Intellian

GX100

Installation and Operation Manual

Marine Satellite Communication Antenna System

Serial number of the product

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

Intellian

Doc. No. UM-P3-190131-V1.7

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.

Table of Contents

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 GX100, 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/**
Director,
Research and Development

Signature: 

Date: **September 01, 2014**

Intellian Technologies USA, Inc.
US Headquarters
9004 Research Drive
Irvine, CA 92618 USA
Tel: +1 949 727 4498

Intellian Technologies, Inc.
EMEA & APAC Headquarters
18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-Si,
Si,
Gyeonggi-do 451-862, Korea
Tel: +82 2 511 2244

Doc Number IT14-DC0901-07

RED Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 451-862, Korea declare under our sole responsibility that the product(s) described in the below to which this declaration relates is in conformity with the *essential requirements* and *other relevant requirements* of the Radio Equipment Directive (2014/53/EU).

Product Information:

Product Name(s):	Intellian GX100, 1m Ka-band Maritime VSAT Antenna System

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

1995/5/EC Article	**Standard(s) Applied in Full**	**Result**
SAFETY (Art 3.1.a)	EN 60950: A2	Pass
EMC (Art. 3.1.b)	EN 301 843-1	Pass
SPECRTUM (Art. 3.2)	EN 301-360 EN 301-459 EN 303-978	Pass

Supplementary Information:

Notified Body Involved: (Testing Organization)	DT&C Co., Ltd. 42, Yurim-ro, 154 beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do 449-935, 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 20 Oct 2012

Authority: **Steve Cha**
/ CTO, R&D

Signature: _____

Date: **20th July, 2017**

Intellian Technologies USA, Inc.
US Headquarters
11 Studebaker
Irvine, CA 92618 USA
Tel: +1 949 727 4498

Intellian Technologies, Inc.
EMEA & APAC Headquarters
348-5 Chungho-Ri, Jinwi-Myeon
Pyeongtaek-Si, Gyeonggi-Do, 451-862 Korea
Tel: +82 31 379 1000

Doc Number IT16-DC0502-03

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 GX100, 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:**

Intellian Technologies USA, Inc.
US Headquarters
9004 Research Drive
Irvine, CA 92618 USA
Tel: +1 949 727 4498

Intellian Technologies, Inc.
EMEA & APAC Headquarters
18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-Si,
Si,
Gyeonggi-do 451-862, Korea
Tel: +82 2 511 2244

Doc Number IT14-DC0901-05

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 GX100, 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
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:**

Intellian Technologies USA, Inc.
US Headquarters
9004 Research Drive
Irvine, CA 92618 USA
Tel: +1 949 727 4498

Intellian Technologies, Inc.
EMEA & APAC Headquarters
18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-Si,
Si,
Gyeonggi-do 451-862, Korea
Tel: +82 2 511 2244

Doc Number IT14-DC0901-06

Introduction

Intellian GX100 Introduction

Intellian GX100 (1.03m) is a Ka-band maritime stabilized antenna, a ready-to-use system for the super-fast, Global Xpress™ (GX) Ka-band broadband service from Inmarsat. The GX100 offers robust Ka-band RF performance optimized for Inmarsat GX service with all new GX BDT.

The GX100 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 GX100 offers the maximized performance on a Ka-band Inmarsat Global Xpress system. The antenna's 3-axis stabilized platform and advanced shock-resistant and vibration damping design of the Pedestal is fully optimized to withstand the demanding maritime conditions and to ensure reliable broadband communications. The 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.

The GX100 BDT combines the Global Xpress Modem internally with the antenna
control unit, saving time and space during installation. The BDT also includes Wi-Fi to allow wireless connection using the dedicated Intellian Aptus software for system control and monitoring.

The Aptus software automatically configures the antenna system, enabling true One Touch Commissioning.

Equipped with Intellian's next generation Antenna Control Software, 'Aptus®', the GX100 antenna can be remotely accessed, monitored and controlled through serial connection or secured TCP/IP network. Its graphic-based user interface provides easy-to-use operating environment. The GX100 also has an embedded webserver and secured web user interface called Aptus Web for remote management of the antenna on a web browser. Network connection can be easily setup through the front Management Ethernet Port on the BDT that supports automatic IP configuration.

Intellian GX100 Features

Ka-band optimized reflector
The GX100 carbon fiber reflector is designed and engineered to operate on the Ka-band while maximizing the RF performance. The reflector of the GX100 is designed to be extremely precise and very stable in all operating conditions.

Frequency tuned radome
To ensure efficient operations for Ka-band Inmarsat Global Xpress™ 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 GX100 to acquire and lock onto the satellite without requiring a separate input from the ship's gyrocompass.

Combined BDT-Global Xpress™ Core Module
The all new GX BDT combines the Core Module internally with the antenna control unit, saving time and space during installation. The BDT also includes a Wi-Fi connection to allow wireless connectivity via the dedicated Intellian Aptus software for system control and monitoring. The Aptus software also helps automatically configure the antenna system during initial commissioning.

Graphical and user-friendly antenna control software
The GX100 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.

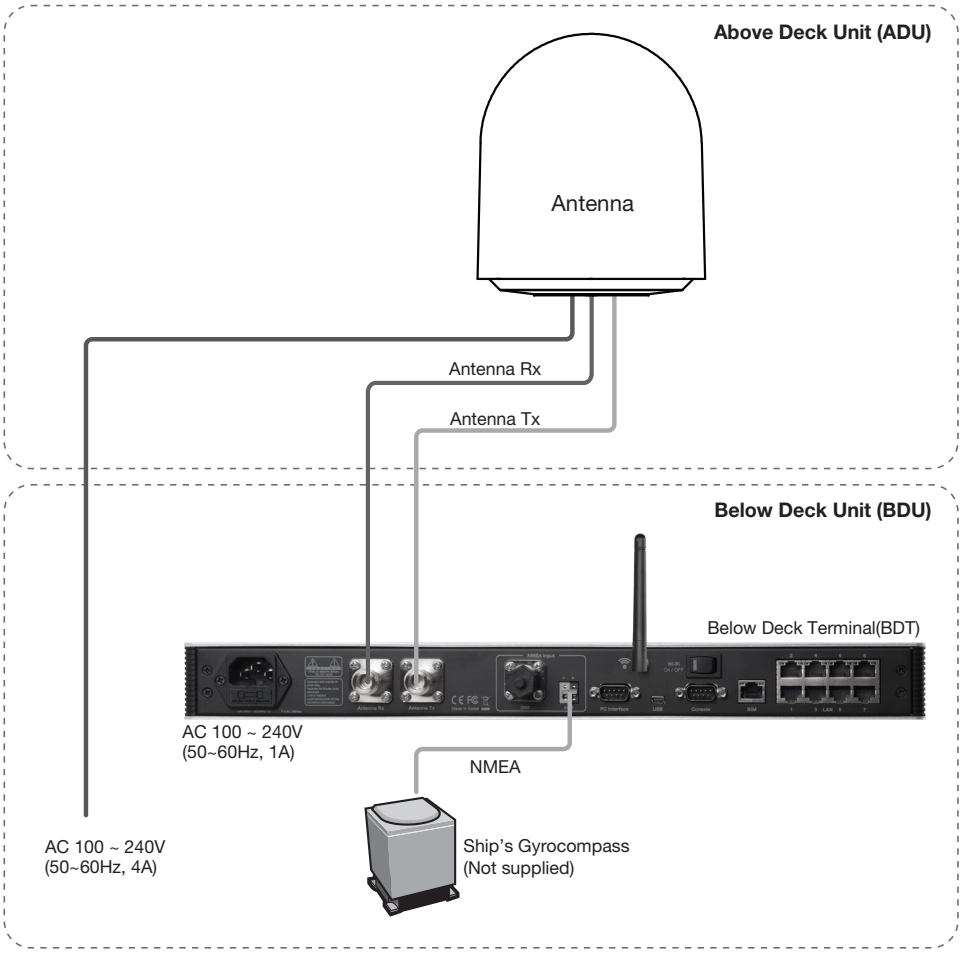
Dedicated Management Ethernet Port
The GX100 has a Management Ethernet Port on the BDT front that enables direct and simple network connection between a PC and the BDT. The Management Port allows Internet access and quick access to Intellian's remote management solution, the Aptus Web.

Wireless access via Wi-Fi
The built-in Wi-Fi wireless network card enables the BDT 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 BDT and monitor, enabling users to control and change the settings of Intellian antenna system wirelessly.

Intelligent firmware upgrade
Intellian GX100 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 BDT front 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 BDT'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

Installing Antenna

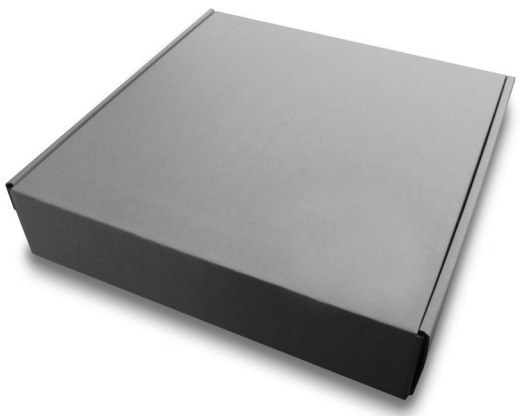
System Package

The package of Intellian GX100 consists of antenna unit, lifting straps, Below Deck Termial(BDT) and installation kit box.

Antenna unit

Below Deck Termial(BDT)

Installation kit box



Antenna Unit

The antenna unit includes an antenna pedestal inside a radome assembly unit. The pedestal consists of a satellite antenna main dish with RF components mounted on a stabilized pedestal. The radome protects the antenna pedestal assembly unit from the severe marine environment.

Antenna unit

Below Deck Termial (BDT)

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

Antenna control unit

Front Panel

Rear Panel

The functions of the BDT 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 BDT 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 BDT to the vessel.

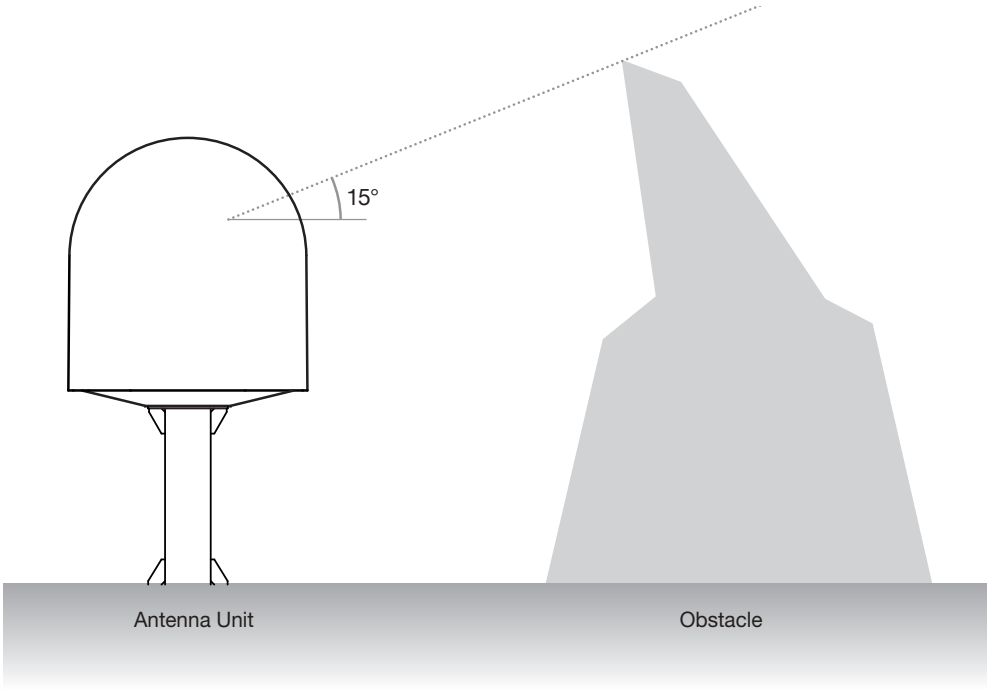
Below Deck Termial(BDT) Box			
Description	Q'ty	Size	Remarks
Below Deck Termial(BDT)	1	43.1 cm x 44.1 cm x 4.4 cm (17" x 17.3" x 1.7")	
User Manual	1		
RF Hazard Sticker	1		Radiation Safety Distance Label
Mounting Template	1		
Wi-Fi Antenna	1	110mm	
USB Flash Drive	1		

Components box			
Description	Q'ty	Size	Remarks
BDT Bracket (Rack)	2		BDT-19inch Rack
BDT Bracket (Table)	2		BDT-Table
AC Power Cord (CEEE7/7)	1	1.5m	BDT Power
AC Power Cord (USA)	1	1.5m	BDT Power
AC Input Cable to Power Box	1	3m	AC Power to Antenna Power Box
PC Serial Cable	1	1.8m	BDT to PC
USB Cable (A-A)	1	1.8m	BDT to PC
Ethernet Cable (RJ45/LAN)	1	1.5m	BDT to PC
N to F Adaptor	2		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	
Sems Bolt	2	M4 x 8	
Self-Tapping Screw	5	M4 x 16	Table Mount Bracket
Flat Head Screw	10	M4 x 12L	Rack Mount Bracket BDT
Sems Bolt	5	M3 x 12L	Table Mount Bracket BDT

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 15º 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 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 at the center of the vessel. If these conditions can be only partially satisfied, find the best compromised installation site between the various considerations.



Setting block zones

The blockages 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 antenna cannot receive satellite signal due to blockages. You can create five block zones by inputting azimuth and elevation value with BDT. When the antenna is within the block zones, the BDT works as follows.

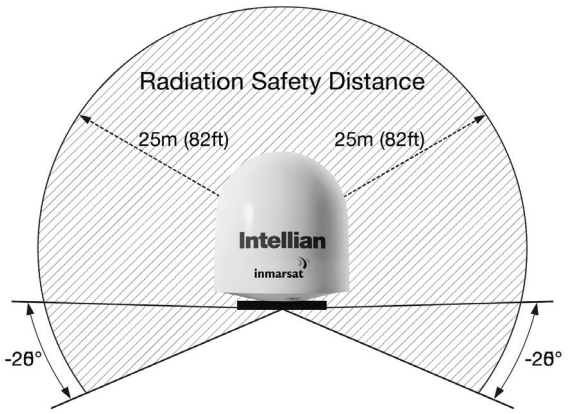
1. "BLOCK" will be displayed on the BDT screen.

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 BDT will disable/mute the modem transmission.

RF Hazard Precautions

The antenna is designed to be used with radiation transmit equipment manufactured by others. Exposure to RF radiation, including exposure associated with an improper use of the transmit equipment, may be hazardous to persons close to the above deck unit. Ensure safety of personnel who work on the system.
During transmission, ensure to keep the minimum safety distance. The recommended minimum safety distance to the reflector on the focal line is about 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.



Safe access from radiation hazard

System Cables

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

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

- **RF Cable (Customer Furnished)**

Due to the voltage losses across the length of the RF coax on L-Band, 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.

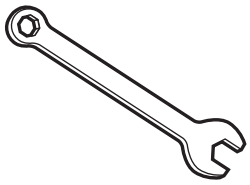
Recommended RF cables

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

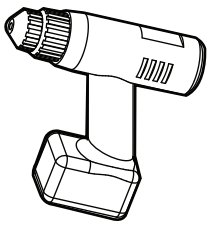
Power Requirement

Intellian GX100 has been designed to work on a vessel's power supply rated at 100-240V AC.

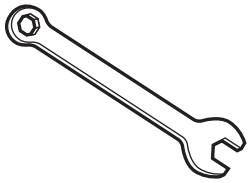
Tools Required for Installation



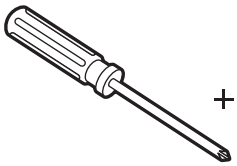
11 mm Wrench



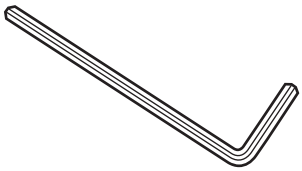
Power Drill



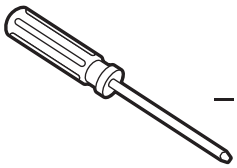
19 mm Wrench



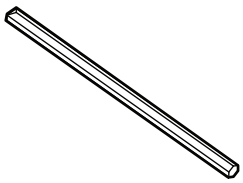
Phillips Head Screwdriver



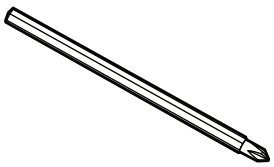
5 mm Allen/Hex key



Flat Head Screwdriver



5 mm Allen/Hex key
(for Power drill)



Head Screwdriver
(for Power drill)

Antenna Installation

Unpacking the wooden crate

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).

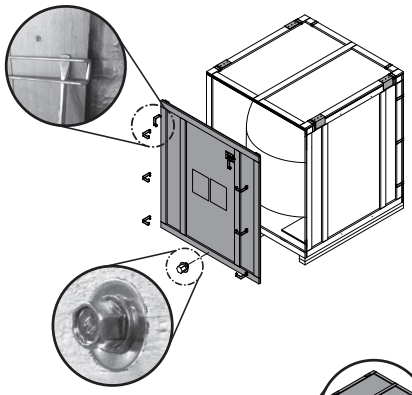
2. Remove the fixing screws (4EA) and clips (6EA) on the top panel. Detach the top panel by carefully pulling it as shown in the picture below.

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.

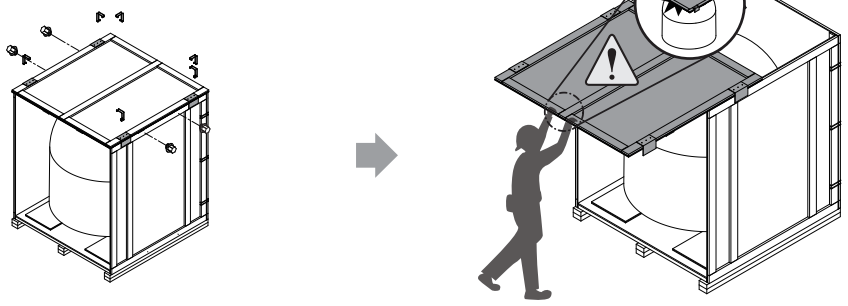
3. Remove the fixing screws (5EA) from the remaining side panels, then detach the side panels with clips on.

①

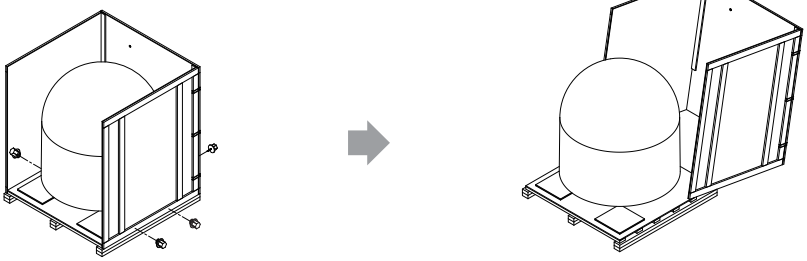
Tips : Using a Flat-head screwdriver, remove the clip as shown in the picture.



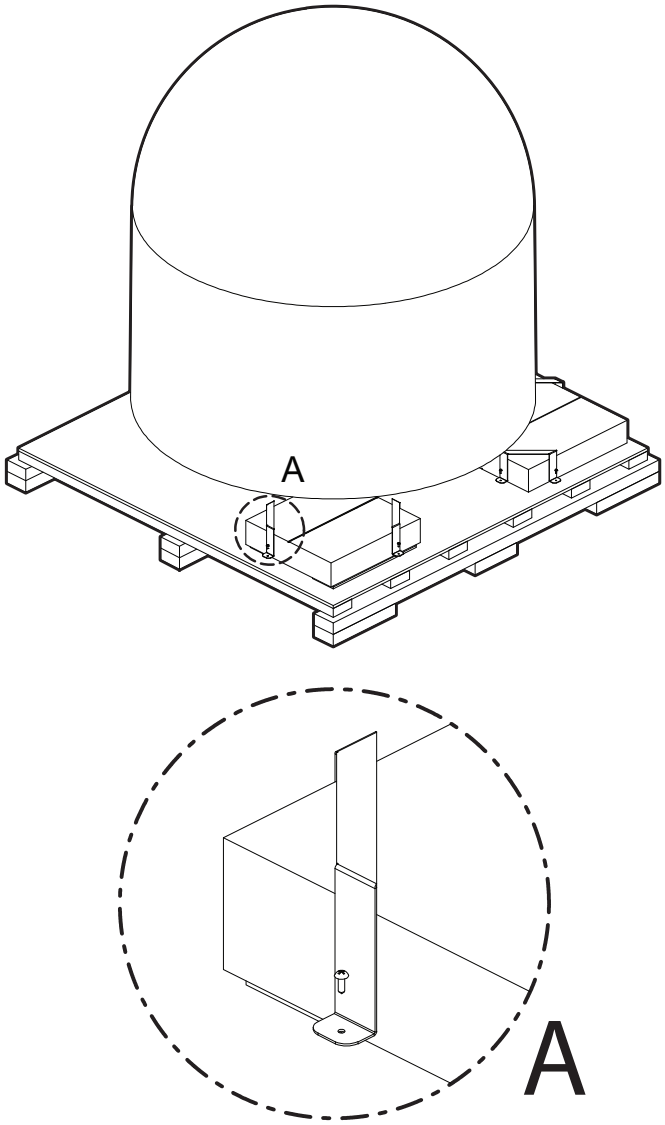
②



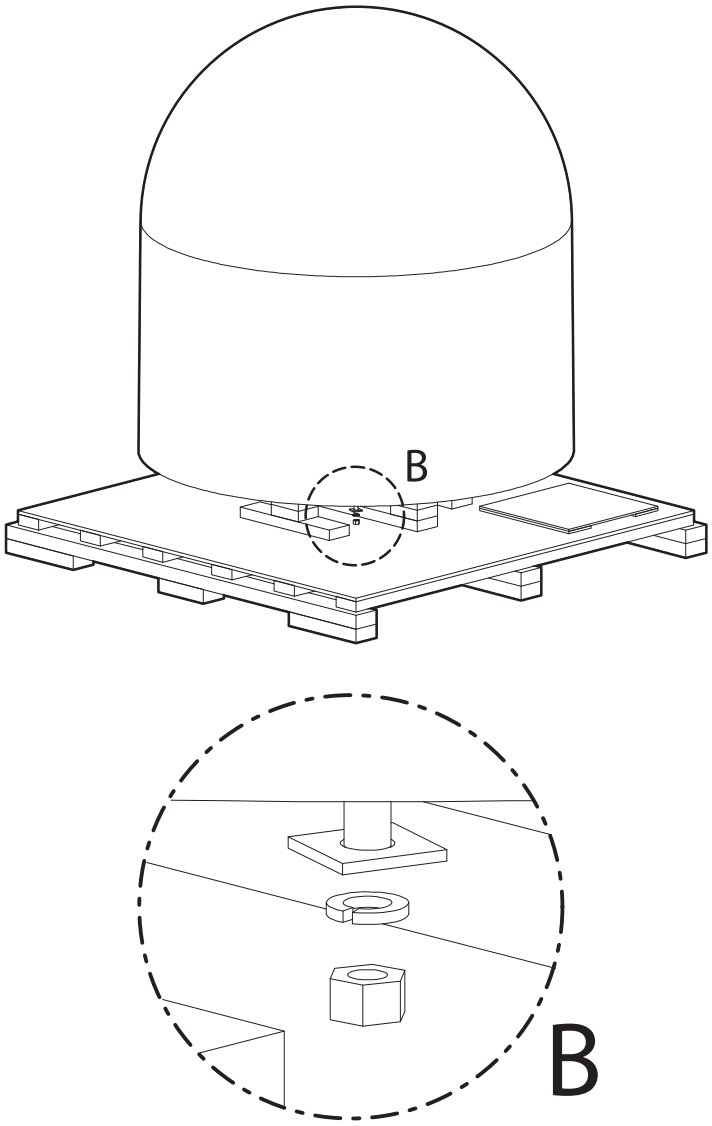
③



Step 2.
Remove tapping screws from the fixing bracket (A) and take out the BDT box and installation kit box from the pallet.



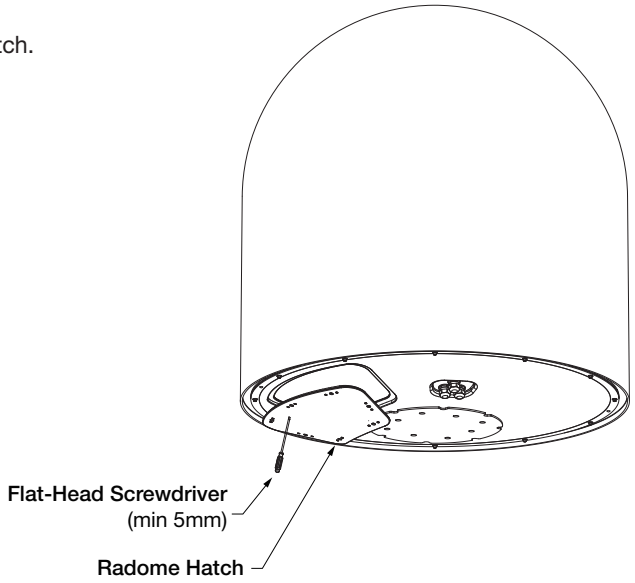
Step 3.
Using a 19mm wrench, remove 4 shipping bolts (B) that mount the antenna to the pallet.



WARNING

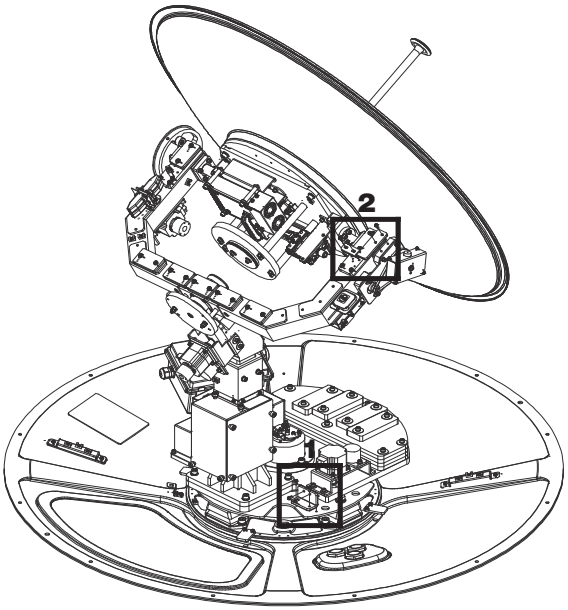
WARNING: When lifting the antenna by using the lifting strap, ensure to disassemble the antenna and the pallet.

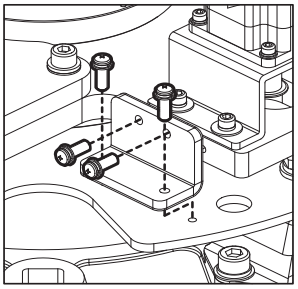
Step 4.
Open the radome hatch.



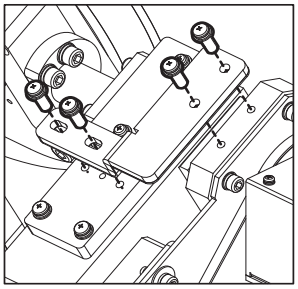
Step 5.
Open the top radome and remove the shipping restraints.

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



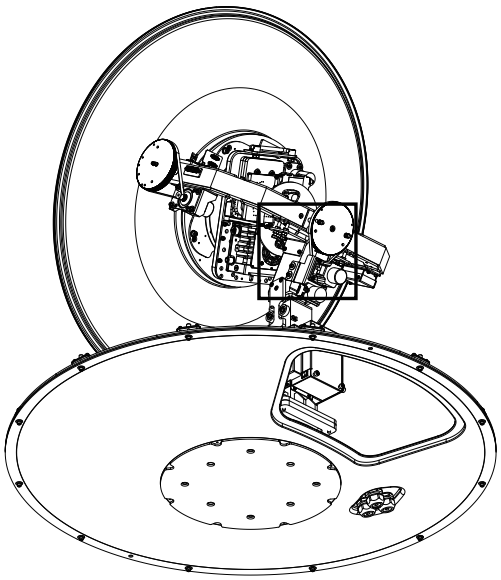


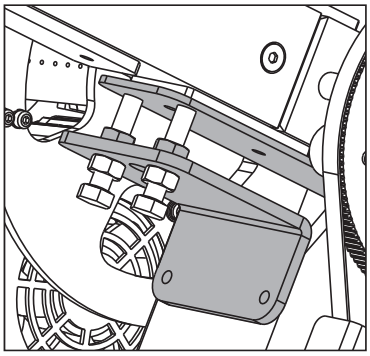
1. Remove the AZ shipping bracket



2. Remove the EL shipping bracket

B. Remove the shipping brackets securing the CL axis.





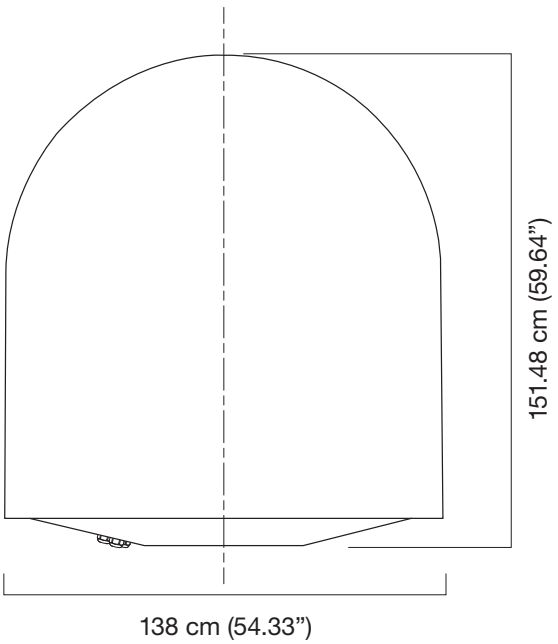
Remove the shipping brackets

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

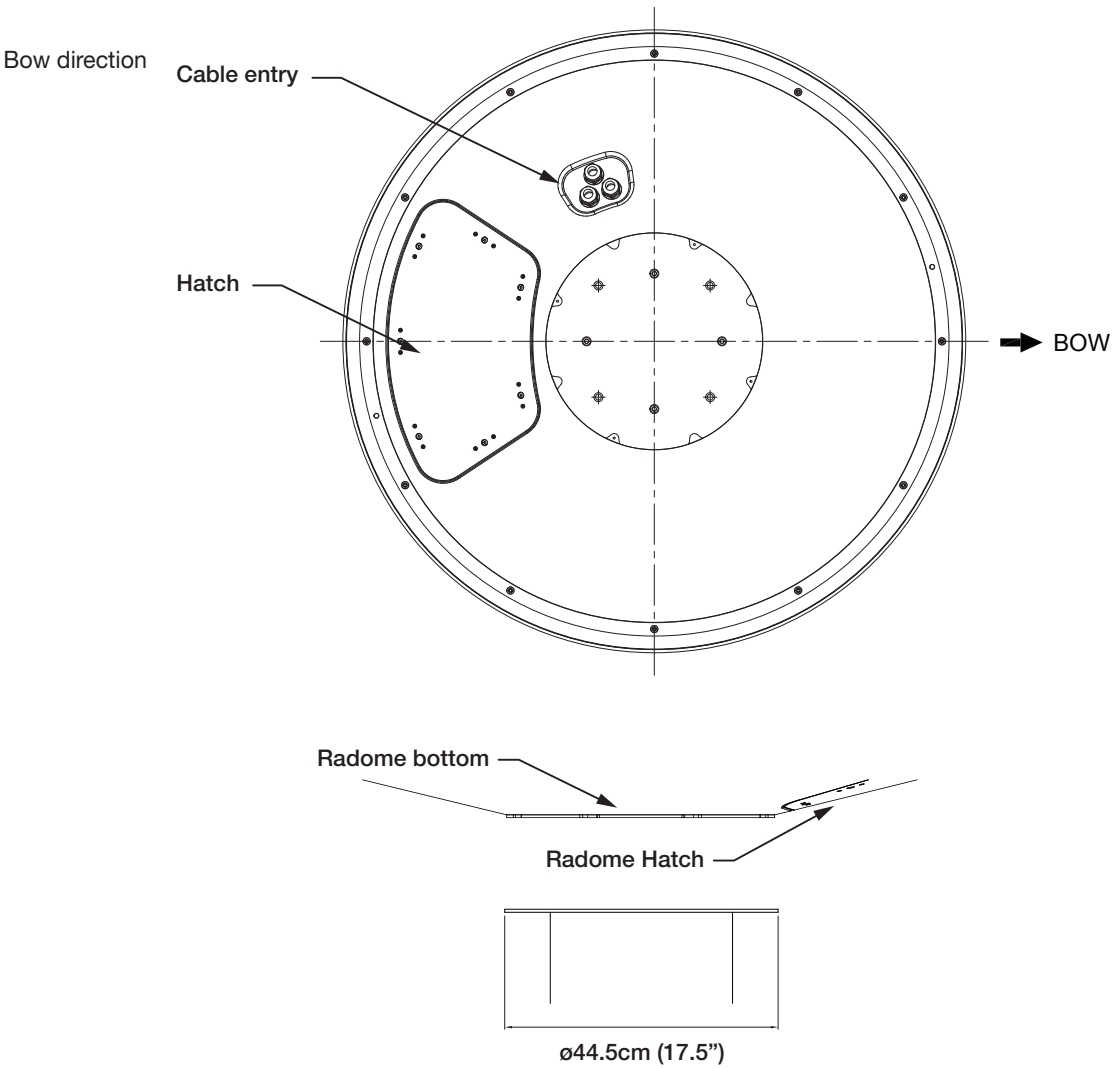
The method of installation and mounting of antenna may vary with vessel design, but the following procedures are applicable in most situations and will result in a secure and effective installation. Confirm the height and diameter of the antenna before installing it.

Radome dimensions

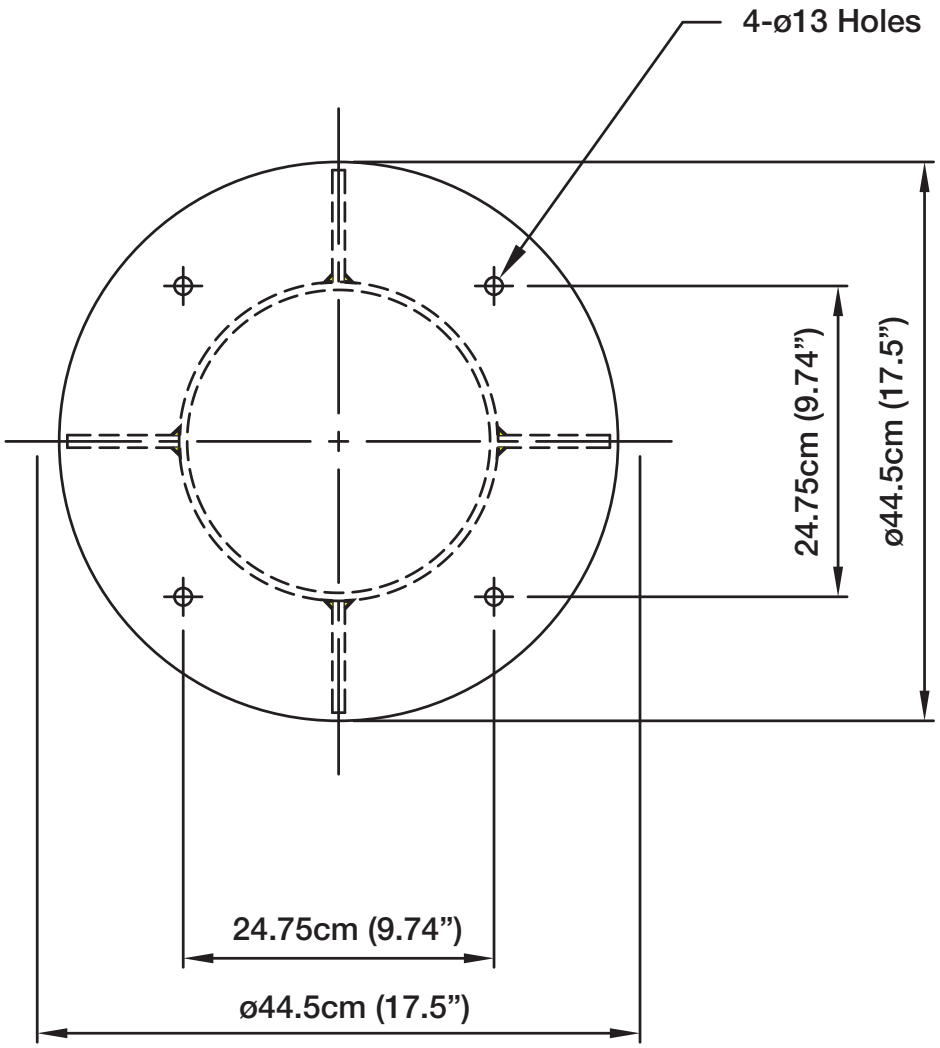


Antenna Mounting Templates

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



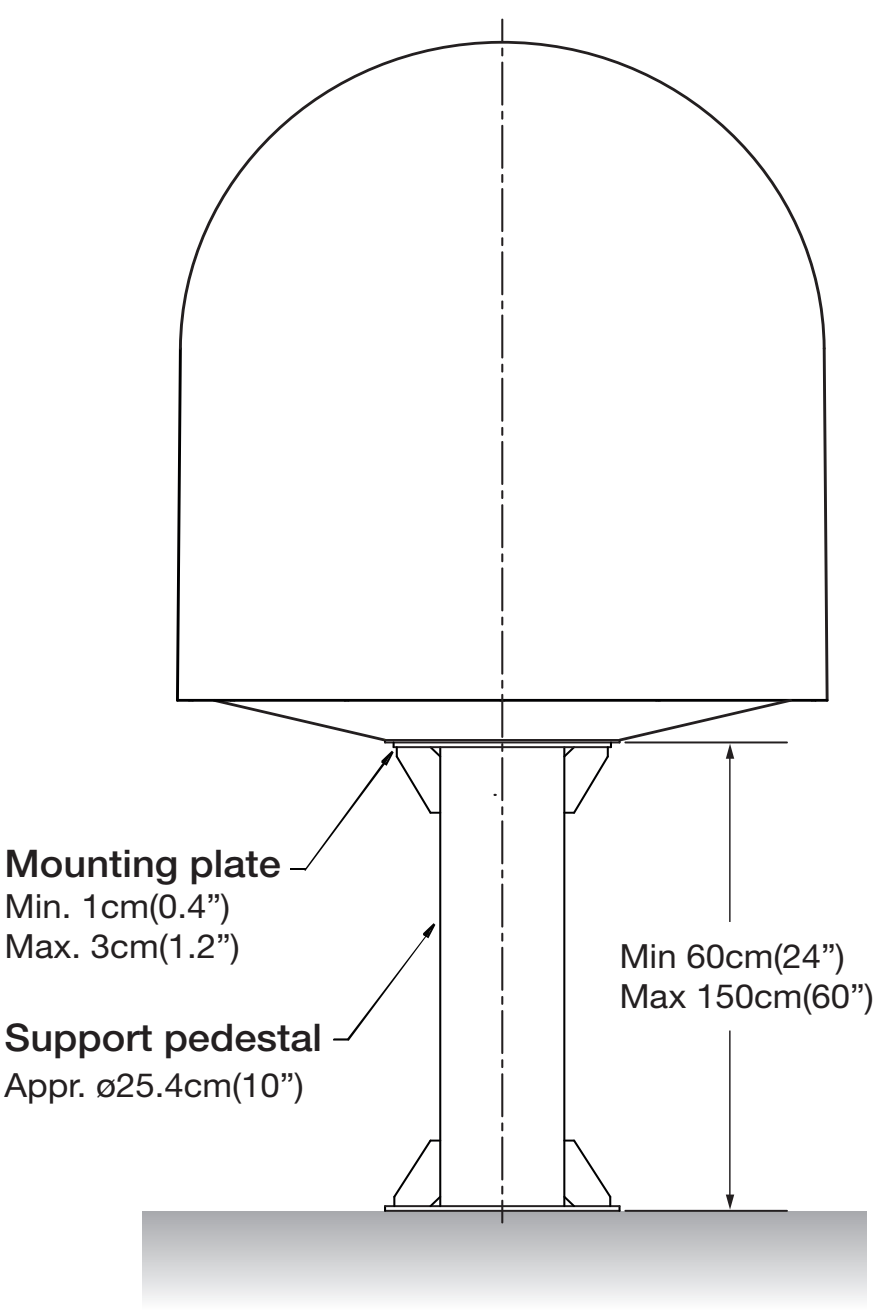
Antenna
mounting hole pattern



Position Radome

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

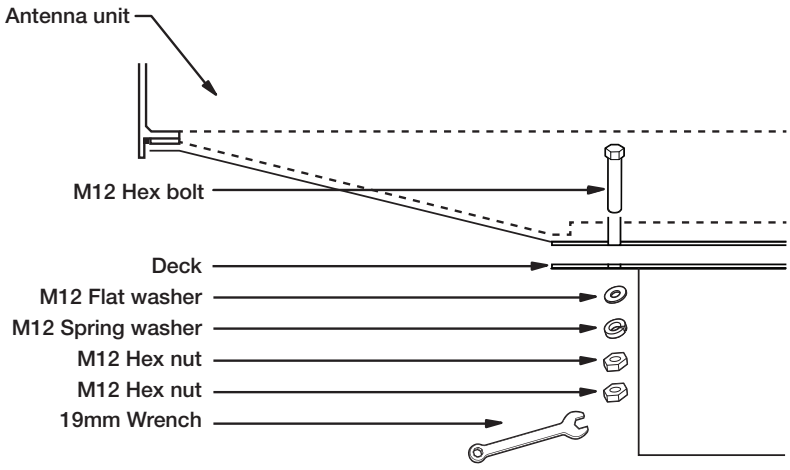
Recommended size of the support pedestal



Mounting Radome

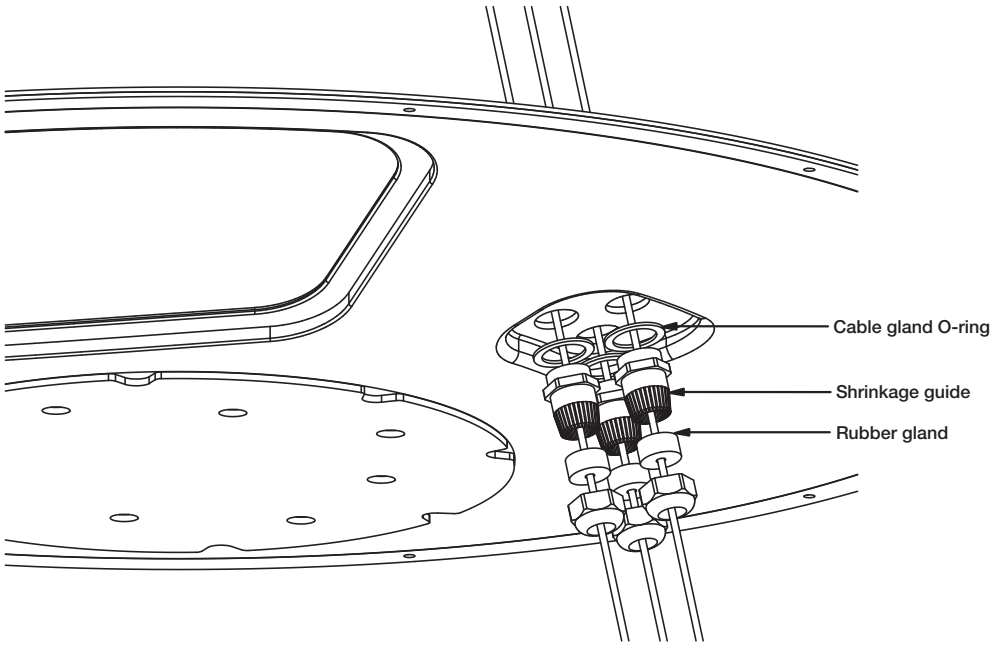
Bolt the radome base directly to the support pedestal.

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.

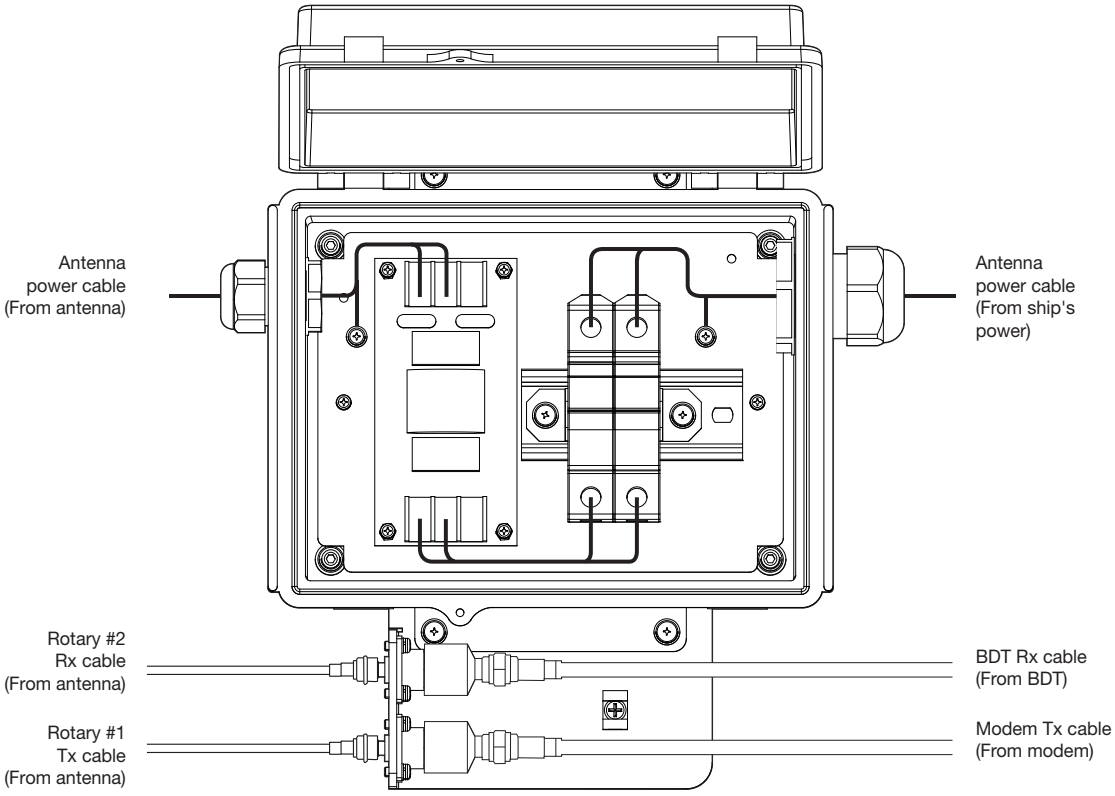


RF Cable Connections

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

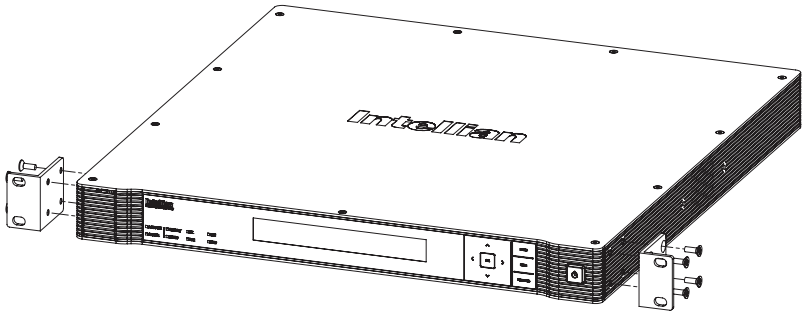
Connector Type	Tightening Torque
F Type	1.0 N-m
SMA	0.6 N-m
N Type	1.5 N-m

Installing BDT

Mounting the BDT

Intellian supplies two types of mounting methods (a) 19" Rack Mount Type and (b)Table Mount Type to mount the BDT.

19" Rack mount type



19" Rack Mount Type

- The BDT should be installed using the two supplied Rack Mounting Brackets which allow for a side 19" rack mounting configuration.
- Using the Flat Head screws supplied, attach the mounting brackets to the sides of the BDT.
- Place the BDT in the location where it is going to be installed.
- Connect the cables to the rear of the BDT.

Table mount type

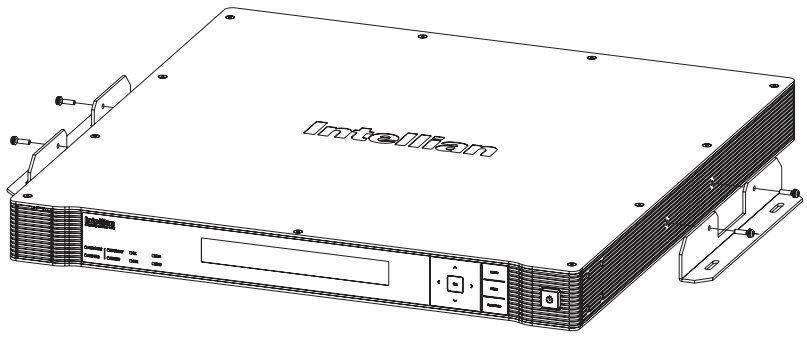


Table Mount Type

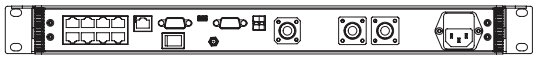
- The BDT should be installed using the two supplied Table Mounting Brackets which allow for a top or bottom mounting configuration.
- Using the Sems Bolts supplied, attach the mounting brackets to the sides of the BDT.
- Place the BDT in the location where it is going to be installed.
- Using a pencil 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 BDT.

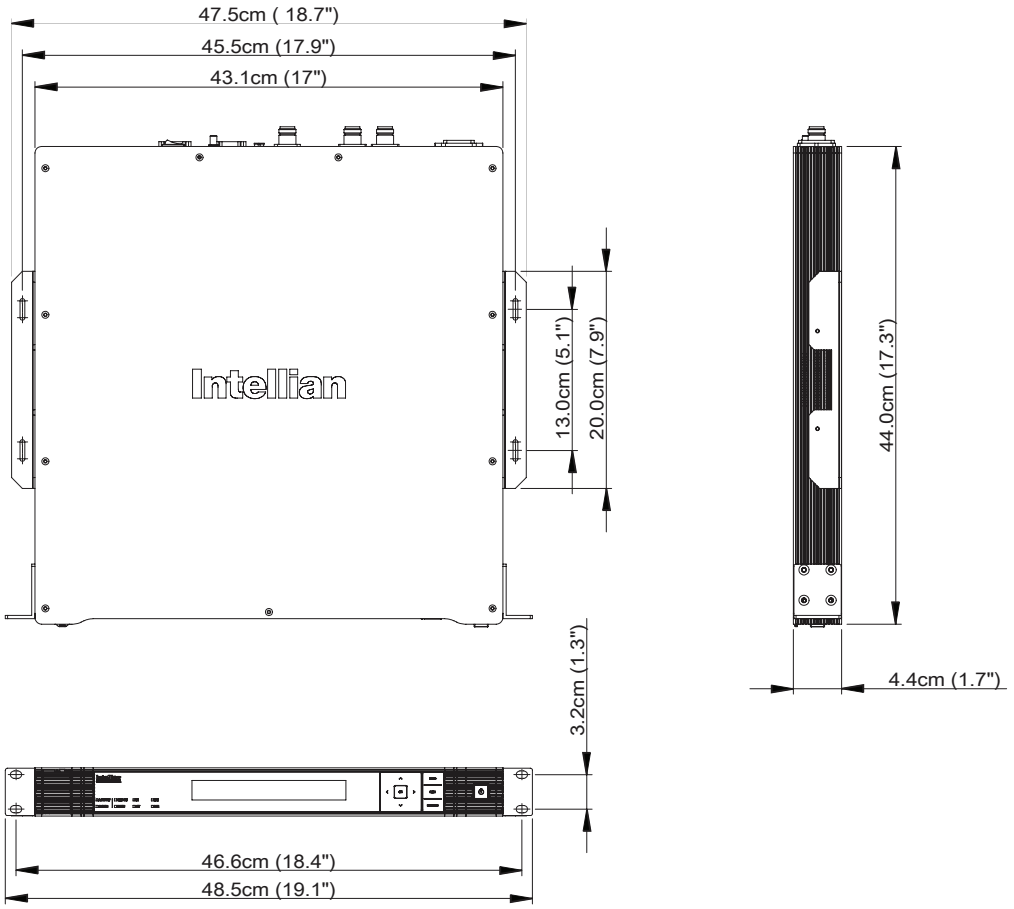
WARNING

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

BDT Dimensions

Dimension of BDT





Selection of BDT Installation Site

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

- Dry, cool, and ventilated.
- The front panel should be easy accessible to user.

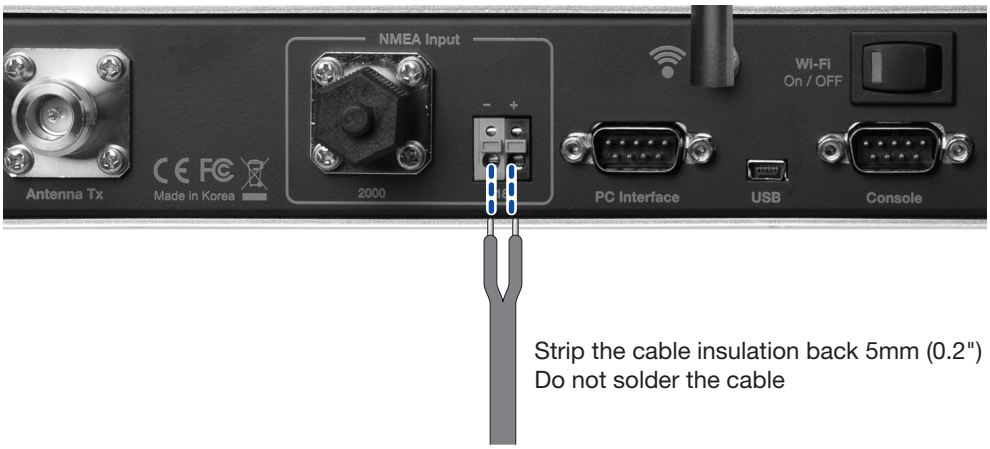
Gyrocompass Connection

Connecting System with Gyrocompass

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

Reommended 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)



Connecting System without 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 according to the existence of heading input and the setting of the heading device.

Search 1: The antenna will search for the target satellite by turning its azimuth angle in CCW(Counter Clockwise) direction until the antenna receives the lock signal from the modem or the DVB(Digital Video Broadcasting) transponder of the target satellite is decoded by the antenna.

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 BDT Communication Setup

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

TCP/IP Connection

Connection through Front Panel Management Port

To connect the BDT to the PC through the Management Ethernet Port on the front BDT panel, the network should be configured by setting up the PC IP before the connection. This method requires separate IP configuration on a PC.

1 Connect an Ethernet cable from a PC Ethernet port to the Management Port on the front of the BDT.

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.

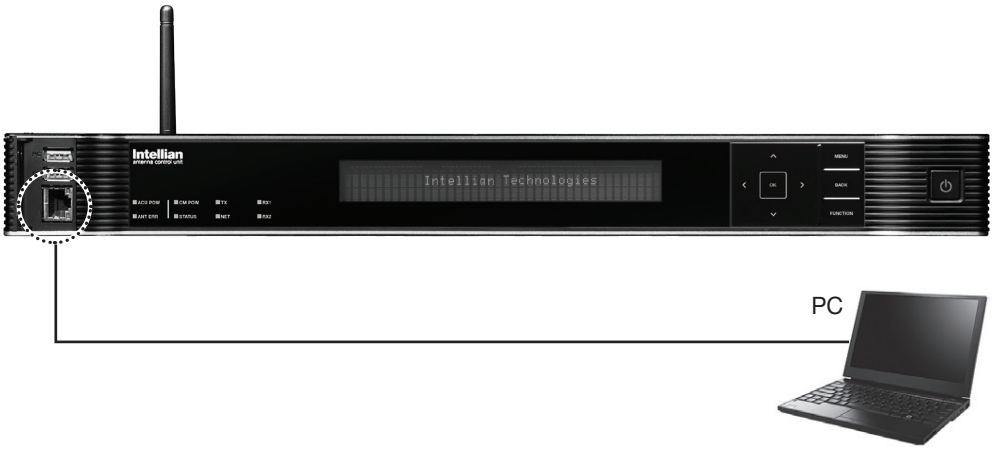
4. Change the network settings on a PC. **(Example)**

- IP: 192.168.1.11 (Do not use 192.168.1.1~10, which are only for internal use.)

- Subnet Mask: 255.255.255.0

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

- Default IP: 192.168.1.2



Wi-Fi Connection

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

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

- Default IP: 192.168.1.2

Checking Modem Information

After installation is complete, terminal activation requires a Provisioning Key and Terminal ID of the iDirect modem. Intellian provides this information in the form of package labels as well as displaying on the Aptus software.

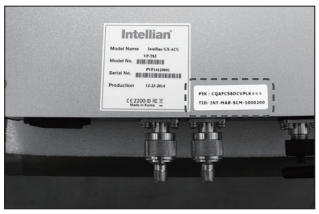
• Provisioning Key and Terminal ID Label

PIK: XXXXXXXXX===
TID: TID: INT-MAR-SCM-XXXXXXX

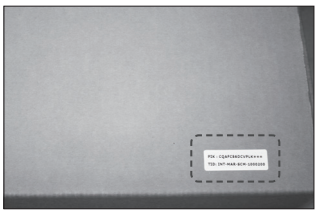
NOTE: The PIK and TID information depends on the serial of the integrated modem and GX antenna model.

• Label positions

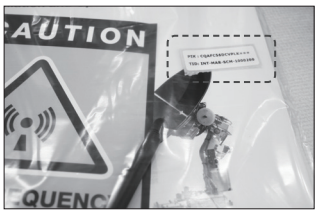
① BDT top cover



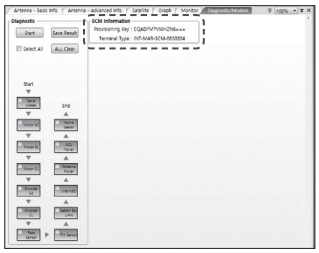
② BDT package box

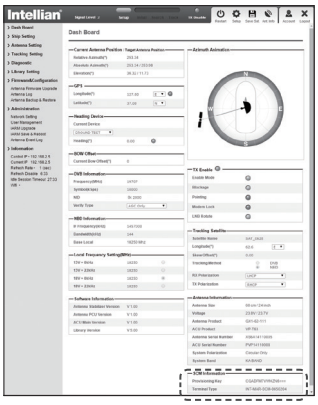


③ User manual package



④ Aptus software display

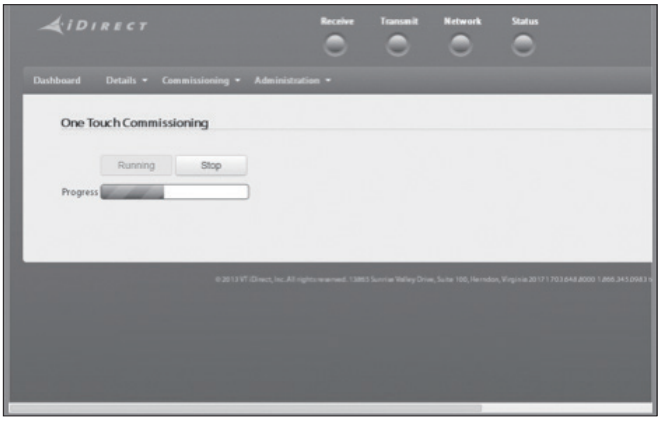




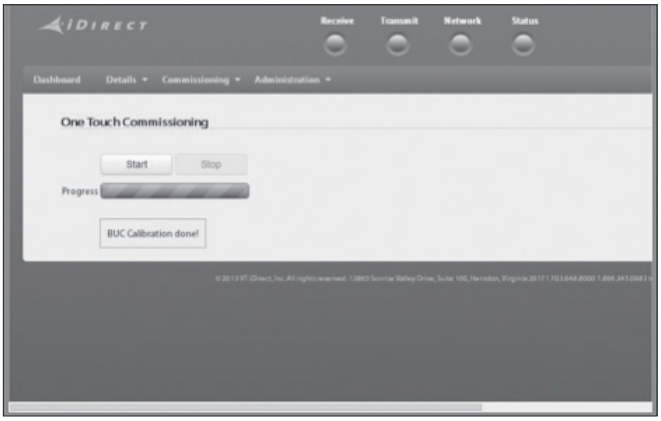
One-touch Commissioning

Ensure to perform One-touch Commissioning after the first-time connection of the GX terminal and the BDT, 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 BDT. (See PC to BDT Communication Setup section for details.)
2. Open a web browser on the PC and type the default IP address (192.168.1.1) to access the iDirect modem's web page.
3. Login to the iDirect modem page using ID: **admin**, PW: **iDirect123!** (or P@55w0rd!).
4. Click "Commissioning" > "One Touch Commissioning"
5. Click "Start" button and monitor the progress on the web page.

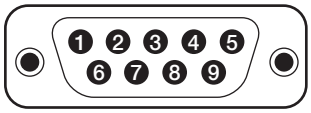


6. Check that Commissioning is complete and "BUC Calibration done!" message is displayed.

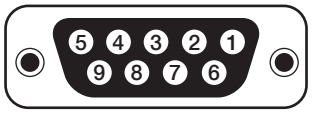


BDT Connector Guide

• Console port



BDT console port:
D-sub 9 pin male



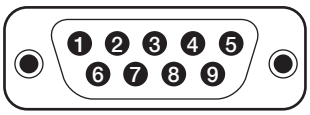
Supplied component:
D-sub 9 pin female

Pin	Signal
1	NC
2	Console RX(RS-232)
3	Console TX(RS-232)
4	NC
5	GND

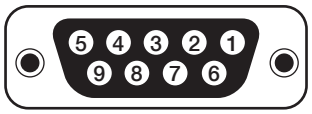
Pin	Signal
6	NC
7	NC
8	NC
9	NC

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

• PC Interface



BDT PC Interface port:
D-sub 9 pin male



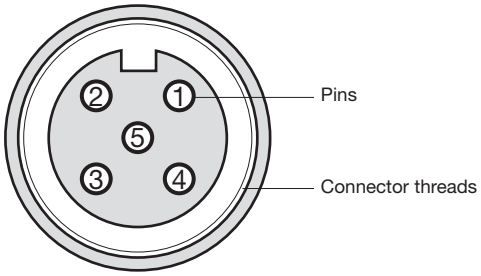
Supplied component:
D-sub 9 pin female

Pin	Signal
1	GPS IN+(Spare)
2	PC RX(RS-232)
3	PC TX(RS-232)
4	NC
5	GND

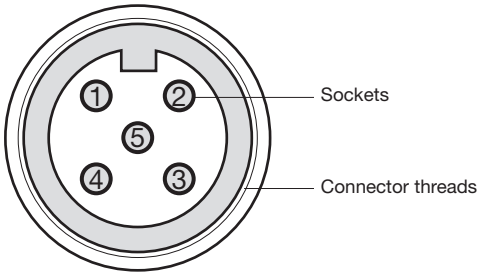
Pin	Signal
6	GPS IN-(Spare)
7	NC
8	NC
9	NC

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

• NMEA 2000



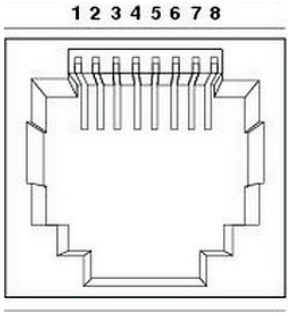
BDT NMEA 2000 port :
male



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



BDT LAN port

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

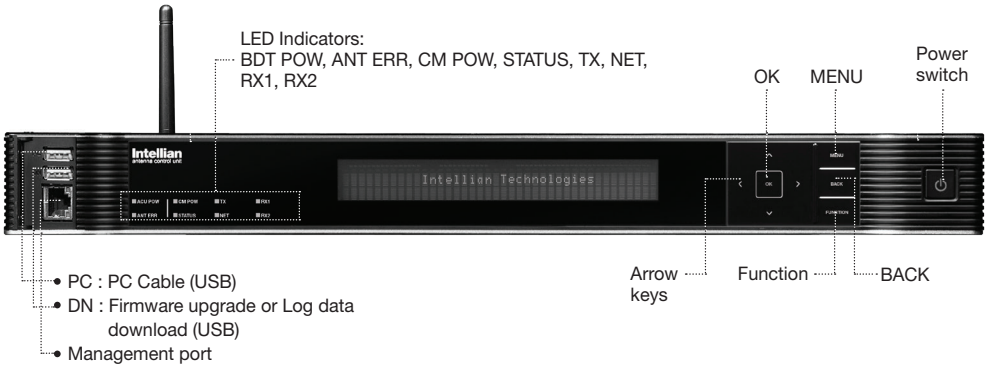
Pin	Signal
6	RX-
7	NC
8	NC

Operating BDT

Introduction

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

BDT 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

Normal Mode

Startup

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

Start up

```
INTELLIAN TECHNOLOGIES INC.
```

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

Initialize antenna info

```
INITIALIZE - ANTENNA INFO
INTELLIAN GX100
```

2. The BDT receives antenna information.

Initialize elevation & Cross level angle

```
INITIALIZE - EL POSITION
INTELLIAN GX100
```

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

Initialize azimuth angle

```
INITIALIZE - AZIMUTH POSITION
INTELLIAN GX100
```

4. The azimuth angle is initialized.

Initialize target satellite position

```
INITIALIZE - SAT POSITION
INTELLIAN GX100
```

5. The antenna returns to the target satellite position.

Search status

```
SEARCH1  062.6E I5_F1     SIG:102
AZ:254.3( 164.3) EL:  10.9
```

6. The antenna is searching for the target satellite.

Tracking status

```
TRACKING 062.6E I5_F1     SIG:201
AZ:254.3( 164.3) EL:  10.9          Fn
```

7. The antenna has locked onto the satellite.

Monitoring Current Antenna Status

When the BDT 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

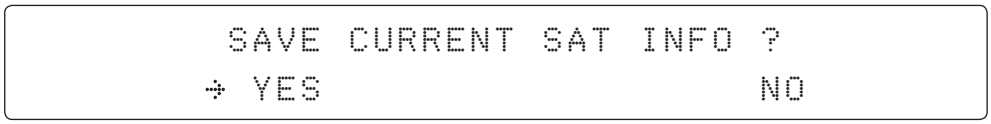
2. The antenna has locked onto the target satellite.
Current IF signal level SIG/ AGC is displayed. SIG will be displayed when NBD (Narrow band detection) mode for TRACKING SIGNAL is chosen to be used and AGC will be displayed when DVB mode of TRACKING SIGNAL is chosen to be used.

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. Touch 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

```
TRACKING 062.6E I5_F1     SIG:201
AZ:254.3( 164.3) EL:  10.9          Fn
```

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

Tracking & Heading information

```
NBD   F:1457000  BW:1440     SIG:201
127.04E  37.06N  HDG:090.0  L:18250 Fn
```

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

- NBD (Narrow Band Detection) IF tracking frequency: 1457000 KHz
- Detected Band Width: 1440KHz
- 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 & BDT versions

```
V3-11G-311   ANT SERIAL   1.00/1.00
VP-T63       ACU SERIAL   1.00
```

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

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

Select USB functions

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

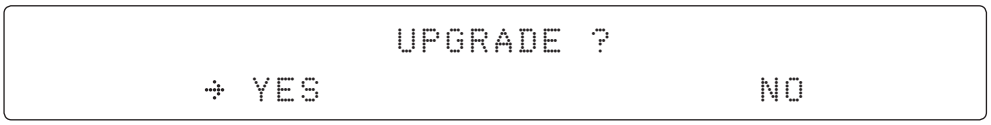
8.Touch RIGHT arrow key to display the **USB FUNCTION***
This menu will be displayed automatically if a USB flash drive is plugged into the USB port located in the front panel of the BDT.

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 DATA: Copy the up-to-date log data from the system to the USB flash drive.

USB

Upgrade the system



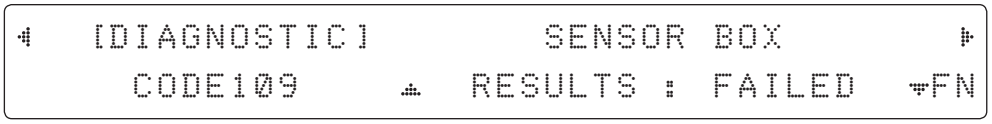
9. Touch OK key to upgrade firmware.

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.

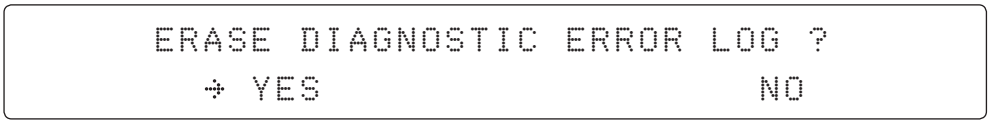
COPY LOG DATA
- COPY LOG DATA TO USB [30%]: display the copy progress in percentages.
- NOT ENOUGH SPACE IN USB: USB occupies no memory space.
- CHECK USB CONNECTION: the USB flash drive is not connected.

Real-time diagnostic result



10. Touch RIGHT arrow key to display the real-time diagnostic result.
The real-time diagnostic code will be displayed automatically if there is any error found during the system operation. However, this page will not be displayed if there is no error message.

Erase error message



11. Touch FUNCTION key to erase diagnostic error message.

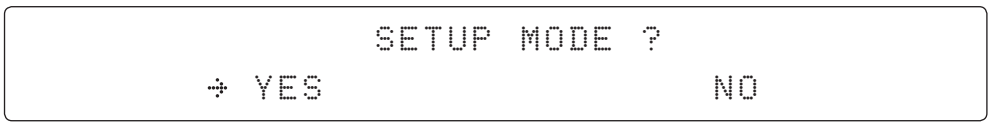
Setup Mode

Enter the SETUP mode. Simply follow the instructions below.

Searching / Tracking mode

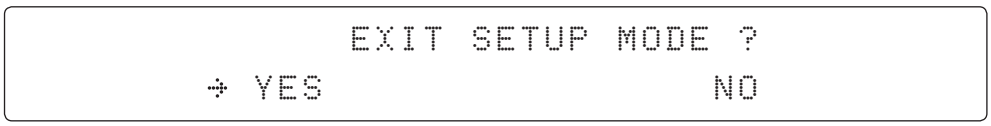
1. While the antenna is in SEARCHING/TRACKING mode, touch MENU key to enter SETUP mode. * indicates the key pad lock function is on (Refer to KEY LOCK menu to setup the key pad lock function). When key pad lock function is activated touch MENU key or when "Fn" menu is activated touch FUNCTION key then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

Setup mode



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

Exit setup mode



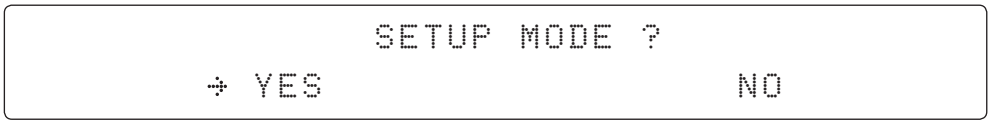
3. While the antenna is in SETUP mode, touch FUNCTION key as shortcut key to exit SETUP mode.

Antenna Settings

Manual Search

Search the desired satellite manually.

Setup mode

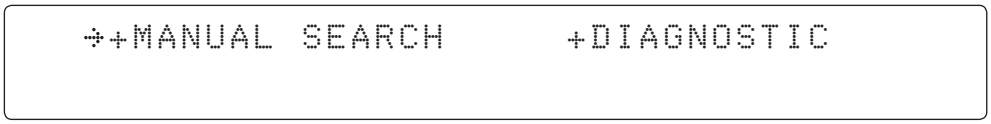


1. Touch LEFT arrow key to move cursor to YES and touch OK key to enter SETUP mode.

Antenna menu

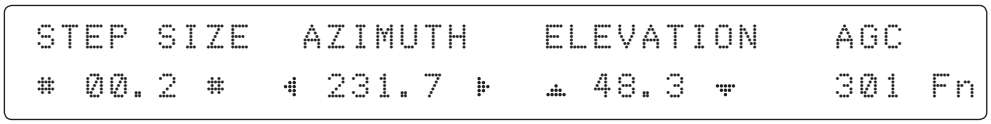
2. Touch OK key to enter ANTENNA menu.

Manual search menu



3. Touch 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.
Touch NUMBER key to change the STEP SIZE (Range: 0.1~99.9). Touch LEFT and RIGHT arrow keys to increase or decrease the azimuth angles. Touch UP and DOWN arrow keys to increase or decrease the elevation angles.
Touch FUNCTION key to save current settings or abort and return to the main display.

Save

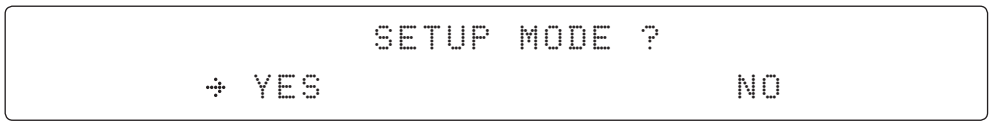
5. If the current settings are able to locate the satellite, touch FUNCTION key to save “current satellite information”. This will help to reduce the satellite acquisition time after restarting the system. Touch LEFT arrow key to move cursor to YES and touch the OK key to save the settings.

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

Antenna Diagnostic Test

Refer to the diagnosis codes for the test results.

Setup mode

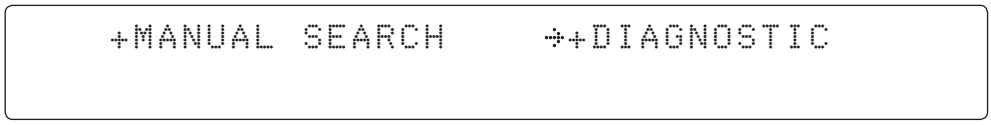


1. Touch LEFT arrow key to move cursor to YES and touch OK key to enter SETUP mode.

Antenna menu

2. Touch OK key to enter ANTENNA menu.

Diagnostic menu



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

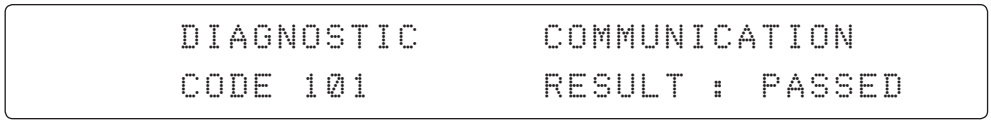
Full diagnostic test

4. Touch UP and DOWN arrow keys to select a full diagnostic test or single diagnostic test and touch 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 BDT 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 BDT power is tested.
CODE 115: The receiver power is tested. (Skip for v-Series communication products)
CODE 116: The home sensor is tested.

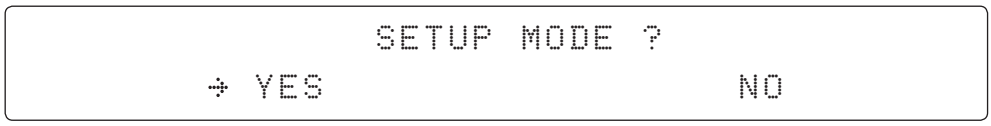
An example of test result after a full test: ●2●●●●●●●●●-●●-●

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

Satellite Settings

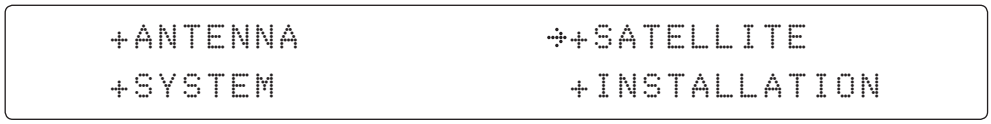
Load Satellite

Setup mode



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

Satellite menu

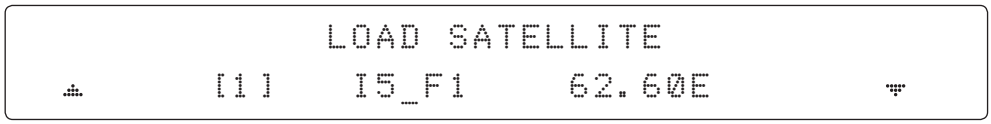


2. Touch RIGHT arrow key to move cursor to SATELLITE and touch OK key to enter it.

Load sat menu

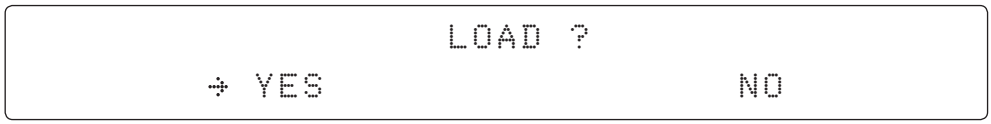
3. Touch OK key to enter LOAD SAT. menu.

Load satellite



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

Load

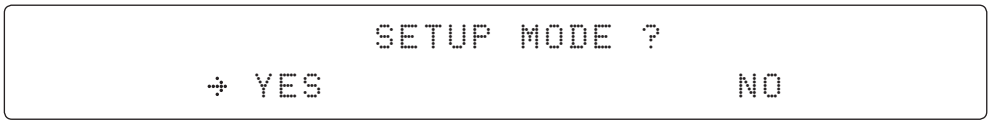


5. Touch LEFT arrow key to move cursor to YES and touch OK key to load the selected satellite and execute the current settings. Or touch RIGHT arrow key to move cursor to NO and touch OK key to abort and return to the main display.

System Settings

Set Location

Setup mode



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

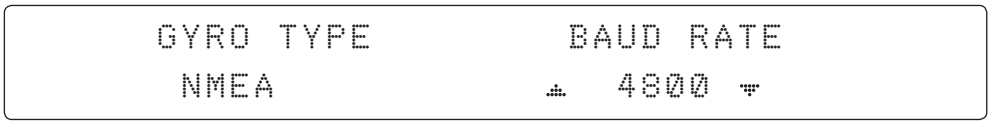
System menu

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

Set location menu

3. Touch RIGHT arrow key to move cursor to SET LOCATION and touch 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

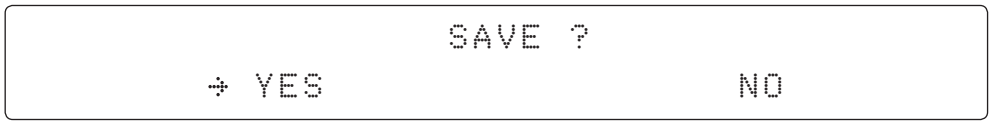
Latitude & longitude

5. Set the current LATITUDE and LONGITUDE
Touch LEFT and RIGHT arrow keys until the desired character is underscored (selected).
Touch UP and DOWN arrow keys to increase or decrease the value, or touch NUMBER keys to set the desired value directly.
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.

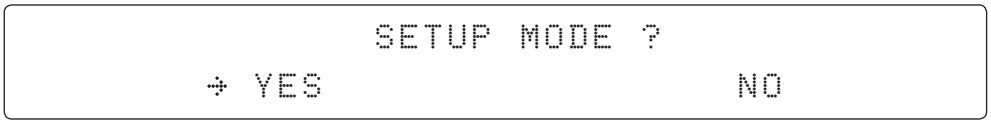
Save



7. Touch LEFT arrow key to move cursor to YES and touch OK key to save current settings, or move cursor to NO and touch OK key to abort and return to the main display.

Management

Setup mode

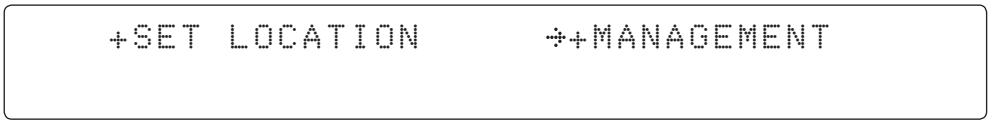


1. Touch LEFT arrow key to move cursor to YES and touch OK key to enter SETUP mode.

System menu

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

Backup and restore menu



3. Touch arrow keys to move cursor to MANAGEMENT menu and touch 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 BDT.

RESTORE USER DATA: To restore the antenna by using the backup user data stored from the BDT.

DEFAULT BDT-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 BDT-REMOTE: To upgrade the system using firmware files (FWP) from a specified folder in a USB flash drive.

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

Using Aptus PC

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:

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

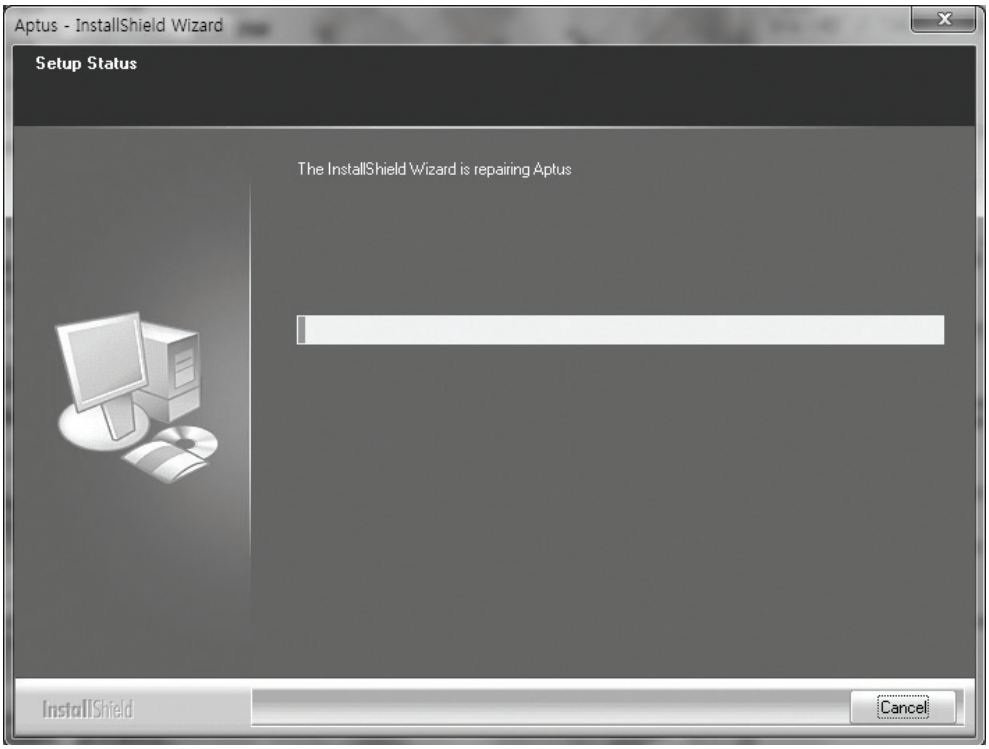
Operating System and Software

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.

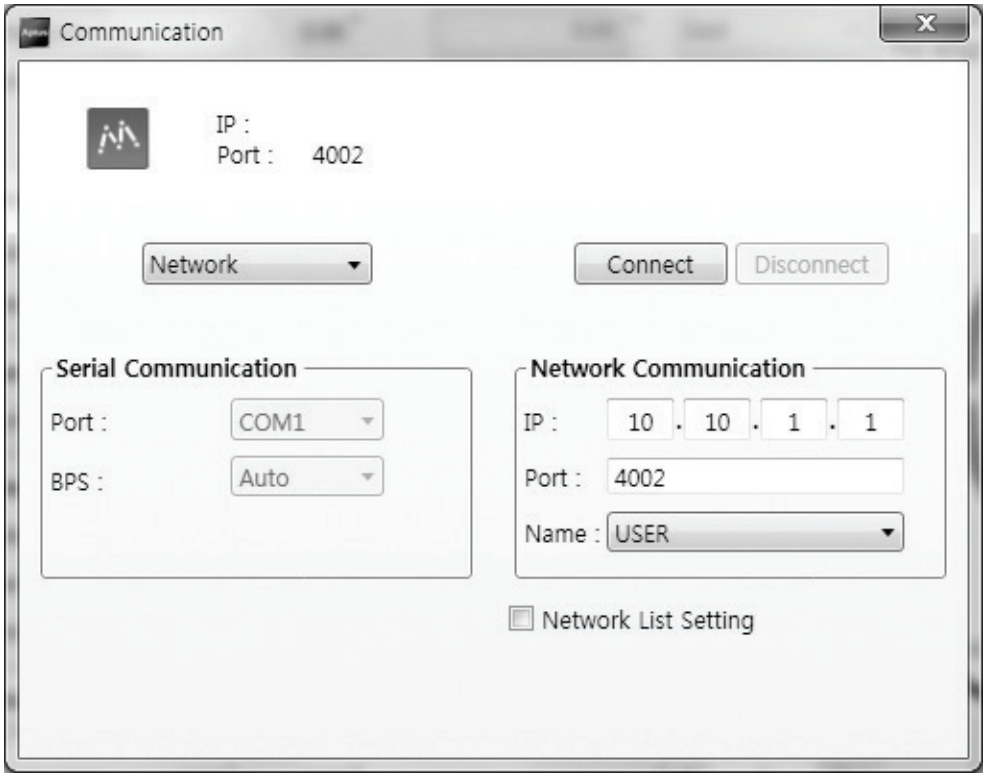


Click the icon to start the software. In addition, Intellian also provides patch files for software upgrade.

PC to BDT 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 BDT. Select your choice of connection method to access your BDT through either the Serial Port Communication or the Network Communication (TCP/IP).



Establish data communication

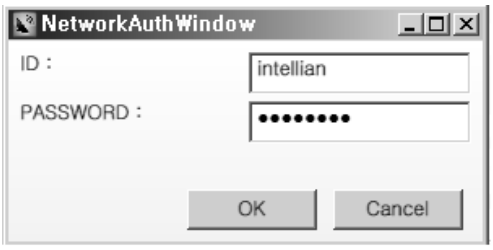
Access BDT through Serial Communication

1. Connect a 9 pin serial cable between the PC INTERFACE connector on the BDT 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 BDT.)
2. Select serial at communication type combo-box.
3. The baud rate of the BDT is 57600.
4. Select a COM port which is not occupied by other devices.
5. Click the Connect button.

Access BDT 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 BDT Communication Setup' section for other network connection methods.)
3. Select Network at communication type combo-box.
4. Enter in the BDT's IP address (Factory default : 192.168.1.2)
5. Enter in the BDT'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 BDT, the BDT can be accessed through the internal IP address. But, if the remote access PC is located outside of the network group, the BDT's IP address should be changed to the IP address assigned by the network service provider.

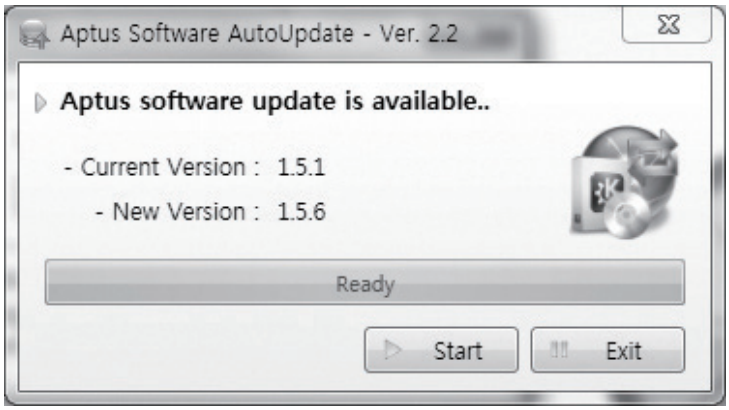
WARNING

WARNING:

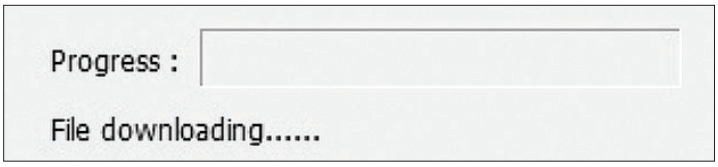
- Do not plug a USB to the BDT while TCP/IP communication is in use. Doing so will disable current PC Software Control because the USB connection has higher priority than TCP/IP connection.
- The amount of data will increase rapidly if Network Communication is in use. Intellian recommends using Aptus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

AutoUpdate

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



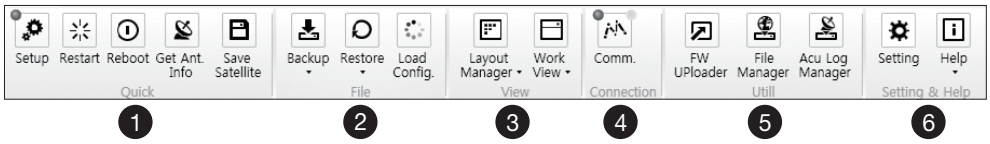
1. When Aptus® is started, it automatically checks the latest software version from the server and runs AutoUpdate if new version is available.
2. Current software version information is displayed.
3. It notifies new software version information.
4. When you click the "start" button, "File downloading…" 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 onto the satellite. The satellite acquisition time can be reduced significantly after the antenna is restarted.

② File

Backup: backups the antenna information to BDT or PC.

- Select 'To BDT' to backup the antenna information to BDT. The backup file (file format: *.ibf) will be stored on the BDT.
- 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.

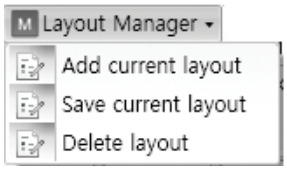
Restore: restores the antenna by using the stored information in BDT or PC.

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

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

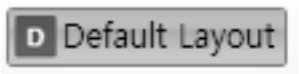


- **Layout Manager:** provides the user with add, delete, and save functionalities in order to manage the user's layouts.

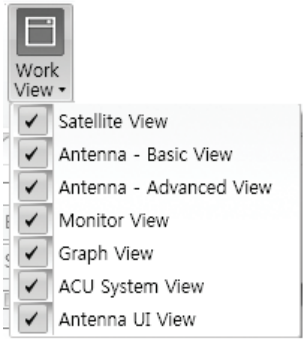
- Selecting 'Add current layout' opens a pop up window. Type in a desired name of current layout and click Add, then the new name of the current layout will be saved to the list under User Layout menu.

- When changes are made to the current layout, select 'Save current layout' option. The current layout will be saved with changes.

- To remove a layout, select '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.



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



- **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.

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 BDT via Serial or Network communication.

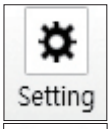
⑤ Utill

- **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.

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

⑥ Help



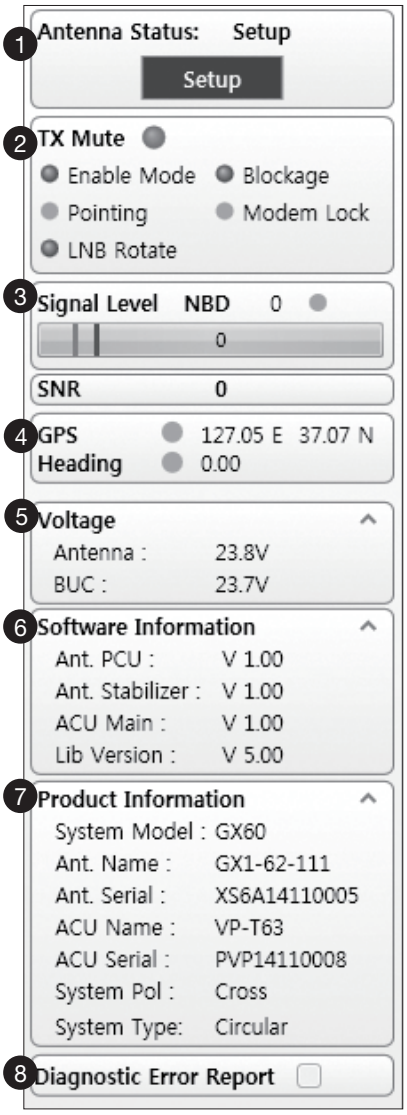
- **Setting:** enables or disables Auto Update function and sets network connection time-out.

- **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 reserved for future use.
- **Search 3:** Search 3 pattern will automatically be initiated when AGC(DVB mode is in use) or SIG/dB (NBD mode is in use) falls below the current tracking level threshold value. Once the desired signal is found and above the predefined tracking threshold, the BDT will enter to tracking mode.

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

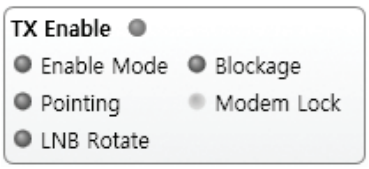
② TX Enable

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 'BDT 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".



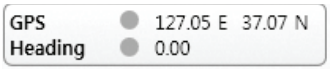
③ Signal Level

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.

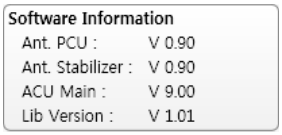
④ GPS and Heading

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.



⑤ Voltage: Displays the antenna and the BDT voltage information.

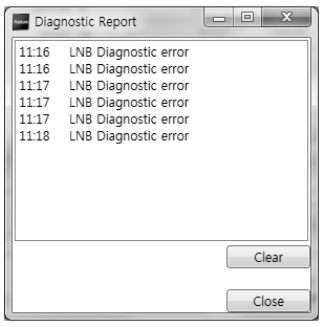
⑥ Software Information: Displays the antenna and the BDT firmware versions, and the library version.



⑦ Product Information: Displays the antenna and BDT serial numbers, antenna model and BDT model.

⑧ 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.



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.

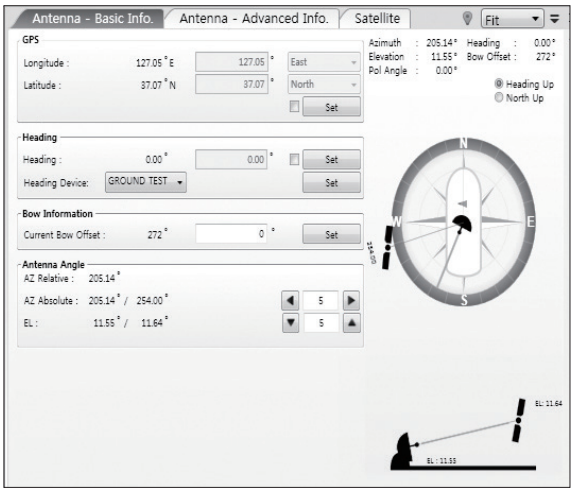
How to modify the settings on Work View:

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.

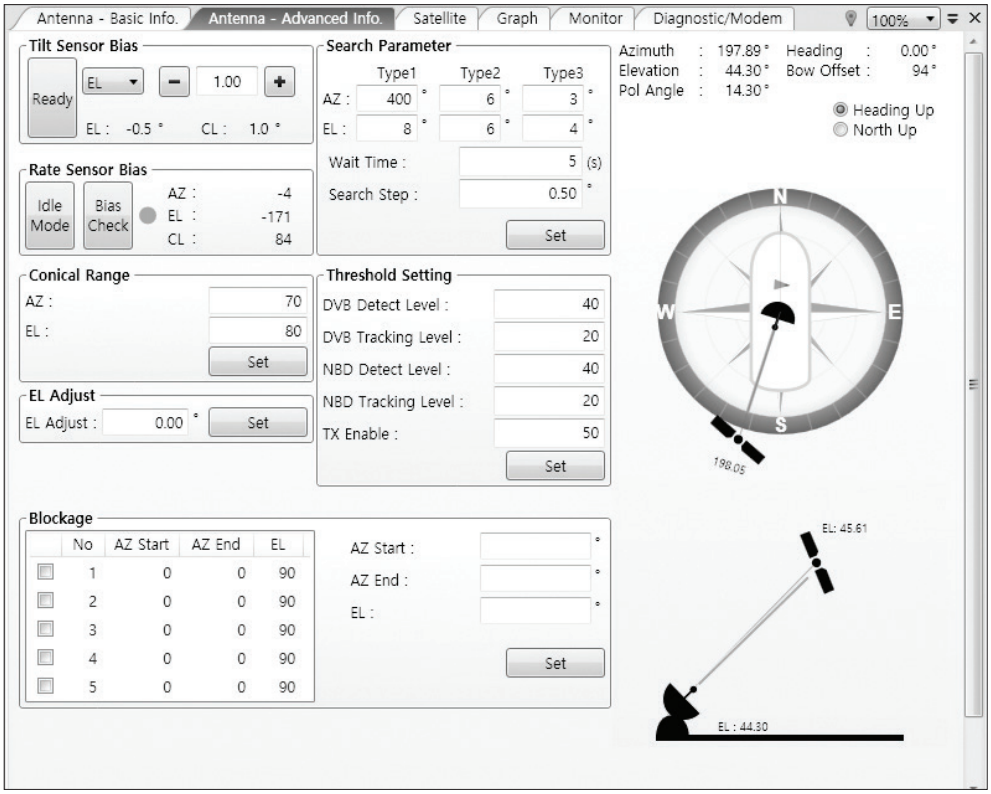
· Heading Device: None / NMEA/ NMEA 2000/Ground Test.
The baud rate (4800/ 9600/ 19200/ 38400) must be set if NMEA is selected.

- 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 reserved for future use.

- 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.

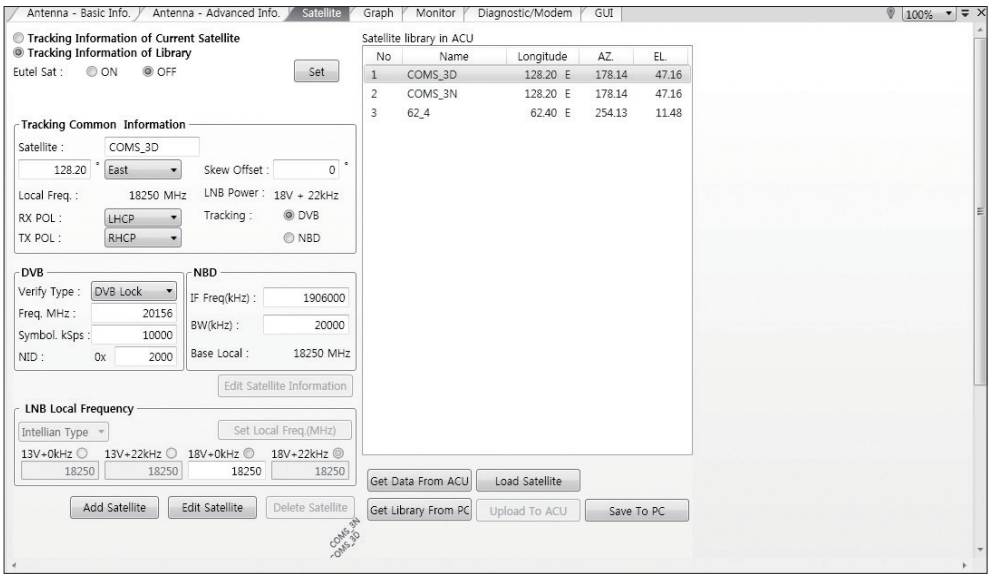
· DVB Tracking Level: displays and sets signal tracking threshold level when DVB tracking mode is in use.

· 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 (Satellite View)



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.

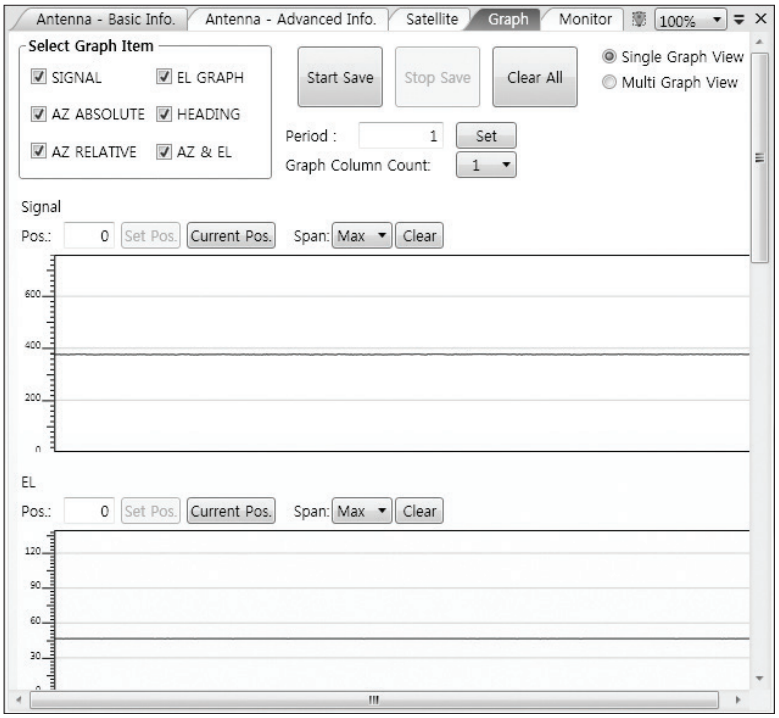
- Tracking Information of Library: Selecting this option enables "Add Satellite", "Edit Satellite", and "Delete Satellite" buttons.

- **Eutelsat:** Select 'ON' when the antenna is tracking an 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 BDT:** obtains the satellite information from the BDT.
- **Load Satellite:** uploads the satellite information to the BDT.
- **Upload to BDT:** uploads the satellite library to BDT.
- **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.

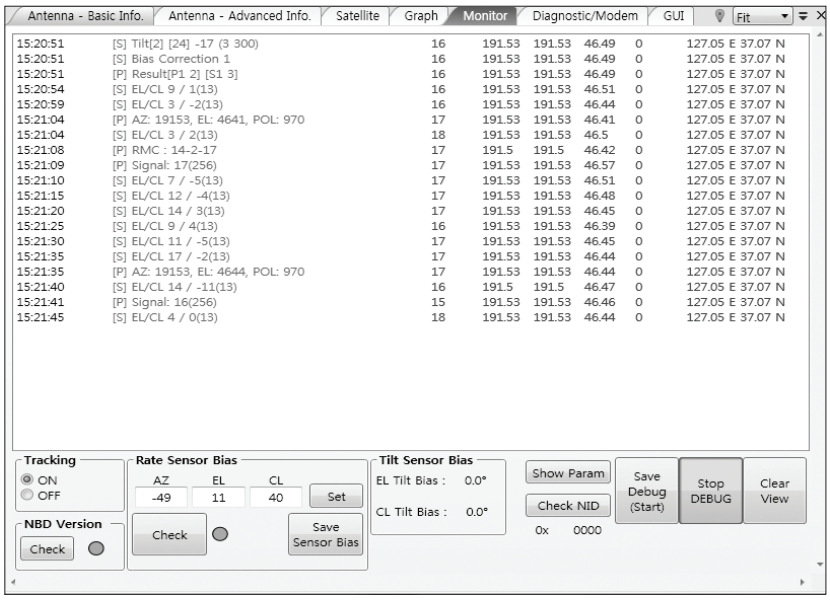
- **Span:** sets the Display Range(s) of each corresponding Graph Item.

- **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

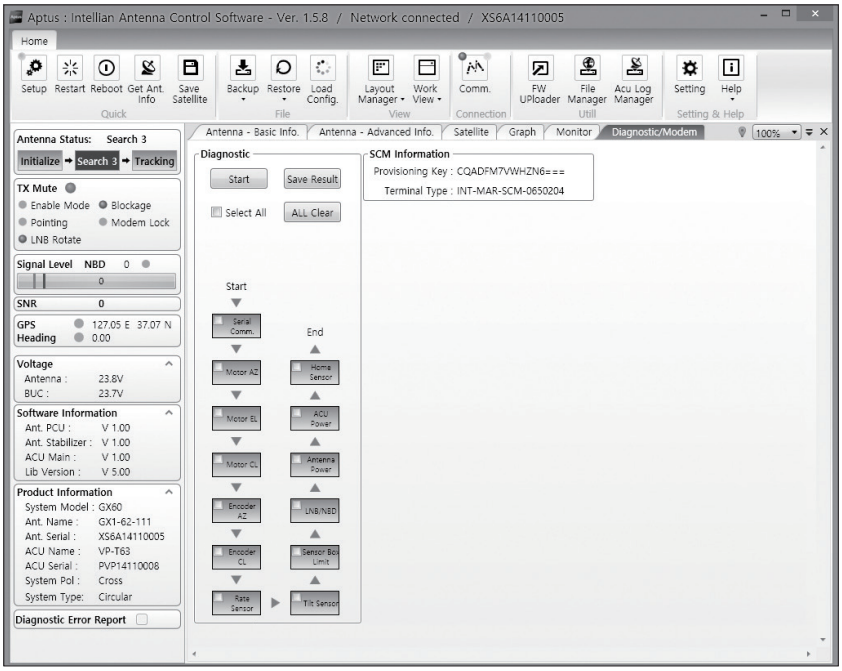
This view provides a UI which can monitor all data that has been received from the BDT.



- **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 BDT and the Intellian VSAT Mediator or the satellite modem.



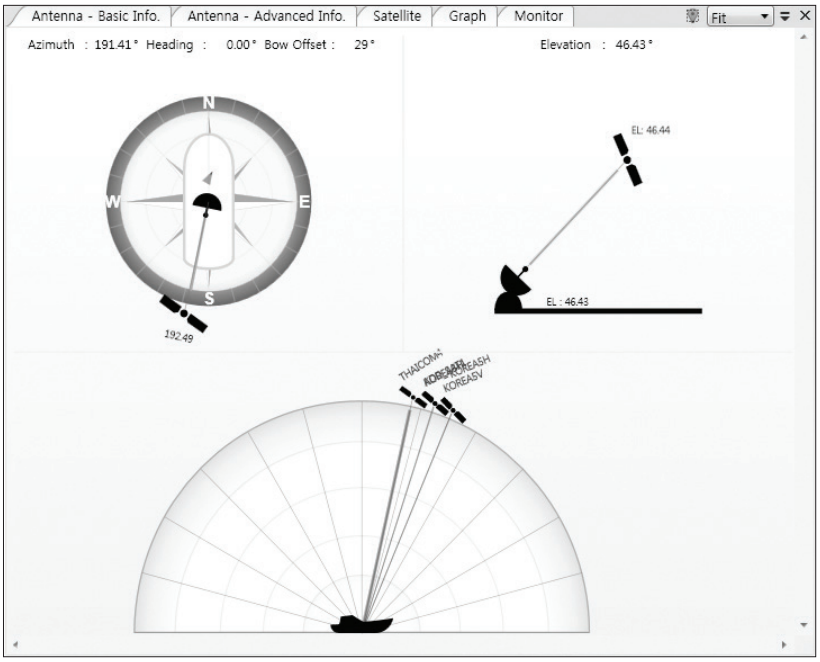
- Diagnostic : select to run a full diagnostic test or single diagnostic test.
"Green" indicator is displayed for the test under progress.
"Blue" indicates the test result as Pass while "Red" indicates the result as Fail.
"Yellow" indicates the test has been skipped.

- **Serial Comm.:** tests the data communication between the antenna and the BDT.
- **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.
- **BDT power:** tests the BDT 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 .

- SCM Information: displays the modem information.

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.



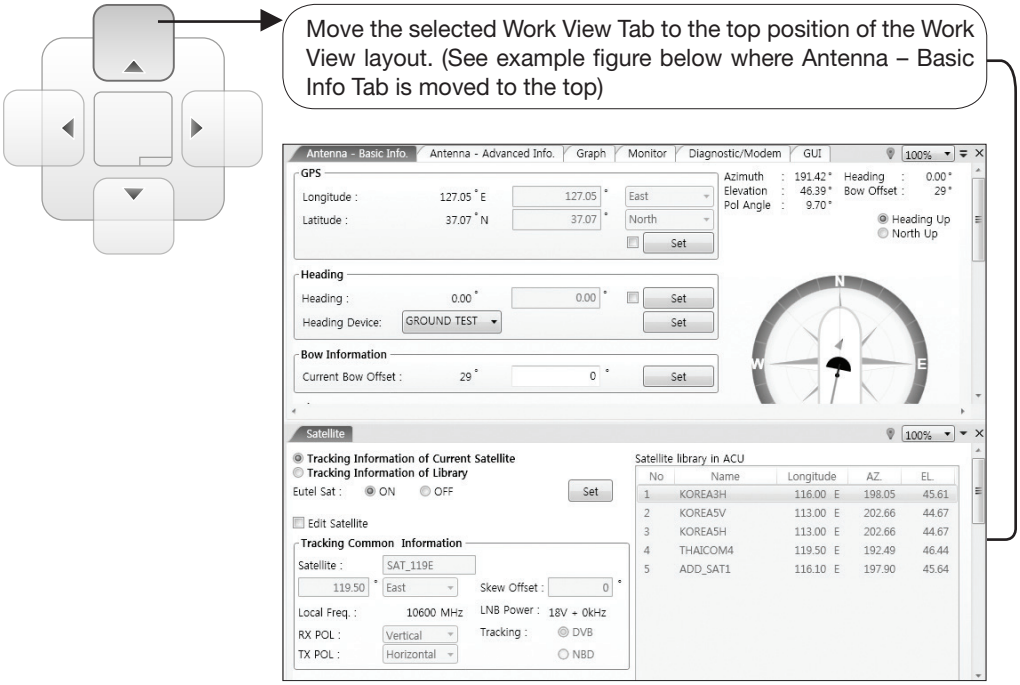
NOTE: Based on the satellite EIRP footprint and the size of the antenna, you may not be able to track all the satellites visible in 180° arc.

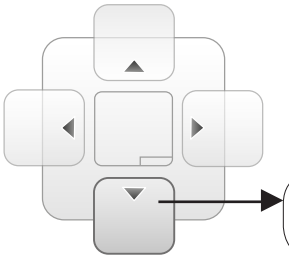
8. Work View Functions

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

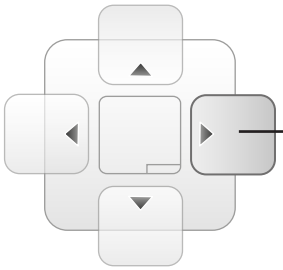
- Layout Formatting

· 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.

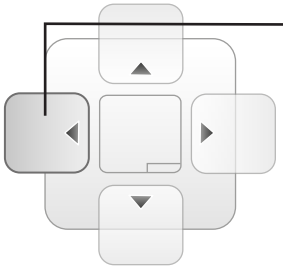




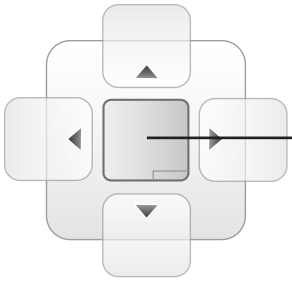
Move the selected Work View Tab to the bottom position of the Work View layout.



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

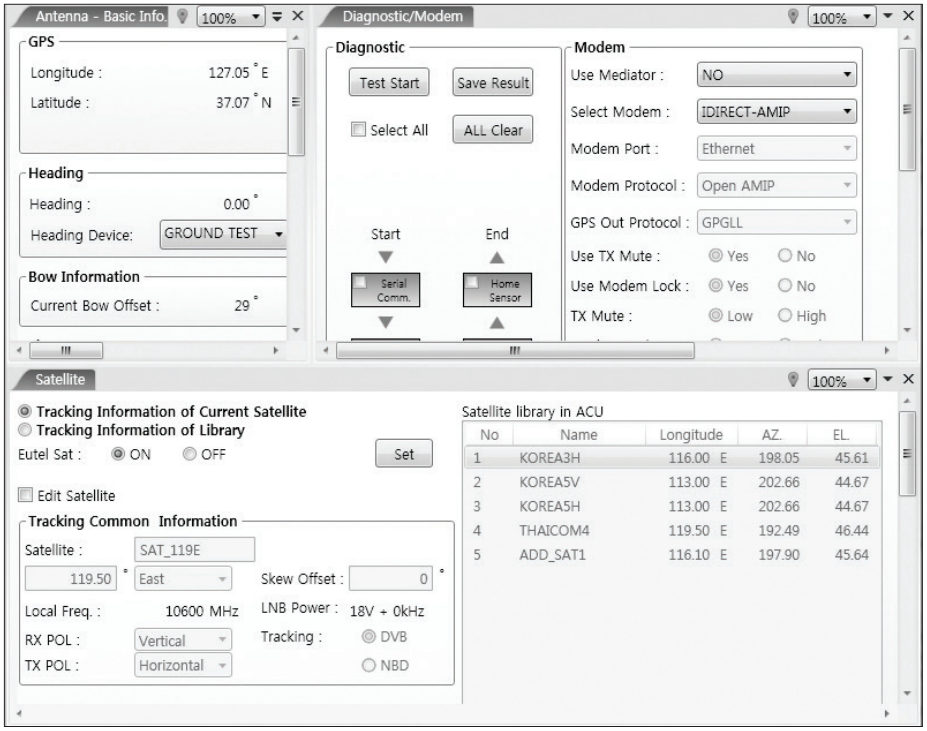


Move the selected Work View Tab to the left position of the Work View layout.



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.

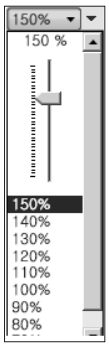
- Closing the Work View Tab

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.

Using Aptus Web

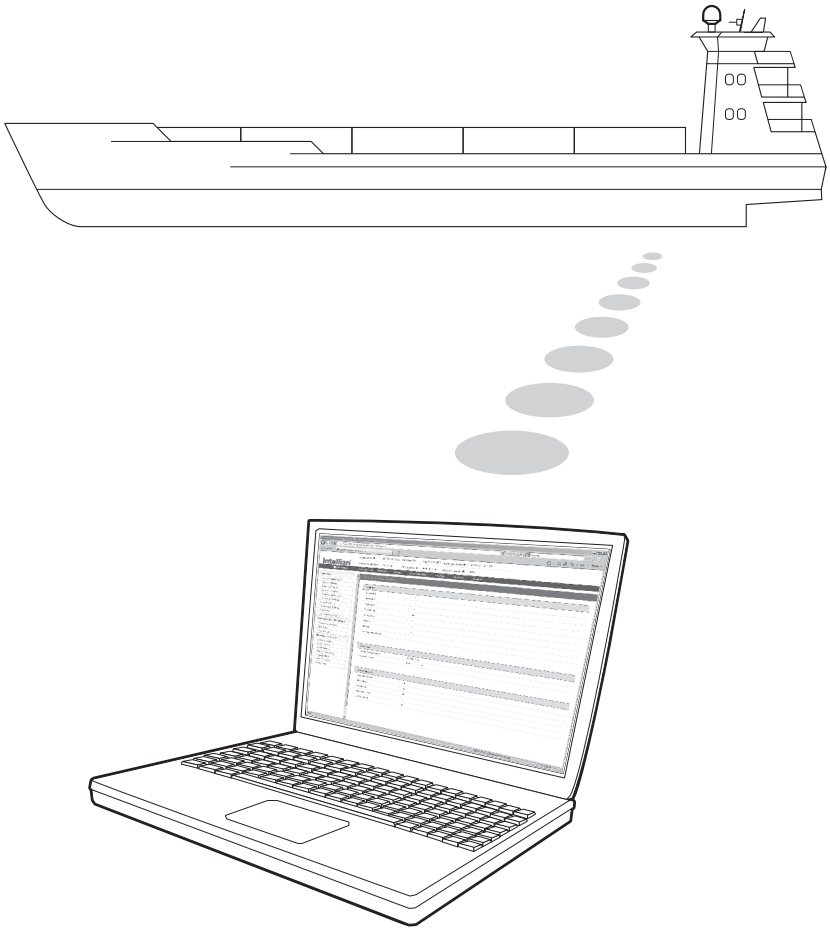
Introduction

With embedded Remote Access (Aptus Web) function, the GX 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 BDT's IP address (192.168.1.2) into your web browser's address bar to login into the BDT's internal HTML page, if this system has not been changed from the BDT's factory default.

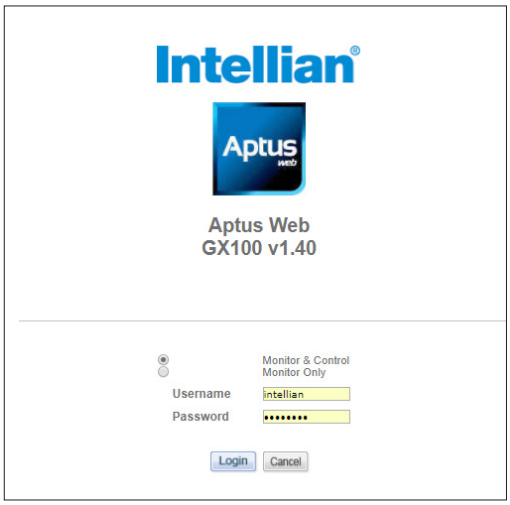
NOTE: Aptus Web can be displayed in Internet Explorer 7 or later and is also compatible with Firefox and Chrome web browser.



Main Page

Page Login

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



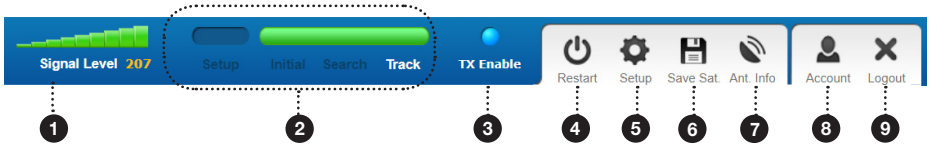
WARNING

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

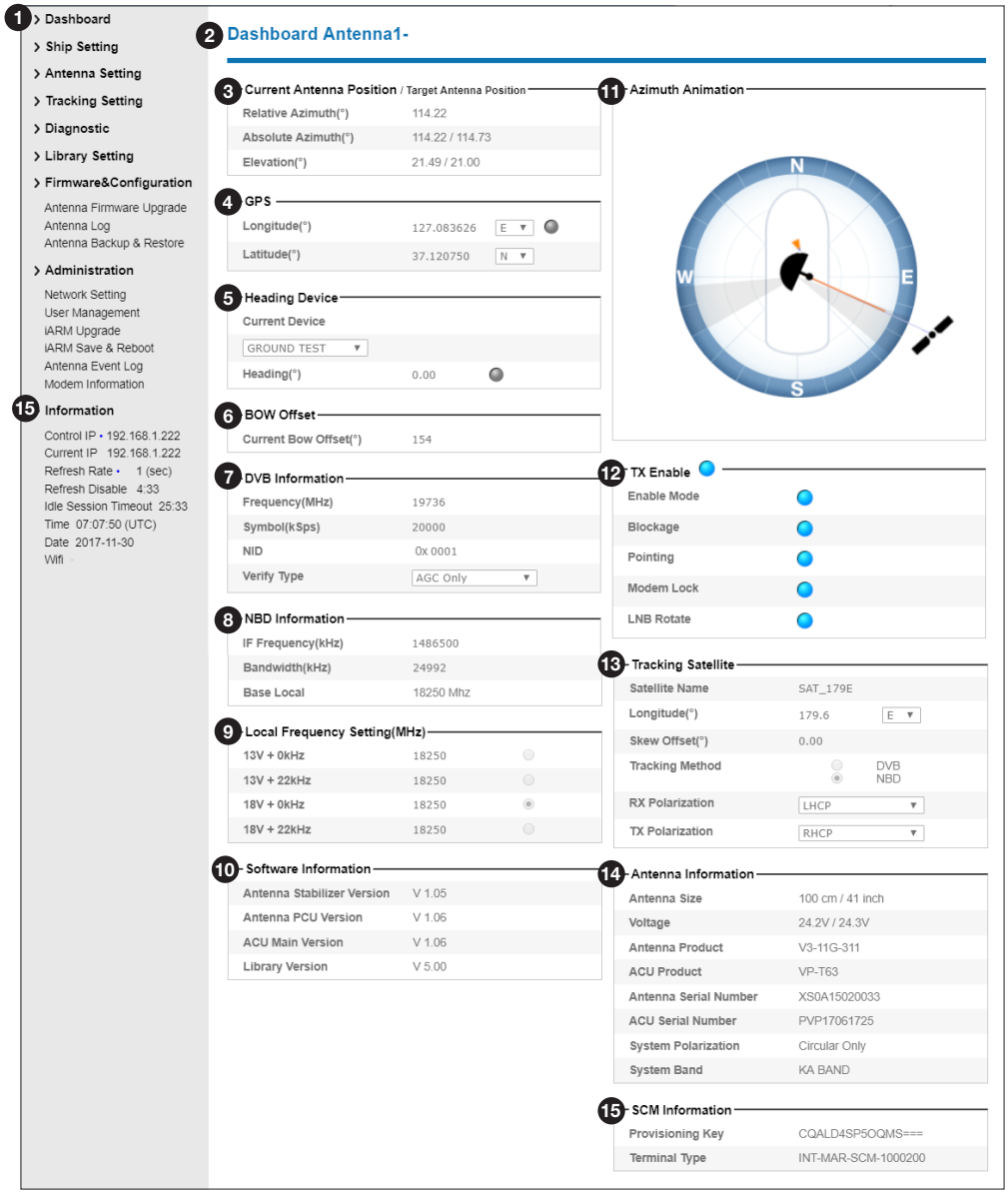
Once you log in, the following information and menus are displayed.



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 BDT 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 BDT'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.

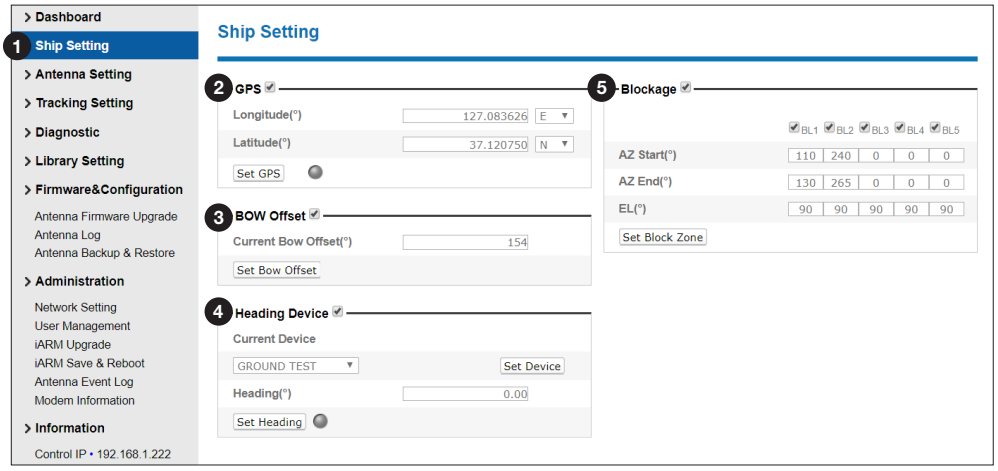


No.	Item	Description
①	Dashboard	Displays current antenna status to be quickly monitored.
②	Current Antenna Name	This function is available when: • the antenna is connected to GX Mediator and GX BDT at the same time. • "Dual Diversity Configuration" is in "Activate" status. You can select status on the "Network Setting" menu. Displays the current antenna name as "Dashboard-Antenna 1 or 2-XX"(XX is antenna description). You can set the description by accessing GX Mediator Web Server: 192.168.1.4 For more information, refer to the “Mediator User Guide” that came with the GX Mediator package.

③	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.
④	GPS	Displays current GPS information. - Longitude (East / West) - Latitude (North / South)
⑤	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.
⑥	BOW Offset	Display current bow offset.
⑦	DVB Information	Displays DVB tracking mode's current tracking information. - Frequency: displays tracking frequency. - Symbol rate: displays symbol rate. - NID: displays network ID. - Verify type: displays verification type(AGC, DVB, DVB Decode).
⑧	NBD Information	Displays NBD tracking mode's current tracking information. - IF Frequency: displays tracking IF frequency. - Bandwidth: displays detection bandwidth. - Base Local: displays base local frequency.
⑨	Local Frequency Setting (MHz)	Displays current LNB's local frequency and voltage.
⑩	Software Information	Displays current Antenna and BDT firmware versions and Satellite Library version installed in the system. - Antenna Stabilizer Version: displays the antenna stabilizer version. - Antenna PCU Version: displays the antenna PCU version. - BDT(BDT) Main Version: displays the BDT(BDT) Main version. - Library Version: displays the Library version.
⑪	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.
⑫	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. - 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 BDT to identify when the antenna tracks on the correct satellite. - LNB Rotate: LNB is not rotating.
⑬	Tracking Satellite	Displays current tracking mode. - Satellite Name: 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.
⑭	Antenna Information	Displays the antenna product information. - Antenna Size: displays the antenna size. - Antenna Product: displays the antenna product name. - BDT Product: displays the BDT product name. - Antenna Serial Number: displays the antenna serial number. - BDT Serial Number: displays the BDT serial number. - System Polarization: displays the system polarization. - System Band: displays the system band.
⑮	SCM Information	Displays the Modem information. - Provisioning Key: displays the provisioning key number. - Terminal Type: displays the terminal type number.

Antenna Settings

Ship Setting

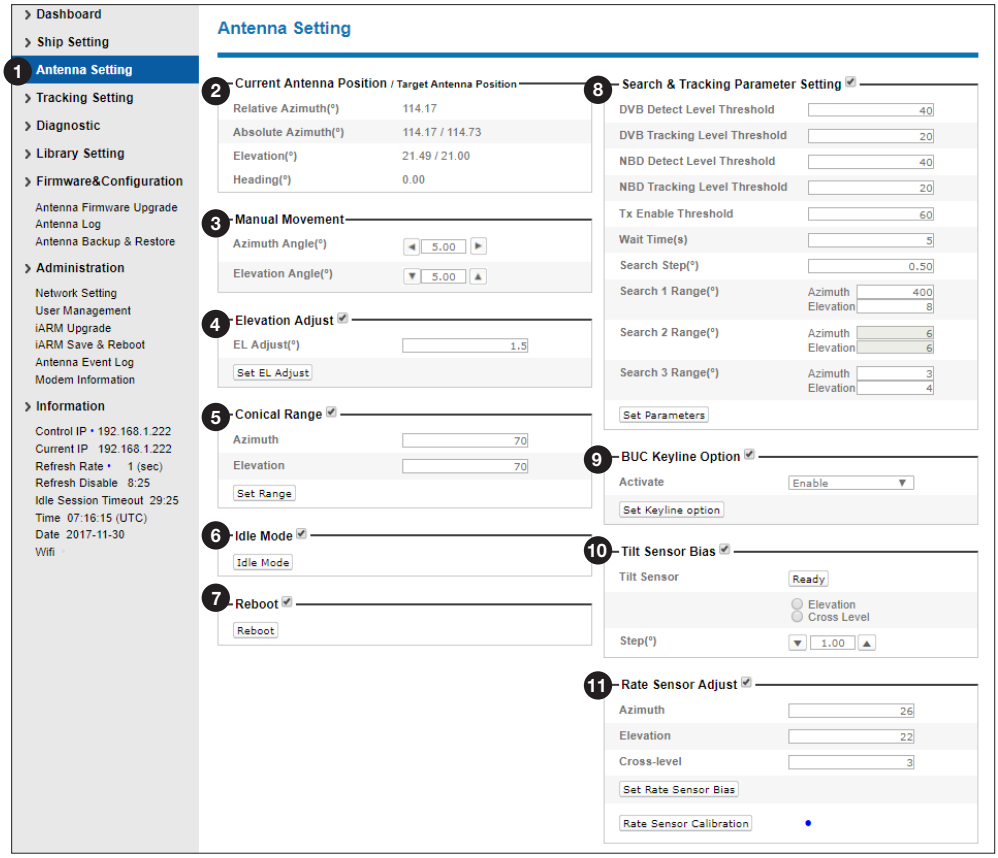


No.	Item	Description
①	Ship Setting	Set the ship information and block zone.
②	GPS	Set GPS information. - Longitude (East/West) - Latitude (North/South)
③	Bow Offset	Set Bow Offset if needed.
④	Heading Device	Set ship's heading device (NONE, NMEA, NMEA2000, GROUND TEST) and ship's heading information
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

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

Antenna Setting

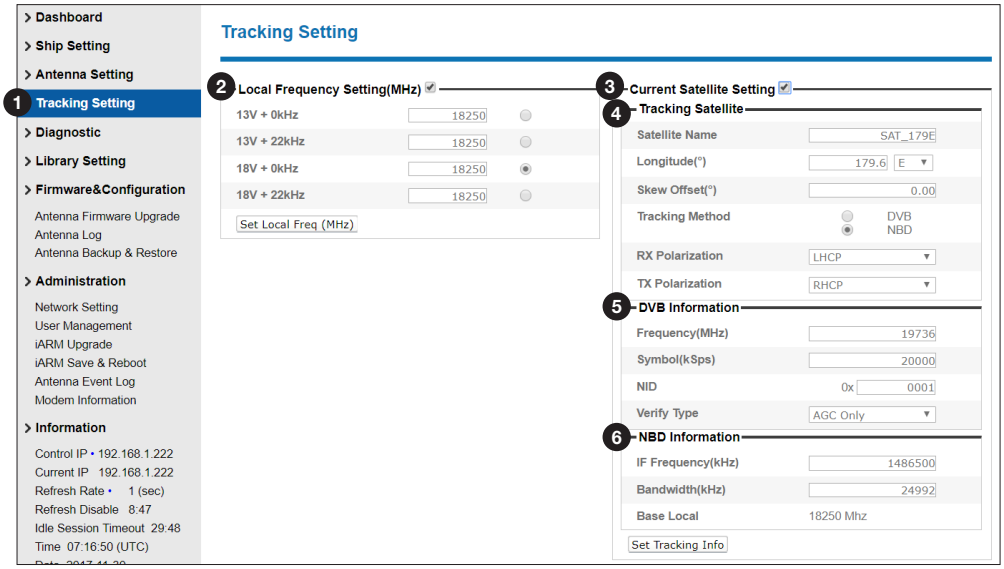


No.	Item	Description
①	Antenna Setting	Set current antenna position and Search and Tracking parameters. These parameters should only be changed by an authorized service technician. Improper setting of these parameters will render your system inoperable.
②	Current Antenna Position/ Target Antenna Position	Display current antenna position. - Relative Azimuth: display antenna relative AZ angle. - Absolute Azimuth: display antenna absolute AZ angle. - Elevation: display antenna elevation angle. - Heading: display ship's heading information.
③	Manual Movement	Move antenna azimuth and elevation angles 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 reserved for future use.
⑨	BUC Keyline Option	Sets Disable or Enable to active BUC Keyline.
⑩	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.
⑪	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

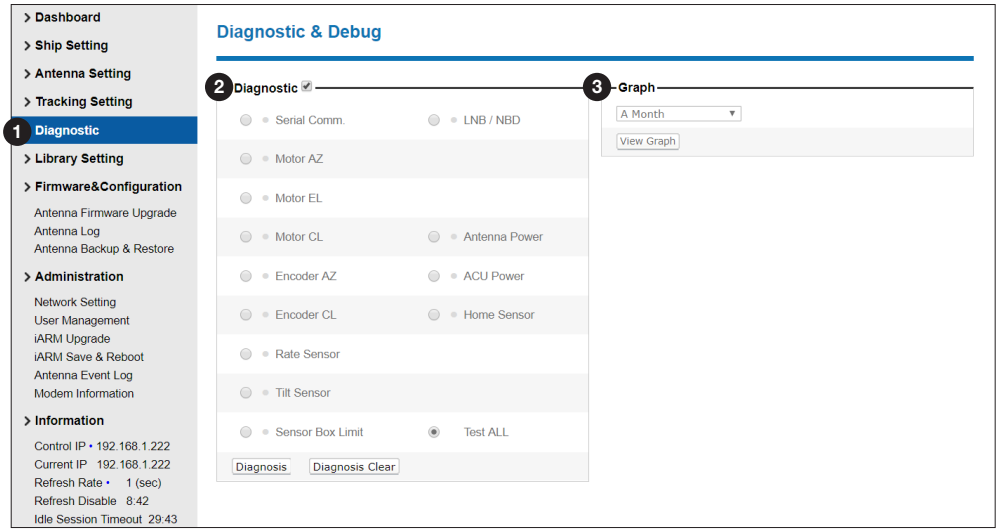


No.	Item	Description
①	Tracking Setting	Display or set current tracking mode and tracking frequency of the target satellite.
②	Local Frequency Setting (MHz)	Display and set LNB's local frequencies. Display current LNB local frequency which is in use and voltage.
③	Current Satellite Setting	Display and set current satellite setting.
④	Tracking Satellite	Display and set current tracking mode. - Satellite Name: 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. - IF Frequency: display and set tracking IF frequency. - Bandwidth: display and set detection bandwidth. - Base Local: displays base local frequency.

WARNING

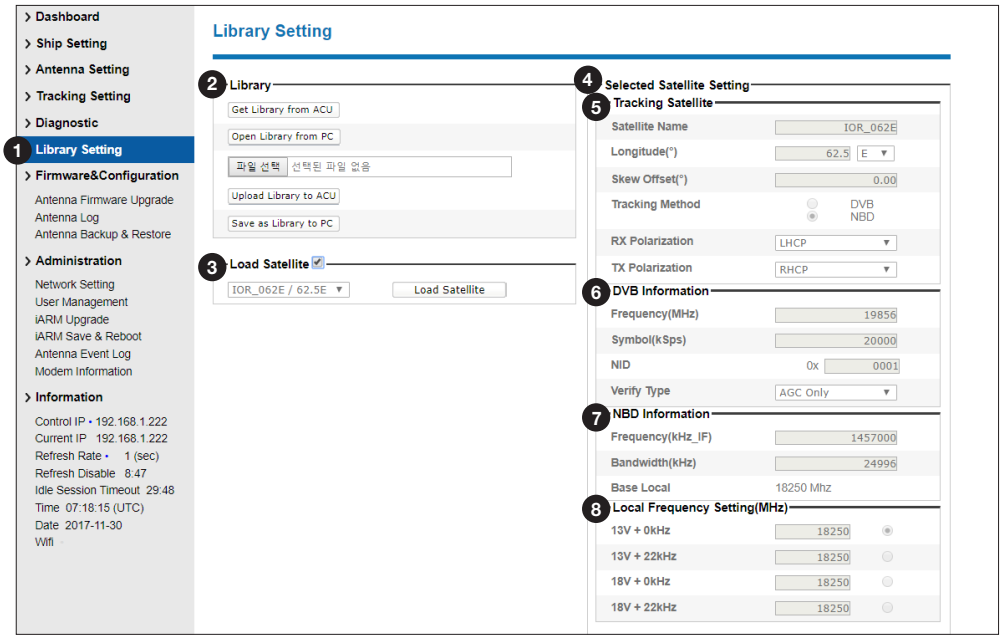
WARNING: Tick the checkbox before modifying the settings. After configuration, click 'set...' button to submit the settings.

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 BDT. - 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. - BDT(BDT) Power: test the BDT 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.

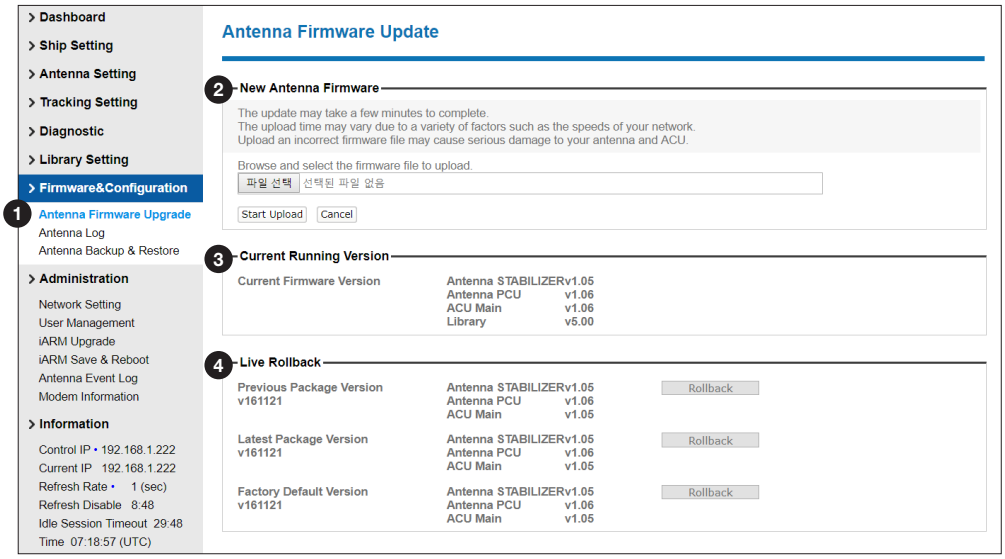
Library Setting



No.	Item	Description
①	Library Setting	Display and set the satellite library information.
②	Library	- Get Library from BDT(BDT): Obtain satellite information installed in the BDT. - 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 BDT(BDT): upload the satellite library file to BDT. - 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 name: 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. - Base Local: displays base local frequency.
⑧	Local Frequency Setting (MHz)	Displays LNB local frequency (MHz) and voltage.

Firmware & Configuration

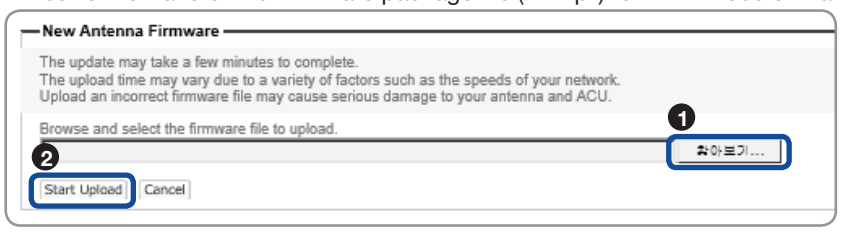
Antenna Firmware Upgrade



No.	Item	Description
①	Antenna Firmware Upgrade	Upgrade antenna and BDT firmware version.
②	New Antenna Firmware	Browse and select the firmware to upgrade. Clicking Start Upload button will start to upgrade the selected firmware.
③	Current Running Version	Display current firmware version (Antenna STABILIZER, Antenna PCU, BDT(BDT) 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.

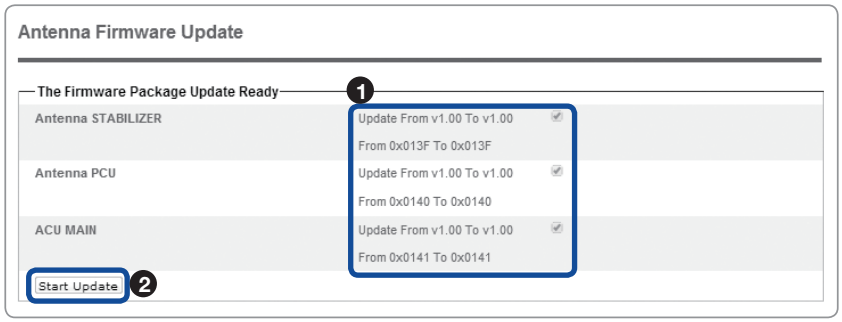
Antenna Firmware Upgrade procedures:

1. Click on "Browse" button to select the upgrade package file that you wish to upgrade. Click on the "Start Upload" button to transfer the Firmware package file ("*.fwp") to iARM module. Wait until the page is loaded.

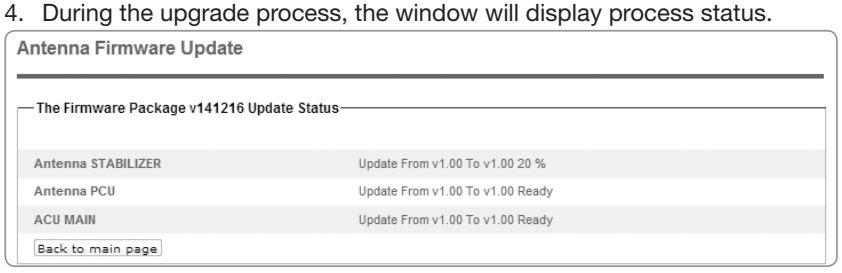


2. After the package file is transferred, it'll show "upgrade from vx.xx Version to vx.xx Version". Enable the checkbox to select the firmware file that you wish to upgrade.

3. Click on "Start Update" button.

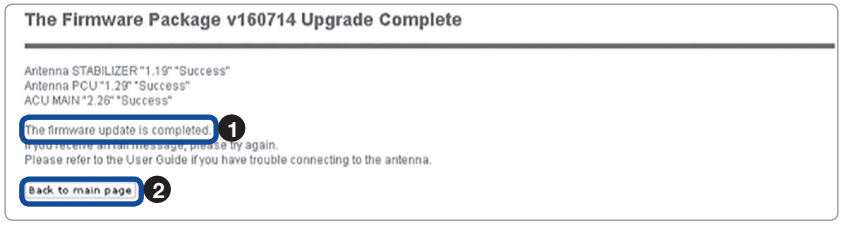


4. During the upgrade process, the window will display process status.



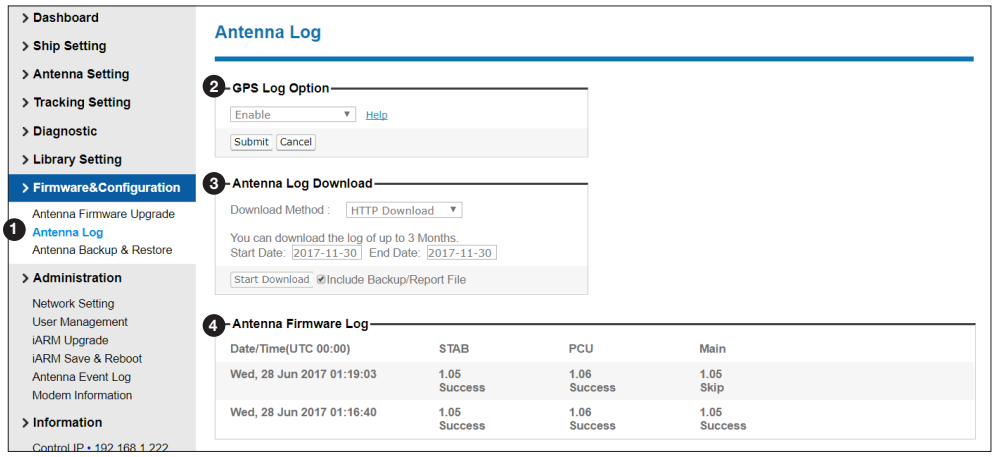
5. If the firmware is successfully upgraded, it will display "The firmware update is completed."

6. 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

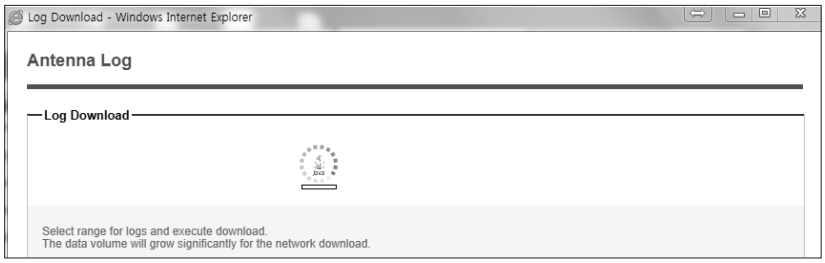


No.	Item	Description
①	Antenna Log	Displays antenna log data.
②	GPS Log Option	Disable/Enable to save GPS information in the antenna log file.
③	Antenna Log Download	Select file transfer protocol between HTTP Download or FTP Download. For the GX terminals, the default option is HTTP Download. Any log 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. - Start Download: Download the antenna log information. Download the Back up/Report file by clicking the "Include Backup/Restore File" check box.
④	Antenna Firmware Log	Display log information of firmware upgrade.

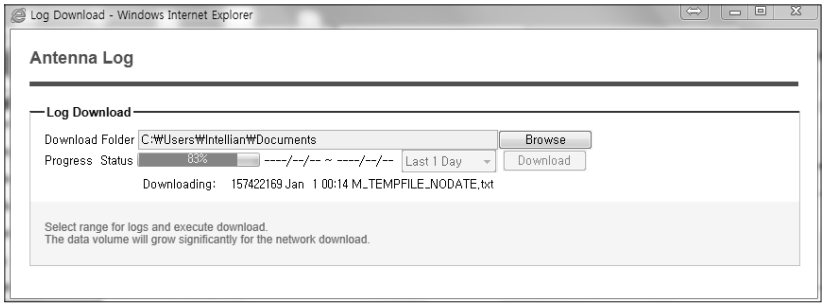
Log Download using FTP Protocol

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.

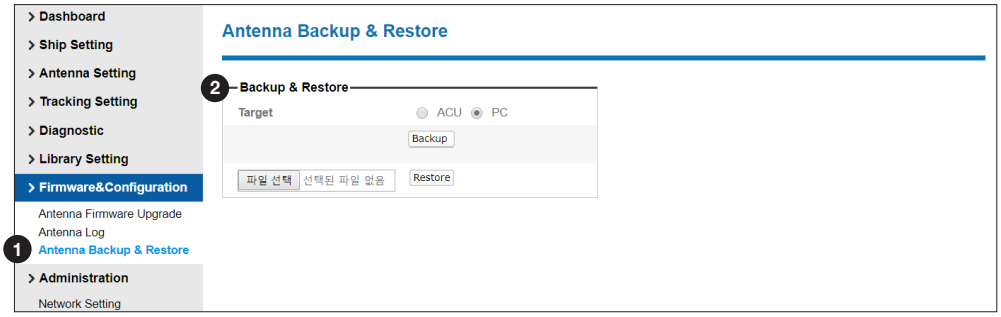


3. Select 'Browse' to browse the target directory of the antenna log file.
4. Select log period for file download.
   - Last 3 Months: download the antenna log information for the past three months.
   - Last 1 Month: download the antenna log informaiton for the past one month.
   - Last 1 week: download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

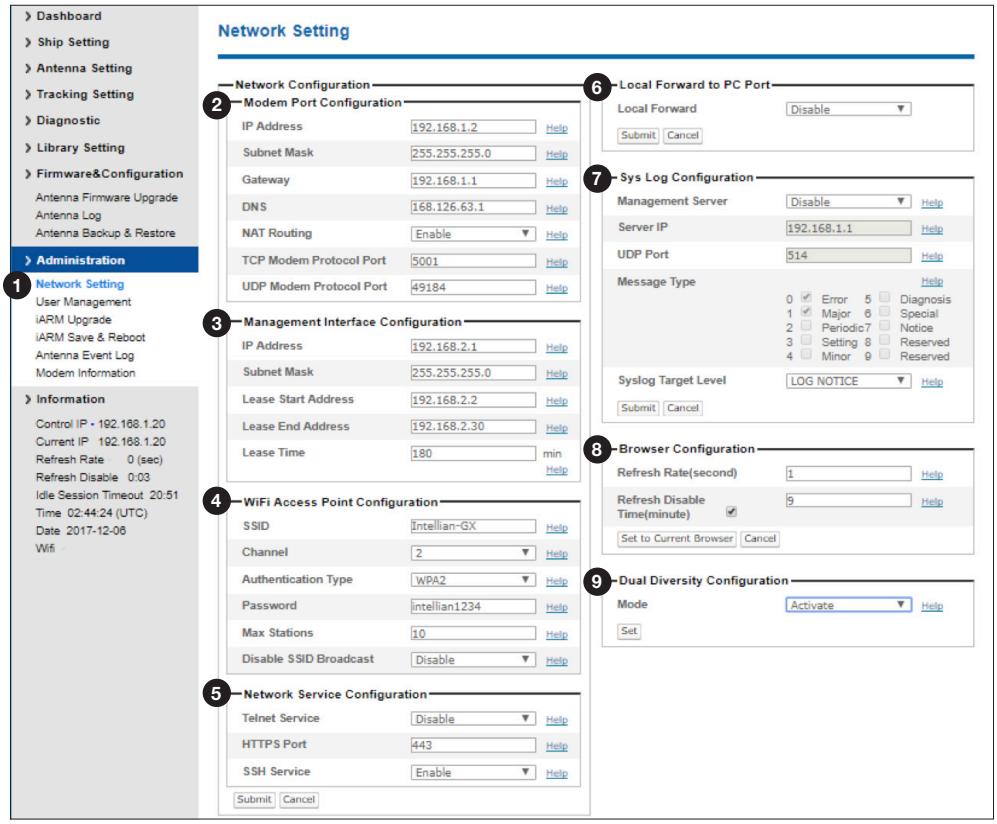
Antenna Backup & Restore



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

Administration

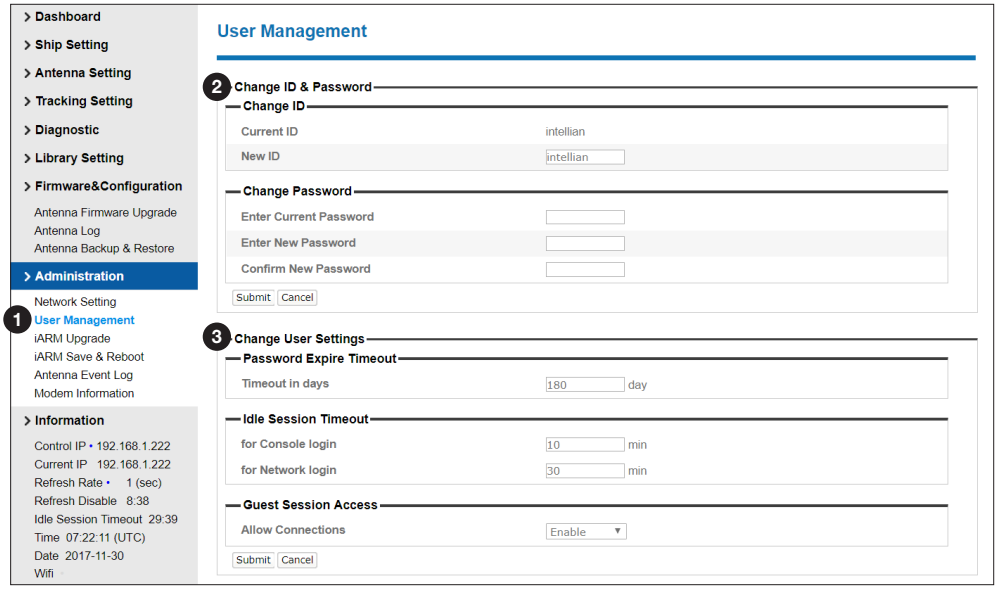
Network Setting



No.	Item	Description
①	Network Setting	Enter network setting page.
②	Modem Port Configuration	Modify BDT's Internal IP addresses, routing, and ports. When complete, press "Submit" button at bottom of page. Go to "Save & Reboot" page and press "Save & Reboot" button to validate the changes. - IP Address : Factory default(Primary:192.168.1.2)/(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 : BDT 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.

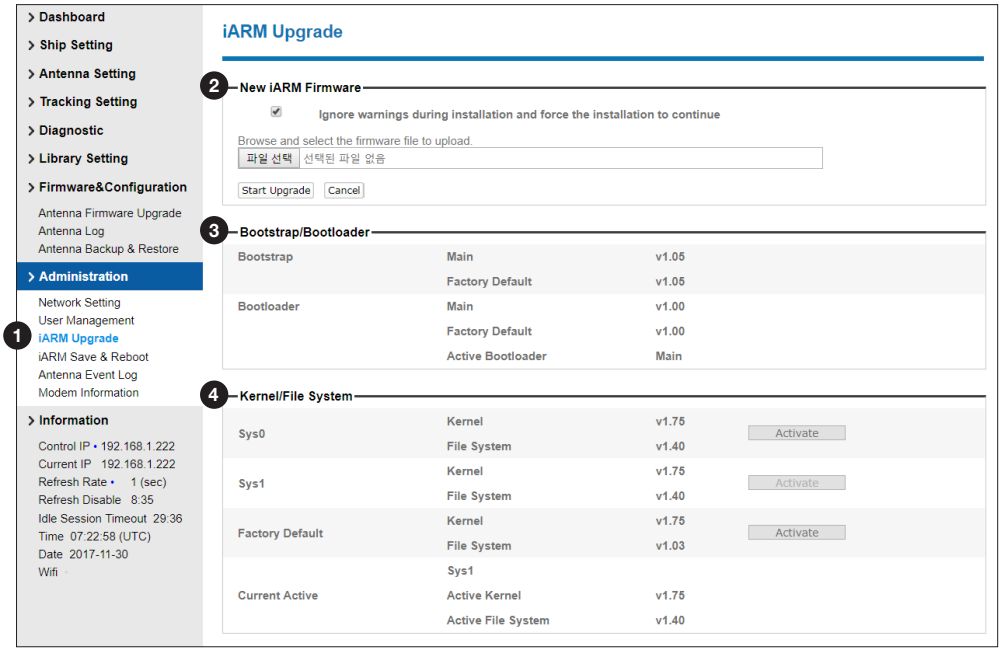
④	Wi-Fi Access Point Configuration	- SSID : The SSID is the network name shared among all devices in a wireless network. The SSID must be identical for all devices in the wireless network. It is case-sensitive and must not exceed 32 alphanumeric characters, which may be any keyboard character. Make sure this setting is the same for all devices in your wireless network. - Channel : Select an appropriate channel from the list provided to correspond with your network settings. All devices in your wireless network must use the same channel in order to function correctly. Try to avoid conflicts with other wireless networks by choosing a channel where the upper and lower three channels are not in use. - Authentication Type : Module supports an authentication mode that the 802.11 device uses when it authenticates and associates with an access point or IBSS cell. - Password : WiFi access password. - 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. - SSH Service: Enable or Disable the CLI access through the SSH protocol.
⑥	GX Local Forward to PC Port	To remotely access GX BDT 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	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.
⑨	Dual Diversity Configuration	This function is available when the antenna is connected to GX Mediator and GX BDT at the same time. - Activate: Select to use the GX Dual Antenna System. The GX BDT will communicate with GX Mediator. For more information about the GX Dual Antenna System, refer to the “GX Mediator User Guide” that came with the GX Mediator package. - Inactivate: Select to use the GX Single Antenna System.

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 timeout. - Password Expire Timeout : Set password expire in days. - Idle Session Timeout : Set for Console and for Network timeout. - Guest Session Access: Set up the guest access option.

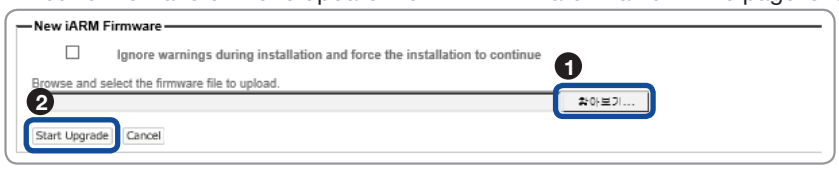
iARM Upgrade



No.	Item	Description
①	iARM Upgrade	Upgrade the firmware of iARM module.
②	New iARM Firmware	Browse and select the firmware file to upload and click Start Upgrade button.
③	Bootstrap /Bootloader	Displays current bootstrap and bootloader version.
④	Kernel /File System	BDT has 3 storage parts sys0, sys1, Factory Default. Display kernel and file system version and current activated part Information.

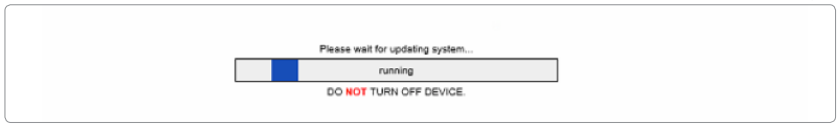
iARM firmware upgrade procedures:

1. Click on "Browse" button to select the the iARM firmware file (.tgz) that you wish to upgrade. Click on the "Start Upload" button to transfer the to update the iARM firmware. Wait until the page is loaded.

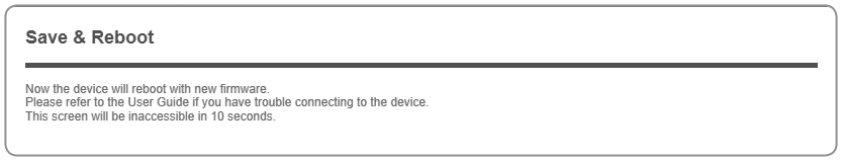


NOTE: When checking the box "Ignore warnings during installation and force the installation to continue" before performing the upgrade, the warning messages do not appear during the upgrade.

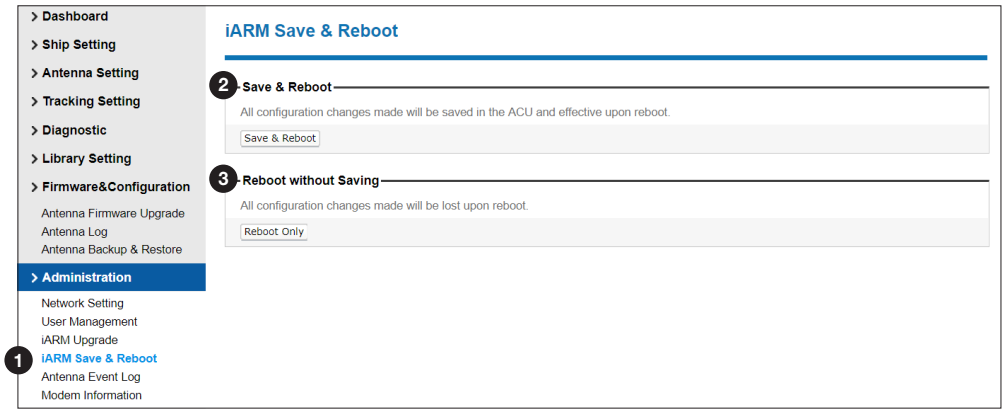
2. Once update starts, a page will indicate upgrade status. Do not turn off the device power if the firmware upgrade page is displayed. It should take around 2 minutes to complete the firmware upgrade.



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

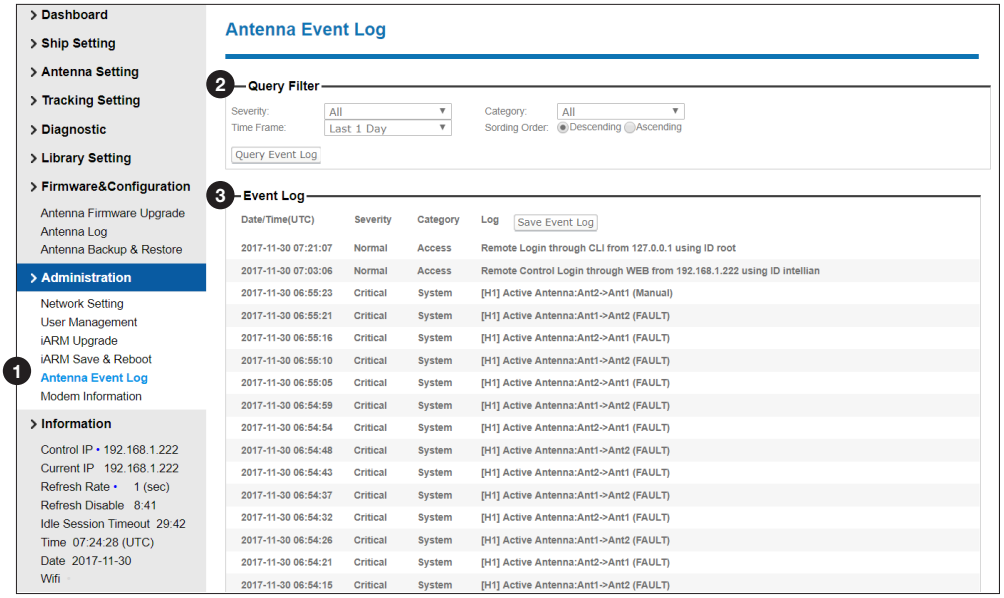


iARM Save & Reboot



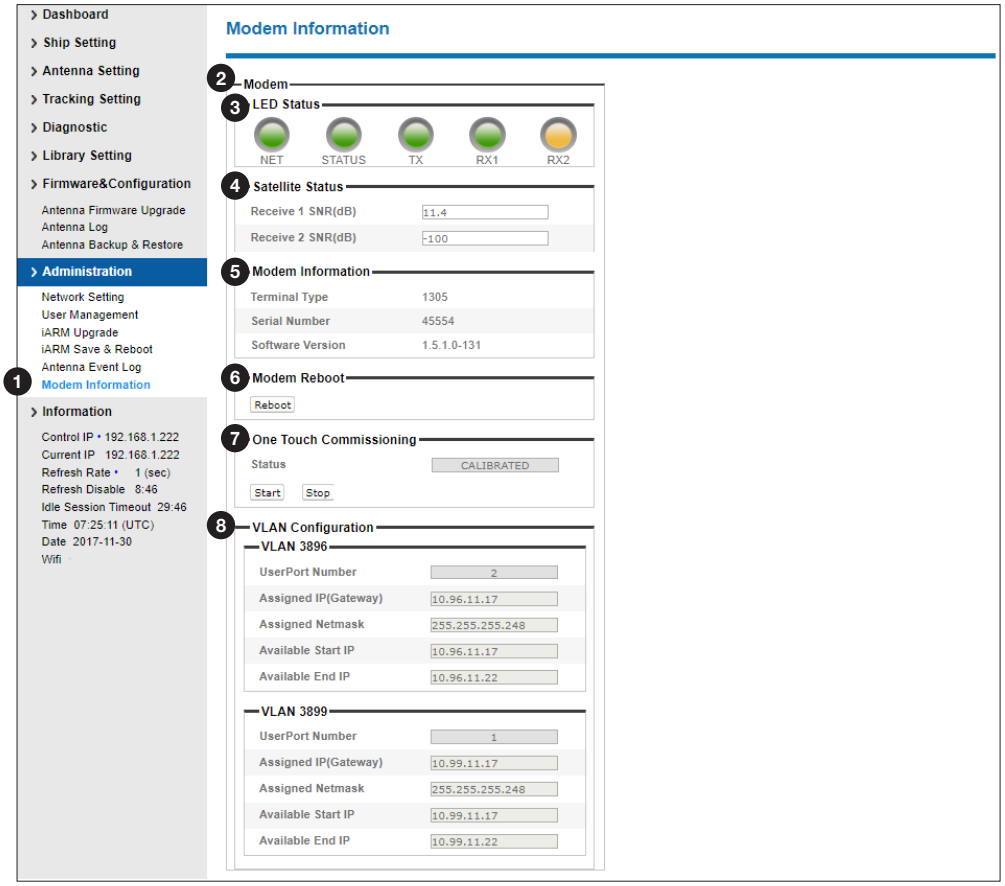
No.	Item	Description
①	iARM Save & Reboot	Save settings to the BDT and reboot or reboot the system without saving.
①	Save & Reboot	Save the modified settings and reboot the system. Click the "Save & Reboot" button.
②	Reboot without Saving	Reboot the system without saving the modified settings. Click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

Antenna Event Log



No.	Item	Description
①	Antenna Event Log	Displays the antenna system and user log information by setting urgency level.
②	Query Filter	Set the Log message option. - Severity : 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	Modem Information	Display modem's operating status and information.
②	Modem	Display modem's operating status.
③	LED Status	Each dots are displayed status as colors. - NET: Displays the network status. (Green: Indicates that the modem has been acquired into the network. Flashing green: Indicates that the modem is in network acquisition.) - STATUS: Displays the modem status. (Green: modem is functioning properly. Flashing green: Indicates that the modem is booting. Red: Indicates a serious fault or failure in software, hardware, or configuration in modem.) - TX: Displays TX enable status. (Green: Indicates that the modem transmitter is enabled. Yellow: Indicates that the modem transmitter is disabled.) - RX1/2: Displays the modem lock status of RX path 1/2. (Green: Indicates that the modem receiver 1 or 2 is successfully locked to the downstream. Yellow: Indicates that the modem receiver 1 or 2 is not locked to the downstream carrier.)
④	Satellite Status	Display the receive 1/2 SNR(dB) of the satellite.
⑤	Modem Information	Display modem information. (Terminal Type, Serial Number and Software Version)
⑥	Modem Reboot	Sets the modem reboot.
⑦	One Touch Commissioning	Sets the One Touch Commissioning (OTC) for calibration of antenna's BUC. - Status: Displays the current OTC status. - Start/Stop: Sets Calibration Start/Stop. **NOTE**: Ensure to perform One-touch Commissioning after the first-time connection of the GX terminal and the BDT, cable replacement or Band conversion.
⑧	VLAN Configuration	Displays the assigned port and IP address of VLAN. (UserPort Number, Assigned IP (Gateway), Assigned Netmask, Available Start IP, Available End IP)

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 44.1cm x 4.4cm (17" x 17.3" x 1.7")
Weight	
Satellite antenna unit	128kg (282lbs)
Antenna control unit	4kg (8.8lbs)
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	20.1 dB/K (Typ.)
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, 4A
Operating temperature range	-25°C to 55°C
Storage temperature range	-40°C to 80°C
Below Deck Termial(BDT)	
Display	2 Line 40 Character Graphic VFD Module
PC Interface	RS232C (57600 bps 8, N, 1)
Modem Interface	Integrated on the BDT
Management Interface	Ethernet / USB / Serial
RF Interface	TX, RX: N 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.