



Intelligent Mediator

Installation and Operation User Guide

Serial number of the product



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

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Disclaimer

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

Precautions

Warnings, Cautions, and Notes

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

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

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Introduction

Intelligent Mediator Introduction

The Intelligent Mediator is capable of controlling and managing either one single satellite modem for C-band, Ku-band and Ka-band or separate modems to support each frequency band to deliver an interruption-free connection all the time. When one antenna was blocked by obstacles or has suddenly lost service, another antenna will immediately provide the fail-safe operation to maintain the highest levels of system performance and reliability. It ensures always-on broadband service by reducing the out of service time.



Intelligent Mediator Features

Smart Handover for seamless satellite tracking

The intelligent mediator performs seamless handovers between the rising satellite and the setting satellite. It must be planned and performed at specific times and ensure continuous data communication. Moreover, the intelligent mediator allows the antenna to support mid-pass switchovers smartly.

RF Switch Enabled Modem Mediator

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

Redundant Antenna System

A redundant antenna system can be easily configured by using the Intelligent Mediator to prevent network outages even when one of the antennas fails due to unfavorable environmental conditions, power outages, technical issues or blocked by obstacles.

Manual Antenna Selection

The Intelligent Mediator provides Aptus software to allow users to manually manage and control one of the antennas which is in service via any PC.

Simple and Easy Installation

The Intelligent Mediator aims to provide a “plug & connect” experience through its simplified yet sophisticated installation design. The Intelligent Mediator is compatible with VSAT terminals. Only firmware upgrade and simple cabling are required to perform Intelligent Mediator.

Intellian Network Device Monitoring

Intellian LAN connection enables integrated monitoring and control of VSAT antenna systems from the Aptus Web for Mediator. Simplified IP network setup allows easy and direct access to the connected VSAT systems. Also, Aptus web utilizes a smart Graphical User Interface(GUI) for easy communication and to look at the current antenna status.

Planning Installation

Installation Kit

Before beginning installation, make sure you have all the included components.

Description	Q'ty	Size	Remarks
Intelligent Mediator	1	43.1 x 38 x 8.8cm	2U Type Mediator Unit
User Guide	1		For Mediator Unit
Mediator Side Bracket (Rack)	2		Mediator to 19inch Rack
Mediator Side Bracket (Table)	2		Mediator to Table
Flat Head Screw	16	M4x12L	Bolt Kit for Rack Mount Bracket
Self-Tapping Screw	5	M4x16L	Bolt Kit for Table Mount Bracket
Sems Bolt	5	M3x12L	
SMA(M) to SMA(M) Cable	3	1.3m	Mediator to Modem(ACU)
N(M) to N(M) Cable	3	1.3m	Mediator to Modem(ACU)
N(M) to SMA(F) Adaptor	3		

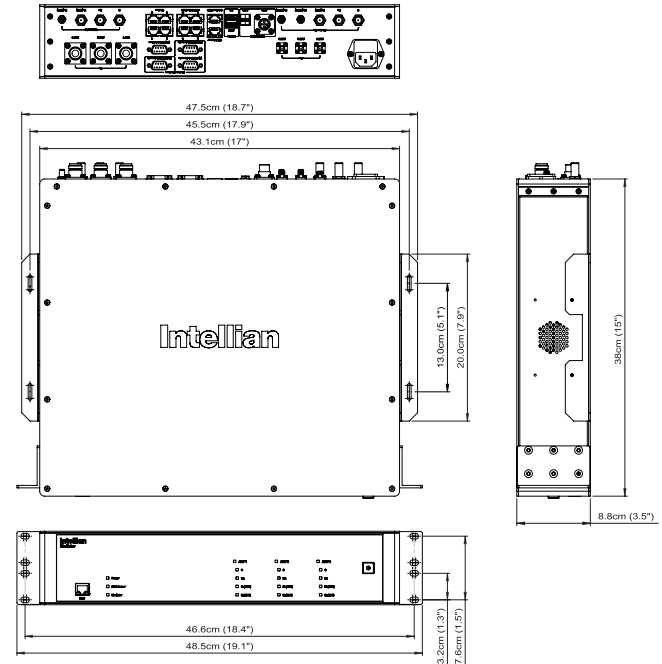
Description	Q'ty	Size	Remarks
Modem Interface Cable (For Comtech Modem_DB-9 pin Female)	2	1.5m	Mediator(RS232&Console:C-band, Ku-band) to Modem (Comtech Modem:C-band, Ku-band)
RG6 Cable (RF Cable)	4	3m	For RX/TX connection: Mediator to Modem(C-band, Ku-band)
PC Serial Cable	2	1.8m	For serial modem & BUC interface
Ethernet Cable (RJ45 / LAN)	3	1.5m	ACU to PC/Intellian M&C
AC Power Cord (CEE7/7)	1	1.5m	Mediator Power (220V)
AC Power Cord (USA)	1	1.5m	Mediator Power (110V)
USB Cable (A-A)	1	1.8m	Mediator to PC
D-Sub 9 pin Female Connector	2		For Mediator-Modem Interface

Installation Site

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

- Dry, cool, and ventilated
- Allows easy access. Near to the Antenna Control Unit and satellite modem

Dimensions



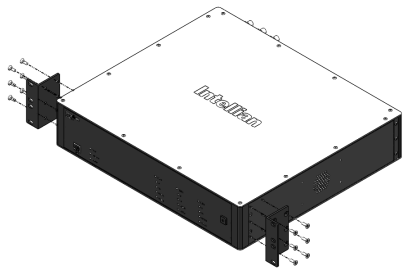
Intelligent Mediator Dimensions

Installation

Mounting the Intelligent Mediator

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

19" Rack Mount Type



19" Rack Mount Type Intelligent Mediator

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

Table Mount Type

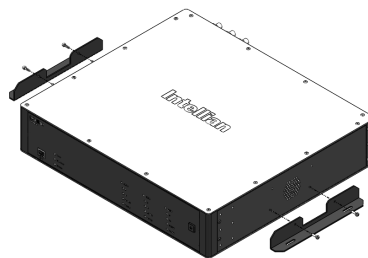


Table Mount Type Intelligent Mediator

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



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

System Configurations

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

Basic System Configuration (Single Data Center)

The basic configuration consists of three antenna system and one data center. This mode of operation can provide the connection via GEO satellite constellations operating in C and Ku band with the adoption of the appropriate modems supported by the satellite network. The modem mediator is required to select electronically via pre-configuration the correct modem to be connected to the Multiband antenna system. The minimum system configuration is shown in the figure below which can provide seamless operation across the tri-band operation.

With the triple Antenna Mediator, 3 multi-band antennas can be configured to provide redundancy to blockages where the 3 antennas would be installed at different locations on a vessel. This will provide seamless and un-disrupted connectivity to any satellite constellation.



NOTE

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

Dual Data Center System Configuration

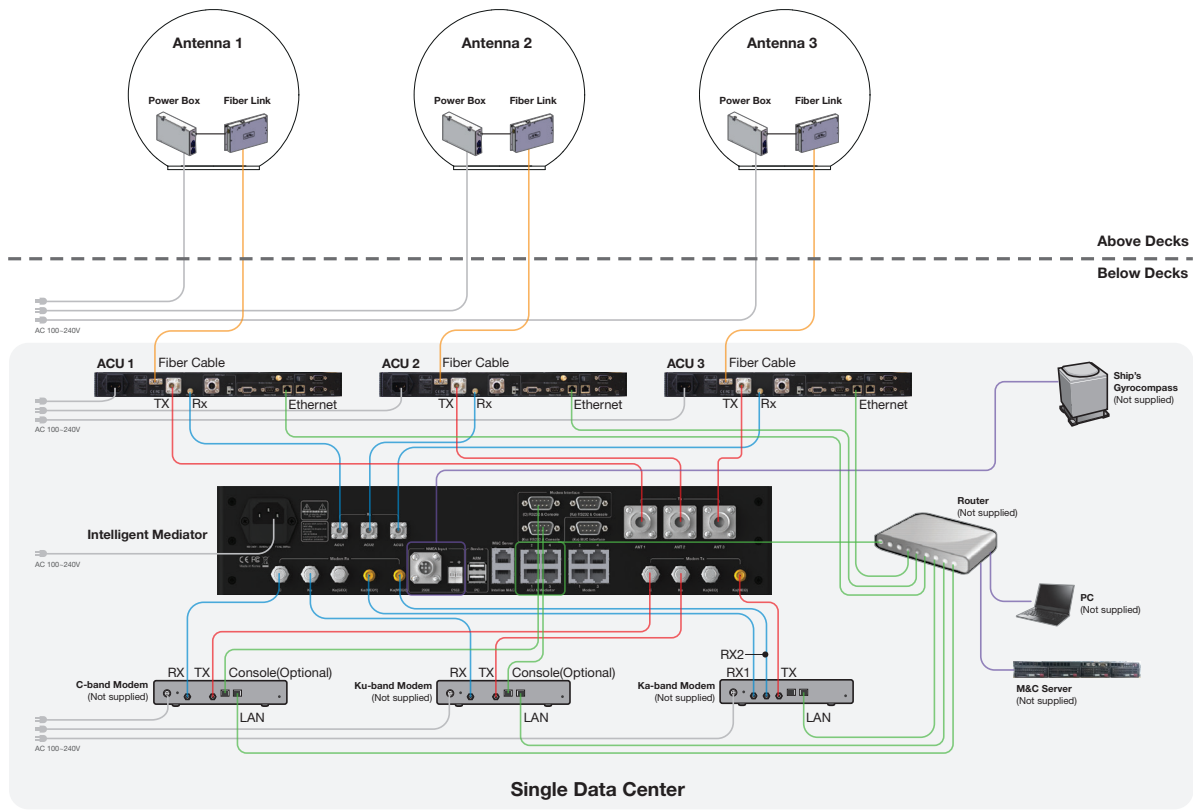
The figure below shows the configuration of a Tri-band antenna system with a Dual Data Center which can provide high versatility in connecting to the various satellite network. If the antenna is installed as the Single Data Center(Primary) system, the antenna needs to be installed additional one Data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



WARNING

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

Tri-band Antenna System with Single Data Center



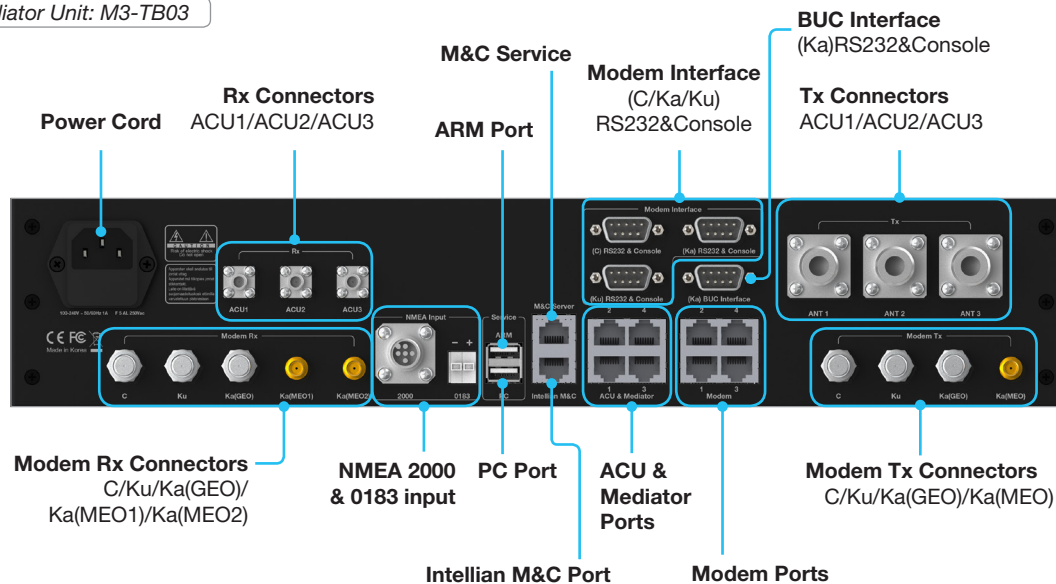


Cable Connection

Name of Rear Panel

The following figure shows the mediator's rear panel.

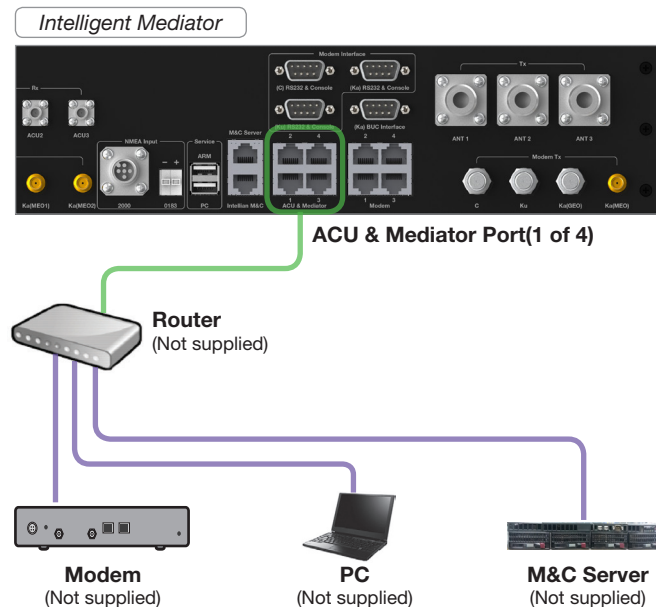
Intelligent Mediator Unit: M3-TB03



Connecting to the Router

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

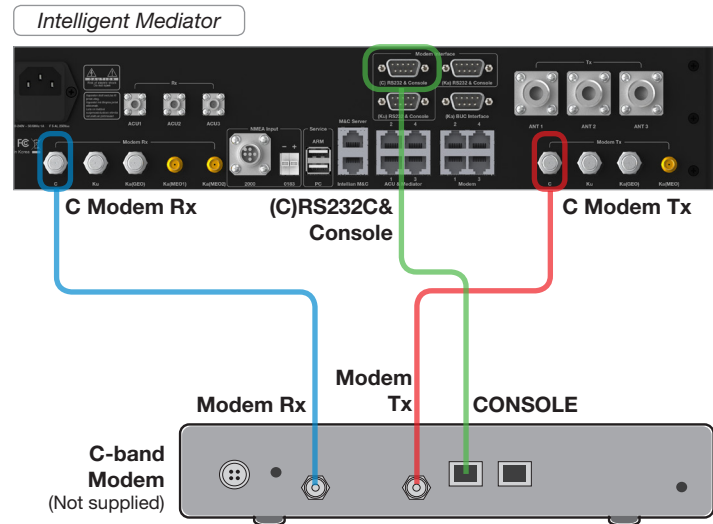
Each modem(C-band, Ku-band, and/or Ka-band), PC, and M&C Server are connected from mediator through the Router.



Connecting to C-band Modem

Connect the “RG6 cable” from the “C Modem Rx” connector on the rear of the Intelligent Mediator to the Rx connector on the C-band modem. Connect the “RG6 cable” from the “C Modem Tx” connector on the rear of the Intelligent Mediator to the Tx connector on the C-band modem.

When using the I/O console system, connect the modem interface cable from the “(C)RS232&Console” connector on the rear of the Intelligent Mediator to the CONSOLE connector on the C-band modem.

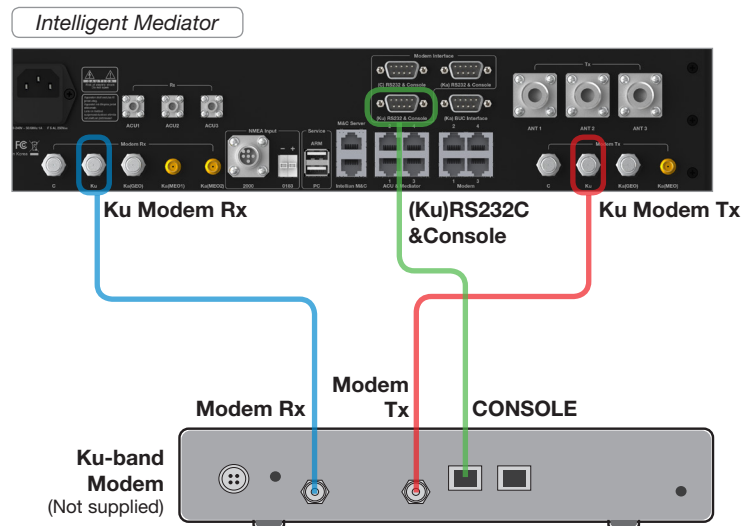


Connecting to Ku-band Modem

Connect the “RG6 cable” from the “Ku Modem Rx” connector on the rear of the Intelligent Mediator to the Rx connector on the Ku-band modem.

Connect the “RG6 cable” from the “Ku Modem TX” connector on the rear of the Intelligent Mediator to the Tx connector on the Ku-band modem.

When using the I/O console system, connect the modem interface cable from the “(Ku)RS232&Console” connector on the rear of the Intelligent Mediator to the CONSOLE connector on the Ku-band modem.



Connecting to Ka-band Modem

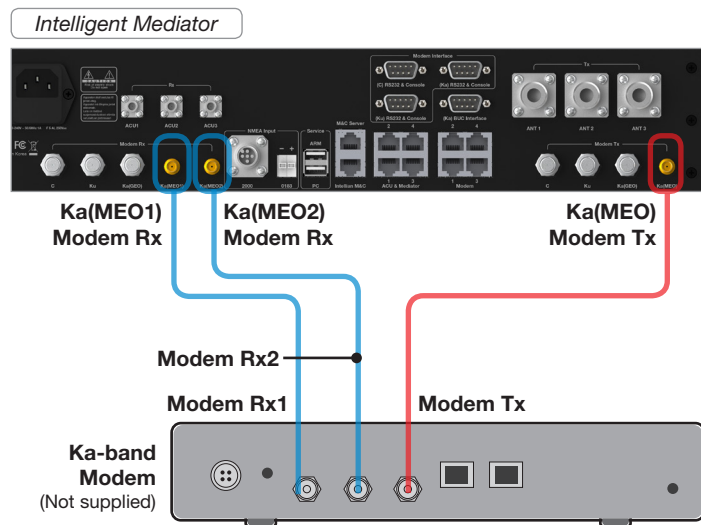
Connect the “SMA to SMA Cable” from the “Ka(MEO1) Modem Rx” connector on the rear of the Intelligent Mediator to the Rx1 connector on the Ka-band modem.

Connect the “SMA to SMA Cable” from the “Ka(MEO2) Modem RX” connector on the rear of the Intelligent Mediator to the Rx2 connector on the Ka-band modem.

Connect the “SMA to SMA Cable” from the “Ka(MEO) Modem Tx” connector on the rear of the Intelligent Mediator to the Tx connector on the Ka-band modem.



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



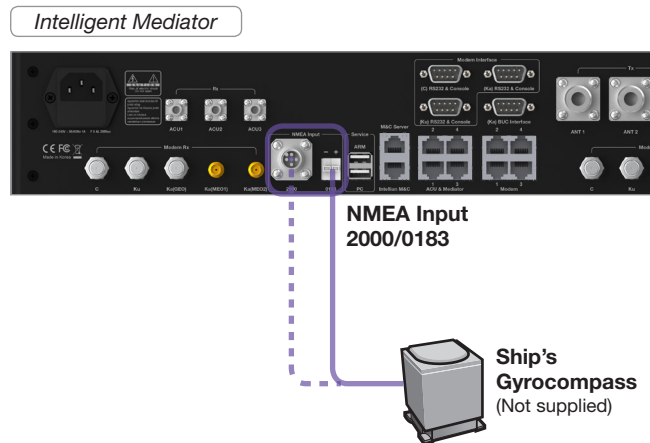
Connecting the System with a Ship's Gyrocompass

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

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

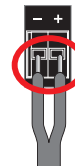
- Gyrocompass Interface Cable(Customer Supplied) Information

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



NOTE:

- When connecting the NMEA 0183 gyrocompass input, strip the cable for 5 mm (0.2"). Do not solder the cable.
- If the ship gyro is connected to the Mediator, a separate gyrocompass connection to the ACU is not required.

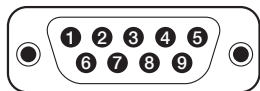


Mediator Connector Pinouts Guide

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

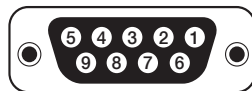
Console Connector (C/Ku/Ka Modem Interface)

Intelligent Mediator:



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

Cable Connector:

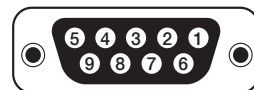


D-Sub 9 Pin-Console
(Female Connector Type)

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

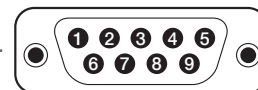
Console Connector (Comtech Modem Interface)

Intelligent Mediator:



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

Cable Connector:

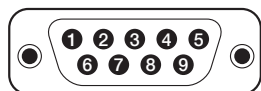


D-Sub 9 Pin-Console
(Male Connector Type)

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

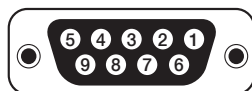
Console Connector (Ka BUC Interface)

Intelligent Mediator:



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

Cable Connector:

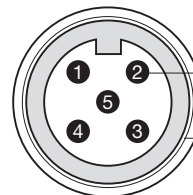


D-Sub 9 Pin-Console
(Female Connector Type)

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

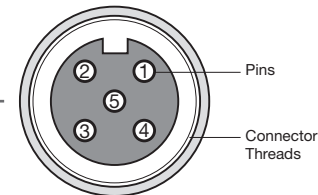
NMEA 2000 Connector

Intelligent Mediator:



NMEA 2000 Connector
(Male Connector Type)

Cable Connector:



NMEA 2000 Connector
(Female Connector Type)

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

PC to Mediator Communication Setup

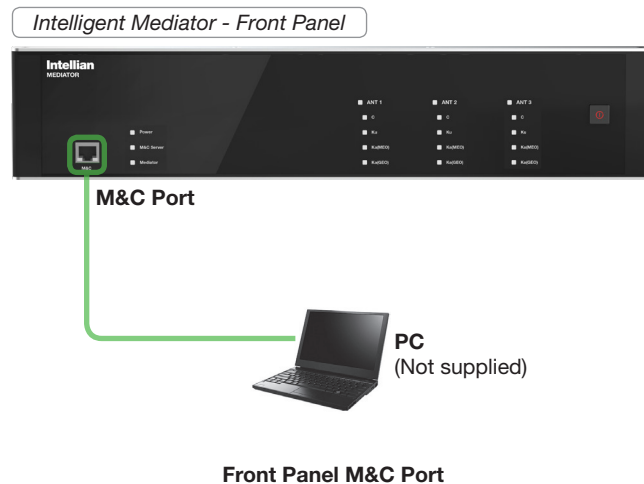
You can establish data communication between a PC and the Intelligent Mediator using one of the following methods.

TCP/IP Connection

Connection through Front Panel M&C Port

This method is most recommended. The network is automatically configured by DHCP without the need of additional PC IP configuration.

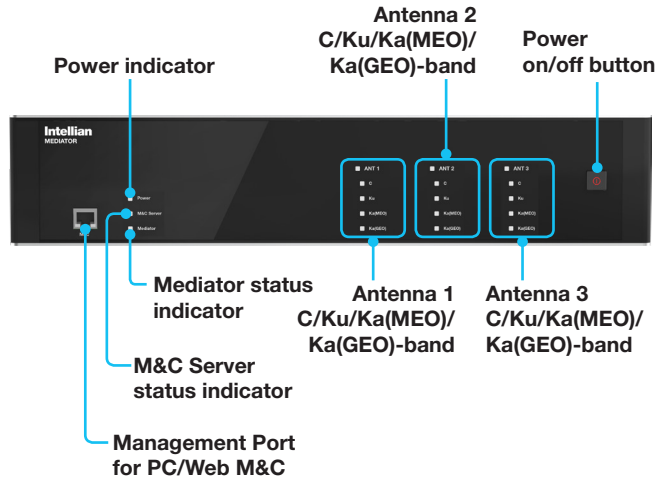
1. Connect an Ethernet cable from the M&C port on the front of the Intelligent Mediator to the LAN port of PC.
2. The network connection is established.
3. Use the following IP address to access Aptus Web page.
 - **192.168.2.1 (Default)**



Operation

Intelligent Mediator Front Panel

The following figure shows the mediator's front panel.



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

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

Aptus Web for the Mediator

Introduction

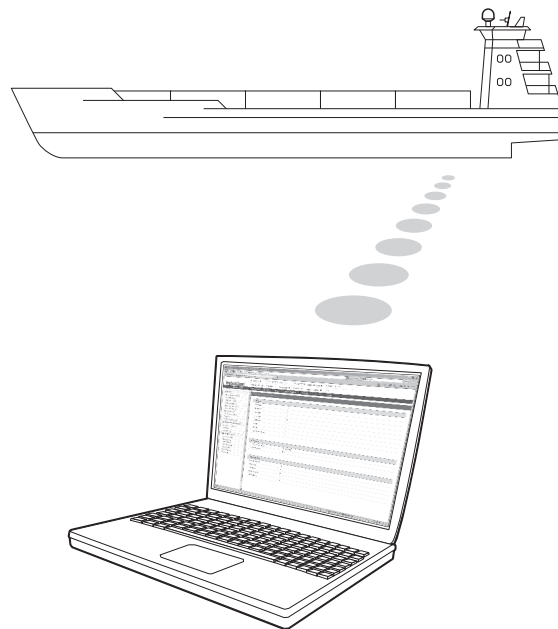
With embedded Aptus Web software, the Mediator can be monitored and controlled remotely through the TCP/IP protocol.

How to access Aptus Web for the Mediator

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



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



Main Page

Page Login

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



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



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

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

Intellian®

Aptus
Web

Aptus Web
MEDIATOR v1.00

☒ Monitor & Control
[Monitor Only](#)

Username

Password

Top Menus

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

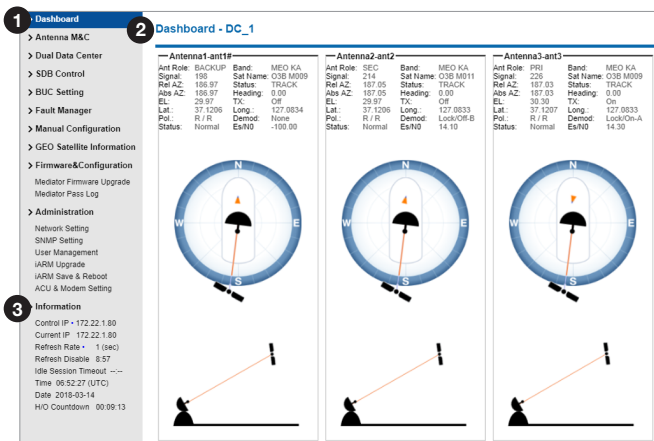


No.	Item	Description
①	H/O Countdown	Displays the time remaining until the next MEO Ka satellite is reached.
②	Mediator Mode	Displays the Mediator Mode(MEO, GEO, MG, MANUAL) for a quick monitoring. You can set mode in the "Manual Configuration-Mediator Mode" menu.
③	Demod A/ Demod B	The symbols only appear in MEO Ka-band satellites. It displays lock status of the modem(Lock or Unlock). The following five status are displayed in colors as below. - Display in the Gray Color • Fault: The modem demodulation is unsuccessful. • Unlock/Off: The modem is unlocked and Off state.(The Off means the modem is not carrying traffic.)

No.	Item	Description
③	Demod A/ Demod B	• Lock/Off: The modem is locked and Off state. (The Off means the modem is not carrying traffic.) - Display in the Yellow Color • Unlock/On: The modem is unlocked and On state.(The On means the modem is carrying traffic.) - Display in the Green Color • Lock/On: The modem is locked and On state. (The On means the modem is carrying traffic.)
④	Ant. Info	Obtain current Mediator information.
⑤	Account	Shortcut to User Management menu. Change login ID and Password.
⑥	Logout	Logout the Mediator's web page.

Dashboard & Information

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



No.	Item	Description
①	Dashboard	Displays current antenna status to be quickly monitored.
②	Dashboard Items	Displays the antenna name as Antenna1/2/3-XX (XX is ACU's description). Set the description in the "Administration-ACU & Modem Setting" menu. Shows a graphical representation of the current antenna position and information to be quickly monitored. - Ant Role: Displays the antenna Role status.(PRI(Primary), SEC(Secondary), Back(Backup)) The currently active antenna is displayed as PRI(Primary) Role. For MEO Ka-band satellites, the antenna in the SEC(Secondary) status is switched to the PRI(Primary) status after the handover. - Band: Displays band of the current tracking satellite(NONE, C, KU, KA(GEO KA), MEO KA). The KA(GEO KA) is not supported yet. - Signal: Displays antenna signal level. - Sat Name: Displays the current tracking satellite name. - Rel AZ: Displays antenna relative azimuth angle. - Status: Displays status of the currently active antenna(Setup, Search, Tracking, etc.).

No.	Item	Description
②	Dashboard Items	- Abs AZ(Absolute Azimuth): displays antenna absolute AZ angle. - Heading: Displays ship's heading information. - EL: Displays antenna relative elevation angle. - TX: Displays transmit status(On or Off). - Lat: Displays GPS latitude. - Long: Displays GPS Longitude. - Pol: Displays Rx/Tx Polarization. - Demod: Displays lock status of the modem as Lock, Unlock in GEO satellite. When using MEO Ka-band satellite, the "Unlock/Off, Unlock/On, Lock/Off, Lock/On" options are displayed. The following five options are displayed as "option name-X"(X is A or B). • Fault: The modem demodulation is unsuccessful. • Unlock/Off: The modem is unlocked and Off state.(The Off means the modem is not carrying traffic.) • Lock/Off: The modem is locked and Off state. • Unlock/On: The modem is unlocked and On state.(The On means the modem is carrying traffic.)

No.	Item	Description
②	Dashboard Items	• Lock/On: The modem is locked and On state. NOTE: This function is also displayed in the Top Menu for a quick monitoring. - Status: Displays antenna's status. (Normal or Fault) - Es/N0: Displays energy per symbol to noise power spectral density.
		- Control IP: Displays current IP that controls the Mediator. - Current IP: Displays current IP address. - Refresh Rate: Displays screen refresh rate (default: 1 sec.) - Refresh Disable: Displays time out. The screen will not refresh once the time-out shows 0:00. (Exception: If the Refresh Disable Time is set to "OFF" in the Network Setting page, then the clock will show "--:--" and the system will keep monitoring all activities regardless of the timeout.)
③	Information	- Time: Displays UTC time. - Date: Displays UTC date. - H/O Countdown: Displays the time remaining until the next satellite is reached.

Antenna Settings

Antenna M&C

The screenshot shows the 'Antenna M&C' page with a sidebar menu on the left and a main content area. The sidebar menu includes: Dashboard, Antenna M&C (selected), Dual Data Center, SDB Control, BUC Setting, Fault Manager, Manual Configuration, GEO Satellite Information, Firmware&Configuration, Administration, and Information. The main content area is divided into four numbered sections: 1. Antenna M&C (header), 2. Antenna State (table for Antenna 1, 2, and 3), 3. Tracking Band (table for Antenna 1, 2, and 3), and 4. Upcoming Handover Schedule (table for Next Satellite).

Antenna State	
Antenna 1	Antenna 2
Satellite Name: O3B M009	Satellite Name: O3B M009
Signal: 215	Signal: 214
Tracking State: TRACK	Tracking State: TRACK

Tracking Band	
Antenna 1	Antenna 2
GEO: Ka (green dot)	GEO: Ka (yellow dot)
Ku: Ku (grey dot)	Ku: Ku (grey dot)
C: C (grey dot)	C: C (grey dot)

Upcoming Handover Schedule	
Next Satellite	O3B M012
Start Time	07:00:30 2018-03-14
Handover Time	07:01:40 2018-03-14
Countdown	00:00:43

No.	Item	Description
①	Antenna M&C	Display antenna state, tracking band status and handover information.
②	Antenna State	Display each antenna state information. - Satellite Name: Displays the current tracking satellite name. - Signal: Displays Signal Level - Tracking State: Displays antenna status in use(Setup, Search, Tracking, etc.)

No.	Item	Description
③	Tracking Band	Display each antenna's tracking band status and sets the tracking band. The status light flashes yellow when Tx signal is Off. The status light flashes green when Tx signal is On.
④	Upcoming Handover Schedule	Display upcoming handover information of MEO Ka satellite. Typically the MEO Ka satellites move into non geostationary orbit. The orbital period of MEO satellite is about 40 minutes. The antenna starts tracking a satellite(Current Satellite) and then searches another satellite(Rising Satellite) within 40 minutes. - Next Satellite: Displays Rising Satellite name. - Start Time: Displays antenna(Secondary and/or Backup role)'s start time to move to the position of the Rising Satellite when two or more antennas are tracking MEO Ka satellites.

No.	Item	Description
④	Upcoming Handover Schedule	- Handover Time: Displays antenna(Primary and Secondary role)'s handover start time. At this time, two antennas track and transmit a signal to each satellite(Current Satellite and Rising Satellite). - Countdown: Displays the time remaining until the next satellite is reached.

Dual Data Center

No.	Item	Description
①	Dual Data Center	The Dual Data Center (DDC) system provides the interface(IFL Switch) that supports the selective connection between one antenna(ADE) and two data centers(BDE). When one of the data centers fails due to unfavorable environmental conditions, power outages, technical issues or blocked by obstacles, the DDC system can be easily switched to the other data center by using the Intelligent Mediator to maintain the antenna operation and the network continuously. For DDC system to function, your equipment must meet the requirements in basic configuration. See “Installing the ACU/Mediator” section for more details.

No.	Item	Description
①	Dual Data Center	WARNING: You must use identical modules in the primary and secondary racks. If you have different models or different versions of the same model or different software, the DDC system will not function properly.
②	Dual Data Center Setting	- Use Dual Data Center: Enable or Disable the DDC system. - Role State: Set Role State for both Data Center. • Primary: Active Data Center(Communicating Tx/Rx) • Secondary: Standby Data Center(Not communicating Tx/Rx) - Peer D/C IP: Sets the Target Data Center's IP address. - Local D/C Name: Sets the Data Center's Description.

SDB Control

No.	Item	Description
①	SDB Control	WARNING: Make sure that upload the correct file. If the wrong file is uploaded, the antenna can not track the MEO satellite.
②	SDB M&C	- SDB File: The SDB contains information needed to track MEO satellite. • Ephemeris: The Ephemeris File provides the orbit propagation information for MEO satellite. • Spacecraft: The Spacecraft File provides the frequency and polarization of the Telemetry (TLM) beacon MEO satellite.

No.	Item	Description
②	SDB M&C	• Schedule: The Schedule file provides the Prepass, Start, Stop, and Handover times which the scheduler will use to plan the ground resources during a satellite pass. • Channels: The Channel Plan provides the RF characteristics for the OTA links. (RF information, Satellite Frequency, IF Frequency, Polarization, and Symbol rate etc. for tracking satellites) - Date: Shows the renewal date. - Size: Shows the file size. - Action • Download: Download the SDB file. • Upload: Upload the SDB file.

BUC Setting for MEO(Ka-band) Satellite

BUC Setting

1 BUC Information Summary

Antenna 1	Antenna 2	Antenna 3
RF Output: 42.0 dBm	RF Output: 26.0 dBm	RF Output: 0.0 dBm
TX State: TRANSMIT	TX State: STANDBY	TX State: STANDBY
Attenuator: 6.3 dB	Attenuator: 0.00 dB	Attenuator: 11.4 dB

2 Amp Status

Amp State: READY
Control: REMOTE, ALL
RF Output: 42.0 dBm
TX State: TRANSMIT
Power Mode: ALC
[Reset Fault]

3 Config

BUC Unlock Type: FAULT
Band Select: HIGH

4 IP Settings

IP Address: 172.22.1.37
IP Mask: 255.255.255.128
IP Gateway: 172.22.1.1

5 Amp Information

S/N: 11297
S/W Version: 02.01.19
Amp Name: 11297_B3KO-124

6 Setpoints

High RF Out Alarm: 44.0 dBm
High RF Out Fault: 46.0 dBm
ALC Set Pt: 42.0 dBm
Manual RF Set Pt: 42.0 dBm
Attenuation Set Pt: 6.3 dB
ALC Disable RF: 20.0 dBm

No.	Item	Description
①	BUC Setting	Set BUC options for the each antenna.

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

No.	Item	Description
④	Amp Status	• REMOTE ALL(Default): Control BUC via Remote Ethernet, Remote Serial and Web. • REMOTE ETHERNET: Control BUC via Remote Ethernet. • REMOTE SERIAL: Control BUC via Remote Serial. • REMOTE WEB: Control BUC via Remote Web. - RF Output: BUC Output level. - TX State: Select the Transmit State(STANDBY, TRANSMIT) in the drop-down list. • STANDBY: Transmit standby state. • TRANSMIT: Transmit active state(On). - Power Mode: Select the Power Mode to control the transmit power(MANUAL, ALC(Automatic Level Control), Reset Fault) in the drop-down list. • MANUAL: Output the power as Manual RF Set Pt. • ALC(Automatic Level Control): Output the power as modem output level(Transmit). - Reset Fault: Reset the BUC Fault state.

No.	Item	Description
⑤	Amp Information	- S/N: Displays Serial Number. - S/W Version: Displays Main S/W Version. - Amp Name: Sets BUC Name.
		Set the control points to BUC.
		- High RF Out Alarm: If the RF Output is more than the setpoint, the Alarm Error message will detect in the BUC. - High RF Out Fault: If the RF Output is more than the setpoint, the Fault Error message will detect in the BUC and the Amp state will change to the Fault state. Click the Reset Fault button in the Amp Status menu to reset the Fault status.
⑥	Set points	- ALC Set Pt: Sets the Max BUC power Point. The BUC power is amplified within the Max range. The function is available when the Power Mode sets ALC(Automatic Level Control) in the Amp state menu. - Manual RF Set Pt: Sets BUC power level. The function is available when the Power Mode sets the Manual in the Amp state menu. - Attenuation Set Pt: Sets BUC Attenuator value. BUC power is attenuated by the setpoint.

No.	Item	Description
⑥	Set points	- ALC Disable RF: Sets Limits the use of the ALC function. If the RF Output is less than the setpoint, the ALC function will be deactivated.
		- BUC Unlock Type: Select the BUC Unlock type. • ALARM: When BUC is in unlock state, the Alarm error message will detect in the BUC. • FAULT: When BUC is in unlock state, the Fault error message will detect in the BUC. - Band Select: Select the BUC Band type. • LOW: Sets BUC Local as Low Band(26.6GHz). • HIGH: Sets BUC Local as High Band(27.2GHz).
⑦	Config (Configuration)	
⑧	IP Settings	- IP Address: Sets BUC IP Address. - IP Mask: Sets BUC Netmask. - IP Gateway: Sets BUC Gateway.



NOTE

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

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

No.	Item	Description
①	BUC Setting	Set BUC options for the each antenna.
②	BUC Information Summary	Displays BUC information summary of each antenna. - RF Output: Displays RF Output level. - TX State: Displays Transmit State(STANDBY, TRANSMIT). • OFF: BUC is in Idle status. • STANDBY: Transmit standby state. • TRANSMIT: Transmit active state(On). - Attenuator: Displays attenuation value.

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

Fault Manager

Dashboard

Antenna M&C

Dual Data Center

SDB Control

BUC Setting

Fault Manager

Manual Configuration

GEO Satellite Information

Firmware&Configuration

Mediator Firmware Upgrade

Mediator Pass Log

Administration

Network Setting

SNMP Setting

User Management

JARM Upgrade

JARM Save & Reboot

ACU & Modem Setting

Information

Control IP : 172.22.1.80

Current IP : 172.22.1.80

Refresh Rate : 1 (sec)

Refresh Disable : 8:33

Idle Session Timeout : ---

Time : 07:00:55 (UTC)

Date : 2018-03-14

H/O Countdown : 00:00:45

Fault Manager

Antenna 1

Antenna 2

Antenna 3

» ADE Comm.

» Motor AZ

» Motor EL

» Motor CL

» Encoder AZ

» Sensor Box Limit

» Rate Sensor

» Tilt Sensor

» LNB / NBD

» SKEW

» Antenna Power

» Home Sensor

» GEO C BUC

» GEO Ku BUC

» GEO Ka BUC

» MEO Ka BUC

» ADE Comm.

» Motor AZ

» Motor EL

» Motor CL

» Encoder AZ

» Sensor Box Limit

» Rate Sensor

» Tilt Sensor

» LNB / NBD

» SKEW

» Antenna Power

» Home Sensor

» GEO C BUC

» GEO Ku BUC

» GEO Ka BUC

» MEO Ka BUC

» ADE Comm.

» Motor AZ

» Motor EL

» Motor CL

» Encoder AZ

» Sensor Box Limit

» Rate Sensor

» Tilt Sensor

» LNB / NBD

» SKEW

» Antenna Power

» Home Sensor

» GEO C BUC

» GEO Ku BUC

» GEO Ka BUC

» MEO Ka BUC

No.	Item	Description
①	Fault Manager	Display the diagnostic results of each antenna.
②	Fault Manager Items	The “Green” indicator is displayed for the test under progress. “Blue” indicates the test result as Pass while “Red” indicates the result as Fail. “Yellow” indicates the test has been skipped.

No.	Item	Description
		- ADE Comm.: Displays the data communication state between the antenna and mediator. - Motor AZ: Displays the azimuth motor state. - Motor EL: Displays the elevation motor state. - Motor CL: Displays the cross-level motor state. - Encoder AZ: Displays the azimuth encoder state. - Rate Sensor: Displays the rate sensor state. - Tilt Sensor: Displays the tilt sensor state. - Sensor Box Limit: Displays the sensor box motor state. - LNB/NBD: Displays the LNB/NBD state. - SKEW: Displays the LNB pol motor state. - Antenna Power: Displays the antenna power state. - ACU Power: Displays the ACU power state. - GEO C BUC: Displays GEO C BUC state. - GEO KU BUC: Displays GEO Ku BUC state. - GEO Ka BUC: GEO Ka BUC state. (Not supported yet) - MEO Ka BUC: Displays CPI MEO Ka BUC state.
②	Fault Manager Items	

Manual Configuration

No.	Item	Description
①	Manual Configuration	Set the mediator mode, role option, antenna role, mediator Rx/Tx and heading device.
②	Mediator Mode	Selects a proper mediator mode to interface with the connected antenna satellite. - MODE • MEO MODE: Antenna tracks MEO(Ka-band) satellite.

No.	Item	Description
②	Mediator Mode	• GEO MODE: Antenna tracks GEO(C/Ku/Ka-band) satellite. • MG MODE: Antenna tracks between MEO(Ka-band) and GEO(C/Ku/Ka-band) satellite. (The antenna automatically switches to MEO/GEO depending on the situation such as Fault, Blockage, etc.) • MANUAL MODE: Antenna tracks between MEO(Ka-band) and GEO(C/Ku/Ka-band) satellite (There is no automatic switching function.) NOTE: This function is also displayed in the Top Menu for a quick monitoring.
③	GEO Change Role Option	Sets the role options to change Primary/Secondary antenna automatically. - Timeout: Sets the Timeout(a second). If the Fault event occurs within the set timeout period, the Role switches automatically. - Signal Threshold: Sets the Signal Threshold. If the signal of the secondary antenna is higher than the threshold, the Role switches automatically.

No.	Item	Description
④	Change Antenna Role	Select the antenna role type(Primary/ Secondary/Backup) manually. Each antenna displays the current tracking satellite information.
⑤	MG Mode Adjustable Option	Set the timer and priority band options In MG mode. - Switch Out Timer: Sets the event standby time when the band switches from MEO to GEO. (Range: 30 sec - 20 min) - Switch Back Timer: Sets the event standby time when the band switches from GEO to MEO. (Range: 30 sec - 20 min) - Priority of GEO Band: Selects a priority band when the band switches from MEO to GEO. (C Band/Ku Band)
⑥	Heading Device	Selects a gyrocompass connected to the mediator(NMEA/NMEA_2000).



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

GEO Satellite Information

The screenshot shows the 'GEO Satellite Information' configuration window. On the left is a sidebar menu with options like Dashboard, Antenna M&C, Dual Data Center, SDB Control, BUC Setting, Fault Manager, Manual Configuration (selected), Firmware Configuration, and Administration. The main area is divided into five numbered sections:

- 1. Manual Configuration:** Includes 'GEO Satellite Information' and 'Firmware Configuration' (Mediator Firmware Upgrade, Mediator Pass Log).
- 2. C-Band Satellite:** Fields for Longitude (96.5 E), IF Frequency (1275000), Bandwidth (2000), RX Local (5150), Skew Offset (0.00), RX Polarization (RHCP), TX Polarization (LHCP), and a 'Set Configuration' button.
- 3. Ku-Band Satellite:** Fields for Longitude (95.0 E), IF Frequency (1241250), Bandwidth (1000), RX Local (11300), Skew Offset (0.00), RX Polarization (HORIZONTAL), TX Polarization (VERTICAL), and a 'Set Configuration' button.
- 4. Load Satellite:** A dropdown menu showing 'AH33 / 96.5E' and a 'Register Satellite Information' button.
- 5. Selected Satellite Library Setting:** Fields for Band (C), Longitude (96.5 E), IF Frequency (1275000), Bandwidth (2000), RX Local (5150), Skew Offset (0.00), RX Polarization (RHCP), and TX Polarization (LHCP).

No.	Item	Description
①	GEO Satellite Information	Displays beam-switch information received from a modem. GEO Satellite information can be also edited manually or registered by a library loading or satellite loading.
②	C/Ku/ Ka Band Satellite	C/Ku/Ka-band satellite information to be stored on the antenna when switching to a C/Ku/Ka-band. - Longitude: Longitude of a target satellite.

No.	Item	Description
②	C/Ku/ Ka Band Satellite	- IF Frequency: Frequency of a target satellite. - Bandwidth: Bandwidth of a target satellite. - RX Local: RX Local Frequency of a target satellite. - Skew Offset: Skew offset of a target satellite. - RX Polarization: RX Pol of a target satellite. - TX Polarization: TX Pol of a target satellite.
③	Library	Browse, Upload and Load the satellite library to update the Satellite information. - Load Library: Load the uploaded library to the mediator. - Browse: Browse the satellite library from the PC. - Upload Library: Upload the selected library to the mediator. - Save Library to PC: Download the library to the PC.
④	Load Satellite	Select the desired satellite list from the dropdown menu to register satellite information.

No.	Item	Description
⑤	Selected Satellite Library Setting	Displays the selected satellite library information.



NOTE

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

Firmware & Configuration

Mediator Firmware Upgrade

No.	Item	Description
①	Mediator Firmware Upgrade	Can upgrade the mediator firmware.
②	New Mediator Firmware	Select Upgrade Method between “Manual Upgrade” or “Auto Upgrade”. With “Auto Upgrade” option selected, click “Check” button to check automatically if there is new firmware available from the server. With “Manual Upgrade” option selected, browse and select the firmware package file to upload and click “Start Upload” button.

No.	Item	Description
②	New Mediator Firmware	NOTE: When using the “Manual Upgrade” method, refer to the following “Mediator Firmware Update(Manual Upgrade method) procedures” page for more details.
③	Current Running Version	Displays current firmware versions.
④	Cold Rollback	Display Previous/Latest Package version. When clicking the Rollback button, the system will be upgraded. Other functions cannot be operated while rollback is in progress.

Mediator Firmware Upgrade(Manual Upgrade method) procedures:

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

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

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

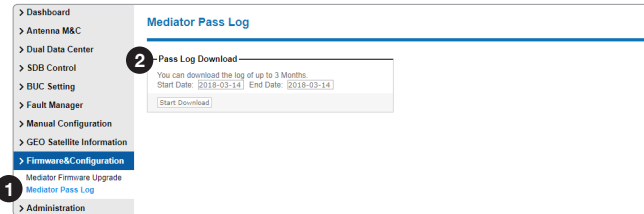
4. If the firmware is successfully upgraded, it will display “The firmware update is completed.” Click on “Back to main page” to go out of the screen. To verify the upgraded firmware version, go to Dashboard > Mediator Information.



NOTE

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

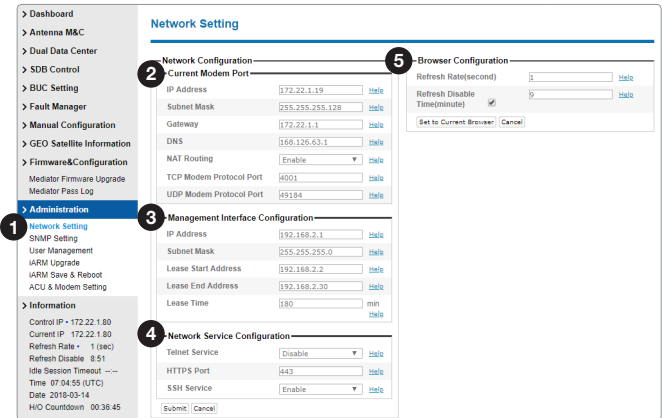
Mediator Pass Log



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

Administration

Network Setting



No.	Item	Description
①	Network Setting	Enter the mediator's network setting page.
②	Current Modem Port	Displays the mediator's internal IP address. - IP Address: Factory default(Primary:192.168.0.223)/(Secondary:10.10.1.1).

No.	Item	Description
②	Current Modem Port	- Subnet Mask: Factory default(255.255.255.0). - Gateway: Factory default(192.168.0.1). - DNS: Current default DNS Address is assigned to. - NAT Routing: Enable/Disable NAT routing. - TCP Modem Protocol Port: This function is not available. - UDP Modem Protocol Port: This function is not available.
③	Management Interface Configuration	Displays Management Port's network configuration. - IP Address: Mediator's front network port /Factory default(192.168.2.1). - Subnet Mask: Factory default(255.255.255.0). - Lease Start Address: Lease IP address start range. - Lease End Address: Lease IP address end range. - Lease Time: Lease IP address update time.

No.	Item	Description
④	Network Service Configuration	Displays Management Service configuration. - Telnet Service: Enable or disable telnet login support. - HTTPS Port: HTTPS port number. - SSH Service: Enable or disable CLI connection via SSH service.
⑤	Browser Configuration	Set refresh rate and refresh disable time. - Refresh Rate: Set the browser refresh rate (Default 1 seconds. Range 1~99). - Refresh Disable Time: Set the browser idle timeout (Default:9 minutes. Range 0~9). To use this function, check the checkbox.

SNMP Setting

SNMP Setting

2 - SNMP Agent Configuration

SNMP V1/V2 Status: Read Write [info](#)

V1/V2 Community Name: Intellan [info](#)

V3 Authentication Type: Auth [info](#)

V3 Authentication Encoding: HDS [info](#)

V3 Username: Intellan / 12345678 [info](#)

V3 Private Encoding: AES [info](#)

V3 Private Password: [info](#)

TRAP IP / Port: 192.168.1.1 / 162 [info](#)

TRAP Parameter: -v 2c -c public [info](#)

[Submit](#) [Cancel](#)

No.	Item	Description
①	SNMP Setting	Can set SNMP configuration.
②	SNMP Agent Configuration	Can retrieve data such as mediator type (Ant, Modem), current RF path, switch selection, modem type, IP information, ACU status, antenna status and switch threshold value. - SNMP V1/V2 Status: Set SNMP mode (Use Attribution Disable, Read Only or Read Write) - V1/V2 Community Name: Set SNMP V2 community name

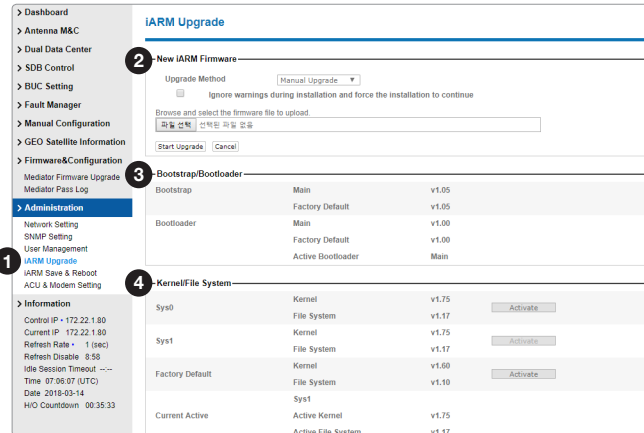
No.	Item	Description
		- V3 Authentication Type: Set SNMP V3 authentication mode - V3 Authentication Encoding: Set SNMP V3 authentication mode - V3 Username: Set the V3 username and password of the SNMP Agent. The password is at least 8 character string.
②	SNMP Agent Configuration	- V3 Private Encoding: Set SNMP V3 Private Encoding - V3 Private Password: Set the V3 password of the SNMP Agent. The password is at least character string - TRAP IP/Port: Set the V3 password of the SNMP Agent. The password is at least character string. - TRAP Parameter: Set the SNMP trap specific parameter.

User Management

No.	Item	Description
①	User Management	Change login ID and Password to access the Aptus Web. This setting can be also accessed by 'Account' icon on the top menu.
②	Change ID & Password	Change your login ID (username) and password.
③	Change ID	Enter your current login ID (username) and new login ID. Click the Submit button to validate the changes that are made to the login ID.

No.	Item	Description
④	Change Password	Enter your current login password and new login password. Click the Submit button to validate the changes that are made to the login password.
⑤	Change User Settings	Change User Password Expire in days and Idle session timeout.
⑥	Password Expire Timeout	Set password expire in days.
⑦	Idle Session Timeout	Set for Console and for Network Timeout.
⑧	Guest Session Access	Enable or disable access to Web or CLI using guest ID.

iARM Upgrade



No.	Item	Description
②	New iARM Firmware	With Manual Upgrade option selected, browse and select the firmware file to upload and click "Start Upgrade" button. NOTE: Refer to the following "iARM firmware upgrade procedures" page for more details.
③	Bootstrap/Bootloader	Displays current bootstrap and bootloader version.
④	Kernel/File System	The mediator has 3 storage parts sys0, sys1, Factory Default. Displays kernel and file system version and current Activated part Information.

No.	Item	Description
①	iARM Upgrade	Upgrade the firmware of iARM module.
②	New iARM Firmware	Select Upgrade Method between Manual Upgrade or Auto Upgrade. With Auto Upgrade option selected, click "Check" button to check automatically if there is new firmware available from the server.

iARM Upgrade(Manual Upgrade method) procedures:

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

New iARM Firmware

Upgrade Method: **Manual Upgrade**

☒ Ignore warnings during installation and force the installation to continue

Browse and select the firmware file to upload. 찾아보기...

Start Upgrade Cancel

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



NOTE

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

iARM Save & Reboot

iARM Save & Reboot

1 Administration

2 Save & Reboot

3 Reboot without Saving

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

ACU & Modem Setting

No.	Item	Description
①	ACU & Modem Setting	Set ACU & Modem options.
②	ACU1/2/3 Setting	- Set ACU options to communicate Mediator and ACU. - Activate: Activate or Inactivate the ACU communication.

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

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



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

Technical Specification

Dimension (W x D x H)	431mm X 381mm X 89mm (17" X 15" X 3.5")	
Weight	4.5Kg (9.9 lbs)	
LED Indicator	3LEDs for Power, Mediator and M&C Server 3LEDs for Antenna 1, Antenna 2 and Antenna 3 12LEDs for Antenna bands	
Ethernet Port	Front Panel	RJ45, TCP/IP connection, Support Web & M&C port
	Rear Panel	Support Web & M&C port, RJ45(8-Ports)
USB Port	Upper Port	i-ARM Connection, Main Connection, Logs Download & Update
	Lower Port	PC or Management Device(57600bps)
Ship's Gyrocompass Interface	NMEA2000 / NMEA0183	
Modem Interface	RS-232C / I/O ports / Ethernet	
BUC Interface	RS232 / I/O PORTS	

PC Serial Interface	RS232 (19200bps, 8, N, 1)
Channel	• TX: 4X3 Matrix Switch • RX: 3X5 Matrix Switch
Gain	• TX: 0dB typ. • RX: 10dB typ.
Gain Control Range (RX Only)	30dB (0.5dB Step)
Port Isolation	• TX: 45dB typ. • RX: 50dB typ.
Impedance	• 50ohm: SMA, N-Type • 75ohm: F-Type
Connectors	• 50ohm: SMA-Type(Female), N-Type(Female) • 75ohm: F-Type(Female)
Frequency Range	950MHz ~ 2150MHz (Reference Signal: 10MHz, 50MHz)
Power Source	100 ~ 240 V AC, 50 ~ 60Hz, 1A
Power Consumption	20W Typ.

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.