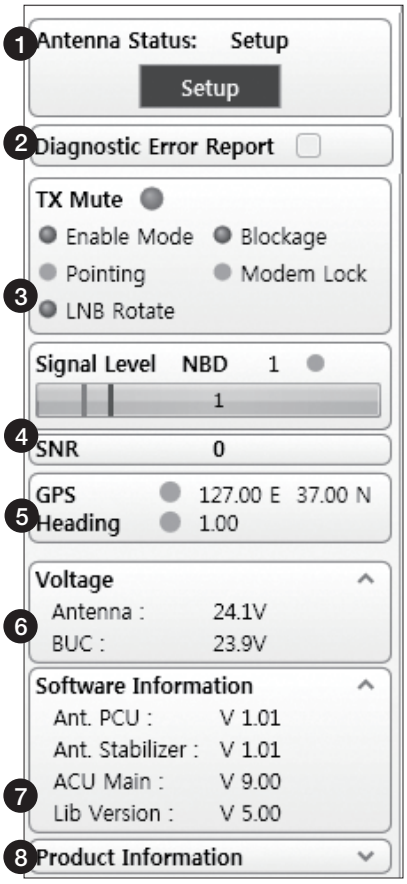


- **Setting:** enables or disables Auto Update function and sets network connection time-out.

- **Help:** 1) Report: provides e-mail contact to Intellian technical support team to let the user report problems at any time. 2) Information: displays the information of current Aptus® software version.

System Property Status Dashboard

The property status dashboard on the left pane of the screen provides the antenna status, the availability of TX transmission, signal level, GPS and heading status, software information, product information and error status to be monitored quickly.

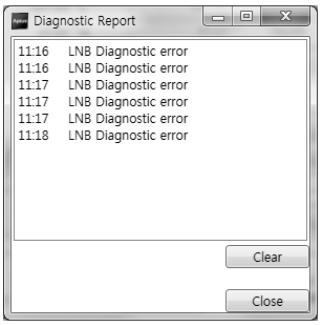


① Antenna Status: Displays the status of the current mode of the antenna.

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

② 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.



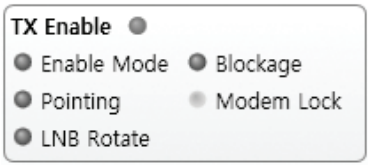
③ TX Enable

Displays the status of TX transmit. If the circle next to the 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. 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.

- **Enable Mode:** displays whether or not the antenna is in transmitting.
- **Blockage:** displays whether or not the antenna is pointing in a predefined block zone(s). If the antenna is pointing in the block zone, the circle next to the Blockage will show “Gray”. If the antenna pointed outside the block 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 mis-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 modem is locked by receiving a confirmation signal from the satellite modem. If the modem is not locked, the circle next to the Modem Lock will show “Gray”. If the modem is locked, the circle next to the Modem Lock will show “Blue”.

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”.



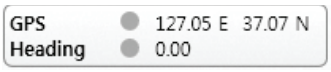
④ Signal Level

Shows “DVB” when DVB mode of tracking signal is in use and “NBD” when NBD mode of tracking signal 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.

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

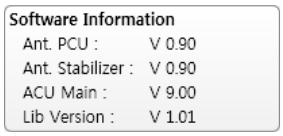
⑤ GPS and Heading

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.



⑥ Voltage: Displays the antenna and the ACU voltage information.

⑦ Software Information: Displays the antenna and the ACU firmware versions, and the library version.



⑧ Product Information: Displays the antenna and ACU serial numbers, antenna model and ACU model.

Work View Tabs

Aptus® provides seven Work View Tabs (Satellite View, Antenna Basic View, Antenna Advanced View, Monitor View, Graph View, Diagnostic/Modem and GUI to manage the Antenna and the Satellite configuration.

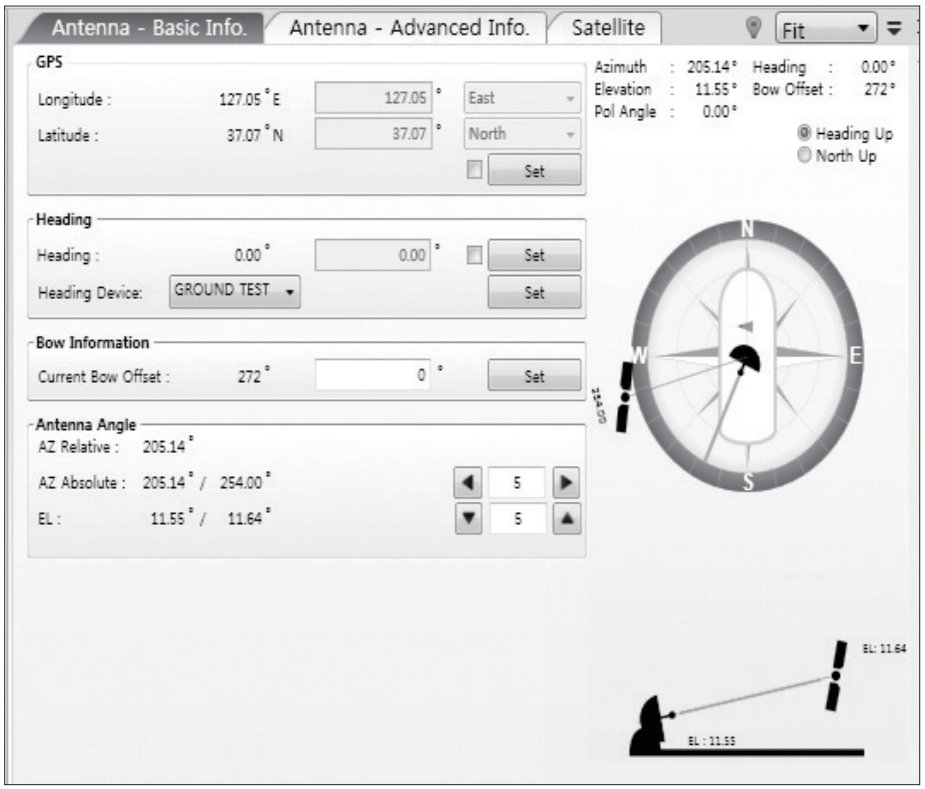
How to modify the settings on Work View:

1. Enter the Setup mode by clicking Setup icon.

2. Tick the checkbox next to the “Set” button to modify the settings.
3. Enter the desired value then press the Set button to save the settings.

1. Antenna – Basic Info.

This view tab provides information on the Antenna’s Current 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).



- **GPS:** displays and sets current antenna's GPS.

- **Heading:** displays and sets current ship's heading information.

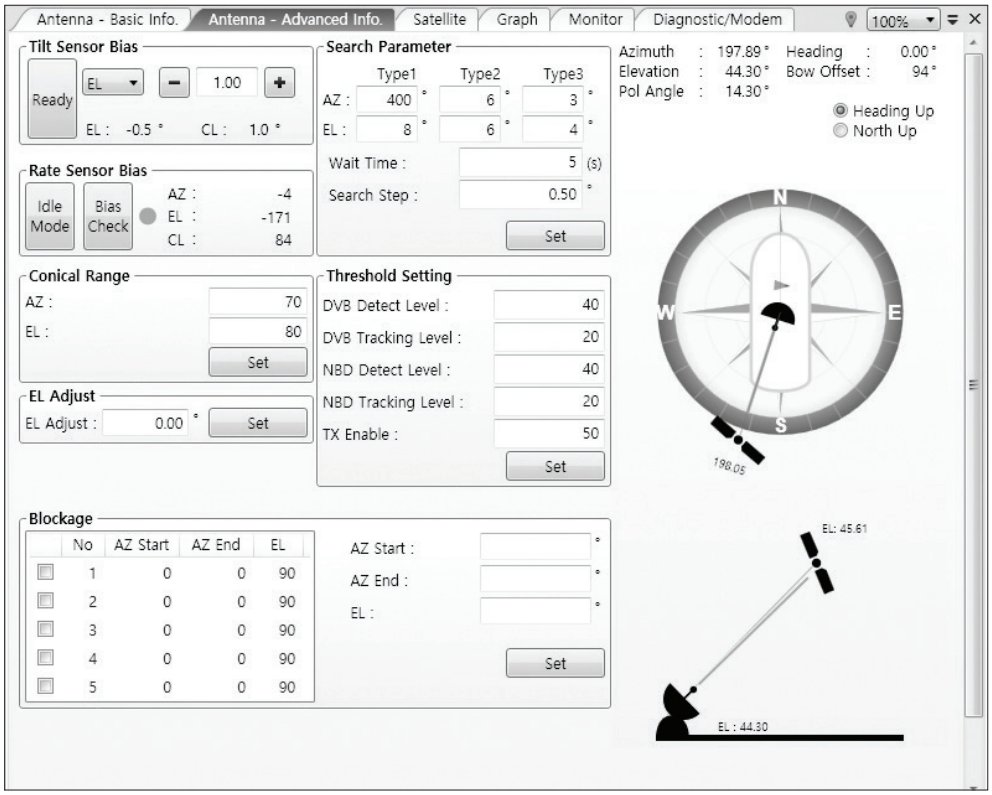
  · Heading Device: None / NMEA/ NMEA 2000/Ground Test.
  The baud rate (4800/ 9600/ 19200/ 38400) must be set if NMEA is selected.

- **Bow Information:** displays and sets current antenna's bow.

- **Antenna Angle:** displays and sets current antenna's absolute and relative AZ (azimuth) position, EL (elevation) position and LNB Pol angle. You can move antenna azimuth and elevation position and LNB Pol angle by using the arrows or inputting a value to find the desired satellite manually.

2. Antenna – Advanced Info.

This view provides information on the Tilt Sensor Bias, Conical Range, EL Adjust, Rate Sensor, Search Parameter and Block Zone.



-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, follow the steps below 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 Up and Down arrow keys to adjust the bubble until it is located in the center ring of the button level.
- Step 3. Select “CL” from the drop down list and press Up and Down arrow keys to adjust the bubble until it is located in the center ring of the button level.

· Step 4. Press the “Restart” icon to restart the antenna.

- 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 in 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 by following 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.

- Conical Range: The relative force of the motors controlling azimuth and elevation. Set the conical range while the antenna is in tracking mode.

- 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.

- Search Parameter:

· Wait time: set the time-out for automatic initiation of a search after the signal level drops below the pre-defined threshold value.

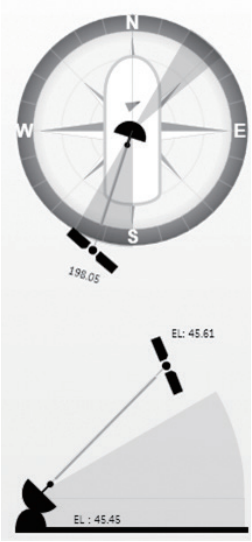
· Search Step: set increment step size.

· Type 1 & Type 3 (Search 1 & 3) Range: set 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 disabled.

- Block Zone

Displays current block zones by azimuth and elevation sectors. Up to 5 block zones can be programmed. Once the block zone is created, a blue shading area will be displayed in the Antenna UI view on the right.



- Threshold Settings

· DVB Detect Level: displays and sets signal detection threshold level when DVB tracking mode is in use.

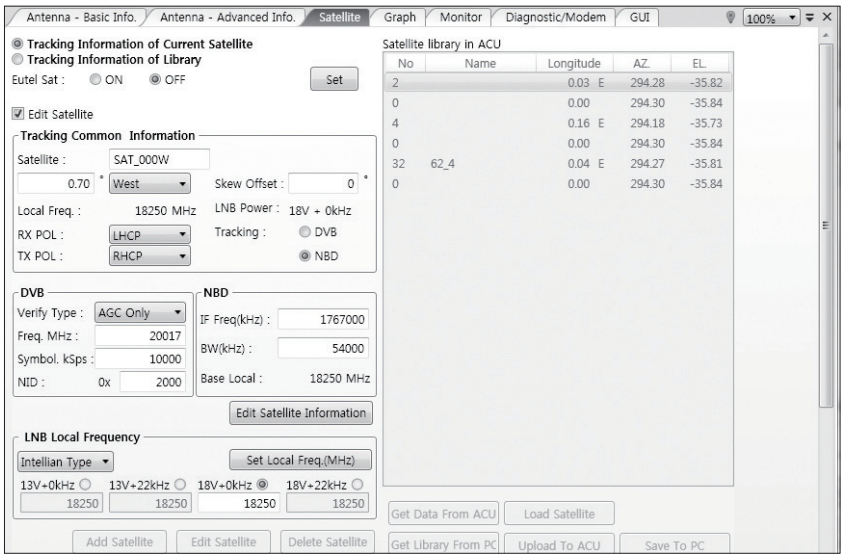
· DVB Tracking Level: displays and sets signal tracking threshold level when DVB tracking mode is in use.

· 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.

3. Satellite



This view provides information on the Satellite's Information, Tracking Common Information, DVB and NBD Tracking Transponder, LNB Local Frequency, and Satellite Library. This view shows a graphic UI of the current satellite that the antenna is pointing at and the satellites that are located at a 180° arc on the horizon with reference to the current position.

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.

- Tracking Information of Current Satellite: displays the current satellite's name, longitude position, and satellite skew of the satellite in the library.

- 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.

- 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.

- 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.

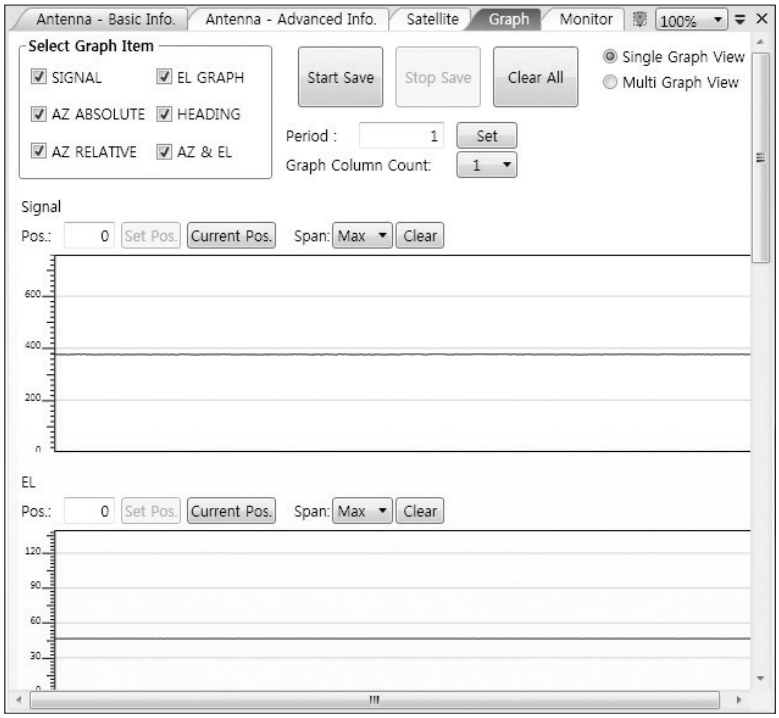
- Tracking Information of Library: Selecting this option enables “Add Satellite”, “Edit Satellite”, and “Delete Satellite” buttons.

- **Eutelsat:** Select 'ON' when the antenna is tracking a 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.
- **Get Library From PC :** opens the satellite library file (File format:*.ilf) from the PC.
- **Get Data From ACU:** obtains the satellite information from the ACU.
- **Load Satellite:** uploads the satellite information to the ACU.
- **Upload to ACU:** uploads the satellite library to ACU.
- **Edit Satellite:** edits the satellite information of the selected satellite. When Eutelsat satellite is selected, enable Eutelsat option. This applies defined skew angles for each Eutelsat satellite automatically and doesn't require manual modification.
- **Add Satellite:** adds the satellite information as defined in the current settings.
- **Delete Satellite:** deletes the selected satellite from the library.
- **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.

4. Graph View

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



- **Select Graph Item:** shows the graphs of only the checked item(s) in a Single or Multi Graph View.

- **Single Graph View:** shows Graph Views per each single Graph Item selected in 'Select Graph Item'.

- **Multi Graph View:** shows one large integrated Graph View of multiple Graph Items selected in 'Select Graph Item'.

- **Start/Stop Save:** the chosen item is saved within 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 to the antenna.

- **Clear All:** clears everything drawn on the Graph View window.

- **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.

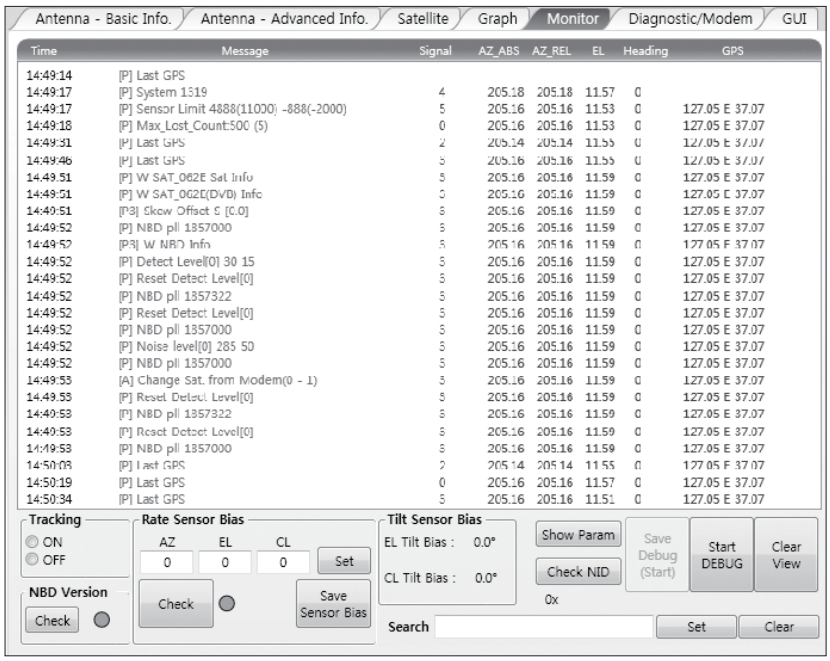
- **Span:** sets the Display Range(s) of each corresponding Graph Item.

- **Period:** displays and sets the signal sampling rate.

- **Graph Column Count:** makes all Graph Views show in either one or two-column format.

5. Monitor

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



- **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.

- **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.

- **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 .

- **Debug (Start):** 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.

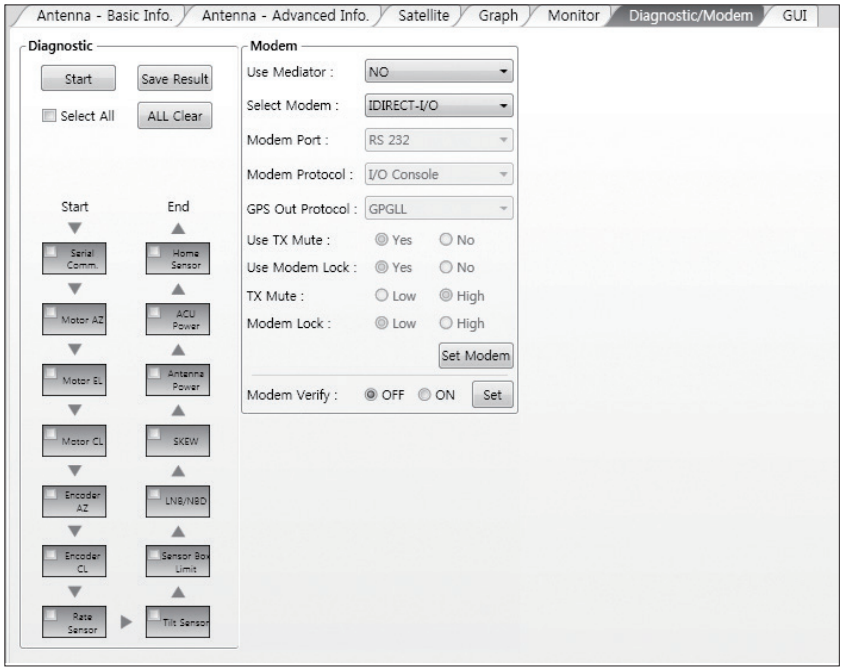
- **Save Log (Start/Stop):** starts or stops the logs of the antenna. This button will be enabled while viewing the debug log. The log message will be stopped or be saved into a *.txt file once the log button is pressed. (V_Date.txt.)

- **Save Debug (Start/Stop):** starts or stops saving the debug log. This button is enabled once the Start Debug button is pressed.

- **Clear View:** clears the debug message or log data in monitoring window.

6. Diagnostic / Modem

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



- 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.
- **Encoder CL:** tests the cross-level 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.

- **LNB/ NBD:** tests the LNB and NBD (narrow band detector).

- **Sensor Box Limit:** tests the sensor box motor .

- **Modem:** sets the interface between the ACU and the Intellian Dual VSAT Mediator or the satellite modem.

NOTE: Before setting this function, make sure connection of a 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 use of the Intellian Dual VSAT 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 work incorrectly.

- **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:** selects a 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 Sentence:** selects GPS out sentence type (GPGLL/ GP GGA/ 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 is mis-pointed 0.5 degrees from the peak satellite position.

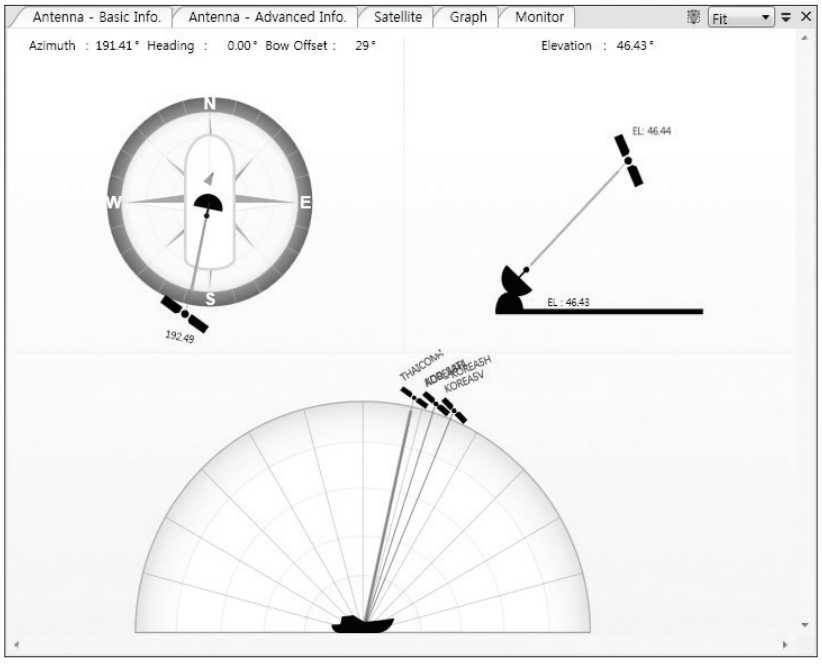
- **Use Modem Lock:** selects whether or not to use external lock signal from the modem. “Use Modem Lock” will only be activated when the modem protocol is set as I/O Console.

- **TX Mute:** TX Mute is a transmit inhibit output from the ACU to dis able /mute the modem transmit through a 5 V (HIGH) or 0 V (LOW) current whenever the antenna is blocked, searching, or is mis-pointed 0.5 degrees from peak satellite position. TX Mute will only be activated when modem protocol is set as I/O console.

- **Modem Lock:** is the modem lock output from the modem. It pro vides 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 as I/O Console.
- **Modem Verify:** With this option on, the antenna will change to search mode if there is no modem lock signal in NBD tracking mode, reducing overall time spent for satellite search. With this option off, the antenna will continue to stay in tracking mode.

7. 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 at a 180° arc on the horizon, according to the current position.



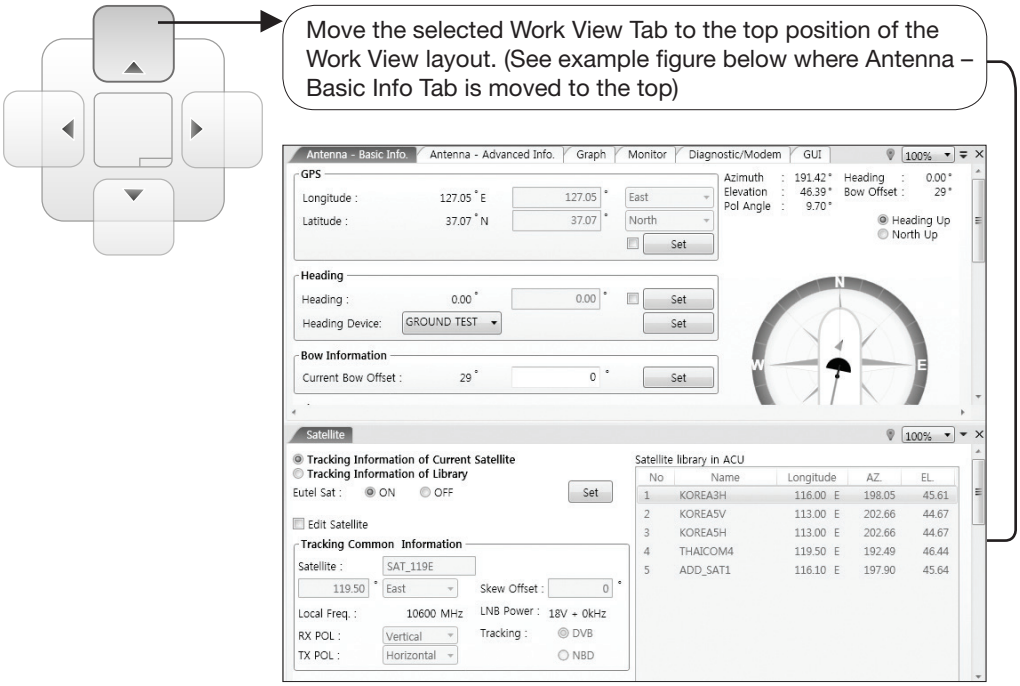
NOTE: Based on the satellite EIRP footprint and the size of the antenna, you may not be able to track all the satellites visible in 180° arc.

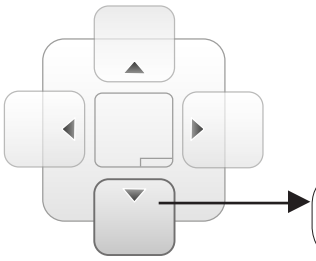
8. Work View Functions

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

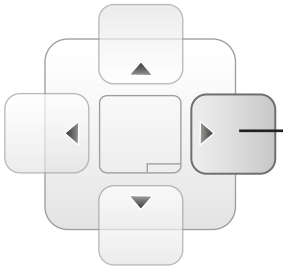
- Layout Formatting

· Each of the Work View Tabs can be separated from the rest of the Tabs. Click and hold the left mouse button on the Work View Tab's header and then drag a 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.

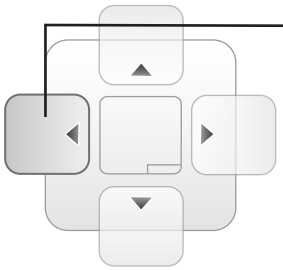




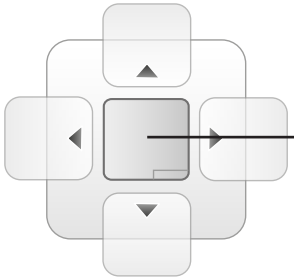
Move the selected Work View Tab to the bottom position of the Work View layout.



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

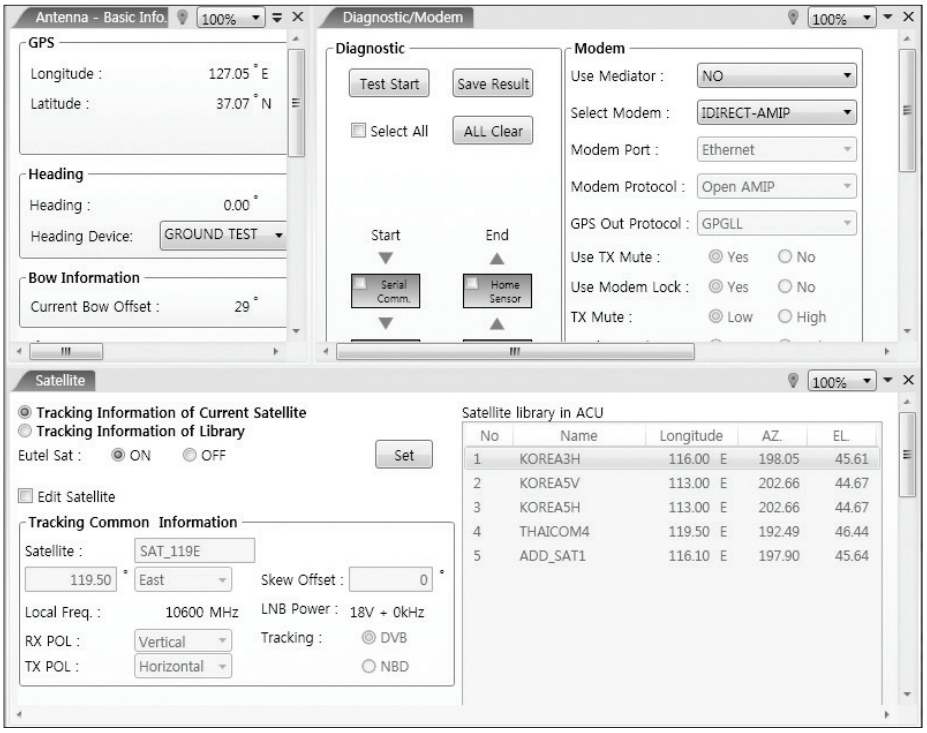


Move the selected Work View Tab to the left position of the Work View layout.



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 a desired arrow on the Navigator icon. Then each Work View Tab can be placed to 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 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 a 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.

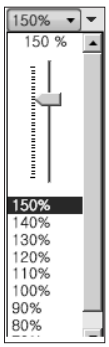
- Closing the Work View Tab

To close the Work View Tab, right-click the mouse button on a desired Tab header and select 'Close' option in the drop down list. To close all Work View Tabs except 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

Introduction

Main Page

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Dash Board & Information

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Antenna Position & Parameters
Tracking Setting
Modem Setting
Diagnostic
Library Setting

Firmware & Configuration

Antenna Firmware Upgrade
Antenna Log
Antenna Backup & Restore

Administration

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User Management
iARM Upgrade
iARM Save & Reboot
Antenna Event Log
Modem Information

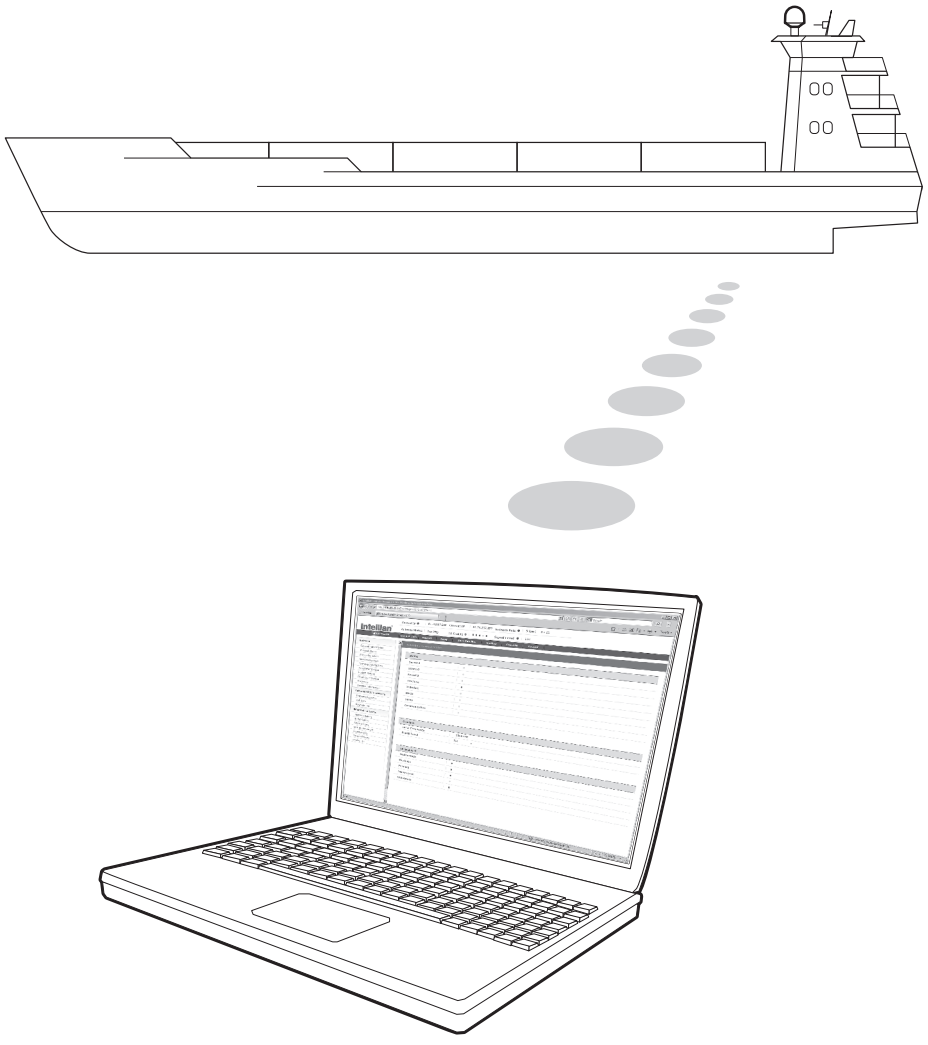
Introduction

With embedded Remote Access (Aptus Web) function, 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 saves 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:

1. Connect an Ethernet Cable between your PC and the Management Ethernet Port.
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.

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



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

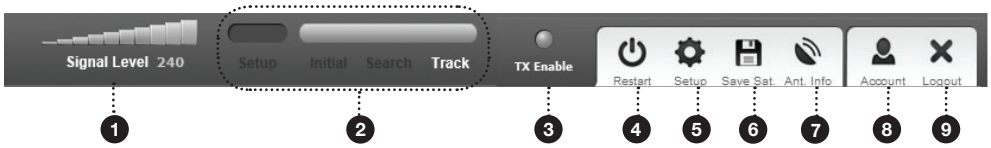
WARNING

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

- If 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.

Top Menus

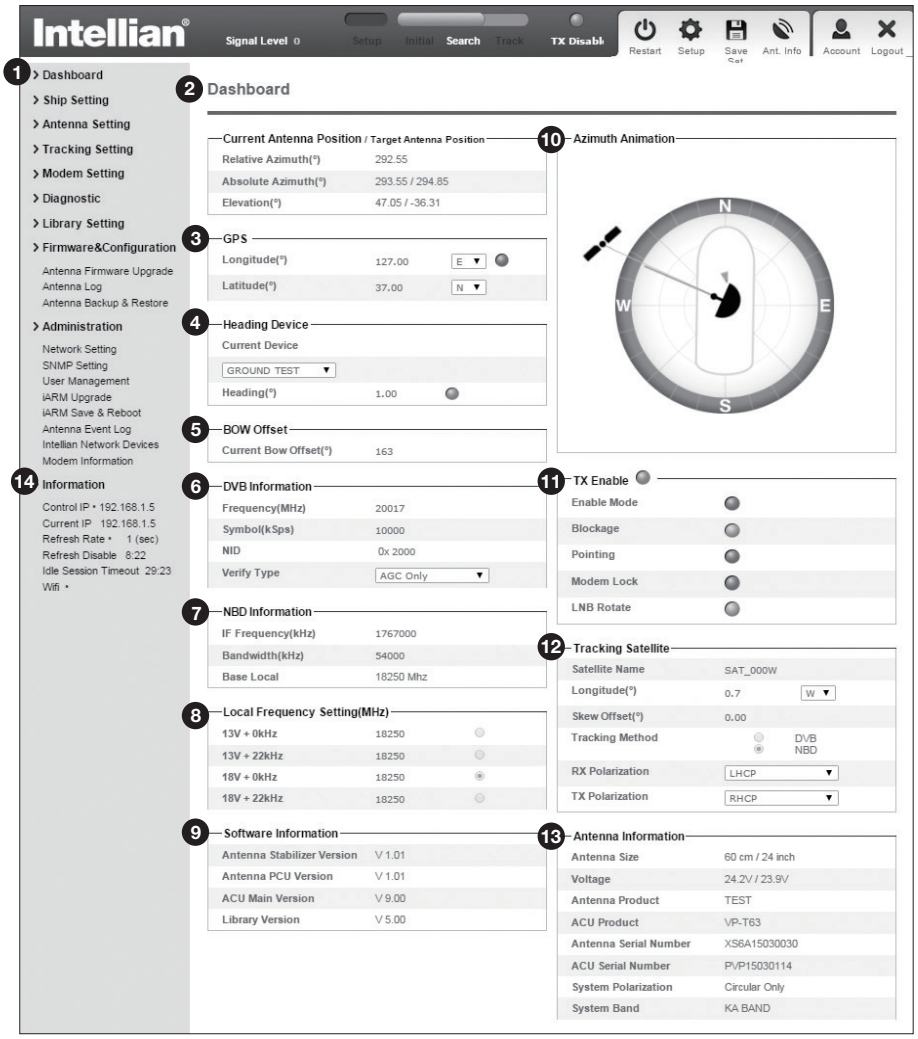
Once you log in, the following information and menus are displayed.



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 Sat.	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 internal HTML page.

Dash Board & Information

On the left side of the page, Dash Board 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.

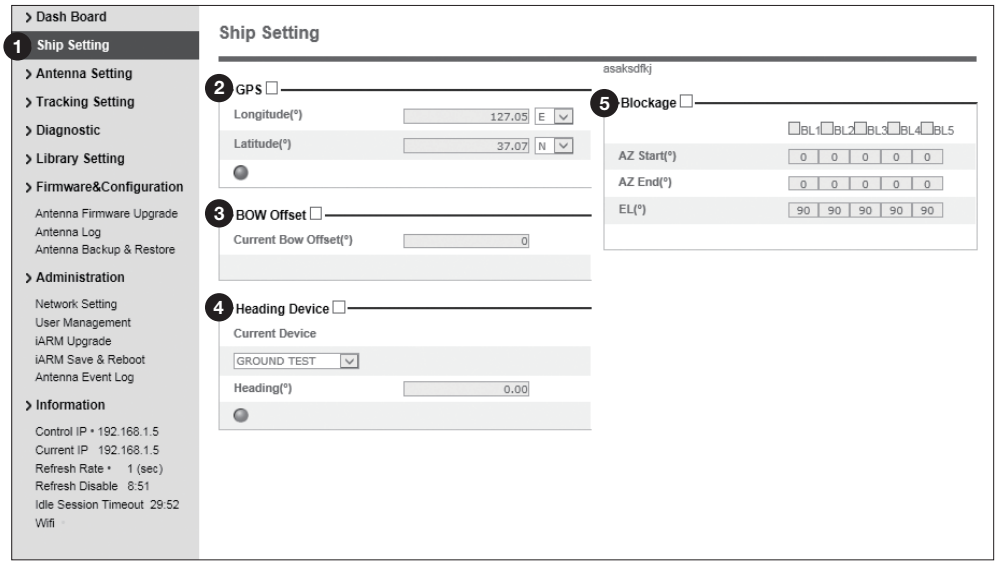


No.	Item	Description
①	Dash Board	Displays current antenna status to be quickly monitored.
②	Current Antenna Position / Target Antenna Position	Displays current antenna position. - Relative Azimuth: displays antenna relative AZ angle. - Absolute Azimuth: displays antenna absolute AZ angle. - Elevation: displays antenna elevation angle.
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	Display 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 typ (AGC, DVB, DVB Decode)
⑦	NBD Information	Displays NBD tracking mode's current tracking information. - Frequency: displays tracking IF frequency. - Bandwidth: displays detection bandwidth.
⑧	Local Frequency Setting (MHz)	Displays current LNB's local frequency and voltage.
⑨	Satellite Information	Displays current Antenna and ACU firmware versions and Satellite Library version installed in the system. - Antenna POL Version (It will display "v-----" if there is no Pol Control Board installed.) - Antenna Stabilizer Version - Antenna PCU Version - ACU Main Version - 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 only be enabled (shows BLUE dot) only if all of the factors listed below shows “BLUE” dot. Exception: If “Use TX Mute” is set as “NO”, the TX function will be enabled regardless of which factor listed below shows “gray” dot or “red” dot. - Enable Mode: antenna is not in SETUP mode. - Blockage: antenna is not facing the predefined block zone(s). - Pointing: antenna is pointing to the target satellite. - Modem Lock: satellite modem is sending a logic input to the ACU to identify when the antenna tracks on the correct satellite. - LNB Rotate: LNB is not rotating.
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 product information
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 system will keep monitoring all activities regardless of timeout. - Wi-Fi : Displays Wifi on/off switch

Antenna Settings

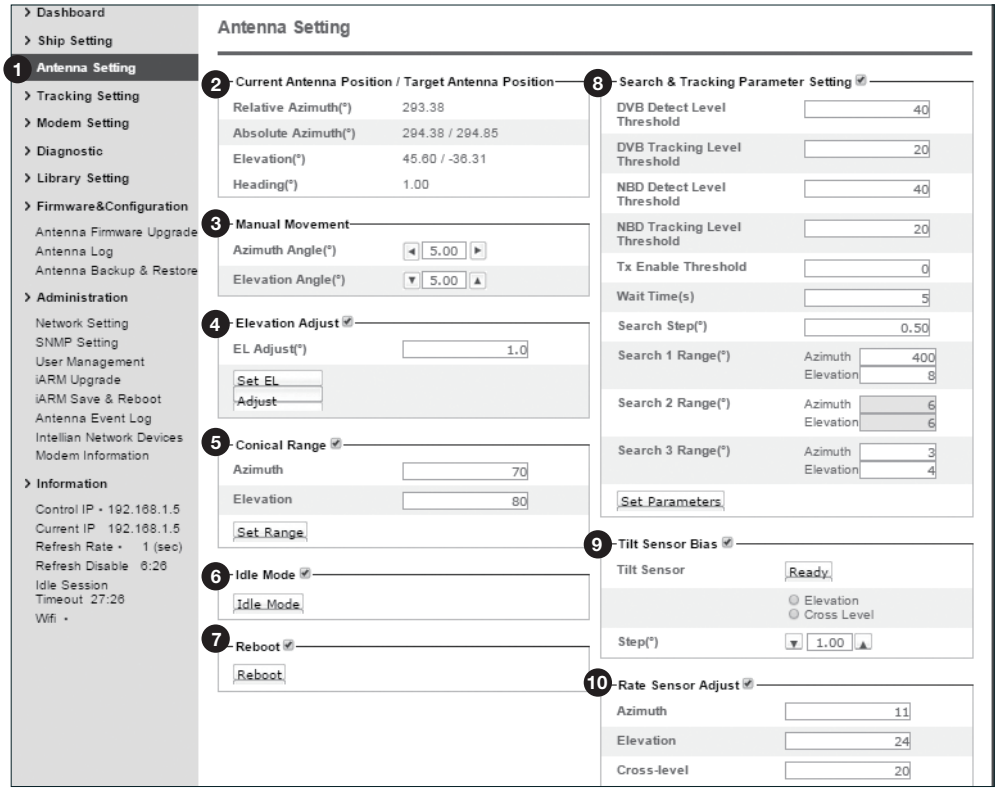
Ship Setting



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 the antenna's block zones up to 5 by azimuth and elevation sectors. AZ. START is where the relative azimuth starts and AZ. END is where the relative azimuth ends (Range: 0 - 360°). EL. Limit is where the elevation starts (Range 0 - 90°).

WARNING: Enter the SETUP mode for configuration. Tick the checkbox before modifying the settings. After configuration, click 'Set ...' button to submit the settings.

Antenna Position & Parameters

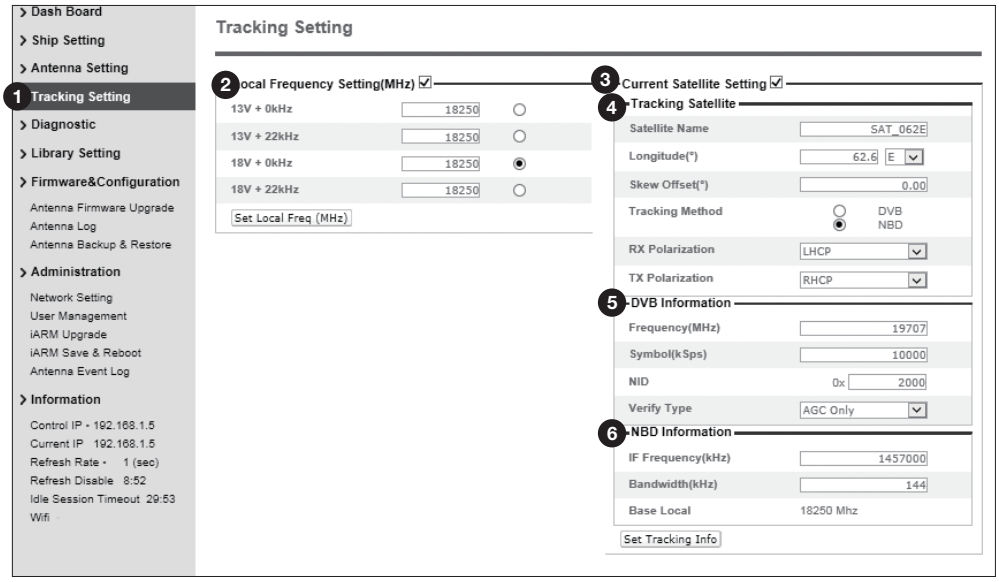


No.	Item	Description
①	Antenna Setting	Set current antenna position and Search and Tracking parameters. These parameters should only be changed by an authorized service technician. Improper setting of these parameters will render your system inoperable.
②	Current Antenna Position/ Target Antenna Position	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 to find the desired satellite manually.
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. Set the conical range while the antenna is in tracking mode.
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	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: display / set TX enable threshold. - 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 expanding square. - Search 2 Range: is disabled.
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.

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

Tracking Setting

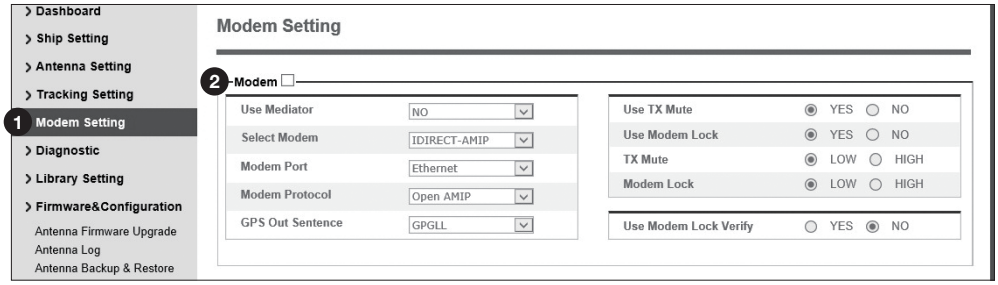


No.	Item	Description
①	Tracking Setting	Display or set current tracking mode and tracking frequency of the target satellite.
②	Local Frequency Setting (MHz)	Display and set LNB's local frequencies. Display current LNB local frequency which is in use and voltage.
③	Current Satellite Setting	Display and set current satellite setting.
④	Tracking Satellite	Display and set current tracking mode. - Satellite: display and set satellite name. - Longitude: display and set satellite orbit position. - Skew Offset: display and set 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)
⑥	NBD Information	Display and set NBD tracking mode's tracking information. - Frequency: display and set tracking IF frequency. - Bandwidth: display and set detection bandwidth.

WARNING

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

Modem Setting

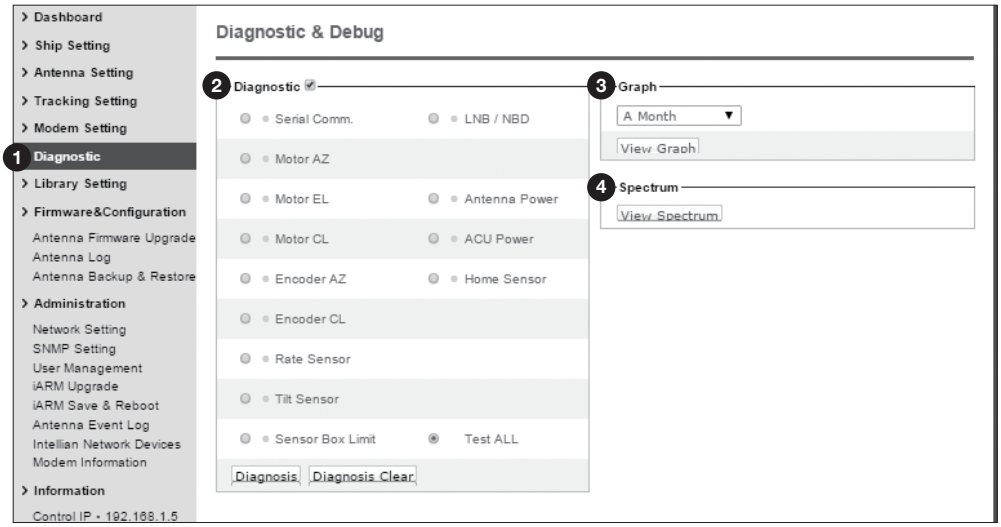


No.	Item	Description
①	Modem Setting	Set the modem interface.
②	Modem	- Use Mediator: enable the usage of Mediator if the antenna is connected to the Intellian Dual VSAT Mediator. Use Mediator must be set to “NO” if there is no MEDIATOR connected to the ACU. Improper setting of this parameter will cause your ACU’s modem interface to work incorrectly. - 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, IDIRECT-I/O, IDREICT-AMIP, COMTECH-I/O, COMTECH-ROSS, HUGHES, SATLINK-SERIAL, SATLINK-VACP, ELEKTRIKOM-AMIP, GILAT-SE-II, IPSTAR-SOTM. However, it is required to set the related settings separately if USER SETTING is selected. - Modem Port: is to select a proper data communication port on the ACU to interface with the satellite modem (RS232/422/ 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). - 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. - 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 mispointed 0.5° 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: With this option on, the antenna will change to search mode if there is no modem lock signal in NBD tracking mode, reducing overall time spent for satellite search. With this option off, the antenna will continue to stay in tracking mode. **Note:** TX Mute and Modem Lock items will only be activated when the modem protocol is set as I/O Console.

WARNING

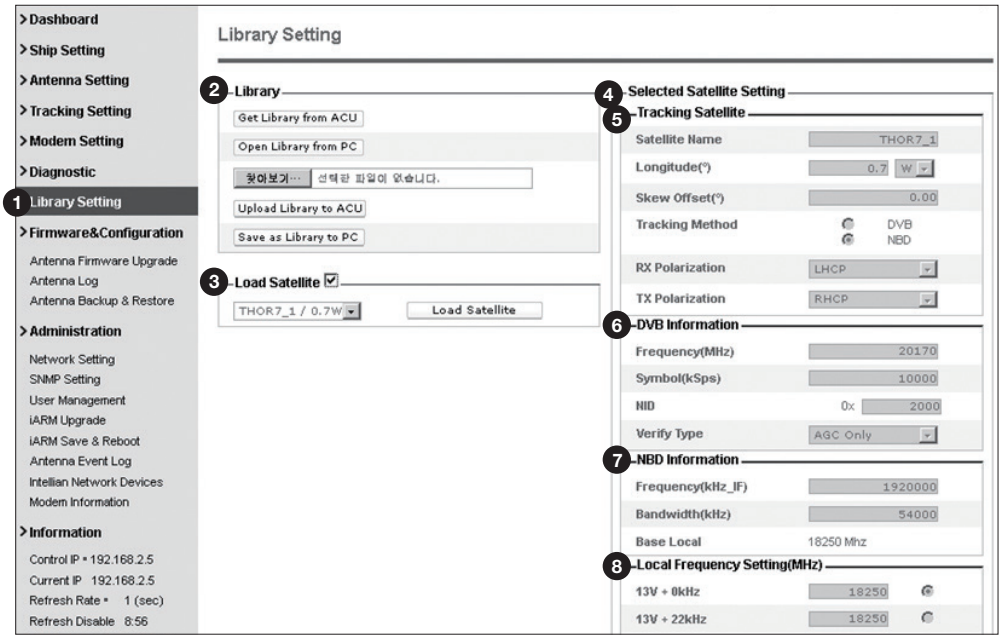
WARNING: Ensure to tick the checkbox before modifying the settings. Select 'Set Modem Configuration' to confirm the modem settings configured.

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. - Encoder CL: test the cross-level 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. - Antenna Power: test the antenna power. - ACU Power: test the ACU power. - Home Sensor: test the home sensor - 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. - Data Num: set the maximum number of graph data set to be displayed. - View Graph: select to view the data graph.
④	Spectrum	Select to view spectrum graph of the current satellite signal.

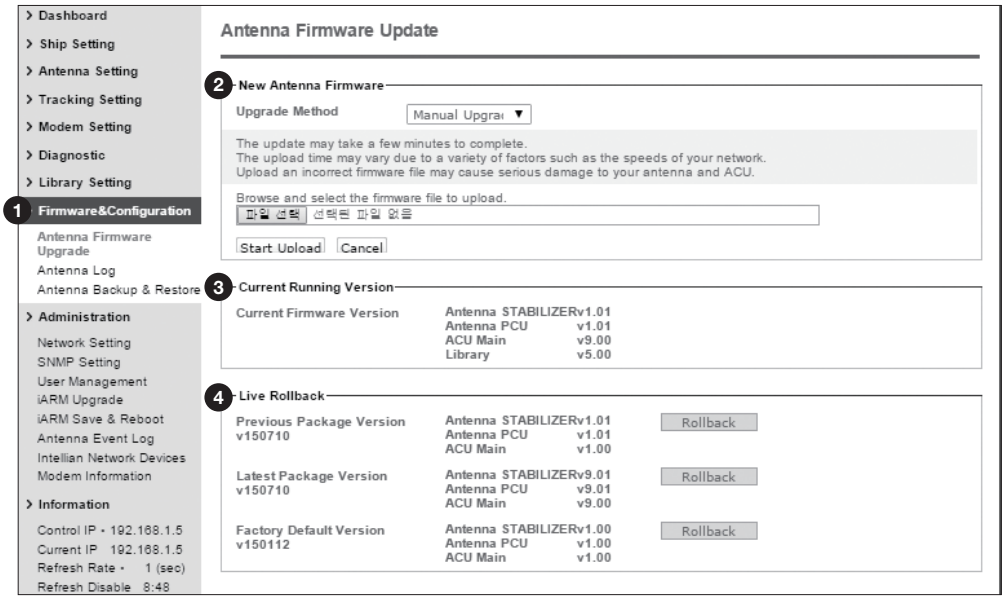
Library Setting



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	- 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)
⑦	NBD Information	Displays NBD tracking mode's tracking information. - Frequency: displays tracking frequency. - Bandwidth: displays detection bandwidth.
⑧	Local Frequency Setting (MHz)	Displays LNB local frequency (MHz) and voltage.

Firmware & Configuration

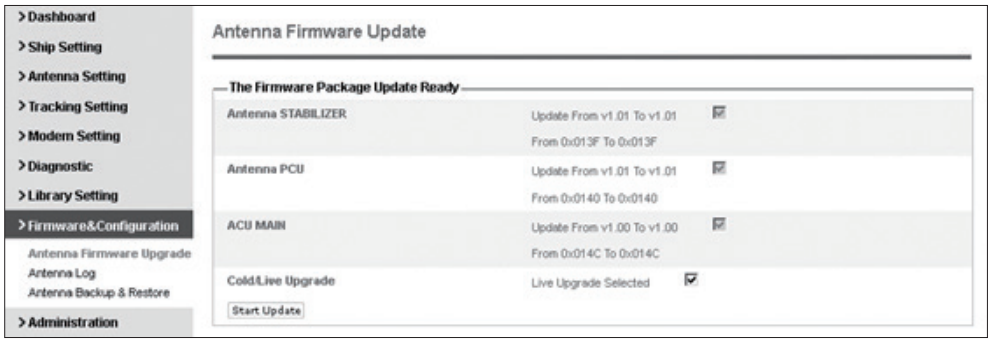
Antenna Firmware Upgrade



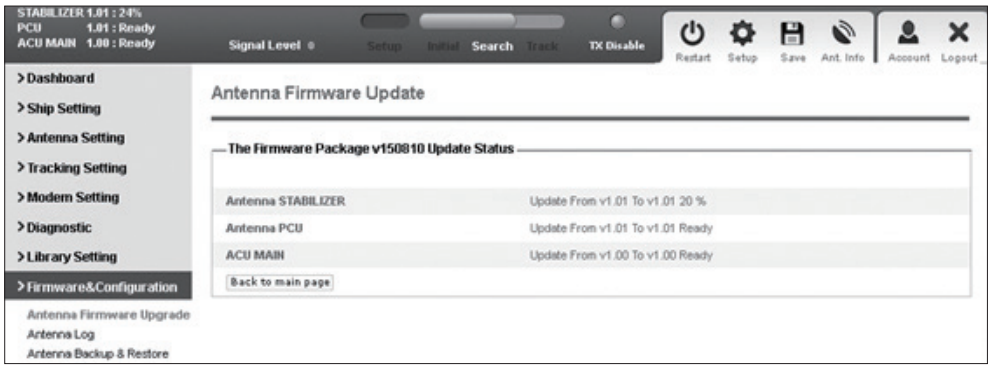
No.	Item	Description
①	Antenna Firmware Upgrade	Upgrade antenna and ACU firmware version.
②	New Antenna Firmware	Select Upgrade Method between Manual Upgrade or Auto Upgrade. With Manual Upgrade option selected, browse and select the firmware package file to upload and click Start Upload button. With Auto Upgrade option selected, click Check button to check automatically if there is new firmware available from the server.
③	Current Running Version	Display current firmware version (Antenna STABILIZER, Antenna PCU, ACU main, Library)
④	Live Rollback	Display Previous/Latest Package version and rollback firmware to Previous or Latest version. During live rollback, the rollback status is displayed on the Top Menu bar. This helps users control and operate other functions while live rollback is in progress. Once the rollback is complete, the antenna reboots to apply the changes.

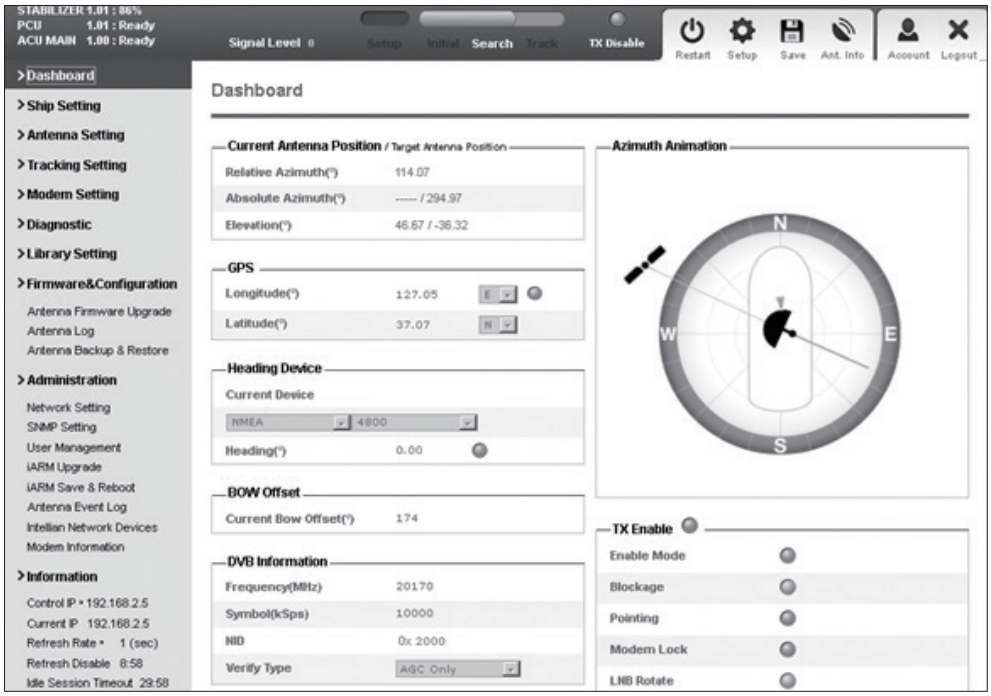
Upgrade procedures:

1. Select the upgrade package file. In Auto Upgrade mode, check new firmware file automatically by clicking Check button.
2. Click on “Start Upload” button to transfer the Firmware package file (“*.fwp”) to iARM module. In Auto Upgrade mode, click "Upgrade" button once new firmware file is detected.
3. After the package file is transferred, it’ll show “upgrade from vx.xx Version to vx.xx Version”. Enable the check box to select the firmware file that you wish to upgrade. To select all firmware files, click Select All Firmwares.
4. Click on “Start Update” button.



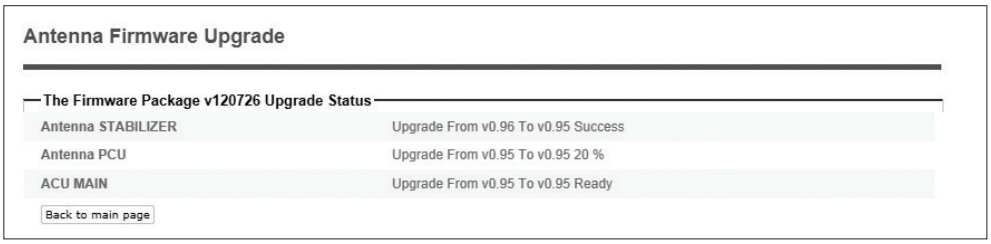
Firmware upgrade status in Live Upgrade mode





5. In Live Upgrade mode, the upgrade process status is displayed at the top left of the web page screen.

Firmware upgrade status in Cold Upgrade mode

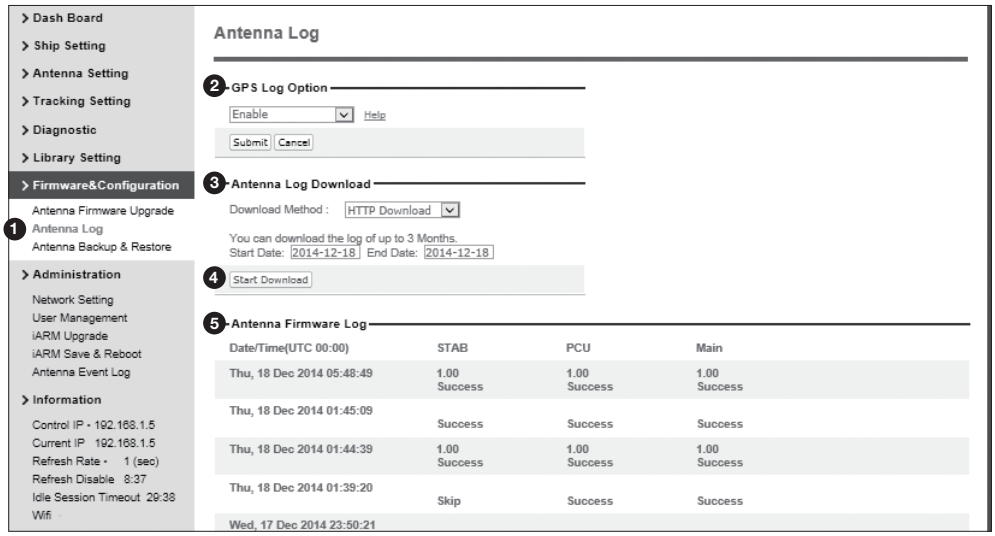


6. In Cold Upgrade mode, the upgrade process status is displayed on the full screen. When the firmware is successfully upgraded, a message displays "The firmware update is completed."

7. Click on "Back to main page" to go out of the screen.
To verify the upgraded firmware version, go to Dash Board > Software Information.

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

Antenna Log

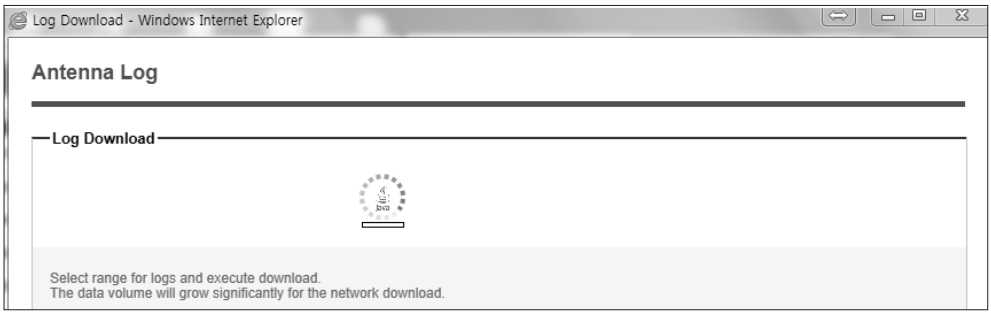


No.	Item	Description
①	Antenna Log	Displays antenna log data.
②	GPS Log Option	Disable/Enable to save GPS information in the antenna log file.
③	Antenna Log Download	Select file transfer protocol between HTTP Download or FTP Download. For this terminals, the default option is HTTP Download. Any log data 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. Select start download button to proceed.
④	Start Download	Download the antenna log information.
⑤	Antenna Firmware Log	Display log information of firmware upgrade.

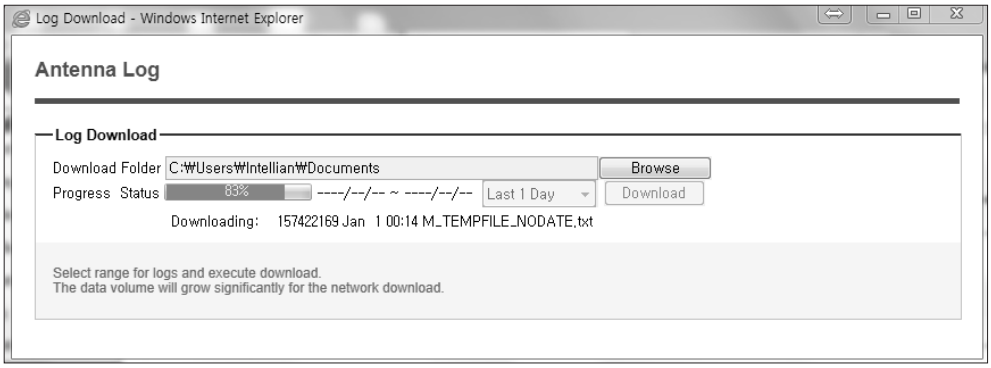
Log Download using FTP Protocol

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 Download Method as FTP Download and click 'Start Download' button.
2. To run Java applications you must have Java Runtime Environment(JRE) version 6.0 and above installed in your PC/ laptop when you access the antenna log page for first time. Click “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 Appendix for Java Installation Instructions if the system does not display the popup message.

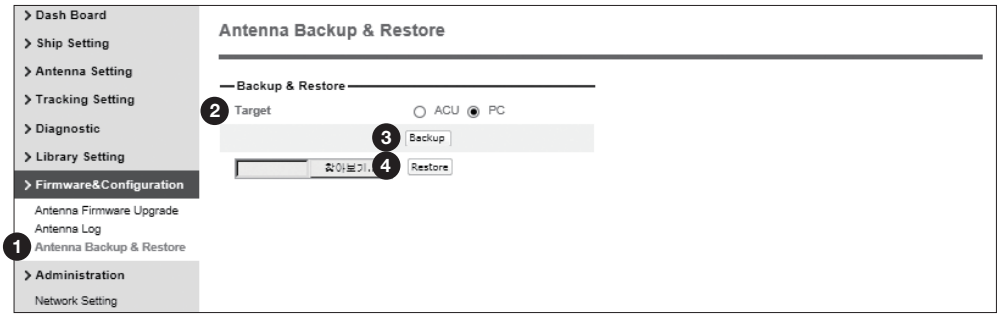


3. Select ‘Browse’ to browse the target directory of the antenna log file.
4. Select log period for file download.
   - Last 3 Months: download the antenna log information for the past three months.
   - Last 1 Month: download the antenna log informaiton for the past one month.
   - Last 1 week: download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



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 operators 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.

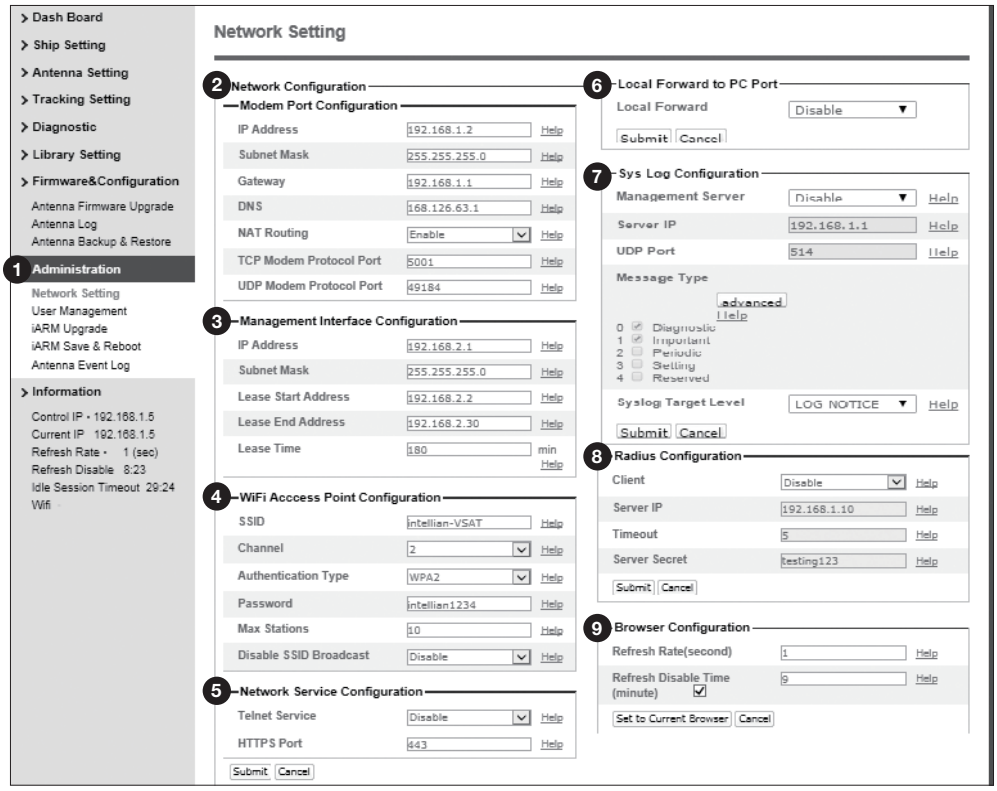
Antenna Backup & Restore



No.	Item	Description
①	Antenna Backup & Restore	Enter Backup & Restore page. (Setup mode is required)
②	Target	Backup antenna information to ACU/PC or restore antenna by using the saved information from ACU/PC.
③	Backup	Backup antenna information.
④	Restore	Restore antenna information.

Administration

Network Setting

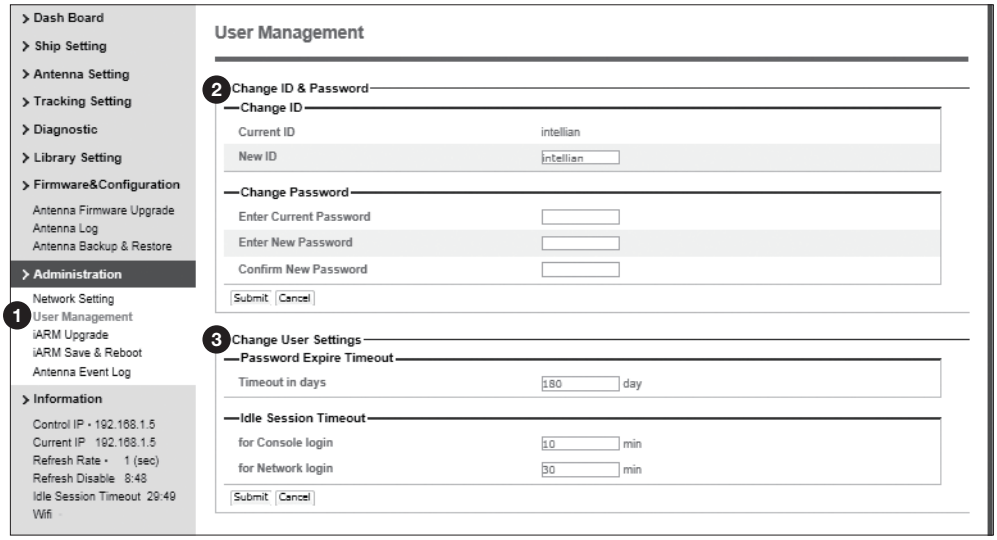


No.	Item	Description
①	Network Setting	Enter network setting page.
②	Modem Port Configuration	Modify ACU's Internal IP address and press Submit button. Go to "Save & Reboot" page and press Save & Reboot button to validate the changes. - IP Address : Factory default(Primary:192.168.1.2)/ (Secondary:10.10.1.1). - Subnet Mask : Factory default(255.255.255.0). - Gateway : Factory default(192.168.1.1). - 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.
③	Management Interface Configuration	Modify Management Port's network configuration and press Submit button. 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	Wi-Fi 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 alpha-numeric 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. - Max Stations : Setting max stations. - Disable SSID Broadcast : Select whether or not to broadcast the SSID in a wireless network. Select Disable to display the network name continuously or select Enable to hide it from the list.
⑤	Network Service Configuration	- Telnet Service : Enable or disable telnet login support. - HTTPS Port : HTTPS port number.
⑥	Local Forward to PC Port	To remotely access ACU from Intellian's Aptus PC Software, either HTTPS or SSH connection needs to be forwarded. It is recommended to forward less preferred protocol. If "HTTPS" is often used and Aptus PC software is also required, select "SSH to PC". If "SSH" is often used, select "Web to PC".
⑦	Sys Log Configuration	Set the system log configuration. Antenna sends log messages according to 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 management server (Lower number indicates higher emergency). - Sys log Target Level : If you select this target level, the management server receives log message equal to or less than this level.

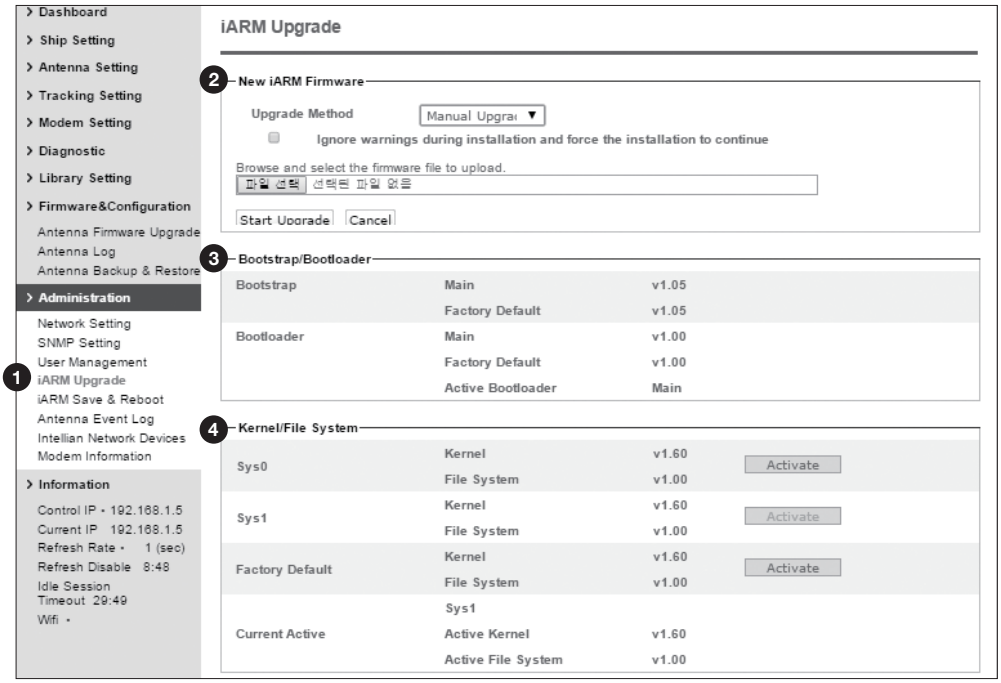
⑧	Radius Configuration	This menu is used when network administrator needs to authorize user connections via Web, SSH, PC Port, Telnet, Console using RADIUS server. - Client : Select to enable RADIUS authentication. - Server IP : RADIUS server IP Address - Timeout : Timeout value in seconds for the authentication process. - Server Secret : Pass-Phase. This should be matched between server and ACU.
⑨	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 time-out (Default:9 minutes. Range 0~9). To use this function, check the check box.

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 (user name) and password. - Change ID : Enter your current login ID (user name) 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. **Note:** New login password will be disallowed in the following cases. • Common dictionary words • Too short password • If not a combination of letters, numbers and special characters • Recently used password
③	Change User Settings	Change User Password Expire in days and Idle session time-out. - Password Expire Time-out : Set password expire in days. - Idle Session Time-out : Set for Console and for Network time-out.

iARM Upgrade



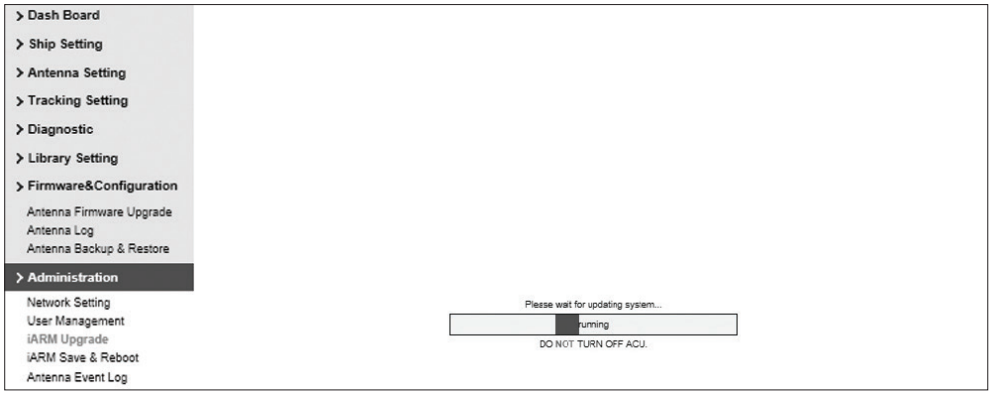
No.	Item	Description
①	iARM Upgrade	Upgrade the firmware of iARM module.
②	New iARM Firmware	Select Upgrade Method between Manual Upgrade or Auto Upgrade. With Manual Upgrade option selected, browse and select the firmware file to upload and click Start Upgrade button. With Auto Upgrade option selected, click Check button to check automatically if there is new firmware available from the server.
③	Bootstrap /Bootloader	Displays current bootstrap and bootloader version.
④	Kernel /File System	ACU has 3 storage parts sys0, sys1, Factory Default. Display kernel and file system version and current activated part Information.

iARM firmware upgrade procedures:

1. Click on “Browse” button to select the iARM firmware file (.tgz) that you wish to upgrade. In Auto Upgrade mode, check new firmware file automatically by clicking Check button.
2. Click on “Start Update” button to update the iARM firmware. Wait until the page is loaded. In Auto Upgrade mode, click "Upgrade" button once new firmware file is detected.

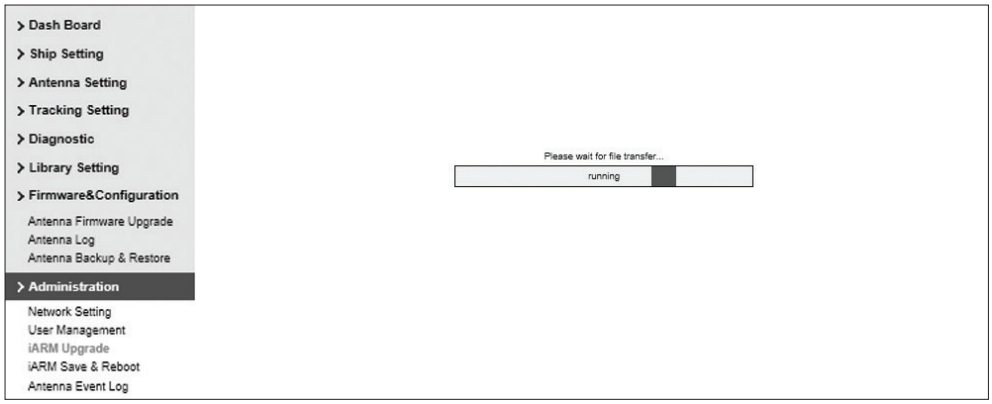
Firmware upload in progress

3. This will inform you that the firmware is being uploaded.

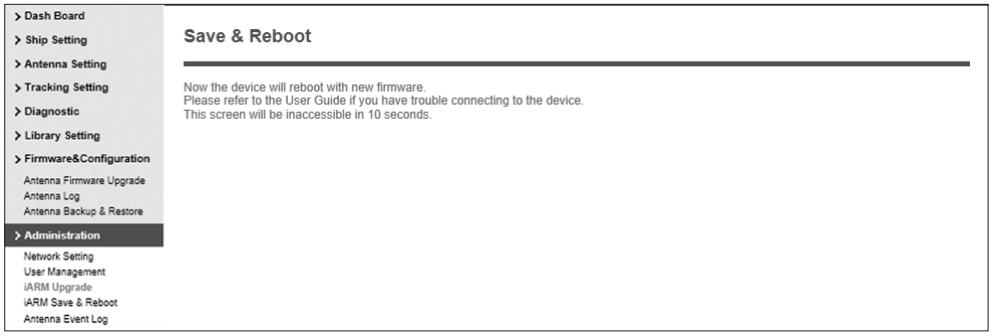


Firmware upgrade in progress

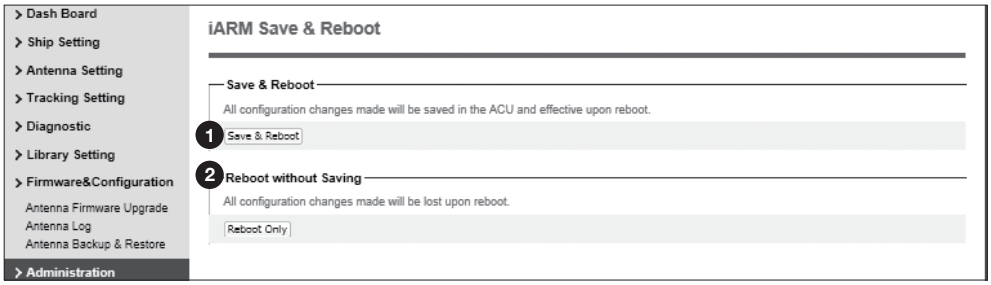
4. Do not turn off the ACU power if the firmware upgrade page is displayed.



5. This will take around 2 minutes to complete the firmware upgrade. Once the upgrade is completed, the system will reboot automatically.

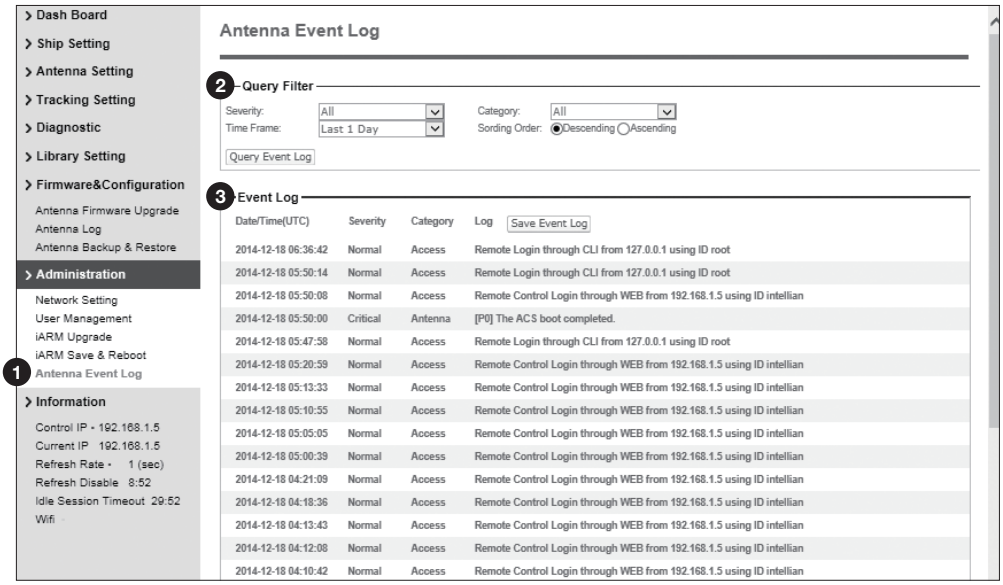


iARM Save & Reboot



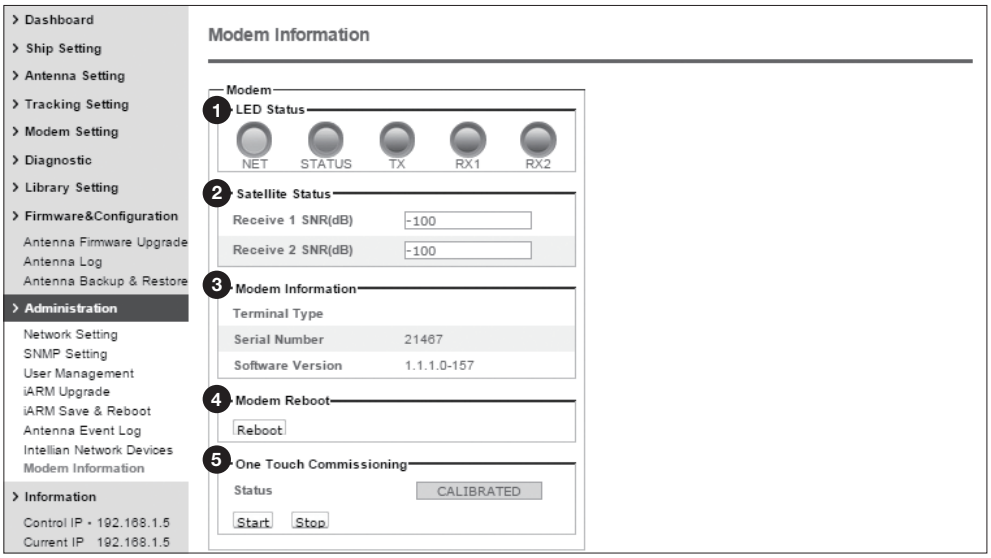
No.	Item	Description
①	Save & Reboot	Save the modified settings and reboot the system. Click Save & Reboot button.
②	Reboot without Saving	Reboot the system without saving the modified settings. Click Reboot Only button.

Antenna Event Log



No.	Item	Description
①	Antenna Event Log	Displays user's log information (Data/Time, Login ID and IP)
②	Query Filter	Set the Log message option. - Severity : Set urgency level. - Category : Set target that caused the message. - Time Frame : Set 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.

Modem Information



No.	Item	Description
①	LED Status	Displays modem network status. Green color indicates normal and red color indicates abnormal stats. Yellow color indicates standby and gray indicates no signal.
②	Satellite Status	Displays signal strength (dB) received from the antenna.
③	Modem Information	Displays the antenna terminal type and serial number and software version information of the modem.
④	Modem Reboot	Reboots the modem.
⑤	One Touch Com-missioning	One touch commissioning is required after the first-time connection of the terminal and the ACU, cable replacement or Ku-to-Ka conversion. Performs calibration and displays the status.

Technical Specification

Dimensions	
Satellite antenna unit	138cm x 151.4cm (54.33” x 59.63”)
Antenna dish diameter	103cm (41”)
Antenna control unit	43.1cm x 38cm x 4.4cm (17” x 15” x 1.7”)
Weight	
Satellite antenna unit	128kg (282lbs)
Antenna control unit	3.5 kg (7.7 lbs)
Antenna system	
Tx Frequency	29.00~30GHz Ka-band
Tx Gain	47.7dBi @ Mid band
Rx Frequency	19.2~20.2GHz Ka-band
Rx Gain	43.7 dBi @ Mid band
Polarized Feed	Circular, Tx:RHCP Rx:LHCP
Cross-pol Isolation	Minimum 35 dB
G/T	> 20 dB/K @ Ka-Band
Azimuth Range	Unlimited
Elevation Range	-20° ~ +115°
Cross-level Range	±37°
Stabilization Accuracy	0.2° peak mis-pointing @ max ship motion condition
Max Ship’s motion	±25°roll, ±15° pitch, ±8°yaw@ 6 sec
Turning rate	Up to 10°/ sec 2
BUC	5W
Power Consumption	100 ~ 240 V AC, 50 ~ 60Hz, 3A
Operating temperature range	-25°C to 55°C
Storage temperature range	-40°C to 80°C
Antenna Control Unit	
Display	2 Line 40 Character Graphic VFD Module
PC Interface	RS232C (57600 bps 8, N, 1) / USB
Modem Interface	Ethernet port / RS232C / I/O ports
RF Interface	Antenna RX: N-Type, Modem RX: F-Type
Gyrocompass Interface	NMEA 2000 / NMEA 0183
GPS Interface	NMEA In / NMEA Out
Ethernet Port	RJ45, TCP / IP
Power Consumption	100 ~ 240 V AC, 50 ~ 60Hz, 1A

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.

Additional Terms and Conditions:

The warranty(THREE (3) YEARS on parts and TWO (2) YEARS on labor) is effective only for products purchased since January 1st, 2017.