

# FB250/Fleet One

Inmarsat FleetBroadband/Fleet One



## Installation & Operation User Guide

Serial number of the product

|  |
|--|
|  |
|--|

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



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# Chapter 1. Precautions

## 1.1 Warnings, Cautions, and Notes

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

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

## 1.2 General Precautions

Before you use the antenna, make sure that you have read and understood all safety requirements.

|                                                                                     |                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>THIS WAY UP</b> <ul style="list-style-type: none"> <li>Place the boxes/crates on the floor with the arrow pointing up.</li> </ul>                                                                                                                                                                      |
|  | <b>FRAGILE</b> <ul style="list-style-type: none"> <li>Since the Radome is fragile, handle it with care. Do not apply excessive pressure or shock. These may cause surface cracking or other damage.</li> </ul>                                                                                            |
|  | <b>DO NOT STACK MORE THAN FOUR UNITS</b> <ul style="list-style-type: none"> <li>Do not stack boxes/crates more than four units as there is a risk boxes/crates may fall and be damaged.</li> </ul>                                                                                                        |
|  | <b>KEEP DRY</b> <ul style="list-style-type: none"> <li>Always make sure the antenna is stored on a dry surface in a dry, well-ventilated area.</li> <li>The antenna is designed to withstand a normal rain shower; however, water resistance cannot be guaranteed if the antenna is submerged.</li> </ul> |

- \* **DO NOT SHIP VIA RAIL:** Ensure not to ship any system via Rail.
- \* **Shock Hazard:** To minimize shock hazard and to protect against lightning, you must connect the equipment chassis and cabinet to an electrical ground. Make sure the system is correctly grounded and power is off when installing, configuring, and connecting components.
- \* **Do not operate in an explosive atmosphere:** Do not operate the equipment in explosive environments or in the presence of flammable gases. Operating this equipment in such an environment causes a definite safety hazard.
- \* **Keep away from living circuits:** Operating personnel must at all times observe all safety regulations. Do not replace components or make adjustment inside the equipment with any power supply turned on. Under certain conditions, dangerous potentials may exist in the power supplies even with the power cable removed. To avoid injuries, always remove the power and discharge a circuit before touching it.

## Chapter 2. Certifications

This device complies with part 15 of the FCC Rules and with Industry Canada licence-exempt RSS standard(s).

Operation is subject to the following two conditions:

- (1) This device may not cause harmful interference, and
- (2) this device must accept any interference received, including interference that may cause undesired operation.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Changes or modifications made to this equipment not expressly approved by Intellian Technologies, Inc. may void the FCC authorization to operate this equipment.

Radiofrequency radiation exposure Information:

This equipment complies with RED and FCC, IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 2.3 m between the radiator and your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

# Chapter 3. Introduction

## 3.1 Introduction of FB250/Fleet One

Intellian's FB250 and Fleet One deliver cost-effective voice and data globally via the world's most reliable commercial L-band satellite, Inmarsat-4s. They introduce the most competitive, highly efficient RF performance, and easy to install solutions that aim to satisfy customers' demand for a low cost of ownership in terms of deployment, installation, and efficient operation.

Intellian Fleet One provides simultaneous voice and IP data up to 150 kbps. Intellian FB250 provides up to 284 kbps IP data and 128 kbps streaming IP with VoIP service and SMS, and it is compatible with the GSM network standard.

## 3.2 Features of FB250/Fleet One

### Inmarsat Fleet Broadband/Fleet One Service

Intellian FB250/Fleet One provides simultaneous high-speed data and voice communication via satellite through the BGAN (Broadband Global Area Network).

### Compatible with GMDSS

Intellian FB250/Fleet One is reliable and compatible with the new Fleet Safety GMDSS system.

### Enhanced Security

Intellian FB250/Fleet One monitors incoming and outgoing network traffic and to allow or block specific traffic based on a defined set of security rules.

### Reliable Data Connectivity

The embedded LAN ports allow various IP device connections for simple use such as SIP phones. The dedicated PoE ports 1 and 2 allow IP device connections with PoE features.

For Intellian FB250, a dedicated WAN port provides a solution for an alternative data connection.

### Simple and Easy

Intellian FB250/Fleet One is designed for simple and easy installation. The ultra-lightweight antenna enables Carry onboard installation and is connected to the below deck unit by a single RF cable.

### Secured Safety at Sea

Intellian FB250/Fleet One ensures reliable connectivity to access critical applications wherever you are. In an emergency, Intellian Fleet One supports Inmarsat's '505' safety service. Also, Intellian FB250/Fleet One supports Maritime Safety Terminal, Inmarsat's next generation of GMDSS.

### Unlimited Back-up to Fleet Xpress Service

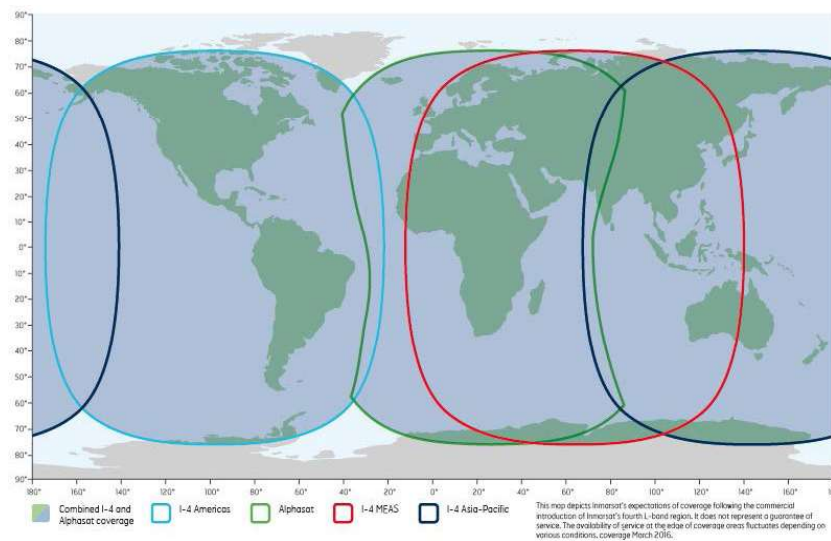
For Intellian FB250, Fleet Xpress is a fully managed and streamlined broadband satellite communications service that promises to be a winning solution for many of the higher volume segments of the maritime market, such as commercial shipping. Reliability of Inmarsat's FleetBroadband network will complete the Fleet Xpress service with Intellian's Global Xpress product line-ups, the GX100NX, and GX60NX.

## 3.3 Overview of FleetBroadband

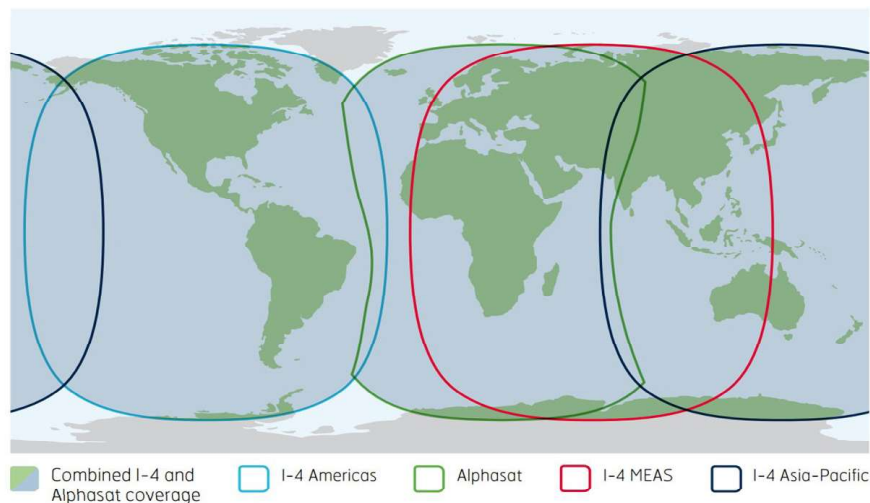
### 3.3.1 BGAN Services

The Broadband Global Area Network (BGAN) is a global Satellite Internet Network using portable terminals. The terminals are usually connected to a laptop computer to access broadband Internet in remote locations, where a line-of-sight to the satellite exists. The user can make phone calls, access the Internet, check e-mail, download files, or perform any other Internet activity using the terminals. The network is provided by Inmarsat and uses four geostationary satellites called I-4 and Alphasat to provide almost global coverage. The map below shows the four satellite coverage regions.

FleetBroadband service coverage

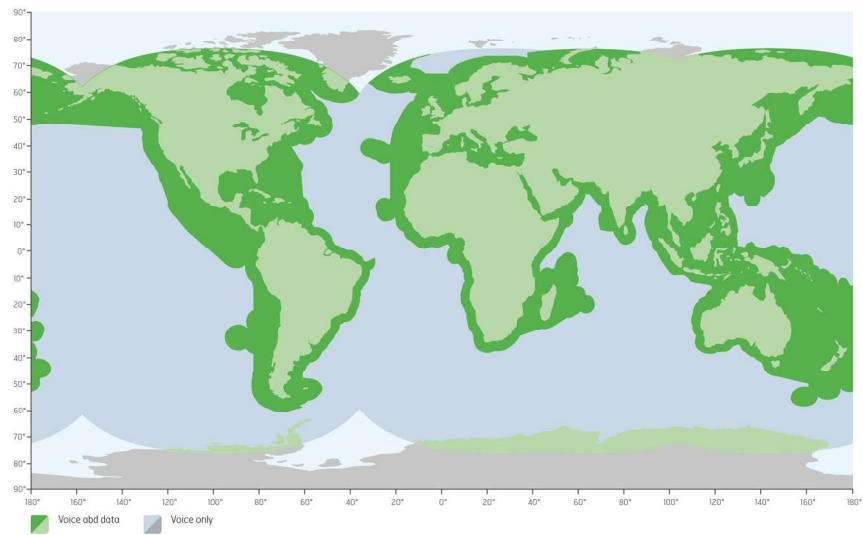


Fleet One Global Coverage





### Fleet One Coastal Coverage and rate regions



#### NOTE

The above map depicts Inmarsat's expectations of coverage but does not represent a guarantee of service. The availability of service at the edge of coverage areas fluctuates depending on various conditions.

## Chapter 4. Planning Installation

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

### 4.1 Selecting Installation Site

The antenna should be placed in an area on-board of the vessel with an unobstructed view extending from (at least)  $-30^\circ$  below the horizontal surface in all azimuth direction. When the antenna is transmitting, obstacles in way of the beam path will cause decreased satellite signal strength. The antenna unit should have direct line-of-sight with the desired satellite without any obstacles in the beam path. Certain minimum distances between the antenna and other onboard devices must also be considered during installation.

Do not place the antenna near to a funnel because smoke deposits can cause corrosion of the antenna. In addition, the deposit can result in any malfunction of the antenna.

Do not place the antenna where there is a direct spray of seawater to avoid percolating any water into the vent hole.

#### 4.1.1 Avoiding RF Interference

Do not install the antenna near the high power shortwave radar. Most radar transmitters emit RF energy within an elevation range of  $-15^\circ$  to  $+15^\circ$ . For this reason, it is recommended to position the antenna at least 4.6 m (15.09 feet) away from any radars (s-band, c-band, and x-band radar up to 50kW).



#### WARNING

Never place the antenna in the beam path of the radar regardless of distance. The high power shortwave radar may impair its performance or damage the antenna.

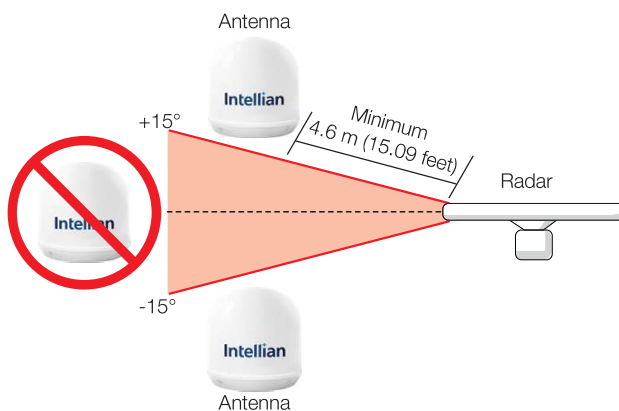


Figure 1: Potential RF Interference

### 4.1.2 RF Hazard Precautions

The antenna is designed to be used with radiation transmitting equipment manufactured by others. Exposure to RF radiation, including exposure associated with improper use of the transmitting equipment, may be hazardous to people who work close to the Above Deck Unit. Ensure the safety of personnel who work with in the system.

During transmission, ensure to keep the minimum safety distance. The recommended minimum safety distance to the reflector on the focal line is as follows. It is based on a Radiation Exposure Level of W/m<sup>2</sup> that applies under an uncontrolled environment. No hazard exists >20° below the antenna's mounting plane.

| Radiation Exposure Level | Recommended Minimum Safety Distance |
|--------------------------|-------------------------------------|
| 10 W/m <sup>2</sup>      | more than 0.8 m                     |
| 25 W/m <sup>2</sup>      | more than 0.5 m                     |
| 100 W/m <sup>2</sup>     | more than 0.25 m                    |



Figure 2: RF Hazard Precautions

## 4.2 System Package

### 4.2.1 Above Deck Unit (ADU) / Antenna Unit

The Above Deck Unit (ADU) consists of a medium-size maritime 2-axis stabilized BGAN antenna, active RF switch, BRM, and GNSS circuit.

The antenna unit is protected from a severe marine environment by a radome. The ADU and BDU are connected by a single coaxial cable which delivers RF signals and DC power.



Figure 3: Above Deck Unit (ADU) / Antenna Unit

### 4.2.2 Below Deck Unit (BDU)

The Below Deck Unit (BDU) supports voice and data communications in a marine environment. The BDU is the main control unit of an antenna system that monitors and controls the antenna operation through Intellian's web-based software. The BDU contains user interfaces and controls all communication between the ADU and the local communication devices such as phones, and computers, etc.



Figure 4: Below Deck Unit (BDU)

### 4.2.3 Packing List

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

The ADU Package & BDU Package are provided in one box.

**NOTE:** The USIM card is provided by the service provider and may be packaged separately.

#### Above Deck Unit (ADU) Package for FB250

| Item                                        | Q'ty | Size      | Description                                        |
|---------------------------------------------|------|-----------|----------------------------------------------------|
| Above Deck Unit (ADU)                       | 1    |           | Antenna Unit                                       |
| Antenna RF Cable (LMR200, TNC/M-TNC/M Type) | 1    | 25 m      | To Connect ADU - BDU                               |
| Antenna Mounting Template                   | 1    |           | Antenna Mounting Template                          |
| Hex Bolt                                    | 5    | M6 x 30 L | To Mount Antenna on Mounting Surface (M6 Bolt Kit) |
| Spring Washer                               | 5    | M6        |                                                    |
| Flat Washer                                 | 5    | M6        |                                                    |

#### Above Deck Unit (ADU) Package for Fleet One

| Item                                        | Q'ty | Size      | Description                                        |
|---------------------------------------------|------|-----------|----------------------------------------------------|
| Above Deck Unit (ADU)                       | 1    |           | Antenna Unit                                       |
| Antenna RF Cable (LMR200, TNC/M-TNC/M Type) | 1    | 10 m      | To Connect ADU - BDU                               |
| Antenna Mounting Template                   | 1    |           | Antenna Mounting Template                          |
| Hex Bolt                                    | 5    | M6 x 30 L | To Mount Antenna on Mounting Surface (M6 Bolt Kit) |
| Spring Washer                               | 5    | M6        |                                                    |
| Flat Washer                                 | 5    | M6        |                                                    |

#### Below Deck Unit (BDU) Package

| Item                           | Q'ty | Size                    | Description                       |
|--------------------------------|------|-------------------------|-----------------------------------|
| Below Deck Unit (BDU)          | 1    | 315 mm x 190 mm x 42 mm | Below Deck Unit                   |
| DC Power Cable                 | 1    | 1 m                     | BDU Power                         |
| Ethernet Cable (RJ45 / LAN)    | 1    | 1 m                     | To Connect BDU to PC              |
| Wi-Fi Antenna                  | 1    |                         |                                   |
| Quick Installation Guide (QIG) | 1    |                         | Quick Installation Guide          |
| Tapping Screw                  | 5    | M5 x 16 L               | To Fix BDU (Direct Mounting Type) |
| Terminal Block                 | 1    | 85 mm x 40 mm x 36 mm   | For Inter-connection of Cables    |

### 19-inch Rack Mount Kit (Optional)

The 19-inch Rack Mount Kit can be purchased separately. When this kit is supplied, it is packaged in the BDU Package.

| Item                                       | Q'ty | Size      | Description               |
|--------------------------------------------|------|-----------|---------------------------|
| AC Power Cord (USA)                        | 1    | 1.5 m     | BDU Power Cord (110 V)    |
| AC Power Cord (CEE7/7)                     | 1    | 1.5 m     | BDU Power Cord (220 V)    |
| AD-DC Adaptor                              | 1    |           | BDU Power Adaptor (150 W) |
| Rackmount Plate                            | 1    |           | Kit for Rackmount Plate   |
| Pan Head Screw (with Spring & Flat Washer) | 5    | M4 x 16 L |                           |
| Cable Tray                                 | 1    |           | Kit for Cable Tray        |
| Flat Head Screw                            | 4    | M3 x 6 L  |                           |

### Antenna Pole Mount Kit (Optional)

The Antenna Pole Mount Kit can be purchased separately. When this kit is supplied, it is provided in a separate box.

| Item                       | Q'ty | Size       | Description                                 |
|----------------------------|------|------------|---------------------------------------------|
| Pole Bracket               | 1    |            |                                             |
| Pole Tube                  | 1    |            |                                             |
| Hex Bolt                   | 5    | M6 x 20 L  | For Inner Holes of Pole Bracket             |
| Hex Bolt                   | 5    | M6 x 30 L  | For Outer Holes of Pole Bracket             |
| Spring Washer              | 10   | M6         |                                             |
| Flat Washer                | 10   | M6         |                                             |
| 40A (1½ inch) Pole Bushing | 1    |            | For Mounting Aantenn on 40 A (1½ inch) Pole |
| Socket Set Screw           | 4    | M12 x 12 L |                                             |

## 4.3 System Cables

Make sure of the following before installing system cables.

1. All cables need to be well clamped and protected from physical damage and exposure to heat and humidity.
2. Don't use any acutely bent cable.
3. Use watertight glands or swan neck tubes on exposed bulkheads or deck heads where the cable passes through.
4. For installing cables longer than the recommended length, consult with Intellian Technologies first.

### 4.3.1 Antenna RF Cable (Connecting ADU - BDU)

Intellian provides the Antenna RF Cable (LMR200, 25 m) for connecting ADU and BDU. Due to the signal losses across the length of the RF coax on L-Band, Intellian recommends the following 50  $\Omega$  coax cable types for standard system installations. Check the instructions from the cable supplier. The table below shows the recommended cable types and maximum cable lengths for the antenna system.

| Coaxial Cable Type | Attenuation (@ 900 MHz) | *Max. Cable Length (17.5 dB loss @ 900 MHz) | Min. Bend Radius                |
|--------------------|-------------------------|---------------------------------------------|---------------------------------|
| LMR200             | 0.326 dB/1 m            | 50 m (17.5 dB loss @ 900 MHz)               | Installation 12.7 mm (0.5 in.)  |
| LMR300             | 0.199 dB/1 m            | 60 m (17.5 dB loss @ 900 MHz)               | Installation 22.2 mm (0.88 in.) |
| LMR400             | 0.1216 dB/1 m           | 100 m (17.5 dB loss @ 900 MHz)              | Installation 25.4 mm (1 in.)    |

- Connector type: TNC
- Optimal tightening torque: 1.5 N-m
- Maximum DC resistance of RF cable: 1.3  $\Omega$
- \*Maximum RF loss at 900MHz: 17.5 dB including connector

## 4.4 Unpacking System Package

Follow the steps for easy and safe unpacking. The system package consists of two sub-packages that an ADU Package and a BDU Package.

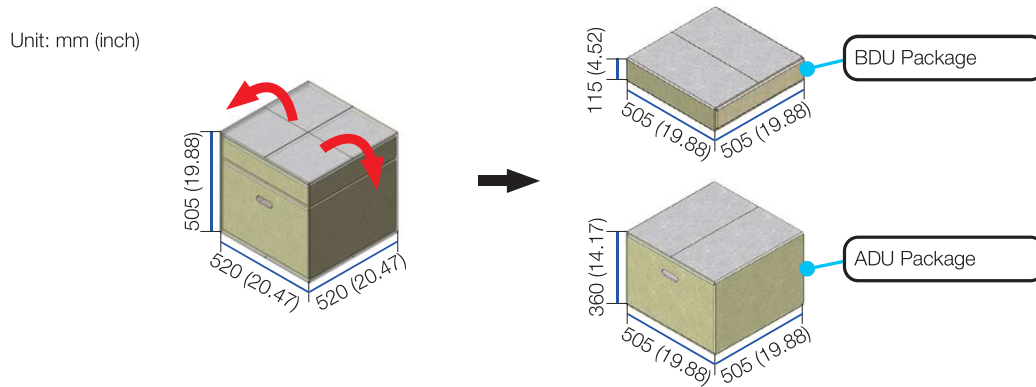


Figure 5: Unpacking System Package (with ADU & BDU Sub-package)

1. Remove the top cover and take out the BDU package including a Quick Installation Guide, a BDU Unit, a Wi-Fi Antenna, a DC Power Cable, an Ethernet Cable, a BDU Bolt Kit, and a Terminal Block. The 19-inch Rack Mount Kit (Optional) can be purchased separately.

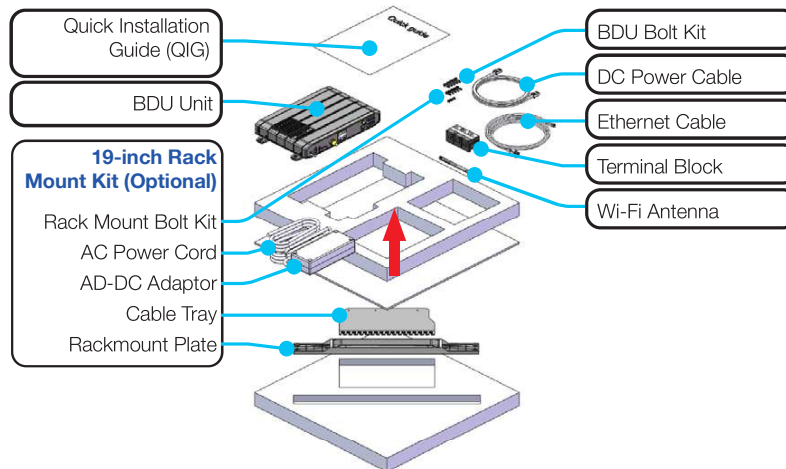


Figure 6: Unpacking BDU Package



2. Take out the ADU package including an Antenna Mounting Template, an ADU Bolt Kit, an Antenna RF Cable, and an ADU Unit.

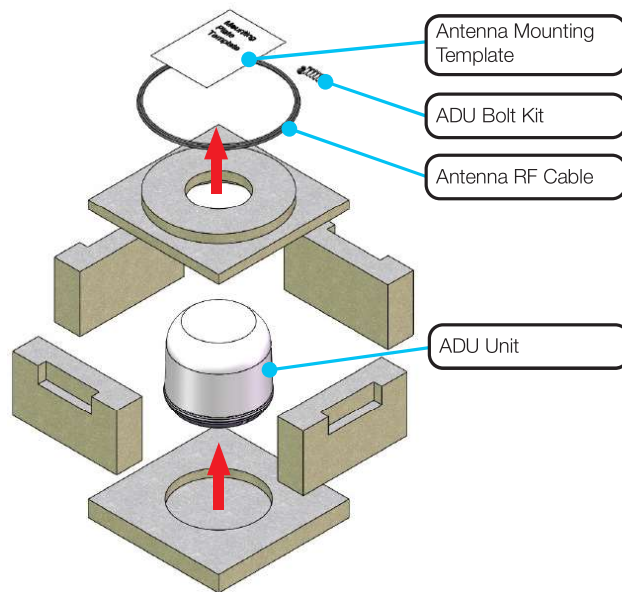


Figure 7: Unpacking ADU Package

# Chapter 5. Installing ADU

## 5.1 Antenna Dimensions

Confirm the height and diameter of the antenna unit shown in the following figure before installing it.

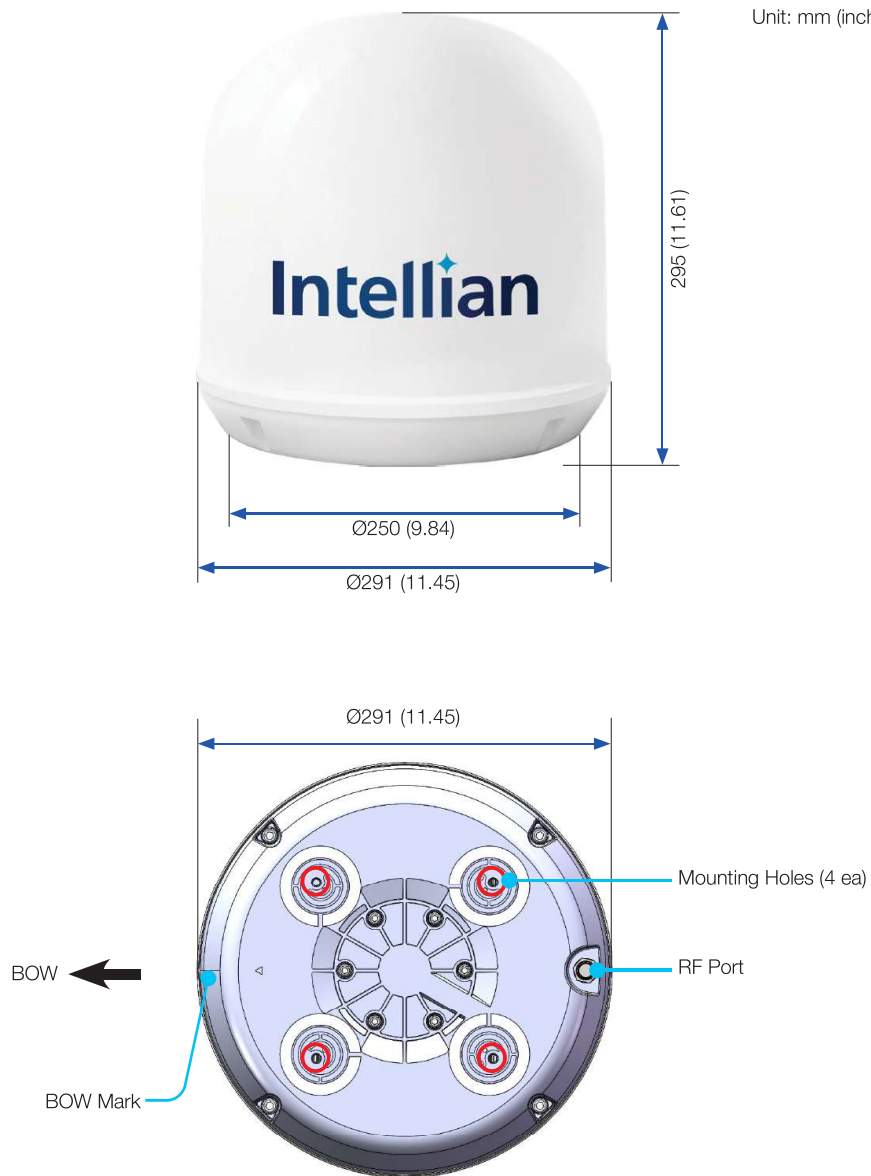


Figure 8: Antenna Dimensions

## 5.2 ADU Mounting Hole Pattern

Use the supplied mounting template when drilling mounting holes on the mast. The hole placement for the antenna must match the mounting hole pattern on the template.

The lower radome has an industry-standard mounting hole with four mounting points. This hole pattern is compatible with other companies' mounting holes. Use the mounting holes to secure the antenna to the desired mounting surface.

Intellian offers the Antenna Pole Mount Kit (separate purchase) that uses holes (with M6 Bolts) to mount the antenna on a pole.



### WARNING

When reusing an existing mast, check the condition of holes on the mast and make sure those are proper to use compared to the hole locations and sizes printed on the mounting template.

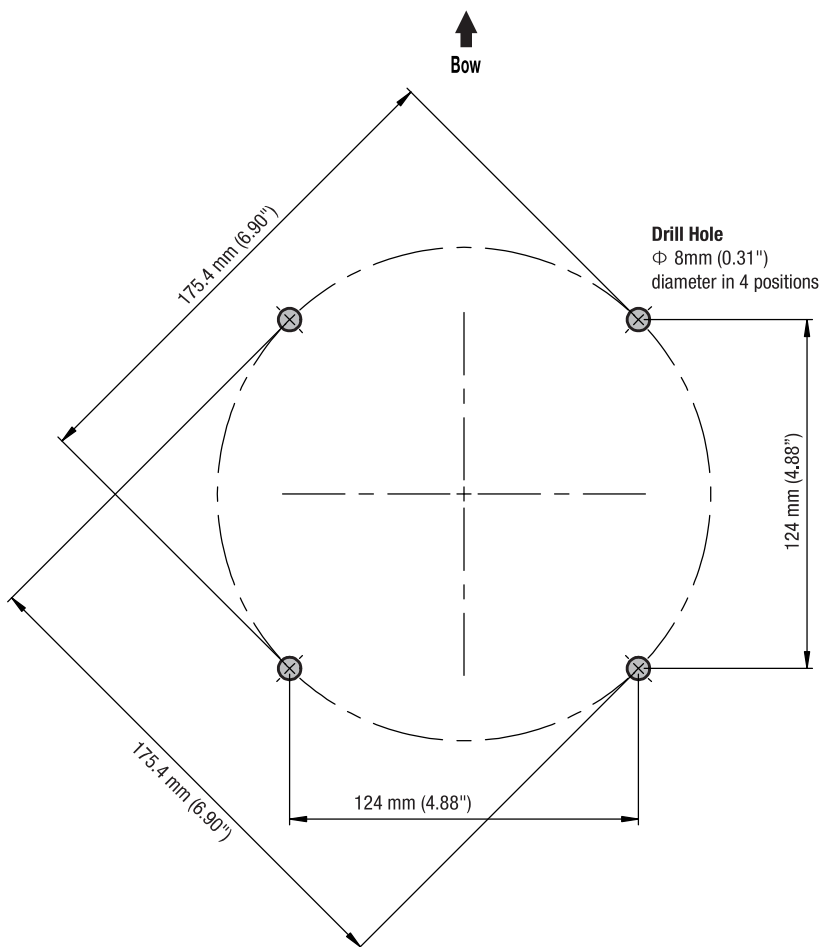


Figure 9: ADU Mounting Hole Pattern

## 5.3 Mast Designing (Installation Example)

The installation mast must be robust enough to prevent flex, vibration, and sway when an external force is exerted on the mast with antenna and radome. Refer to the following mast drawings for more details.

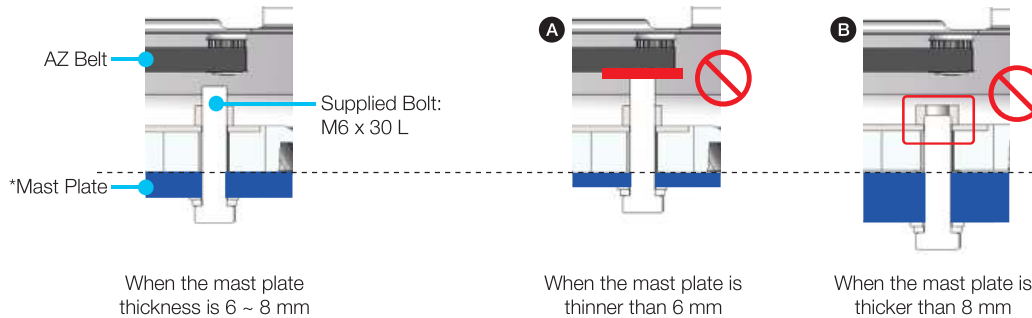


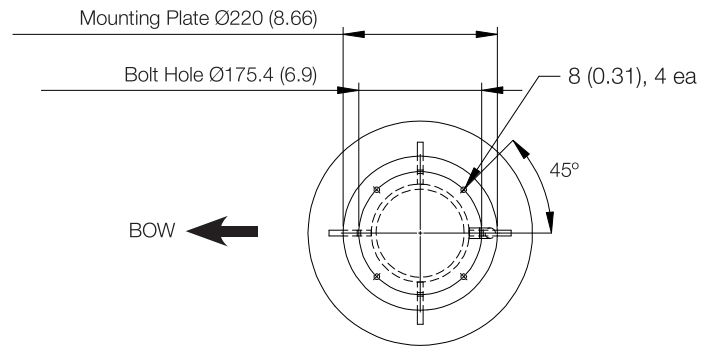
### WARNING

When designing a mast, consider the minimum and maximum thickness of the mast plate marked on the diagram. If the thickness of the mast plate is different from the recommended size (Min. 6.0 mm / Max. 8.0 mm), choose right sized bolts for mounting antenna on the mast according to the table below.

| Mast Plate Thickness   | Recommended Bolt Size |
|------------------------|-----------------------|
| 3 ~ 5 mm               | M6 x 25 L             |
| 6 ~ 8 mm (Recommended) | M6 x 30 L (Supplied)  |
| 9 ~ 12 mm              | M6 x 35 L             |

- To use the supplied bolts (M6 x 30 L) for mounting antenna on a mast, the thickness of mast plate must be 6 ~ 8 mm. **A** If the mast plate is thinner than 6 mm, the bolt thread stick-out protruding beyond the nut inside the radome can damage the AZ belt of the antenna. **B** If the mast plate is thicker than 8 mm, the supplied antenna-mast mounting bolts can be too short to mount the antenna on the mast securely.





Unit: mm (inch)

\* **NOTE:** There is no need to install gusset at the top end of the mast.

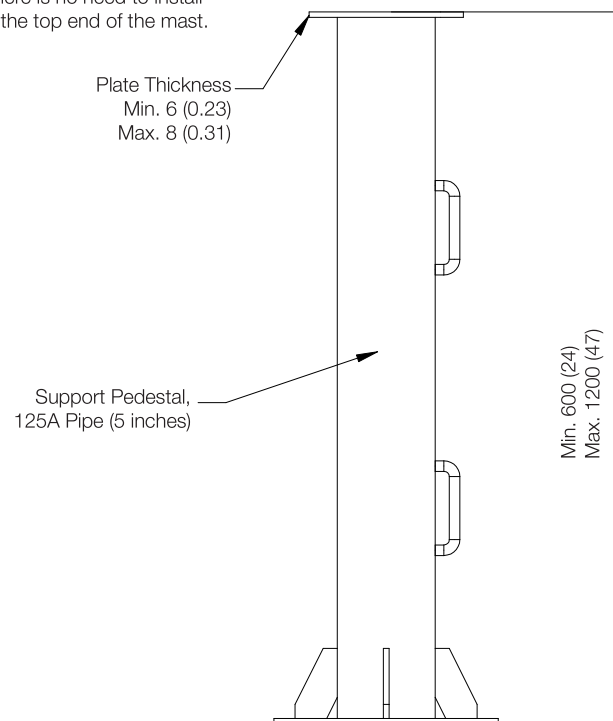


Figure 10: Recommended Mast Design

## 5.4 Mounting Antenna

The lower radome has an industry-standard mounting hole with four mounting points. This hole pattern is compatible with other companies' mounting holes. Use the mounting holes to secure the antenna to the desired mounting surface. Bring the provided Antenna Mounting Template and the ADU Bolt Kit from the ADU package. Create the appropriate hole pattern in the desired mounting surface.

### 5.4.1 Mounting Antenna on Mast

Check the position of **A** the antenna's RF port and BOW direction. Lift the antenna above the mounting surface using hands and carefully put the antenna down in place. Before assembling bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly. Insert **B** the bolts and washers from under the mast into the radome then fasten them to the nuts assembled inside the radome using the torque wrench.

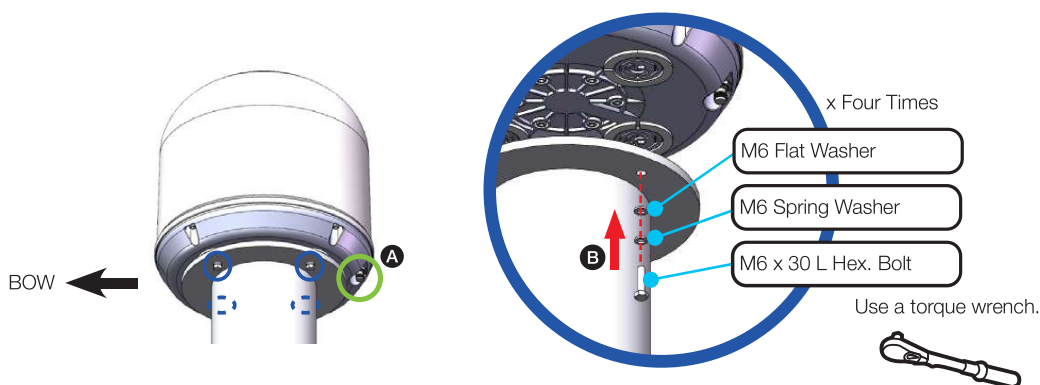


Figure 11: Mounting Antenna on Mast

### 5.4.2 Mounting Antenna on Pole (Optional)

Intellian offers the Antenna Pole Mount Kit (separate purchase) to mount the antenna on the pole. The kit is designed to work on the 40 A pole. The kit has mounting holes that match the inner hole with M6 bolts on the bottom of the antenna.

| Name | Diameter (inch) | External Diameter (mm) |
|------|-----------------|------------------------|
| 40 A | 1½              | 48.6                   |

- When mounting antenna on the 40 A pole, the 40 A pole bushing needs to be installed inside pole tube additionally. **A** The position between holes of the pole tube must be aligned with the BOW direction. Place the 40 A pole bushing inside pole tube, then tighten them on the top end of the 40 A pole using bolts. Before assembling bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly. \*The pole tube Inner Diameter is Ø 52 mm.

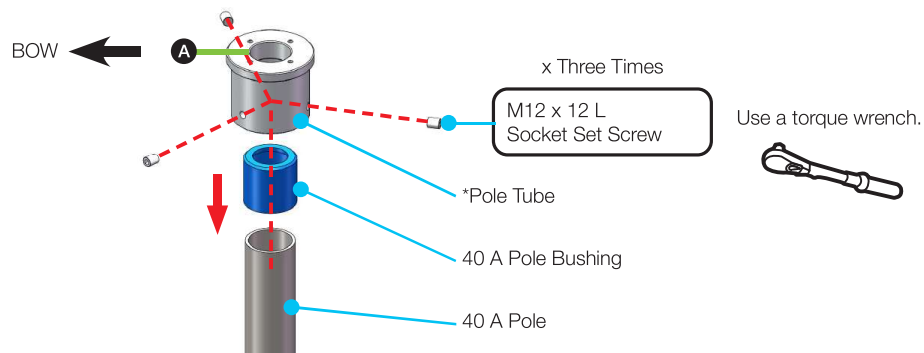


Figure 12: Installing 40 A Pole Bushing inside Pole Tube

2. **A** The position between the end of legs of the pole bracket must be aligned with the BOW direction. Place the pole bracket onto the pole tube then tighten them using bolts. Before assembling bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.

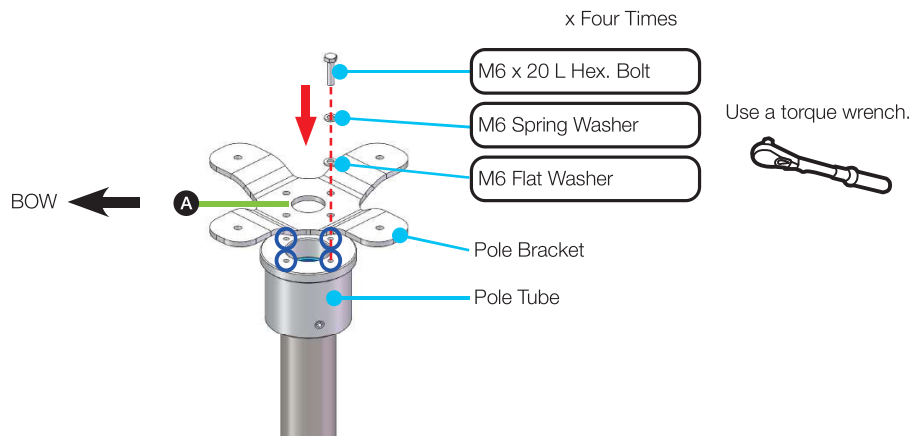


Figure 13: Installing Pole Bracket

3. Check the position of **A** the antenna's RF port and BOW direction. Place the antenna on the pole-mounted bracket then tighten them using bolts. Before assembling bolts, apply Loctite #263 to the bolt's threads to ensure the bolts are fastened firmly.

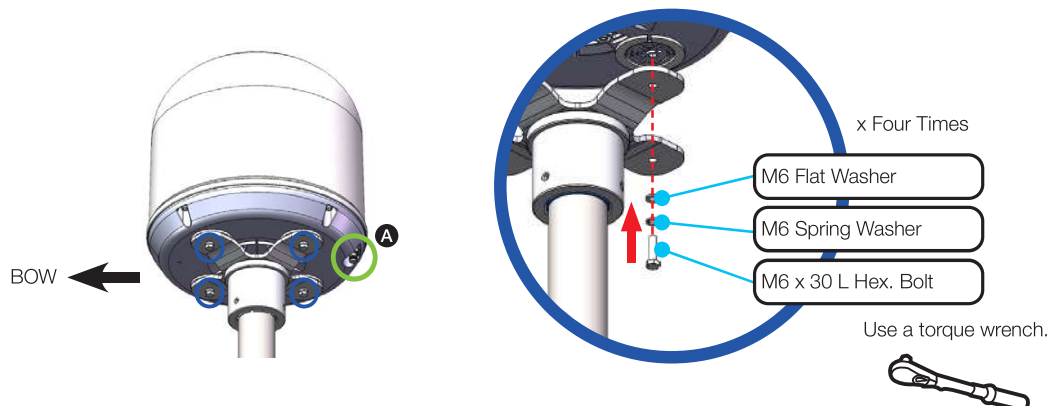


Figure 14: Mounting Antenna on Pole Mounted Bracket

## 5.5 Connecting Antenna RF Cable

The cable must be routed from the antenna and through various areas of the ship to end up at the Below Deck Unit. When pulling the cables in place, avoid sharp bends, kinking, and excessive force. After placement, seal the deck penetration gland and tie the cable securely in place. The cable bracket must be installed on the mast to fix the relevant cable. The gooseneck must be installed on the side of the mast to protect the relevant cable against water. The supplied RF cable connector has the rubber grommet to protect inside the ADU from any water.

1. The RF cable is connected to the **Antenna** port of the BDU. Route the RF cable from the gooseneck placed on the deck to the antenna.
2. Maintain a cable length at least 2 m considering service loops when routing the cable on the mast. Connect the RF cable to the RF port on the bottom of radome, adjust the length, and fix the cable position along the routing path using cable ties on the cable brackets. Since the cable connector at the bottom of radome is waterproofed at the factory, there is no need to work waterproofing.

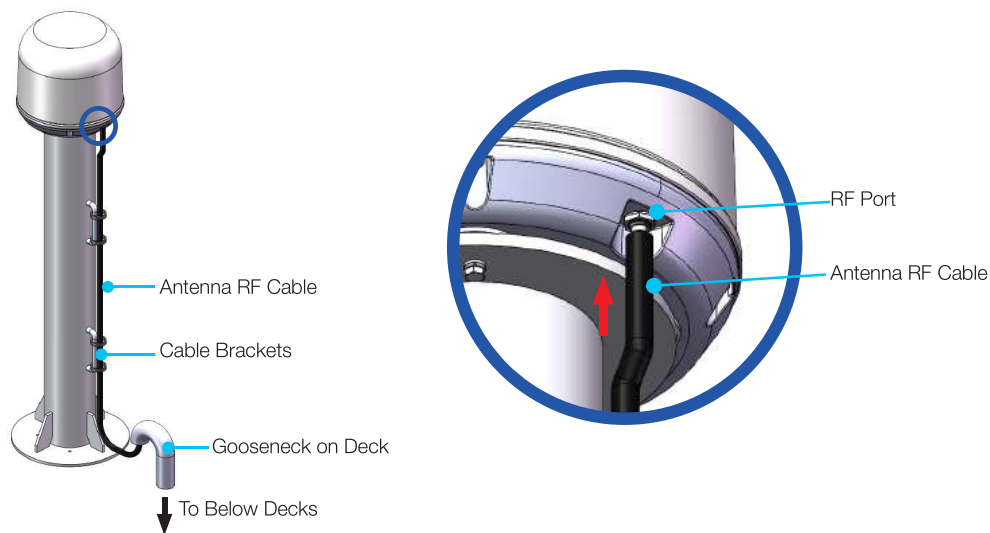


Figure 15: Connecting Antenna RF Cable



## Chapter 6. Installing BDU

The Intellian offers two versions of BDU installation, one can be installed to the surface of the wall or desktop, and one can be installed to the 19-inch rack frame using the BDU Rack Mount Kit (separate purchase).

### 6.1 Selecting BDU Installation Site

The BDU should be installed below the deck in a location that is dry, cool, and ventilated. The front panel of BDU should be easily accessible to users.

### 6.2 BDU Dimensions

Confirm the dimension of the BDU before installing it.

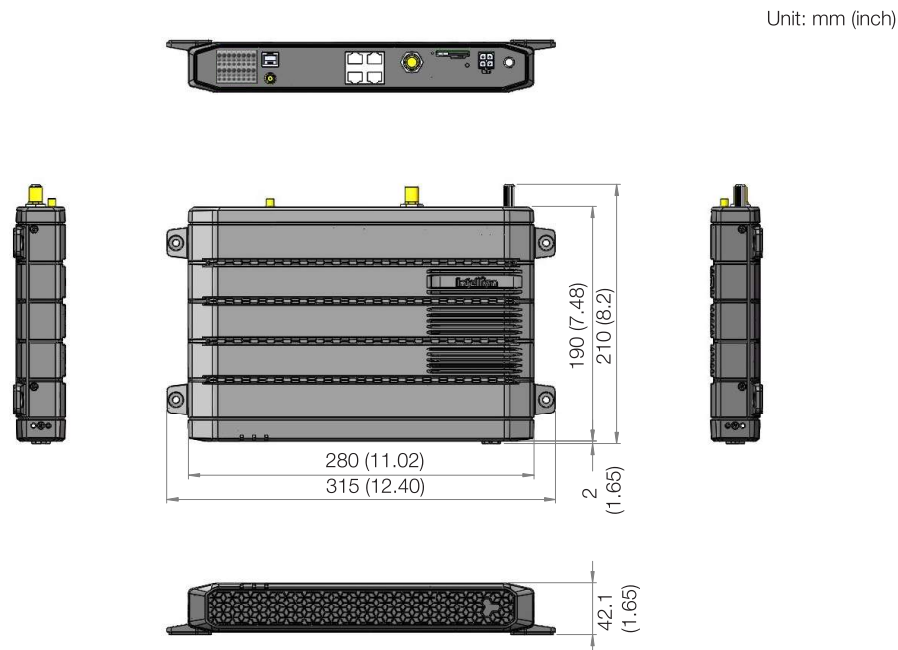


Figure 16: BDU Dimensions (Direct Mounting Type)

Unit: mm (inch)

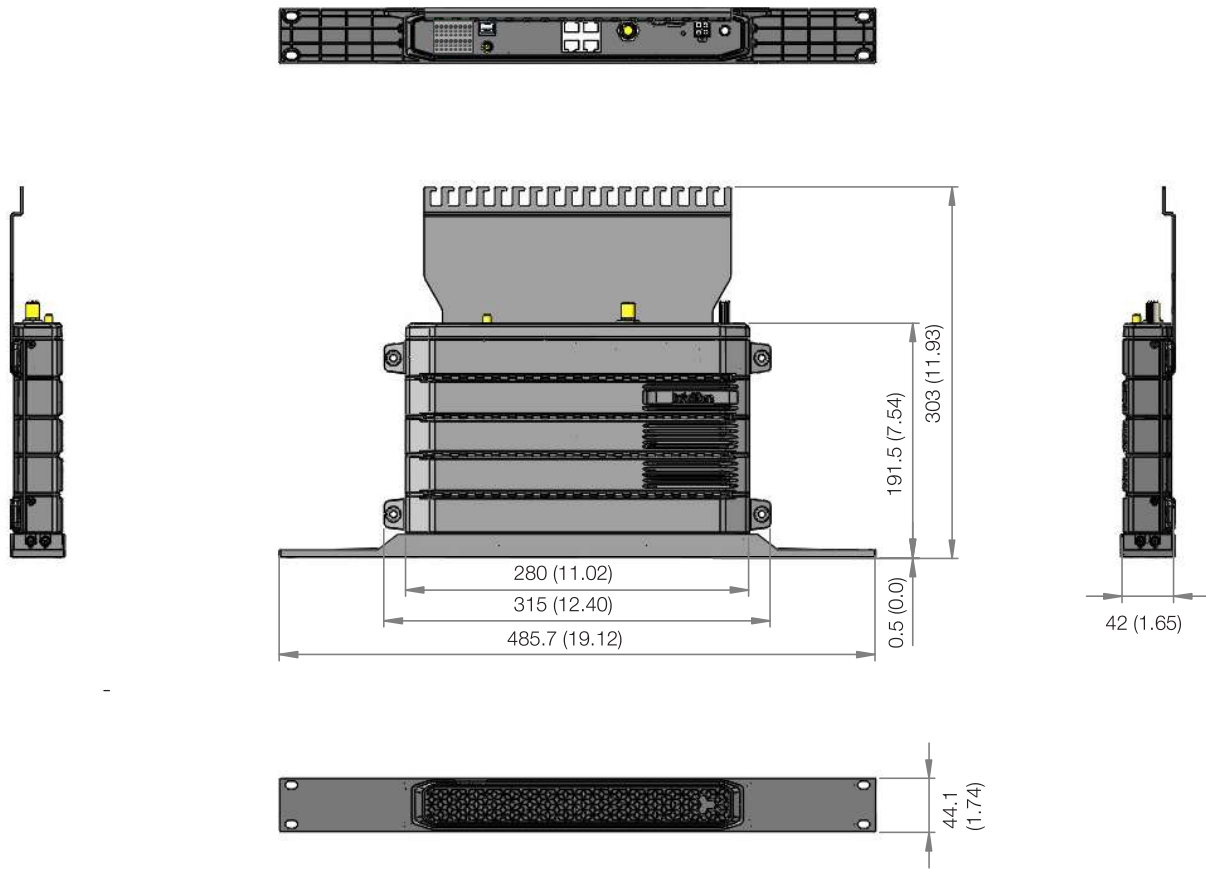


Figure 17: BDU Dimensions (19-inch Rack Mounting Type\_Optional)

## 6.3 BDU Mounting Template

The BDU mounting holes must be in the exact same place as shown in the provided mounting template below.

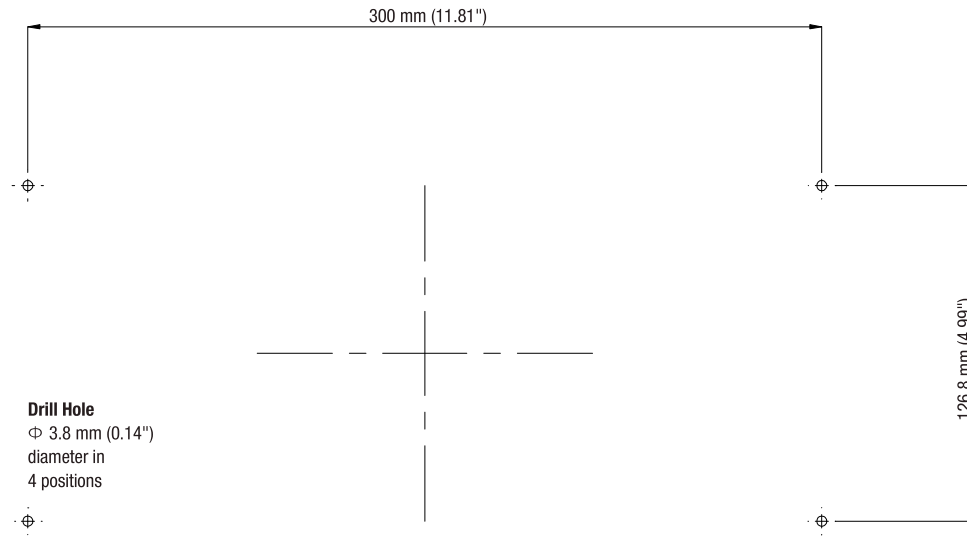


Figure 18: BDU Mounting Template

## 6.4 Mounting BDU

The BDU can be mounted in any orientation but for best performance, Intellian recommends that it is mounted horizontally.

**WARNING**

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

### 6.4.1 Direct Mounting Type

The BDU is designed with four corner mounting holes to make direct mounting on the wall or desktop easily.

1. Mount the BDU on the mounting surface by inserting four screws through the mounting holes.

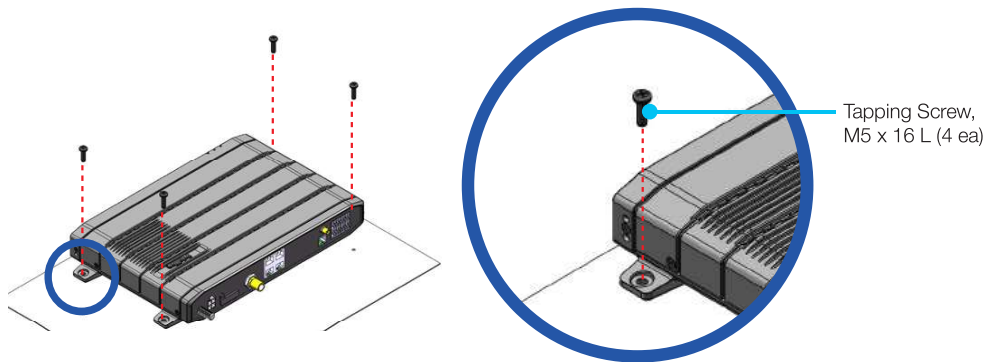


Figure 19: Direct Mounting of BDU

### 6.4.2 19-inch Rack Mounting Type (Optional)

Intellian offers the BDU Rack Mount Kit (separate purchase) including the rackmount plate and cable tray to mount the BDU in a 19" rack.

1. Using the Screws supplied, attach the cable tray to the BDU.

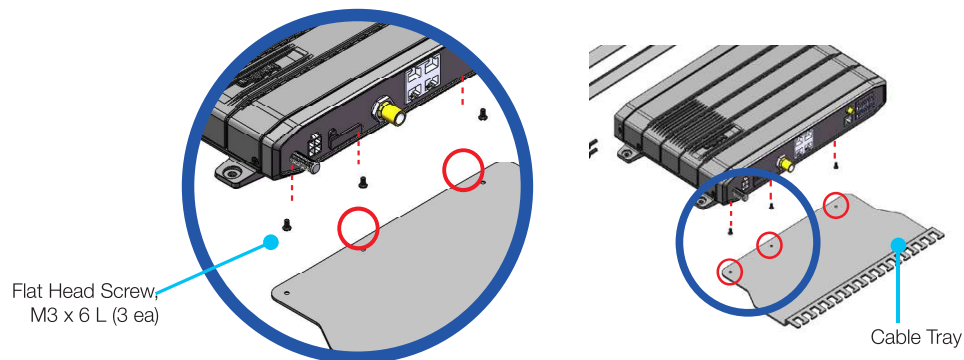


Figure 20: Attach Cable Tray to BDU

2. Using the Screws supplied, attach the rackmount plate to the BDU.

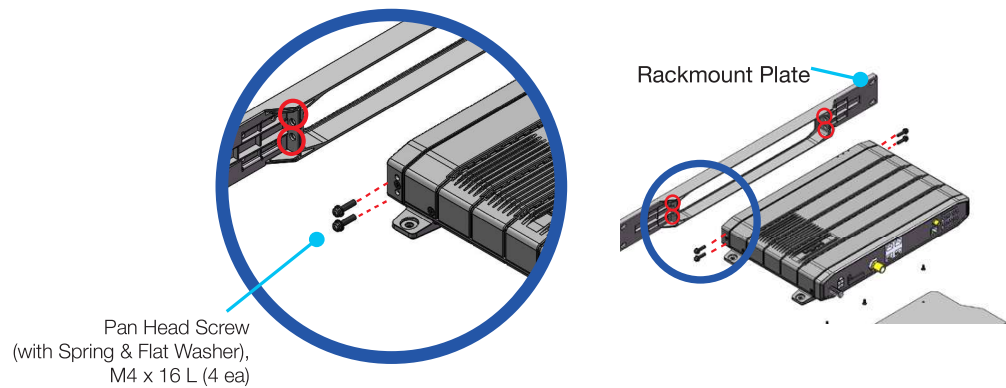


Figure 21: Attach Rackmount Plate to BDU

3. and fasten the screws to the rack. Make sure that the BDU assembly is mounted securely according to the requirements for your 19" rack. In case of using a provided AC-DC adapter for AC power connection, mount it securely in a safe place. After connecting all cables, fix the cables on the end of the cable tray using cable ties.

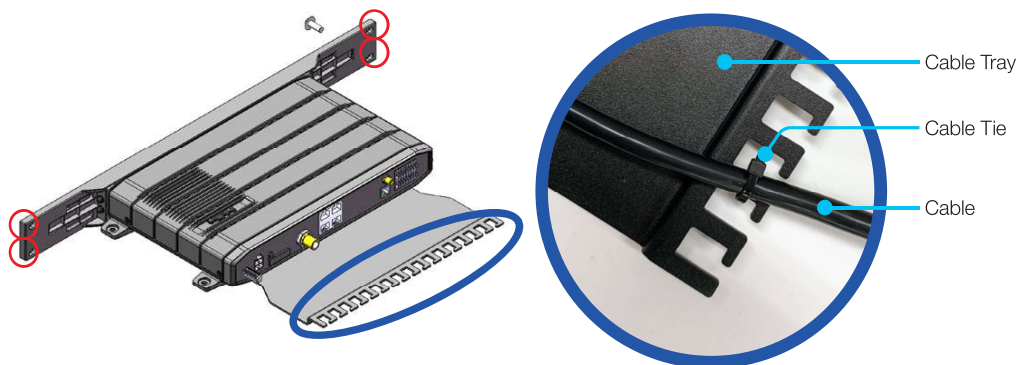


Figure 22: Mount BDU Assembly into 19" Rack

## 6.5 Antenna System Configuration

The basic system consists of one antenna and one BDU. Separate purchase of standard items including POTS phones, SIP phones, computers, etc. may be needed. For your satellite communication system to work properly, connect the cables according to the configuration below.

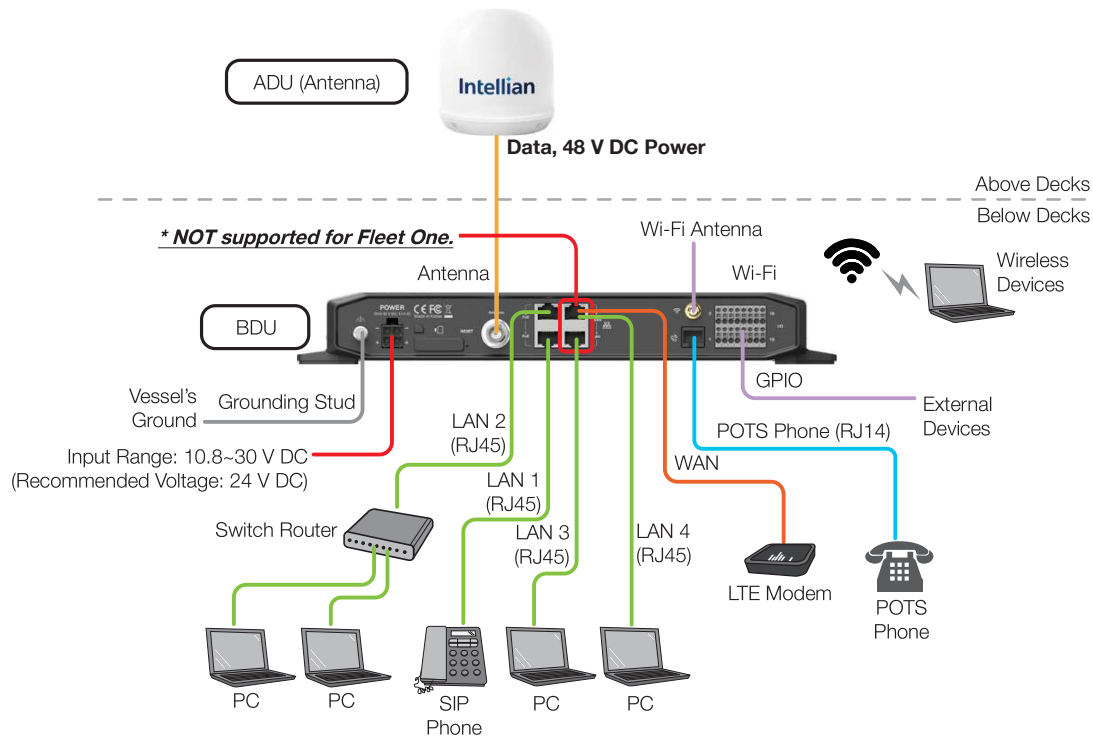


Figure 23: System with Connected Devices for FB250 and not Fleet One

### 6.5.1 Data sessions and voice calls

The System provides up to 3 high-quality voice calls, multiple data sessions, Wi-Fi, and supports up to 18 extensions (including 2 analog phones and 16 sip phones).

The BDU communicates directly with SIP phones on any of the LAN user ports (**FB250**: LAN 1, 2, 3, or 4 / **Fleet One**: LAN 1 or 2). The SIP phones register directly to the SIP server in the BDU.

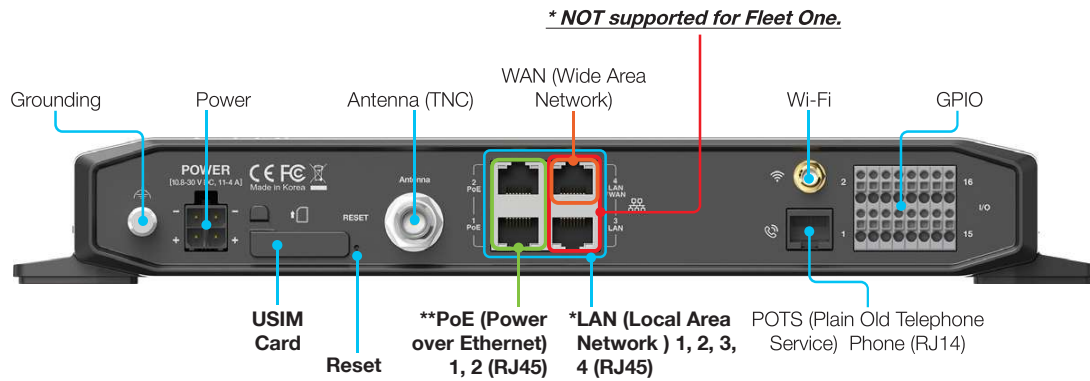
## Recommended VoIP Phones

- Grandstream GXP16 Series: 1610, 1615, 1620, 1625, 1628, 1630
- Grandstream GXP17 Series: 1760, 1780
- Grandstream GXP21 Series: 2120, 2130, 2135, 2140, 2160, 2170
- Grandstream GXV32 Series: 3240, 3275

## 6.6 BDU Cable Connection

### 6.6.1 BDU Back Panel View

The following figure shows the BDU back panel.



\* All LAN ports are IEEE 802.3 compliant.

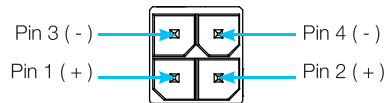
\*\* Each PoE Port is designed to use 7.5 W power. When using over 12.5 W in one port, the PoE function will be stopped in port 1 or port 2.

Figure 24: BDU Back Panel View

### 6.6.2 BDU Connector Pinout Guide

The BDU connector pins and their corresponding descriptions are shown in the following figures and tables.

#### Power Connector (DC Power)

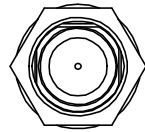


4 Contact Power Plug Male

| Pin | Signal |
|-----|--------|
| 1   | +      |
| 2   | +      |
| 3   | -      |
| 4   | -      |

Figure 25: DC Power Connector Pinout

### Antenna Connector (TNC)

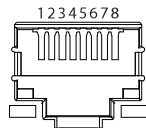


RF TNC Female

| Conductor | Function            |
|-----------|---------------------|
| Inner     | Data, 48 V DC Power |
| Outer     | Ground              |

Figure 26: Antenna Connector (TNC) Pinout

### LAN Connectors (1~4) (RJ45)

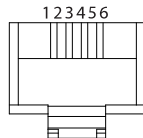


RJ-45 Female

| Pin | Signal |
|-----|--------|
| 1   | Tx+    |
| 2   | Tx-    |
| 3   | Rx+    |
| 4   | N/C    |
| 5   | N/C    |
| 6   | Rx-    |
| 7   | N/C    |
| 8   | N/C    |

Figure 27: LAN Connector (RJ45) Pinout

### POTS Phone Connector (RJ14)



RJ14 & 6P4C  
(6-Positions 4-Contacts) Female

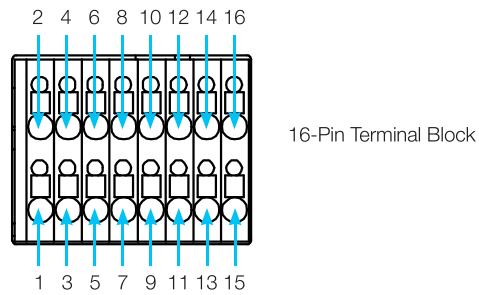
| Pin | Signal                      |
|-----|-----------------------------|
| 1   | N/C                         |
| 2   | T2+ (POTS Phone 2, no. 102) |
| 3   | R1- (POTS Phone 1, no. 101) |
| 4   | T1+ (POTS Phone 1, no. 101) |
| 5   | R2- (POTS Phone 2, no. 102) |
| 6   | N/C                         |

Figure 28: POTS Phone Connector (RJ14 & 6P4C) Pinout



### General Purpose Inputs/Outputs (GPIO) Connector

The BDU has a dedicated 16-pin connector to provide a GPIO (General Purpose Input/Output) interface to the external devices. All wires for the GPIO connector must use AWG 24 unscreened wire type.

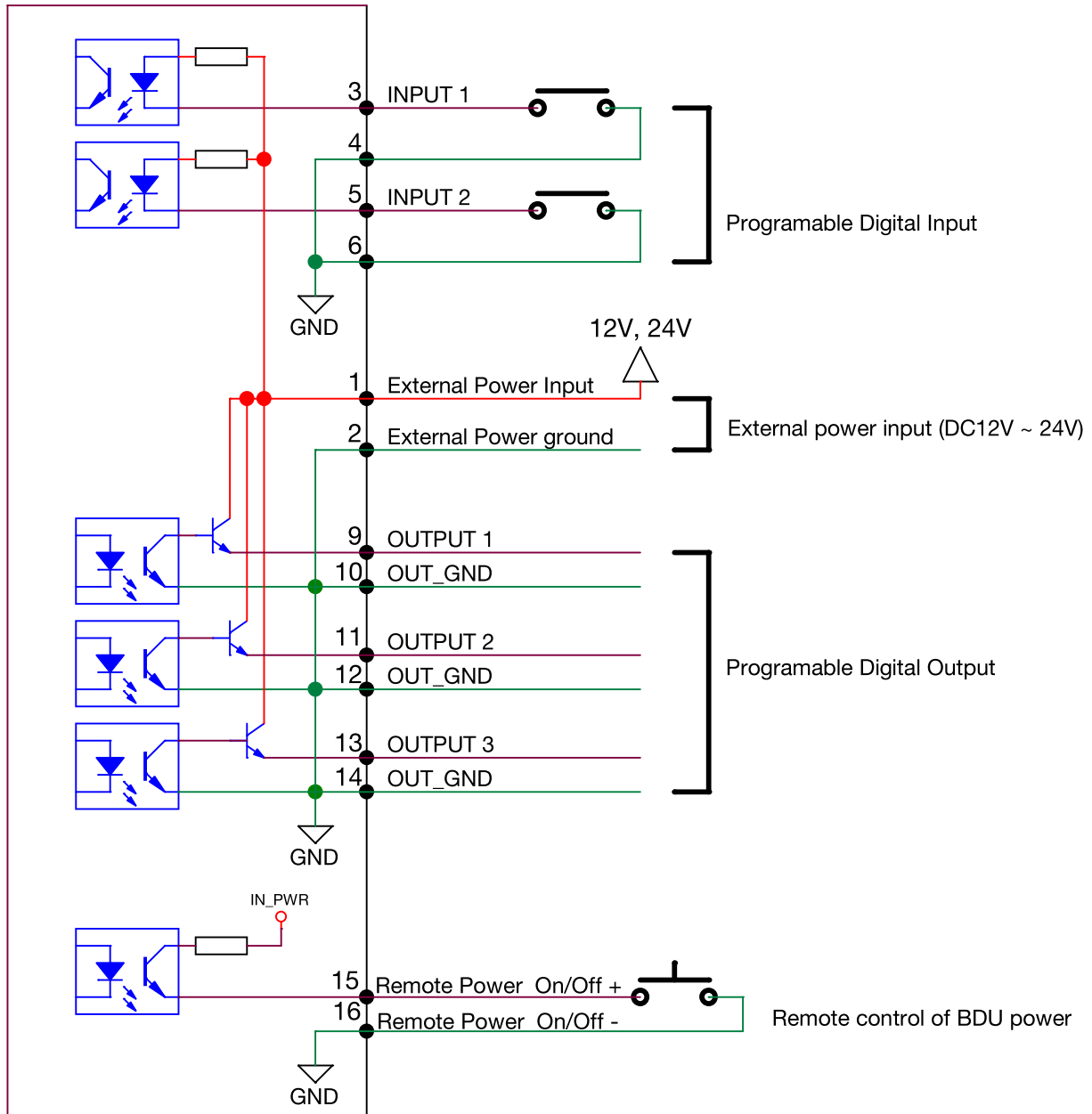


| Pin | Signal                | Explanation                     | Pin | Signal                | Explanation                   |
|-----|-----------------------|---------------------------------|-----|-----------------------|-------------------------------|
| 1   | External Power Input  | Power Input (DC 12 V ~ DC 24 V) | 2   | External Power Ground | Input/Output Ground           |
| 3   | Input 1               | • Satellite Data Prevention     | 4   |                       |                               |
| 5   | Input 2               | • Force Prevent RF Activity     | 6   |                       |                               |
| 7   | N/A                   |                                 | 8   |                       |                               |
| 9   | Output 1              | • Incoming Call Alarm           | 10  |                       |                               |
| 11  | Output 2              | • Data Connection Indication    | 12  |                       |                               |
| 13  | Output 3              | • System Event Indication       | 14  |                       |                               |
| 15  | Remote Power On/Off + | Remote Control of BDU Power +   | 16  | Remote Power On/Off - | Remote Control of BDU Power - |

Figure 29: GPIO Connector Pinout

To use External GPIO, connect the external power (DC 12 V ~ 24 V). Refer to the External GPIO Block Diagram below.

### External GPIO Block Diagram



### 6.6.3 Connecting DC Power to BDU

You can supply DC power to the BDU in the following methods depending on the power supply available in the vessel. Intellian provides a DC Power Cable, an AC-DC Adapter (optional), and a Terminal Block for the power connections.

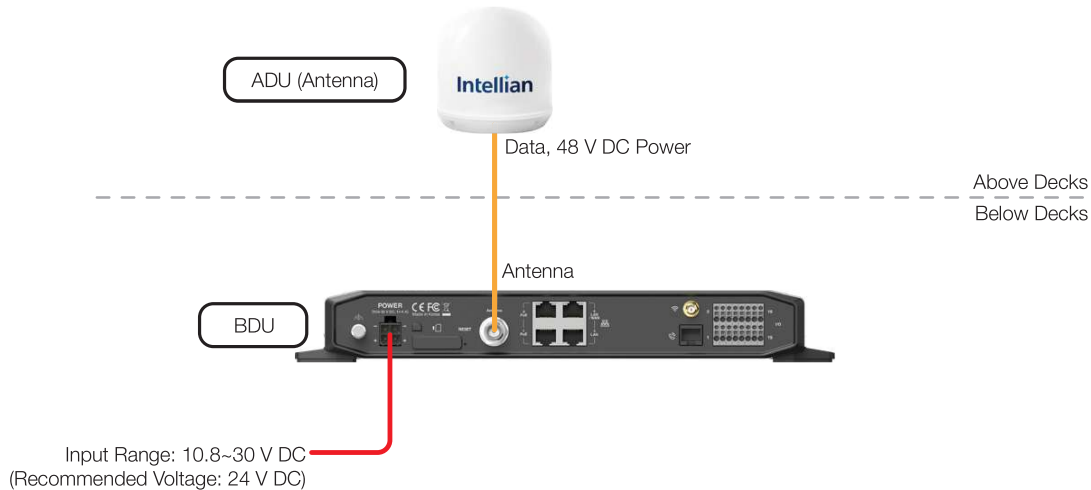


Figure 30: DC Power to BDU Connection

1. Connecting to Battery (default): Using the DC power cable (1 m), supply the DC power to the BDU from the battery. The power cable is installed with the Molex connector (P/No. 1716920204, Max. AWG 12). Use 1~2 m (3.28~6.56 ft) length wire for the power supply to prevent voltage drop. If you need an extended length of power cable, refer to the following table to choose a correct size cable. Check with your cable supplier for more information.

| Cable Length    | Maximum Wire Size |                 |
|-----------------|-------------------|-----------------|
|                 | AWG               | mm <sup>2</sup> |
| 5 m (16.40 ft)  | 13                | 2.62            |
| 10 m (32.80 ft) | 11                | 4.17            |
| 20 m (65.61 ft) | 9                 | 6.63            |

BDU Power Input Range: 10.8~30 V DC

2. Connecting to AC Power Source (optional): Using the AC-DC adapter (110~220 V Input, 24 V DC output) and power cord, supply the DC power to the BDU from the AC power source. (You can find the AC-DC adapter in the 19-inch Rack Mount Kit).



#### NOTE

To connect multiple power cables from the power source, use a Terminal Block (supplied). Refer to the following page "How to Use Terminal Block" for more details.

## How to Use Terminal Block

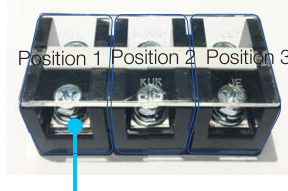


### WARNING

Turn off the power before installing the wire nut connector.

Intellian provides a 3-position double-row barrier terminal block as below.

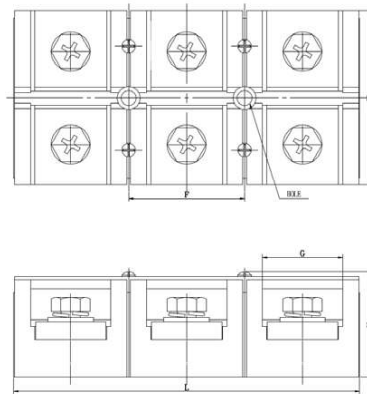
**Terminal Block: KH-6060-3P**



Barrier type terminal strip:  
3 positions, 6 contacts

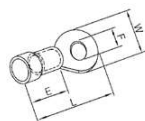
| KH-6060-3P Specification |                     |
|--------------------------|---------------------|
| Rated Voltage            | 600 V               |
| Rated Current            | 60A (250 V)         |
| Insulation Resistance    | 100M $\Omega$ min.  |
| Dielectric Strength      | 2,500 VAC for 1min. |
| Wire                     | 22 mm <sup>2</sup>  |
| Terminal Screw           | M6                  |

### Terminal Blocks Dimension

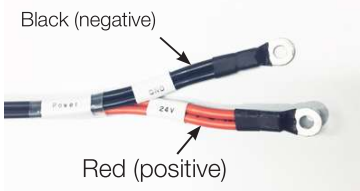
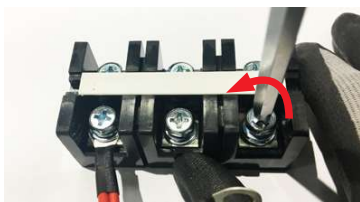
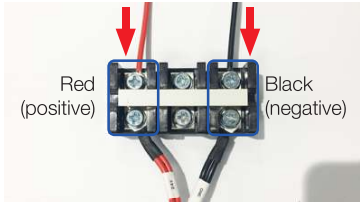
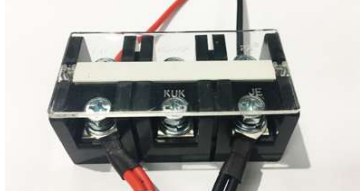


| Rating/Pole | F(mm) | G(mm) | Hole( $\varnothing$ ) | L(mm) | W(mm) | H(mm) | Weight |
|-------------|-------|-------|-----------------------|-------|-------|-------|--------|
| 60A 3P      | 28    | 16    | 5.2                   | 85    | 40    | 36    | 142 g  |

### Wiring Lug Dimension



|   |                        |
|---|------------------------|
| E | 14.5 mm                |
| F | Min. $\varnothing$ 6.1 |
| W | Max. 16.8 mm           |
| L | 35.5 mm                |

|                                                                                                                                   |                                                                                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>Black (negative)</p> <p>Red (positive)</p>   | <p>For the DC power wires, Red (positive) and Black (negative), you can connect each wire with other wires using the terminal block.</p>                                                                                                                         |
|                                                  | <p>1. Open the top cover of the terminal block.</p>                                                                                                                                                                                                              |
|                                                  | <p>2. Unscrew the 1st position terminal using a Phillips screwdriver. Insert the ring connector of the Red (positive) wire to the terminal and tighten the screw back into the terminal.</p>                                                                     |
|                                                | <p>3. Unscrew the 3rd position terminal using a Phillips screwdriver. Insert the ring connector of the Black (negative) wire to the terminal and tighten the screw back into the terminal.</p>                                                                   |
|  <p>Red (positive)</p> <p>Black (negative)</p> | <p>4. Connect wires for distribution to the terminals on the opposite side of each connected wires.</p> <p><b>CAUTION:</b> DO NOT switch positions of the Red (positive) and Black (negative) wires. Switching the polarity of power may damage the product.</p> |
|                                                | <p>5. Close the top cover of the terminal block.</p>                                                                                                                                                                                                             |

### 6.6.4 Connecting BDU to ADU (Antenna)

Intellian provides the Antenna RF Cable (LMR200, 25 m) for connecting ADU and BDU. Connect the **Antenna RF Cable** from the **Antenna** port on the back of the BDU to the RF port on the bottom of radome (Antenna).

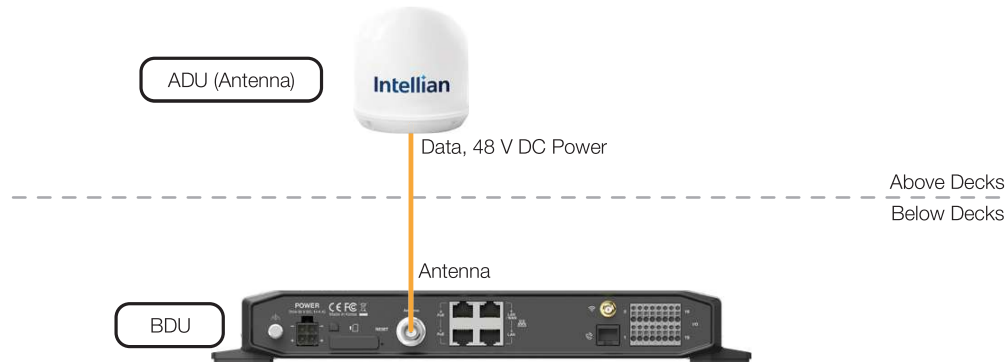


Figure 31: BDU to Antenna Cable Connection

### 6.6.5 Connecting BDU to Devices using LAN Port (RJ45)

Intellian provides the Ethernet Cable. Connect the **Ethernet Cable** from the **Port 1, Port 2, Port 3, or Port 4** on the back of the BDU to the **LAN** port on the devices such as SIP Phone or Computer.

Only the **Port 1** and **Port 2** include Power over Ethernet (PoE).

**\* The LAN port 3 and LAN port 4 are not supported for Fleet One model.**

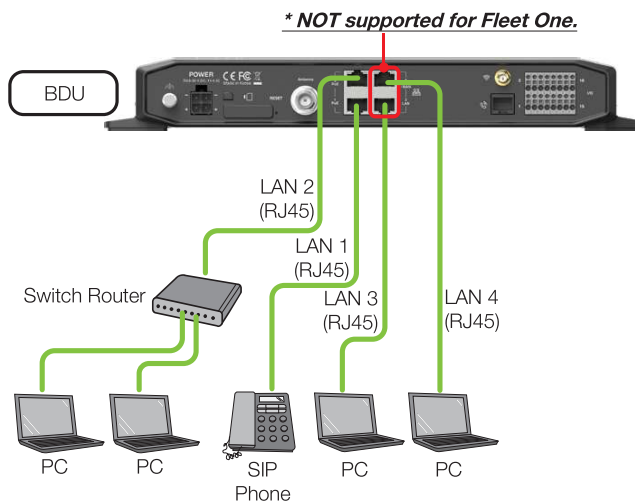


Figure 32: BDU to Devices Cable Connection using LAN Port (RJ45)

### 6.6.6 Connecting BDU to Device using WAN Port

Intellian provides the Ethernet Cable. Connect the **Ethernet Cable** from the **WAN port** on the back of the BDU to the **RJ-45 port** on the devices such as LTE modem.

*\* The WAN port is not supported for Fleet One model.*

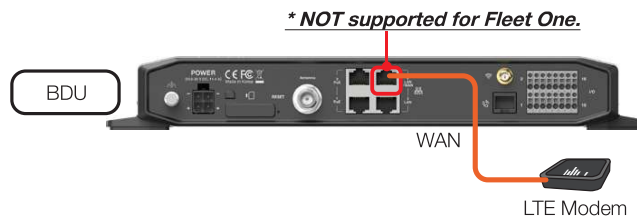


Figure 33: BDU to Device Cable Connection using WAN Port

### 6.6.7 Connecting BDU to POTS Phone (RJ14)

Connect the standard phone cord (customer supplied) from the **POTS Phone port** on the back of the BDU to the **RJ-14 port** on the POTS phone as default.



Figure 34: BDU to POTS Phone (RJ14) Cable Connection

Up to 2 POTS Phones can be connected to the BDU using a RJ14 Cable Splitter (customer supplied). Using a RJ14 Cable Splitter, the two POTS phones can each have a separate phone line (not two phones using the same phone line). The POTS phone 1 (no. 101) is connected to a pair of Pin 3 (R1-) and Pin 4 (T1+) wires. The POTS phone 2 (no. 102) is connected to a pair of Pin 5 (R2-) and Pin 2 (T2+) wires.

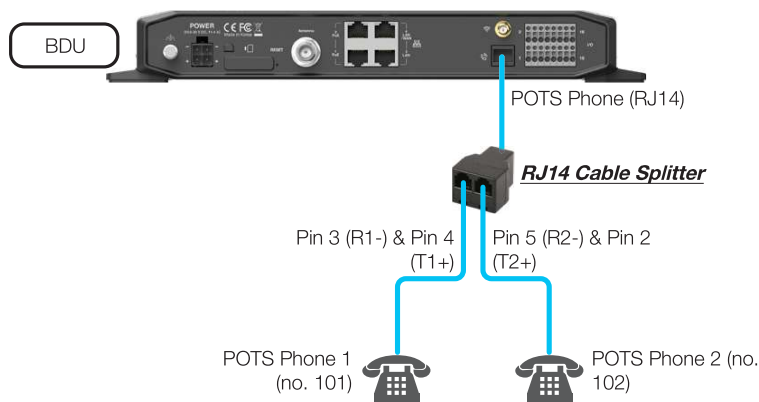


Figure 35: Using Cable Splitter with POTS Phones (RJ14)

### 6.6.8 Connecting BDU to External Devices

The BDU has a dedicated 16-pin connector to provide a GPIO (General Purpose Input/Output) interface to the external devices. All wires for the GPIO port must use AWG 24 unscreened wire type. Connect the end of these AWG 24 wires to the GPIO port's Pin A (point 1) and Pin B (point 2) respectively.



Figure 36: BDU to External Devices Connection

### 6.6.9 Connecting Wi-Fi Antenna to BDU

Intellian provides the Wi-Fi Antenna for Wi-Fi connection. Plug the **Wi-Fi Antenna** into the **Wi-Fi** port on the back of the BDU.

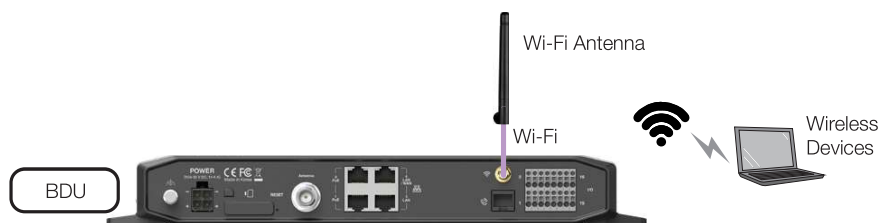


Figure 37: Wi-Fi Antenna to BDU Connection

### 6.6.10 Grounding Stud

The BDU should be grounded. Use a heavy ground cable (customer supplied) to connect the BDU to the vessel's ground during normal use. A safety grounding system is necessary to protect your radio hardware from lightning strikes and the build-up of static electricity. The grounding system must comply with the safety standards that apply in your country.

Ground the BDU using a heavy ground cable (not included) from the **Grounding Stud** of the BDU back panel to the vessel's ground to protect the system from unwanted surges and voltage differentials.

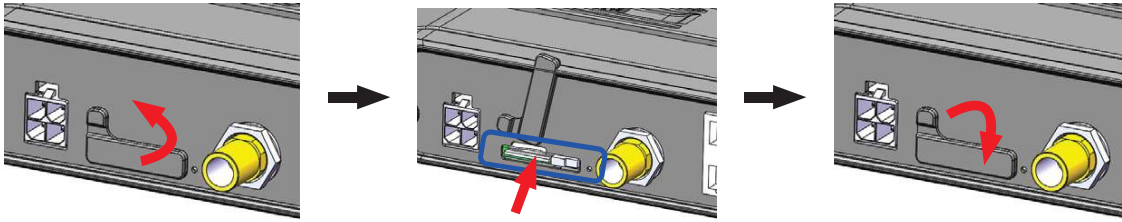


Figure 38: Grounding Stud Connection



### 6.6.11 Inserting USIM Card

The system requires a USIM card from the service provider to use the terminal and configure the settings of the BDU.



1. Find the USIM card slot on the BDU and open the cover.
2. Insert the USIM card into the slot until it clicks. Face the contact surface down when inserting it.
3. After the USIM Card is placed in the slot, close the cover.



#### NOTE

If the USIM card is not detected properly ("NO USIM" message is displayed on the dashboard), remove and re-insert the USIM card or turn the BDU power off and on again with the USIM card inserted.

## Chapter 7. Operating BDU

The BDU and ADU are connected by a single coaxial cable through which power and Ethernet data are delivered between the BDU and ADU. The BDU is responsible for all the terminal management, system monitoring, control, error detection, and maintenance operations.

### 7.1 BDU Front Panel

The following figure shows the BDU's front panel.



Figure 39: BDU Front Panel

The following table shows status indicators on the face of BDU.

| LED Indicator | Color        | Description                                                                                                                                  |
|---------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Power         | Off          | The terminal is powered off.                                                                                                                 |
|               | Blinking     | The terminal is booting a system.<br>The terminal is calibrating a system.<br>The terminal is in error.<br>There is no USIM card inside BDU. |
|               | Steady Green | The terminal is powered on.                                                                                                                  |
| Satellite     | Off          | The system is not connected to a satellite.                                                                                                  |
|               | Blinking     | The system is acquiring a satellite.<br>The system is searching for a satellite.                                                             |
|               | Steady Green | The system is connected to a satellite.                                                                                                      |
| Event         | Off          | The system has no event (call or data).                                                                                                      |
|               | Blinking     | The system has an alert, an unread message, an incoming call.                                                                                |
|               | Steady Green | The system has a voice or data.                                                                                                              |

**NOTE:** When 3 LEDs blink simultaneously, the BDU is in a low power state. Check the current input voltage status.

## 7.2 Powering On System

Use the power ON/OFF button on the BDU's front panel. Wait for all LED indicators to turn green to indicate the system is completely powered up.

## 7.3 Making POTS Phone Call

To make POTS phone calls, do as follows:

1. Connect an phone cable from the Phone Port (RJ14) on the back of the BDU to the **POTS phone**.



### NOTE

When connecting a cable to the Phone port (RJ14), a pair of wires are connected to Pin 3 (R1-) and Pin 4 (T1+) of the analog POTS phone 1 (no. 101), and another pair of wires are connected to Pin 5 (R2-) and Pin 2 (T2+) of the analog POTS phone 2 (no. 102).

2. Lift the POTS handset and listen for dial tone.
3. Make a test call to check the voice clarity. Enter '9 + 00 + Country code + Area code + Phone #' using the keypad. (e.g. 9 00 1 209 1234 5678).

## 7.4 Enabling PoE

To use PoE, you need to enable in the terminal. Only the LAN Port 1 and LAN Port 2 of BDU are Power over Ethernet (PoE) capable.

The network is automatically configured by DHCP without the need for additional PC or device IP configuration.

1. Connect an Ethernet cable from the **LAN Port 1** or **LAN Port 2** on the back of the BDU to devices. The network connection is established automatically.
2. Use the following IP address to access the Intellian AptusLX Web page.

- **IP Address: 192.168.200.1 (Default)**

3. Log in to the AptusLX Web by typing in a user name and password information. If this system has not been changed from the factory default:

- **User Name: intellian**

- **Password: 12345678**

4. Select the **SETUP** on the main menu then go to the **Network → Port** menu.
5. Toggle PoE button to the ON position on the port 1 or port 2. If you don't want to use PoE connection, choose the OFF position.

**NOTE:** The LAN port 3 and LAN port 4 are not available for Fleet One model.

6. Click the **Apply** button to apply the settings to the system.

The screenshot shows the AptusLX Web interface. At the top, there are tabs: DASHBOARD, STATUS, SETUP (1), and TOOLS. On the left sidebar, the 'Network' menu item is highlighted (2). The main content area shows network configuration fields: Subnet Mask (255.255.255.0), Gateway (192.168.200.1), and Lease Time (604800 sec). Below these is a table for Port configuration:

| Name | PoE Status                              | Port Type | Link Status      |
|------|-----------------------------------------|-----------|------------------|
| 1    | <input checked="" type="checkbox"/> (3) | LAN       | PD Connected     |
| 2    | <input type="checkbox"/>                | LAN       | Non-PD Connected |
| 3    |                                         | LAN       | Non-PD Connected |
| 4    |                                         | LAN/WAN   | Not Connected    |

At the bottom of the table is an 'Apply' button (4). A 'NOTE' box on the right side of the table states: 'NOTE: The LAN port 3 and LAN port 4 are not available for Fleet One model.'

### NOTE



Users can check the Link Status (PoE) following messages;

Not Connected: No device is connected to the BDU.

PD connected: A device that uses PoE is connected to the BDU.

Non-PD connected: A device that does not use PoE is connected to the BDU.

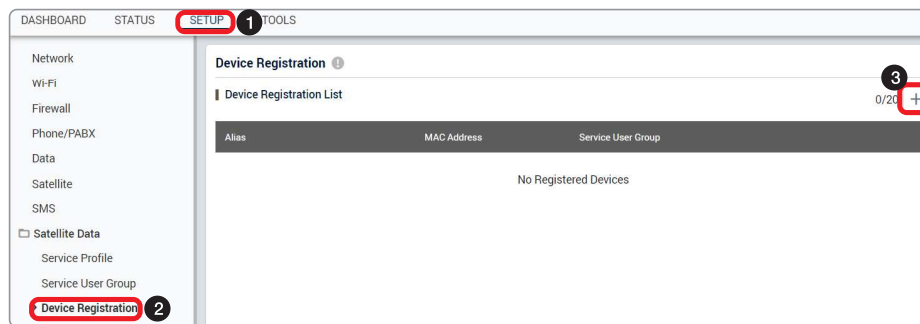
## 7.5 Activating Data Connection

The terminal does not automatically connect to the satellite data when you connect your computer or other equipment to the LAN interface. You must activate the data connection on the Dashboard of the web interface.

### 7.5.1 Registering Device

The device registration option is available only when you log in with the admin account (**intellian**).

1. Connect an Ethernet cable from the **LAN Port 1** or **LAN Port 2** on the back of the BDU to devices. The network connection is established automatically.
2. Use the following IP address to access the Intellian AptusLX Web page.
  - **IP Address: 192.168.0.1 (Default)**
3. Log in to the AptusLX Web by typing in a user name and password information. If this system has not been changed from the factory default:
  - **User Name: intellian**
  - **Password: 12345678**
4. Select the **SETUP** on the main menu then go to the **Network → Device Registration** menu.
5. To add a new device, click the **Add(+)** button.



6. To create an **Alias** for the device, input the **MAC Address** (if the device is connected to the BDU, a drop-down menu will be shown), and select a **Service User Group**.

#### Service User Group

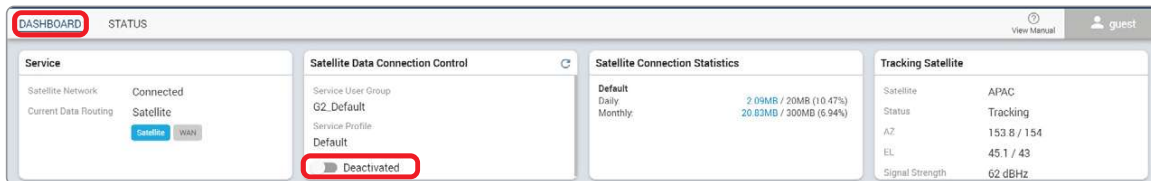
- **G2\_Default**: Background profile for normal use. Multiple users can share the data simultaneously. The users need to pay per the amount of data usage in byte.
- **G6\_DataStream**: Streaming profile. You get an exclusive and high-priority connection that ensures seamless transfer of data. The users need to pay per the time of data usage in second.
- **G5\_DataCustom**: Specified profiles by user.
- **G7\_DataSecondary**: Secondary profile of the G2\_Default or the G5\_DataStream.

## 7.5.2 Activating Data Connection

When logging in with the admin account (**intellian**), all the service groups are displayed for devices including non-registered devices. Device registration is not required when you are logged in with admin account (**intellian**). Activate the data connections on the dashboard with the activation buttons.

When logging in with a guest account (**guest**), available service groups are displayed on the dashboard for the devices which are already registered. You can activate the data connections with the activation buttons, then you can use the satellite data of the service groups.

1. Log in to the AptusLX Web by typing in a user name and password information. If this system has not been changed from the factory default:
  - **User Name: guest**
  - **Password: guest**
2. Toggle the Deactivated switch to the **Activated** position on the **Satellite Data Connection Control** in the Dashboard. If the device is not registered in the **Device Registration** menu, 'Unregistered device' is displayed on the screen and the data cannot be used.



## 7.6 Using Grandstream VoIP Phone Call

Use the Grandstream VoIP phone to make VoIP phone calls.

### Recommended VoIP Phones

- Grandstream GXP16 Series: 1610, 1615, 1620, 1625, 1628, 1630
- Grandstream GXP17 Series: 1760, 1780
- Grandstream GXP21 Series: 2120, 2130, 2135, 2140, 2160, 2170
- Grandstream GXV32 Series: 3240, 3275

1. Connect an Ethernet Cable from a LAN port (**Port 1~ Port 4**) on the back of the BDU to a LAN port of devices. Only the **LAN Port 1** and **LAN Port 2** of BDU are Power over Ethernet (PoE) capable.



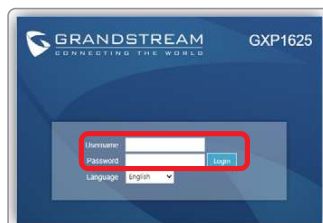
2. On the front LCD panel of the phone, go to Menu > Status > Network Status. Note the IP address for IPv4 accessing the web interface of the VoIP phone.

For example, IP address 192.168.0.132 is displayed on the LCD panel.

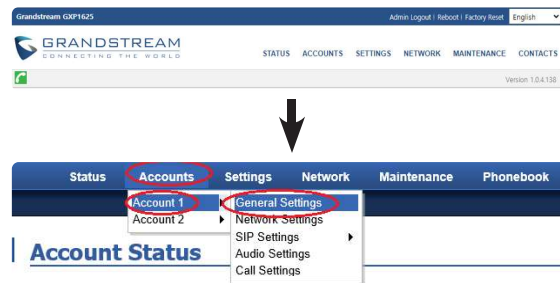


3. On your laptop, open a web browser and type in the IP address for IPv4 (<http://192.168.0.132>). Log into the web interface of the VoIP phone using the user name and password.

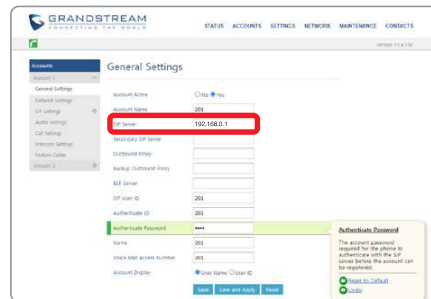
- **Login Username:** admin
- **Password:** admin



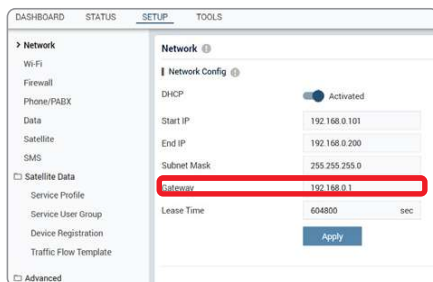
4. Go to **Account > Account 1 > General Settings**.



5. According to the AptusLX setting, enter the values for General Settings.

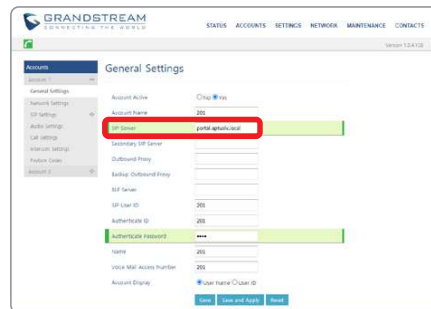


or



**AptusLX**

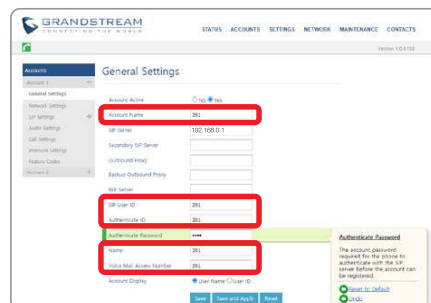
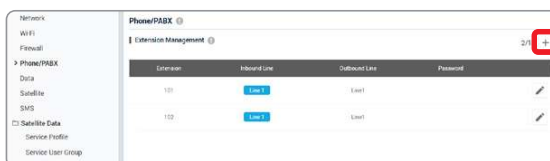
Enter the values according to the AptusLX setting (**SETUP > Network**).



**VoIP Phone**

The engineer needs to remember the default IP for BDU **192.168.0.1** or can simply input '**portal.aptuslx.local**'.

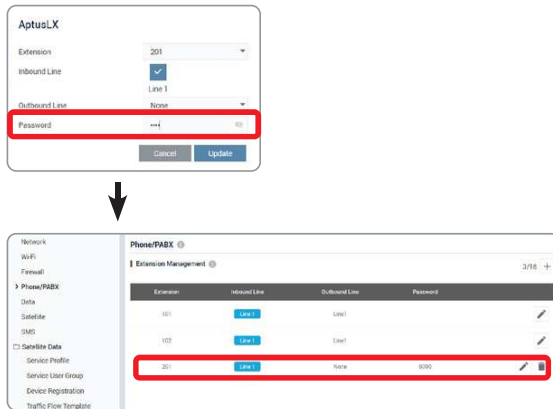
Need to input IP into SIP Server on GRANDSTREAM SIP Server IP.





## AptusLX

Go to **SETUP > Phone/PABX**. Extension 10X (ex.101,102) is used for analog phones. For VoIP phones, used Extension **20X** to assign desired number. To create new extension numbers, click the Add(+) button. Then the pop-up window is opened.



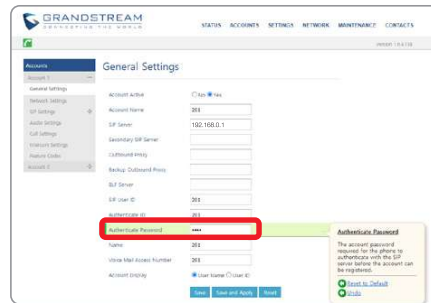
## AptusLX

Assign the **Password** for Inbound Line/Outbound Line according to the vessel's purpose to assigned phone location.

The created extension numbers are displayed on the list.

## VoIP Phone

Input values for **Account Name / SIP User ID / Authenticate ID / Name / Voice Mail Access Number** according to the AptusLX setting.



## VoIP Phone

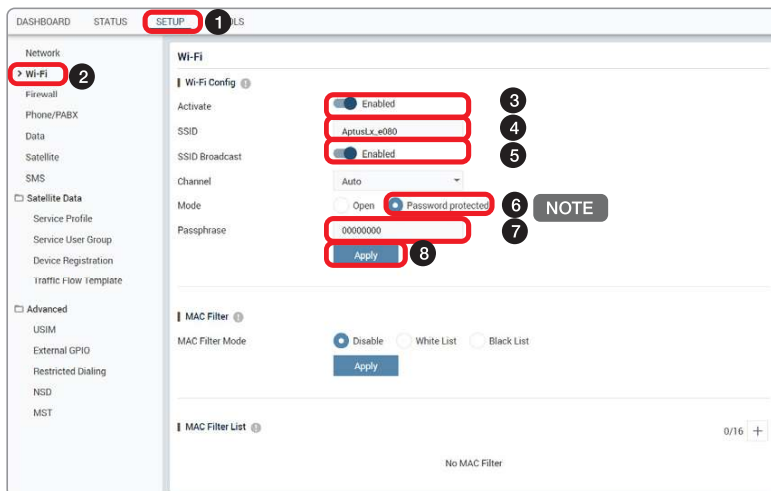
The **Password** should be the same for AptusLX and VoIP Phone.

## 7.7 Using Wireless Devices through Wi-Fi

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

1. Bring the Wi-Fi Antenna located in the BDU package. Plug the Wi-Fi Antenna into the Wi-Fi port on the back of the BDU.
2. Connect an Ethernet cable from any LAN ports (**Port 1~ Port 4**) on the back of the BDU to the LAN port of PC. The network connection is established automatically.
3. Use the following IP address to access the Intellian AptusLX Web page.
  - **IP Address: 192.168.0.1 (Default)**
4. Log into the AptusLX Web by typing in a user name and password information. If this system has not been changed from the factory default:
  - **User Name: intellian**
  - **Password: 12345678**
5. Select the **SETUP** on the main menu then go to the **Wi-Fi → Wi-Fi Config** menu.
6. Toggle Activation button to the **Enabled** position on the **Activate**. If you don't want to use Wi-Fi Connection, choose the **Disabled** position.
7. Check the **SSID (Wi-Fi AP Name)** information.
8. Choose the SSID Broadcast **Enabled** button to show the SSID (Wi-Fi AP Name) on the Wi-Fi list.
9. Click the **Password protected** button on the **Mode** menu.
 

**NOTE:** Password protection uses WPA2 protocol.
10. Set a Wi-Fi password on the **Passphrase** menu.
11. Click the **Apply** button to apply the settings to the system.
12. Connect to the Wi-Fi.



## 7.8 Using Mobile Phone Call

### 7.8.1 Installing Mobile Application

To be able to use a mobile phone call you must install a compatible mobile application. Intellian recommends using the following mobile application:

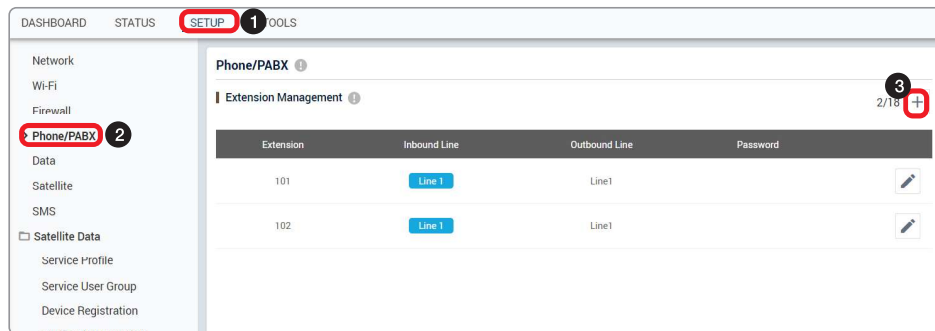
#### Grandstream Wave App

- **App Store:** <https://apps.apple.com/us/app/grandstream-wave/id1029274043?ls=1>
- **Google Play:** <https://play.google.com/store/apps/details?id=com.grandstream.wave>

### 7.8.2 Registering New Extension for Voice Service (Optional)

If voice services are required, register the new extension of the terminal.

1. Select the **SETUP** on the main menu then go to the **Phone/PABX** menu.
2. To add a new extension, click the **Add(+)** button.



3. The registration window will appear in the pop-up window. Enter the new extension information. When you want to use the external call, select the **Inbound Line** and **Outbound Line**. Click the **Update** button.

**AptusLX**

Extension: 201

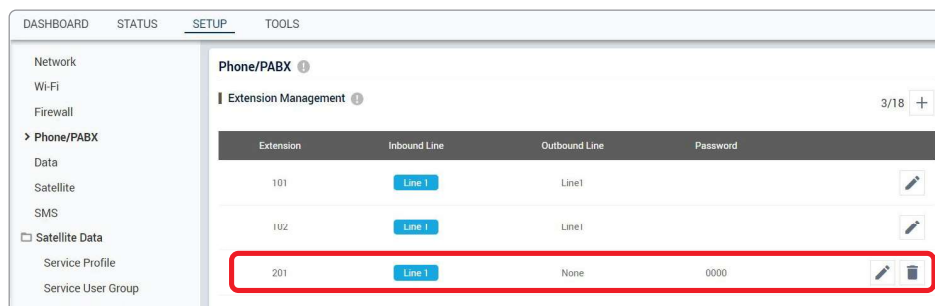
Inbound Line: Line 1

Outbound Line: None

Password: \*\*\*\*

Cancel Update

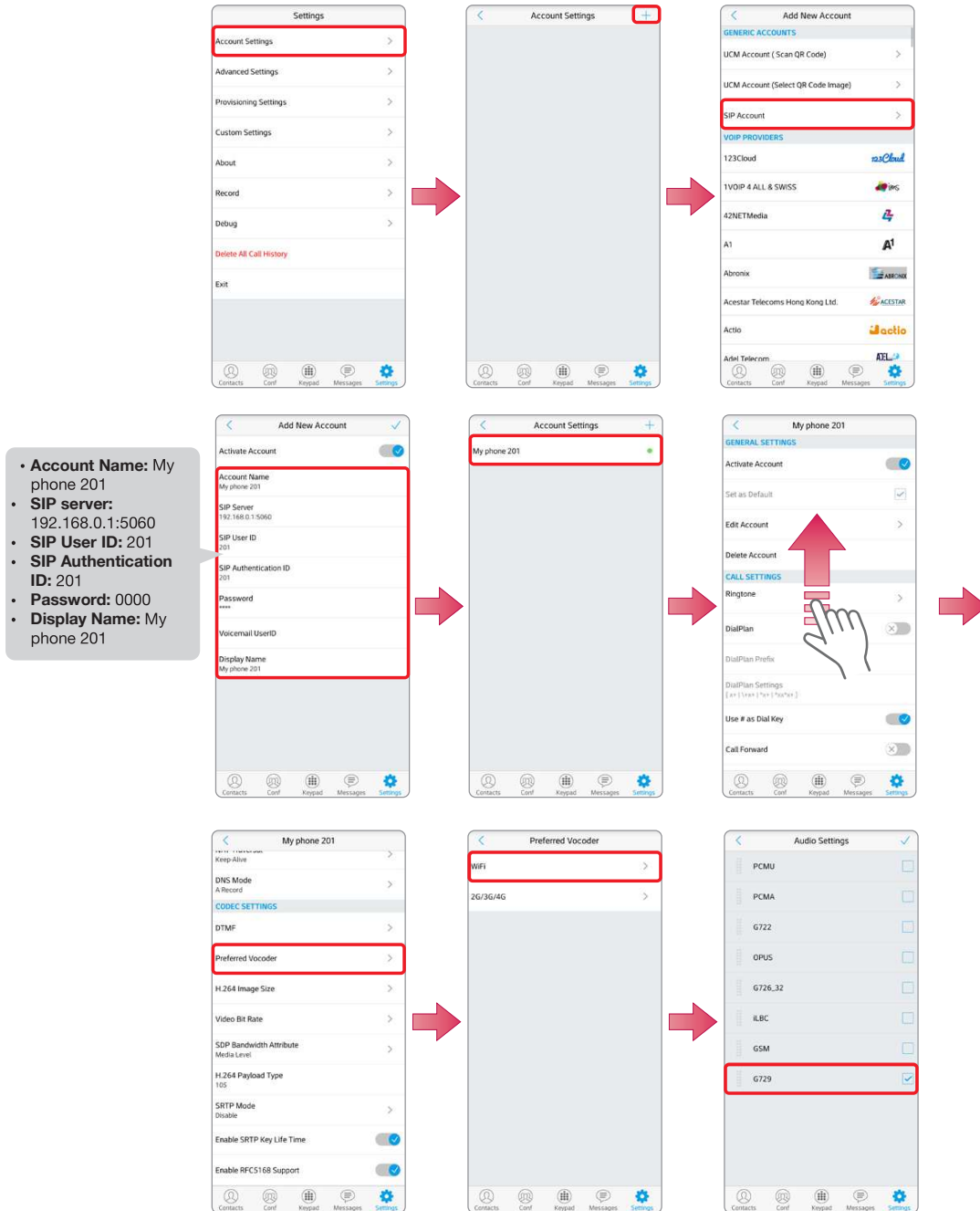
4. Check the new extension added.



### 7.8.3 Setting Mobile Phone

#### Using Grandstream Wave App (Recommended) through Mobile Phone

To make a call on your mobile phone, Intellian recommends using the Grandstream Wave app. Follow the steps below to set up your mobile phone.



# Chapter 8. Using AptusLX

## 8.1 Introduction

With the embedded **AptusLX** software, the antenna can be monitored, controlled, and diagnosed remotely, anytime through the TCP/IP protocol. It saves your time and cost generated by various maintenance activities such as operating firmware upgrades, tracking parameter resets, and system diagnosis, etc.

## 8.2 Accessing Internal Webpage of BDU

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

1. Connect an Ethernet cable from any LAN ports (**Port 1~ Port 4**) on the back of the BDU to the LAN port of PC. The network connection is established automatically.
2. Enter the BDU IP address (**Default: 192.168.0.1**) or (<https://portal.aptuslx.local>) into the address bar of the web browser to login to the internal HTML page of BDU.

### NOTE



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

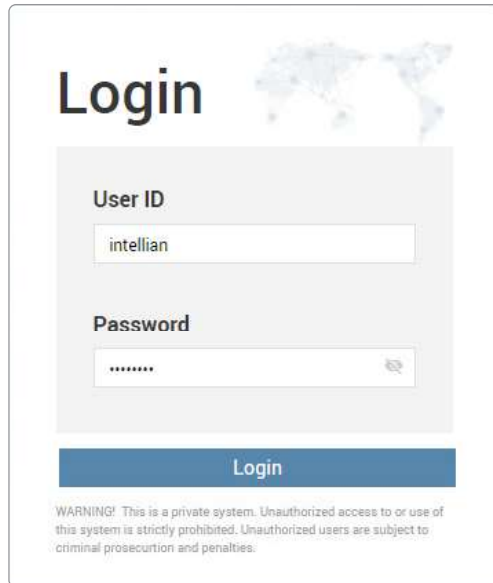
If you cannot open AptusLX on Chrome, clear all browsing data (history, cookies, cache, and more) in Chrome's setting and try again.

## 8.3 Login

The Intellian software Aptus provides different user access levels to protect the system for safe operation. Depending on the user access level, the accessible range of functions in the software can be limited.

Log into the BDU by typing in User Name and Password information. If this system has not been changed from the factory default:

| User ID   | Password | Access Authority                               |
|-----------|----------|------------------------------------------------|
| intellian | 12345678 | Supports all menus for monitoring and setting. |
| guest     | guest    | Only some menus for monitoring are supported.  |



### NOTE

After entering the default password, the user must change the default password to a new password for security. If you have forgotten your ID and/or password, you can reset it on the Reset ID/Password menu. Refer to the “8.5 Account Menu” on page 60.

## 8.4 Top Menu

Once you log in, the following information and menus are displayed. The overall state of the system is always displayed in the top menu.



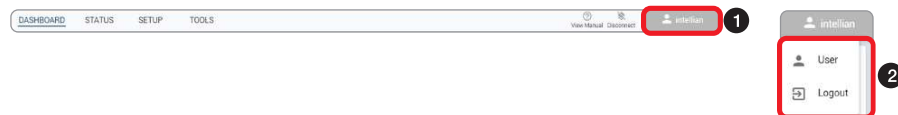
| No. | Item             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Satellite Status | <p>Displays the status of the satellite network connection.</p> <ul style="list-style-type: none"> <li>• Off: The system has not detected the Satellite network.</li> <li>• Steady Green: The Satellite Network available, ready to connect.</li> <li>• Blinking Green (Acquiring): The system is connecting to the satellite network.</li> <li>• Steady Blue: The system is registered and connected to the satellite network.</li> <li>• Steady Red: Registration on the network was denied. If the USIM card is inserted incorrectly, insert the USIM card in place. Refer to the “6.6.11 Inserting USIM Card” on page 45. If there is no error with the USIM card status, contact the service provider.</li> </ul> |
| ②   | WAN Status       | <p><b><u>This function is not available for Fleet One model.</u></b></p> <p>Displays the status of the wide-area network (WAN) connection. The system connects to the WAN according to the setting of the routing policy. You can also check the status of the WAN connection on the 'Current Route Selection' panel of the “8.6 Dashboard” on page 62.</p> <ul style="list-style-type: none"> <li>• Steady Blue: The WAN is connected.</li> <li>• Red/Off: The WAN is not connected.</li> </ul>                                                                                                                                                                                                                       |
| ③   | Wi-Fi Status     | <p>Displays the status of the Wi-Fi connection.</p> <ul style="list-style-type: none"> <li>• Off: The Wi-Fi connection is disabled.</li> <li>• Steady Green: The Wi-Fi connection is enabled. Ready to connect.</li> <li>• Steady Blue: The Wi-Fi is connected.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| ④   | Signal Strength  | <p>Displays the current signal level.</p> <ul style="list-style-type: none"> <li>• Off: The network is disabled.</li> <li>• Steady Green: The network is enabled. Displays the current signal level.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ⑤   | System Power     | <p>Displays the current system power.</p> <ul style="list-style-type: none"> <li>• Steady Blue: The system is in normal operation.</li> <li>• Steady Red: A error is detected.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| ⑥   | Call             | <p>Displays the status of the call connection.</p> <ul style="list-style-type: none"> <li>• Steady Green: The extension call is available.</li> <li>• Steady Blue: The extension and external call is available.</li> <li>• Blinking Blue: The external call is active.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| No. | Item               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ⑦   | SMS                | <p>Displays the status of SMS messages.</p> <ul style="list-style-type: none"> <li>• Off: The system cannot send and receive SMS messages.</li> <li>• Steady Green: The system can send and receive SMS messages normally. Displays the number of unread messages next to the SMS icon. Click the icon to see new messages. For more information, see “8.8.7 SMS” on page 79.</li> <li>• Blinking Red: There is no space to store new a SMS message in the SMS inbox. After deleting existing SMS messages, you can receive the new SMS message.</li> </ul> |
| ⑧   | Main Menu          | Select the Main Menu. Each main menu offers side menus on the left of the screen.                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ⑨   | View Manual Button | Select the <b>View Manual</b> button to open the user guide pop-up window.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| ⑩   | Disconnect Button  | Select the <b>Disconnect</b> button to terminate all Packet Data Protocol (PDP) or Data connections.                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ⑪   | Account Button     | Select the <b>Intellian</b> button to manage your account details and select the <b>Logout</b> menu to log out of the AptusLX web page.                                                                                                                                                                                                                                                                                                                                                                                                                     |

## 8.5 Account Menu

Click the **Intellian** button to manage the user account.

The **User** menus are for user management. Click the **Logout** button to log- out of the AptusLX web page.



### 8.5.1 User



| No. | Item                   | Description                                                                                                                                                                                                                                                                                                                                                      |
|-----|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | User                   | Updates your password and ID.                                                                                                                                                                                                                                                                                                                                    |
| ②   | User ID Change         | <p>You can change your ID</p> <ul style="list-style-type: none"> <li>• ID: Displays the user current ID.</li> <li>• New ID: Enter the new ID you want to change.</li> </ul> <p>Click the <b>Apply</b> button to set the ID to the new ID.</p>                                                                                                                    |
| ③   | User Password Change   | <p>You can change your password.</p> <ul style="list-style-type: none"> <li>• ID: Displays the user current ID.</li> <li>• Old Password: Enter the current password.</li> <li>• New Password: Enter the new password.</li> </ul> <p>Click the <b>Apply</b> button to set the password to the new password. For the next login, the new password is required.</p> |
| ④   | Reset ID/ Password     | <p>If you have forgotten your ID and/or password, you can reset depending on your account level. The admin account (<b>intellian</b>) allows you to reset the guest account (<b>guest</b>).</p> <p>Click the account button to reset to the default id and password. For the next login, the default id and password are required.</p>                           |
| ⑤   | Session Timeout Change | <p>Enter the session timeout (min.).</p> <p>Click the <b>Apply</b> button to apply the settings to the system.</p>                                                                                                                                                                                                                                               |
| ⑥   | Language Setting       | <p>You can change the language.</p> <p>Select the language you want to change and click the <b>Apply</b> button to apply the settings to the system.</p> <p>Log in again after changing the language.</p>                                                                                                                                                        |

## 8.5.2 Logout

Click the **Logout** button to log out from the AptusLX.

## 8.6 Dashboard

The Dashboard menu is displayed as below to provide quick monitoring of the antenna status. The Dashboard helps you arrange panels on a single screen while providing you with a broad view of a variety of information at once.

The dashboard interface includes a top navigation bar with the following tabs: **DASHBOARD** (highlighted with a red circle), **STATUS**, **SETUP**, and **TOOLS**. On the right side of the navigation bar, there are links for **View Manual**, **Disconnect**, and a user profile icon labeled **intellian**.

The dashboard is divided into several panels:

- Service**: Shows 'Satellite Network' as **Connected**. It includes a 'Current Data Routing' section with a **NOTE 1** and buttons for **Satellite** and **WAN**.
- Tracking Satellite**: Displays satellite details for **APAC**. It includes a **NOTE 2** next to the **Status** (Tracking) and a **NOTE 3** next to the **Quality** (12). Other details include AZ (153.5 / 154), EL (45.1 / 43), Signal Strength (63dBHz), and Quality (12).
- Terminal**: Shows terminal status as **OK**. Other details include Operation Mode (Normal), SIM Inserted (Normal), SIM Connected (Normal), ADU Status (OK), and Modem Status (OK).
- Location**: Displays location information including Valid (Normal), Latitude (37.401736 (N)), Longitude (127.112515 (E)), Date (2021-07-28), and Time(UTC) (00:00:00).
- Product Info**: Shows package software version (1.0.11), BDU Serial, BDU MAC (d0:03:eb:d3:e0:80), ADU software version (1.0.11), ADU Serial, and Model (FB250).
- Modem Info**: Shows software version (5.9.4), hardware version (07-01), IMEI (004433060000261), and serial (IBO1000956).
- Environment**: Displays BDU Voltage (23.5 V), ADU Temperature (51.7 °C), and ADU Voltage (47.7 V).
- System Event**: Shows '- No Event'.

At the bottom of the dashboard, there are two main sections:

- 1 Satellite Data Connection Control**: A table listing various service user groups and profiles, each with a 'Deactivated' toggle switch. The groups include G2\_Default, G6\_DataStream, G8\_DataUser1, G10\_DataUser3, G5\_DataCustom, G7\_DataSecondary, G9\_DataUser2, and G11\_DataUser4.
- 2 Satellite Connection Statistics**: A table showing incoming and outgoing call statistics for various users and profiles. It includes columns for 'Incoming Call' and 'Outgoing Call' with daily and monthly usage. A **NOTE 4** is present at the bottom right of this section.

**NOTE 1.****Service - Current Data Routing: WAN**

This menu is not available for Fleet One model.

**NOTE 2.****Tracking Satellite - Status:**

The following 6 status information is displayed.

- Initialize: The antenna system is Initializing.
- Setup: The antenna system is waiting for BDU commands.
- Searching: The antenna system is searching for a satellite connection.
- Tracking: The antenna system is connected to the satellite, and is tracking.
- Diagnostic: The antenna system is performing antenna diagnosis.
- Upgrading: The antenna system is upgrading firmware.

**NOTE 3.****Tracking Satellite - Quality:**

This value is provided by Modem and displays the quality score of the received signal (Range: 0 ~ 20).

**NOTE4.**

To send a new SMS click the letter icon. Type the message and recipient's phone number.  
For more information see "8.8.7 SMS" on page 79.

## 8.6.1 Satellite Data Connection Control

| No. | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|     | Displays the satellite data connection status. The screen is different depending on the user access level.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ①   | <p>When logging in with the admin account (<b>intellian</b>);</p> <ul style="list-style-type: none"> <li>• Monitors the connection status of all service user groups.</li> </ul> <p><b>NOTE: For Fleet One, the service user group which has the streaming profile is not displayed because it does not support data streaming.</b></p> <ul style="list-style-type: none"> <li>• All the service groups are displayed for devices including non-registered devices. Device registration is not required when you are logged in with admin account (<b>intellian</b>). Activate the data connections on the dashboard with the activation buttons to use the device which is logged in with admin account (<b>intellian</b>).</li> <li>• If you deactivated a service user group, the data sessions of all devices included in the service user group are terminated.</li> </ul> | <p>When logging in with a guest account (<b>guest</b>);</p> <ul style="list-style-type: none"> <li>• Available service groups are displayed on the dashboard for the devices which are already registered. You can activate the data connection of your own service group with the activation button, then you can use the satellite data of your service group.</li> <li>• If you deactivate the service user group, the data session of your device is terminated.</li> <li>• If the device is not registered in the Device Registration menu, 'Unregistered device' is displayed and the data cannot be used. For device registration, refer to the "7.5 Activating Data Connection" on page 49.</li> </ul> |

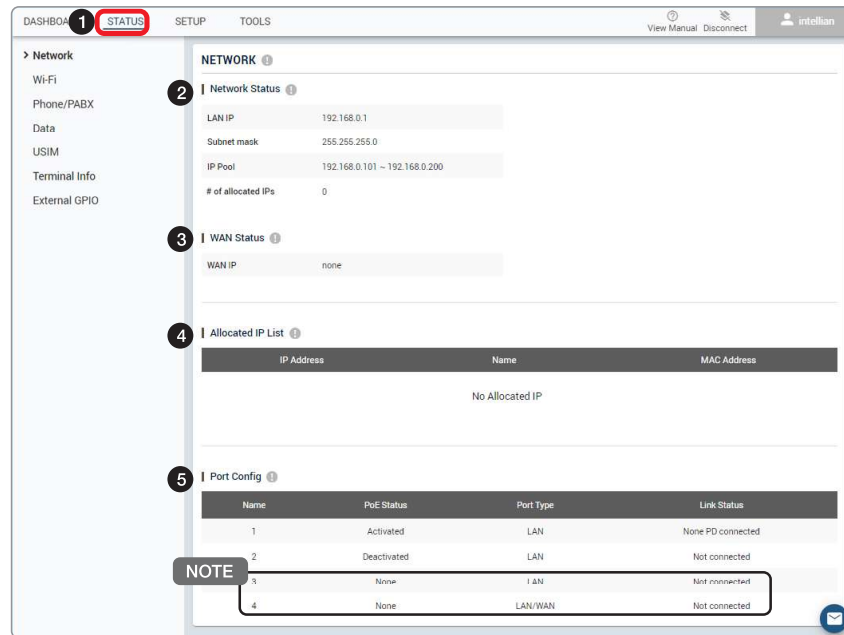
## 8.6.2 Satellite Connection Statistics

| No. | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                  |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ②   | <p>Displays Satellite Connection Statistic. You can check Incoming/Outgoing usage for satellite call and each profiles usage for satellite data.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                  |
|     | <p>When logging in with the admin account (<b>intellian</b>);</p> <ul style="list-style-type: none"> <li>• In voice case, you can check a Daily/Monthly for Incoming/Outgoing call usage.</li> <li>• In data case, you can check current Daily/Monthly usage and Daily/Monthly limit for all user profiles.</li> <li>• For Default, User_1, User_2, User_3, the usage of background data is displayed in MB. For Strm8/16/32/64/128, the usage of streaming data is displayed in time.</li> </ul> <p><b>NOTE: For Fleet One, the connection statistics of the streaming profile is not displayed because it does not support data streaming.</b></p> | <p>When logging in with a guest account (<b>guest</b>);</p> <ul style="list-style-type: none"> <li>• In guest account case, you can check current Daily/Monthly usage and Daily/Monthly limit for guest account only.</li> </ul> |

## 8.7 Status

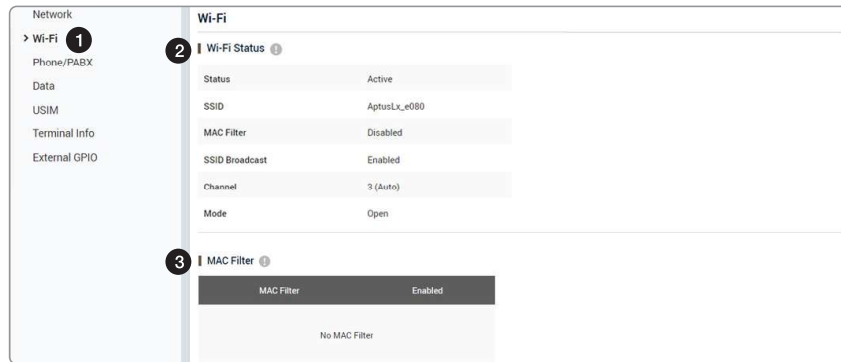
This menu displays the Network, Wi-Fi, Phone/PABX, Data, USIM, Terminal Info, and External GPIO function.

### 8.7.1 Network



| No. | Item              | Description                                                                                                                                                                                                                                                                                                                                                                                |
|-----|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Network           | Displays the information about a network and ports.                                                                                                                                                                                                                                                                                                                                        |
| ②   | Network Status    | Displays the network information in use. <ul style="list-style-type: none"> <li>• LAN IP: Displays the network IP address (Factory default: 192.168.0.1).</li> <li>• Subnet Mask: Displays the subnet mask (Factory default: 255.255.255.0).</li> <li>• IP Pool: Displays the range of available IP.</li> <li>• # of allocated IPs: Displays the number of IP devices assigned.</li> </ul> |
| ③   | WAN Status        | <b><i>This function is not available for Fleet One model.</i></b><br>Displays the WAN information in use. <ul style="list-style-type: none"> <li>• WAN IP: Displays the WAN IP address.</li> </ul>                                                                                                                                                                                         |
| ④   | Allocated IP List | Displays the allocated IP list and information.                                                                                                                                                                                                                                                                                                                                            |
| ⑤   | Port Config       | Displays the switch port list and information.<br><b>NOTE: <i>The LAN port 3 and LAN port 4 are not available for Fleet One model.</i></b>                                                                                                                                                                                                                                                 |

## 8.7.2 Wi-Fi



| No. | Item            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|-----|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Wi-Fi           | Displays Wi-Fi access information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| ②   | Wi-Fi Status    | Displays the Wi-Fi access point configuration. <ul style="list-style-type: none"> <li>• Status: Displays the Wi-Fi status (Active / Inactive).</li> <li>• SSID: Displays the SSID network name.</li> <li>• MAC Filter: Displays the MAC address filtering status (Enabled/Disable).</li> <li>• SSID Broadcast: Displays the SSID broadcast status (Enabled/Disable).</li> <li>• Channel: Displays the WLAN (wireless local area network) channel in use.</li> <li>• Mode: Displays the security mode (Open/Password protected).</li> </ul> |
| ③   | MAC Filter List | Displays devices to either your whitelist or blacklist simply.                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### 8.7.3 Phone/PABX

The screenshot shows the 'Phone/PABX' configuration page. On the left, a sidebar lists 'Network', 'Wi-Fi', and 'Phone/PABX' (highlighted with a circled 1). The main content area is titled 'Phone/PABX' and contains two sections: 'Extension Management' (highlighted with a circled 2) and 'Call History' (highlighted with a circled 3).

**Extension Management Table:**

| Extension | Inbound Line | Outbound Line |
|-----------|--------------|---------------|
| 101       | Line 1       | Line1         |
| 102       | Line 1       | Line1         |
| 201       | Line 1       | Line1         |

**Call History Table:**

Filters: All, Search, Clear Call History

| Source       | Destination              | Start Time          | Duration (sec) | Disposition |
|--------------|--------------------------|---------------------|----------------|-------------|
| 203          | 008225112244             | 2021-07-28 00:57:02 | 4              | Answer      |
| 008225112244 | 901112114169861(ext-203) | 2021-07-28 00:56:42 | 0              | No Answer   |
| 008225112244 | 901112114169861(ext-201) | 2021-07-28 00:56:42 | 5              | Answer      |
| 008225112244 | 901112114169861(ext-102) | 2021-07-28 00:56:42 | 0              | No Answer   |
| 008225112244 | 901112114169861(ext-101) | 2021-07-28 00:56:42 | 0              | No Answer   |

| No. | Item                 | Description                                                                                                                                                                                                                                                                              |
|-----|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Phone/PABX           | Displays the phone and Private Automatic Branch Exchange (PABX) status.                                                                                                                                                                                                                  |
| ②   | Extension Management | Displays the extension number and details. <ul style="list-style-type: none"> <li>• Extension: Displays the registered extension.</li> <li>• Inbound Line: Displays the inbound line in use through the blue indicator.</li> <li>• Outbound Line: Displays the outbound line.</li> </ul> |
| ③   | Call History         | Displays the made and received call history log. You can set view details from the drop-down list. Remove the history by clicking the <b>Clear Call History</b> button.                                                                                                                  |

## 8.7.4 Data

**1 Data**

**2 Routing**

Routing Policy: Satellite Only

Satellite Link: Active

WAN Link: Inactive

**3 Port Forwarding**

| Link    | Type | Internal IP | Protocol | Internal Port | External Port | Enable |
|---------|------|-------------|----------|---------------|---------------|--------|
| No Data |      |             |          |               |               |        |

**4 Data Call History**

All Search Clear Call History

10 1~10/27

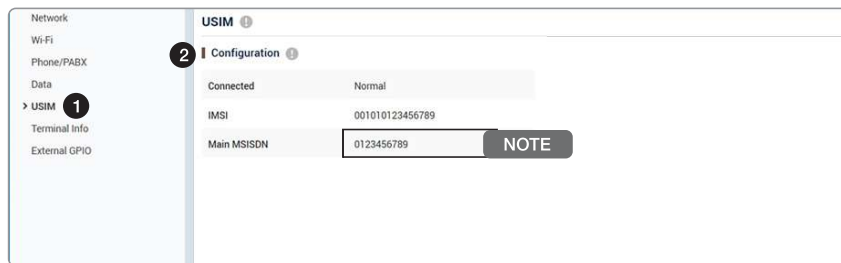
| Alias        | Service Profile | Start Time          | End Time            | Duration (sec) | Session Transmission Volume (bytes) | Session Receive Volume (bytes) |
|--------------|-----------------|---------------------|---------------------|----------------|-------------------------------------|--------------------------------|
| 1st_laptop_u | Default         | 2021-07-28 00:13:18 | 2021-07-28 00:23:10 | 592            | 280,219                             | 1,915,699                      |
| 1st_laptop_u | Default         | 2021-07-28 00:13:16 | -                   | 0              | 0                                   | 0                              |
| 1st_laptop_u | Default         | 2021-07-27 23:23:05 | 2021-07-27 23:24:39 | 94             | 420                                 | 420                            |
| 1st_laptop_u | Default         | 2021-07-27 23:23:04 | -                   | 0              | 0                                   | 0                              |
| 1st_laptop_u | Default         | 2021-07-27 05:55:35 | -                   | 0              | 0                                   | 0                              |
| 1st_laptop_u | Default         | 2021-07-26 05:05:20 | -                   | 0              | 0                                   | 0                              |
| 2nd_laptop   | Default         | 2021-07-26 04:59:33 | 2021-07-26 05:05:16 | 343            | 405,887                             | 306,606                        |
| 2nd_laptop   | Default         | 2021-07-26 04:59:30 | -                   | 0              | 0                                   | 0                              |
| 2nd_laptop   | Default         | 2021-07-26 04:49:02 | 2021-07-26 04:55:58 | 416            | 714,807                             | 1,033,323                      |

10 1~10/27

| No. | Item              | Description                                                                                                                                                                       |
|-----|-------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Data              | Displays the data setting status.                                                                                                                                                 |
| ②   | Routing           | Displays the data route status (Routing Policy, Satellite Link, WAN Link).<br><b><i>This Wan Link menu is not available for Fleet One model.</i></b>                              |
| ③   | Port Forwarding   | Displays the port forwarding data information.                                                                                                                                    |
| ④   | Data Call History | Displays the connected/disconnected data call history log. You can set view details from the drop-down list. Remove the history by clicking the <b>Clear Call History</b> button. |



## 8.7.5 USIM



| No. | Item          | Description                                                                                                                                                                                                                                                                                        |
|-----|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | USIM          | Displays information about the USIM card.                                                                                                                                                                                                                                                          |
| ②   | Configuration | Displays the USIM card information in use. <ul style="list-style-type: none"> <li>• Connected: Displays the connection status of the USIM card. The USIM must be inserted.</li> <li>• IMSI: Displays a unique identifier to the USIM card.</li> <li>• Main MSISDN: Displays main MSISDN</li> </ul> |



### NOTE

The Number is for your information.

## 8.7.6 Terminal info

Network

Wi-Fi

Phone/PABX

Data

USIM

> Terminal Info

External GPIO

### Terminal Info

#### 1 BDU

Software Version 1.0.11

Model Info FB250

Serial -

System MAC 18-d6-6a-10-02-b5

#### 2 ADU

Software Version 1.0.11

Hardware Version 6

Serial -

Model Info FB250

#### 3 Modem

Software Version 5.9.4

Hardware Version 07-01

IMEI 004433060000261

Serial 1B01001321

| No. | Item          | Description                               |
|-----|---------------|-------------------------------------------|
| ①   | Terminal info | Displays the system terminal information. |
| ②   | BDU           | Displays BDU information in use.          |
| ③   | ADU           | Displays ADU information in use.          |
| ④   | Modem         | Displays the modem information in use.    |

## 8.7.7 External GPIO

Network

Wi-Fi

Phone/PABX

Data

USIM

Terminal Info

> External GPIO

### External GPIO

#### 1 Inputs

Input 0 Disabled

Input 1 Disabled

#### 2 Outputs

Output 0 Disabled

Output 1 Disabled

Output 2 Disabled

| No. | Item          | Description                         |
|-----|---------------|-------------------------------------|
| ①   | External GPIO | Displays external GPIO.             |
| ②   | Inputs        | Displays input information in use.  |
| ③   | Outputs       | Displays output information in use. |

## 8.8 Setup

This menu sets and displays the Network, Wi-Fi, Firewall, Phone/PABX, Data, Satellite, SMS, Service Profile, Service User Group, Device Registration, Traffic Flow Template, USIM, External GPIO, Restricted Dialing, Multi Voice, NSD, and MST function.

### 8.8.1 Network

The screenshot shows the 'Setup' menu with the 'Network' option selected. The 'Network Config' section is active, showing DHCP settings. The 'Port' section shows a table of ports with their respective configurations and link statuses. A note indicates that LAN ports 3 and 4 are not available for the Fleet One model.

| Name | PoE Status  | Port Type | Link Status      |
|------|-------------|-----------|------------------|
| 1    | Activated   | LAN       | PD Connected     |
| 2    | Deactivated | LAN       | Non-PD Connected |
| 3    | Deactivated | LAN       | Non-PD Connected |
| 4    | Deactivated | LAN/WAN   | Not Connected    |

| No. | Item           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Network        | Sets the information about a network and ports.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ②   | Network Config | <p>Sets the network configuration.</p> <ul style="list-style-type: none"> <li>• DHCP: Sets the DHCP function by toggling the activation button (Activated/ Deactivated).</li> <li>• Start IP: Sets the start range of lease IP address.</li> <li>• End IP: Sets the end range of lease IP address.</li> <li>• Subnet Mask: Sets the subnet mask (Factory default: 255.255.255.0).</li> <li>• Gateway: Sets the gateway IP address.</li> <li>• Lease Time: Sets the lease time (sec).</li> </ul> <p>Click the <b>Apply</b> button to apply the settings to the system.</p> |
| ③   | Port           | <p>Sets each switch port.</p> <p><b>NOTE: <u>The LAN port 3 and LAN port 4 are not available for Fleet One model.</u></b></p> <ul style="list-style-type: none"> <li>• Name: Displays the port mane.</li> <li>• PoE Status: Sets the PoE function by toggling the activation button on port 1 and 2.</li> <li>• Port Type: Displays the port type.</li> <li>• Link Status: Displays the link status (Up/Down).</li> </ul> <p>Click the <b>Apply</b> button to apply the settings to the system.</p>                                                                       |

## 8.8.2 Wi-Fi

| No. | Item            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----|-----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Wi-Fi           | Sets the Wi-Fi access information.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| ②   | Wi-Fi Config    | <p>Sets the Wi-Fi access point configuration.</p> <ul style="list-style-type: none"> <li>• <b>Activate:</b> Sets the Wi-Fi function by toggling the activation button (Enabled/Disabled).</li> <li>• <b>SSID:</b> 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.</li> <li>• <b>SSID Broadcast:</b> Sets the SSID broadcast function by toggling the activation button (Enabled/Disabled).</li> <li>• <b>Channel:</b> Selects 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.</li> <li>• <b>Mode:</b> Sets the security mode type (Open/Password protected).</li> <li>• <b>Passphrase:</b> Enter the user name connected to Wi-Fi.</li> </ul> <p>Click the <b>Apply</b> button to apply the settings to the system.</p> |
| ③   | MAC Filter      | <ul style="list-style-type: none"> <li>• <b>MAC Filter Mode:</b> Select the MAC filter mode (Disable/White List/Black List). <ul style="list-style-type: none"> <li>- <b>Disable:</b> The MAC filter is disabled.</li> <li>- <b>White List:</b> In Whitelist mode, the router will restrict LAN access to all computers except those contained in the MAC Filter List.</li> <li>- <b>Black List:</b> In Blacklist mode, the listed devices are completely blocked from local network access.</li> </ul> </li> </ul> <p>Click the <b>Apply</b> button to apply the settings to the system.</p> <p><b>NOTE:</b> Use caution when using the MAC Filter to avoid accidentally blocking yourself from accessing the router.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ④   | MAC Filter List | <p>Displays the MAC address. To create new MAC addresses, click the Add(+) button. Then the pop-up window is opened. You can assign the new MAC address. Click the <b>Create</b> button. The created MAC addresses display on the list.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### 8.8.3 Firewall

The screenshot displays the AptusLX Firewall configuration interface. On the left, a sidebar lists various network settings. The main area is divided into three sections: **Firewall** (1), **Firewall Config** (2), and **Firewall Rules** (3). The **Firewall Config** section shows the Firewall is **Enabled**, with Inbound and Outbound Default Actions set to **Accept**. The **Firewall Rules** section shows two rules: an **Outbound Rule** and an **Inbound Rule**, both **Enabled** and set to **Drop**. A red box highlights the **+** button to add a new rule. To the right, a pop-up window titled **AptusLX** shows the configuration for a new rule. The **Direction** dropdown is highlighted with a red box and set to **Inbound**.

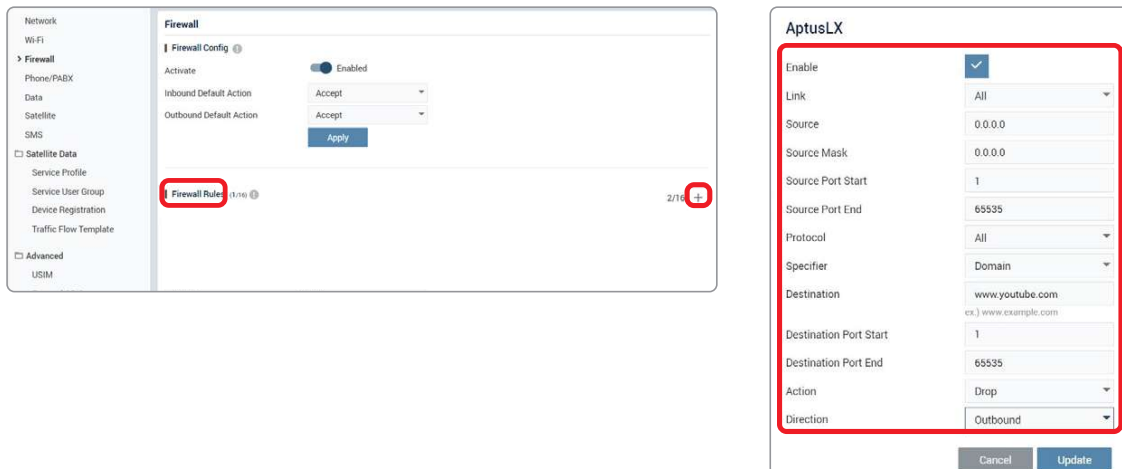
| No. | Item            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Firewall        | Sets the firewall, network security system, which monitors and controls incoming and outgoing network traffic based on predetermined security rules.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| ②   | Firewall Config | <p>Sets the firewall configuration.</p> <ul style="list-style-type: none"> <li>• <b>Activate:</b> Sets the firewall function by toggling the activation button (Enabled/Disable).</li> <li>• <b>Inbound Default Action:</b> Select the default settings for the incoming network from the drop-down list (Accept/Drop).</li> <li>• <b>Outbound Default Action:</b> Select the default settings for the outgoing network from the drop-down list (Accept/Drop).</li> </ul> <p>Click the <b>Apply</b> button to apply the settings to the system.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ③   | Firewall Rules  | <p>Displays firewall rule lists.</p> <ul style="list-style-type: none"> <li>• <b>Add(+) button:</b> To create new firewall rules, click the Add(+) button. Then the pop-up window is opened. Click the <b>Update</b> button. The created firewall rules are displayed on the list. <ul style="list-style-type: none"> <li>- <b>Enable:</b> Select the checkbox to use the firewall rule.</li> <li>- <b>Link:</b> Select the link from the drop-down list.</li> <li>- <b>Source:</b> Enter the origin IP address.</li> <li>- <b>Source Mask:</b> Enter the source mask.</li> <li>- <b>Source Port Start:</b> Enter the source mask start.</li> <li>- <b>Source Port End:</b> Enter the source mask end.</li> <li>- <b>Protocol:</b> Select the protocol from the drop-down list.</li> <li>- <b>Specifier:</b> Select the Specifier from the drop-down list.</li> <li>- <b>Destination:</b> Enter the destination IP address.</li> <li>- <b>Destination Mask:</b> Enter the destination mask.</li> <li>- <b>Destination Port Start:</b> Enter the destination mask start.</li> <li>- <b>Destination Port End:</b> Enter the destination mask end.</li> <li>- <b>Action:</b> Select the action from the drop-down list.</li> <li>- <b>Direction:</b> You can assign the new rule entered above to the <b>Inbound</b> or the <b>Outbound</b> in the <b>Direction</b> menu.</li> </ul> </li> </ul> |

**Creating Firewall Rules (Example):**

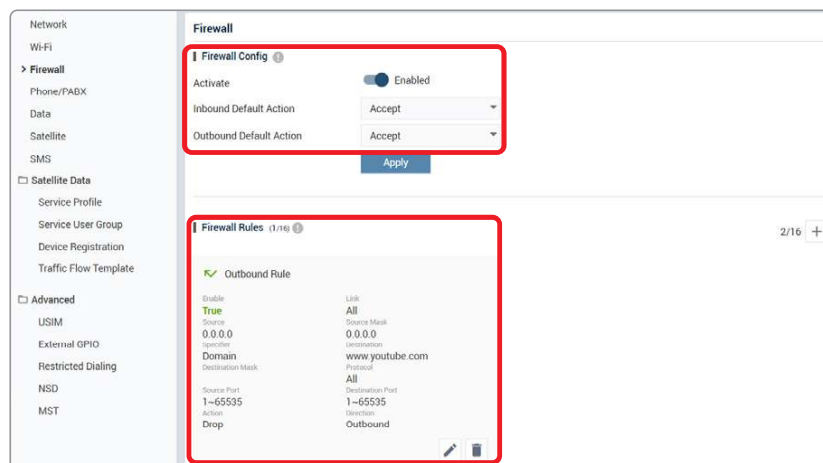
To block www.youtube.com,

1. Click the **Add(+)** button. On the pop-up window, enter the settings. Click the **Update** button to save. Enter each value accurately as the following.

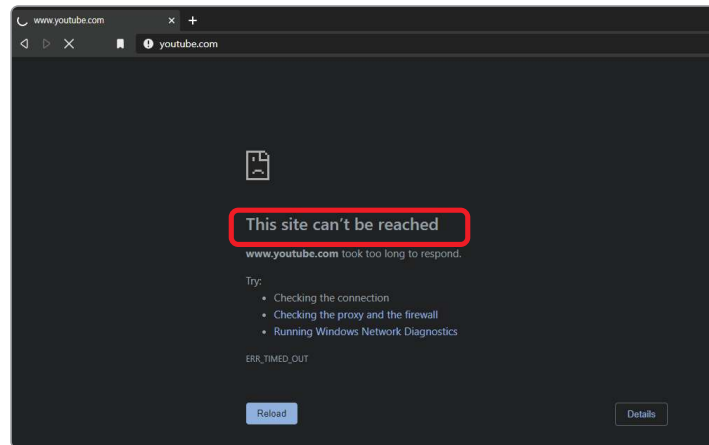
- Link: **All**
- Source: **IP address** or **0.0.0.0** (0.0.0.0 means all the IP addresses)
- Source Mask: **Subnet Mask** (ex: 255.255.0.0) or **0.0.0.0** (0.0.0.0 means any masks)
- Source Port Start: **1 ~ 65535** (Source Port Start 1~ Source Port End 65535 means all the ports)
- Source Port End: **1 ~ 65535** (Source Port Start 1~ Source Port End 65535 means all the ports)
- Protocol: **All**
- Specifier: **Domain**
- Destination: **www.youtube.com**
- Destination Port Start: **1 ~ 65535** (Source Port Start 1~ Source Port End 65535 means all the ports)
- Destination Port End: **1 ~ 65535** (Source Port Start 1~ Source Port End 65535 means all the ports)
- Action: **Drop**
- Direction: **Outbound**



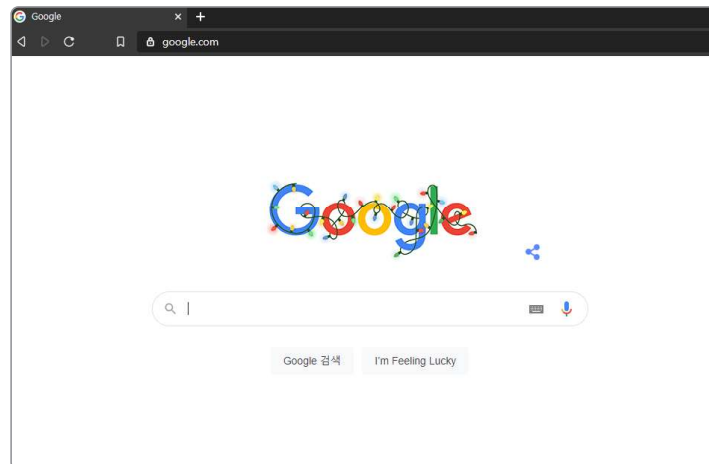
2. The Firewall rules are displayed on the Firewall page. Check the Firewall configuration setup and confirm the created Firewall Rules.



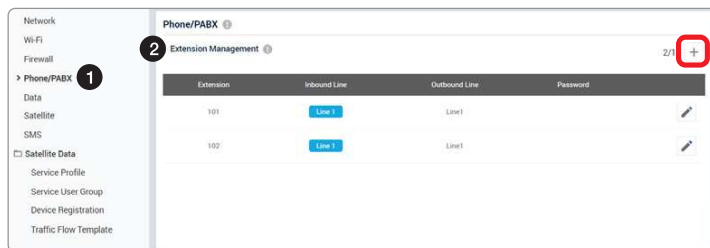
3. Try to open [www.youtube.com](http://www.youtube.com) on your web browser. Once applied, the user will not be able to access the website.



4. Make sure you can open websites other than [www.youtube.com](http://www.youtube.com).



## 8.8.4 Phone/PABX



**AptusLX**

Extension: 201

Inbound Line: ☒ Line 1

Outbound Line: None

Password: ...

Cancel Update

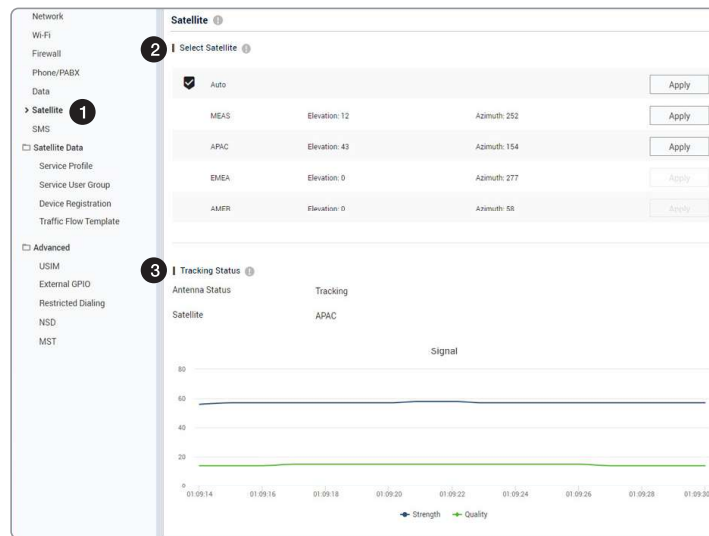
| No. | Item                  | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-----|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Phone/PABX            | Sets the phone and Private Automatic Branch Exchange (PABX).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| ②   | Extensions Management | <p>Sets the extension number and details.</p> <ul style="list-style-type: none"> <li>• Edit() button: To edit the registered extension, click the Edit() button. Then the pop-up window is opened. You can edit details.</li> <li>• Delete() button: To delete the registered extension, click the Delete() button. (Extension 101 and 102 have no Delete() button.)</li> <li>• Add() button: To create new extension numbers, click the Add() button. Then the pop-up window is opened. You can assign the new extension number. Click the <b>Update</b> button. The created extension numbers are displayed on the list. <ul style="list-style-type: none"> <li>- Extension: Displays the registered extension.</li> <li>- Inbound Line: The inbound line can be controlled and managed by individual selection through the blue indicator.</li> <li>- Outbound Line: Displays the outbound line.</li> <li>- Password: Displays the password.</li> </ul> </li> </ul> |



## 8.8.5 Data

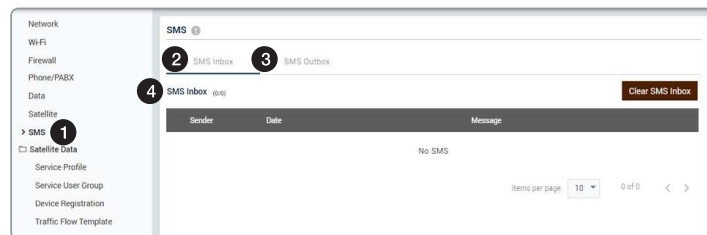
| No. | Item            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-----|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Data            | Sets the data settings.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ②   | Routing Config  | <p>Selects the Routing Config (None, Satellite Only, WAN Only).</p> <p>Click the <b>Apply</b> button to apply the settings to the system.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| ③   | WAN Link        | <p><b><i>This function is available in the WAN Only mode of the Routing Config.</i></b></p> <p>Sets the WAN Link configuration.</p> <ul style="list-style-type: none"> <li>• Address Mode: Select the Address Mode (Dynamic/Static).</li> <li>• Static Config: Set the IP manually. <ul style="list-style-type: none"> <li>- IP: Enter the IP address.</li> <li>- Subnet Mask: Enter the subnet mask.</li> <li>- Gateway: Enter the gateway IP address.</li> <li>- DNS: Enter the DNS.</li> </ul> </li> </ul> <p>Click the <b>Apply</b> button to apply the settings to the system.</p>                                                                                                                                                                                                                                                                                                                                                                                                 |
| ④   | Port Forwarding | <p>Displays the port forwarding list. To connect to the internal PC from the outside, create a rule of port forwarding.</p> <ul style="list-style-type: none"> <li>• Add(+) button: To create new port forwarding rule, click the Add(+) button. Then the pop-up window is opened. Enter the details, then click the <b>Update</b> button. The created ports are displayed on the list. <ul style="list-style-type: none"> <li>- Enable: Select the checkbox to use the new port forwarding rule.</li> <li>- Internal IP: Enter the internal IP address.</li> <li>- Link: Select the link from the drop-down list.</li> <li>- Specifier: Select the specifier from the drop-down list.</li> <li>- Protocol: Select the protocol from the drop-down list.</li> <li>- Internal Port: Enter the port number of internal IP for forwarding the target port.</li> <li>- External Port: Enter the external port number for accessing the internal PC from the outside.</li> </ul> </li> </ul> |

## 8.8.6 Satellite



| No. | Item             | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Satellite        | By the satellite setup, the terminal automatically finds and connects to the most appropriate satellite in the default mode. In an area available with multi BGAN satellites, select a satellite to use for the registration on the BGAN network.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ②   | Select Satellite | <p>Select a satellite to use.</p> <p>Check Auto and click the Apply button for setting the Auto Satellite mode (default). In the Auto Satellite mode, the terminal automatically finds and connects to the most appropriate satellite.</p> <p>To select a preferred satellite, check the satellite to use and click the Apply button. The terminal connects to the selected satellite only. If the antenna locates outside the coverage area of that satellite, the terminal is disconnected from the BGAN network.</p> <p><b>Note:</b> When you click the Apply button, all of ongoing connections (calls, data transfer, etc.) with currently registered satellite will be terminated before registering the new satellite.</p> |
| ③   | Tracking Status  | <p>When a satellite is selected, the antenna status is changed from Searching to Tracking Status.</p> <ul style="list-style-type: none"> <li>Searching Status: The antenna is searching for the BGAN signal.</li> <li>Tracking Status: The antenna is locked to and tracking the BGAN signal. In the graphic chart, the blue line shows Signal Strength (dBHz) and the green line shows Signal Quality Scores.</li> </ul>                                                                                                                                                                                                                                                                                                         |

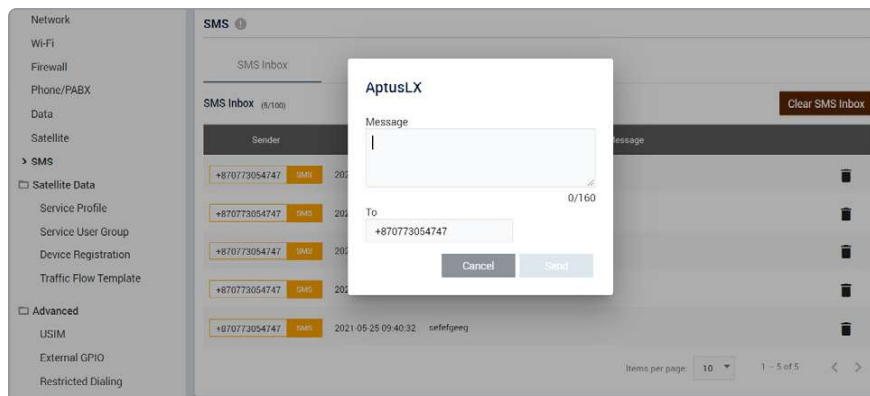
## 8.8.7 SMS



| No. | Item                      | Description                                                                                                                                                                                                                                                                                                                                                                 |
|-----|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | SMS                       | The BGAN system provides a Short Messaging Service (SMS) for sending and receiving SMS messages (Standard 3G, up to 160 characters per SMS) to and from the terminal.                                                                                                                                                                                                       |
| ②   | SMS Inbox                 | <p>All received SMS messages are stored in the inbox. Unread messages are marked with a New icon. If you have received a message with more than USIM capacity, you have to delete some of them in order to free space for new messages. Also, you can check a new SMS message at the top menu.</p> <p>Click <b>Clear SMS Inbox</b> to delete all messages in the Inbox.</p> |
| ③   | SMS Outbox                | <p>All sent messages are stored in the outbox. If sending is successful, it is displayed as Success, and if it is unsuccessful, it is displayed as Error. Click the <b>Receiver</b> number field to re-send the message.</p> <p>Click <b>Clear SMS Outbox</b> to delete all messages in the Inbox.</p>                                                                      |
| ④   | SMS Inbox/<br>Outbox List | <p>Click the number field in the list, a pop-up window will appear for sending SMS. Also, you can send SMS by clicking the letter icon at the bottom right of the screen. Refer to the following page for more details.</p> <p>Click the text field in the list, a pop-up window will appear to see the entire message.</p>                                                 |

### **Sending SMS message**

1. Click the **Sender** number field in the list of SMS Inbox. Then the pop-up window is opened.
2. Type in the message in the Message field (Standard 3G, up to 160 characters per SMS). Check the number of written characters counted under the message field.
3. Type in the phone number in the To field (Recipient). Remember 00 and country code (e.g., 00 1 for the USA). '+' and country code is also available.
4. Click the Send button. The message is now sent and moved to the SMS Outbox.



## 8.8.8 Service Profile

**Service Profile**

**2 Profile List**

| Name    | Traffic Class | Max Bitrate Downlink | Max Bitrate Uplink | Guaranteed Bitrate Downlink | Guaranteed Bitrate Uplink | Data Limit |
|---------|---------------|----------------------|--------------------|-----------------------------|---------------------------|------------|
| Default | Background    | 256                  | 256                | 0                           | 0                         | 2/50       |
| Strm8   | Streaming     | 8                    | 8                  | 8                           | 8                         | 0/10       |
| Strm16  | Streaming     | 16                   | 16                 | 16                          | 16                        | 0/0        |
| Strm32  | Streaming     | 32                   | 32                 | 32                          | 32                        | 0/0        |
| Strm64  | Streaming     | 64                   | 64                 | 64                          | 64                        | 0/0        |
| Strm128 | Streaming     | 128                  | 128                | 128                         | 128                       | 0/0        |
| User_1  | Background    | 0                    | 0                  | 0                           | 0                         | 0/0        |
| User_2  | Background    | 0                    | 0                  | 0                           | 0                         | 0/0        |

**AptusLX**

Name: **Default**

Traffic Class: **Background**

Max Bitrate Downlink: **256**

Max Bitrate Uplink: **256**

Guaranteed Bitrate Downlink: **0**

Guaranteed Bitrate Uplink: **0**

Data Limit(Daily): **2**

Data Limit(Monthly): **50**

Use USIM Default APN: ☒ Enable ☐ Disable

User Defined APN:

**Cancel Update**

| No. | Item            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Service Profile | <p>A profile includes Quality of Service (QoS) settings and other which define the data transmission mode on an interface. For example, a profile defines whether the traffic class should be a Background or Streaming.</p> <ul style="list-style-type: none"> <li>• <b>Background:</b> is the background profile for normal use. Several users can share the data connection simultaneously. The user pays for the amount of data sent and received (per byte).</li> <li>• <b>Streaming:</b> is the streaming profile. You get an exclusive, high-priority connection, that ensures seamless transfer of data. The user pays for the duration of the connection (per second).</li> </ul> <p>Select a profile among predefined profiles or define your own profiles for the data transmission.</p> |

| No. | Item         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ②   | Profile List | <p>Displays information of predefined service profiles.</p> <p>When you set up a service user group, you select the profiles to use. Select one primary profile and one secondary (optional) profile for the service user group.</p> <ul style="list-style-type: none"> <li>• Edit() button: To edit the profile, click the Edit() button. Then the pop-up window is opened. Enter the details, then click the <b>Update</b> button. <ul style="list-style-type: none"> <li>- Name: Displays the name of profile.</li> <li>- Traffic Class: Select a traffic class from the drop-down list.<br/>NOTE: Choose the right traffic class for your network service for the best performance. Recommended to choose Background for TCP/IP service and Streaming IP for UDP traffic such as live video or audio.</li> <li>• Subscribed: This function is not available.</li> <li>• Conversational: This function is not available.</li> <li>• Streaming: Real-time 2 way communication. It is primarily used for video and audio.</li> <li>• Interactive: This function is not available.</li> <li>• Background: Used for data which is not delay-sensitive, such as Email SMS, download of databases, and reception of measurement records.</li> </ul> </li> <li>- Max Bitrate Downlink: Select the maximum download bit rate allowed for this profile from the drop-down list.</li> <li>- Max Bitrate Uplink: Select the maximum upload bit rate allowed for this profile from the drop-down list.</li> <li>- Guranteed Bitrate Downlink: Select the guaranteed download bit rate needed for this profile from the drop-down list.</li> <li>- Guranteed Bitrate Uplink: Select the guaranteed upload bit rate needed for this profile from the drop-down list.</li> <li>- Data Limit: Set the Daily and Monthly limit. <ul style="list-style-type: none"> <li>• In background: Enter a value between 1~102400 MBytes (MB: Enter a number, 0: unlimited).</li> <li>• In streaming: Enter a value between 1~1440 minutes for daily limit or 1~44640 minutes for monthly limit (Minute: Enter a number, 0: unlimited).</li> </ul> </li> </ul> <p>For further information on the principles and parameters of the traffic flow filters, refer to the 3GPP standards TS 23.060.</p> <ul style="list-style-type: none"> <li>- Use USIM Default APN: Recommended. Choose whether to use the default APN (Access Point Name) value of USIM or not (Enabled/Disable). The APN is defined on the USIM card.</li> <li>- Use Defined APN: When you want to use a user-defined APN value, enter the APN value. APNs are provided by service providers.</li> </ul> |

## 8.8.9 Service User Group

**Service User Group List**

| Name                             | Status   | Primary Profile | Secondary Profile |  |
|----------------------------------|----------|-----------------|-------------------|--|
| G2_Default <small>Active</small> | Enabled  | Default         | -                 |  |
| G5_DataCustom                    | Enabled  | User_1          | -                 |  |
| G6_DataStream                    | Enabled  | Strm128         | -                 |  |
| G7_DataSecondary                 | Enabled  | Default         | Strm32            |  |
| G8_DataUser1                     | Disabled | User_1          | -                 |  |
| G9_DataUser2                     | Disabled | User_1          | -                 |  |
| G10_DataUser3                    | Disabled | User_2          | -                 |  |
| G11_DataUser4                    | Disabled | User_2          | -                 |  |

**AptusLX**

Name: G2\_Default

Auto Activation: ☒ Enable ☐ Disable

Primary Profile: Default

Secondary Profile: None

Cancel Update

| No. | Item                    | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Service User Group      | <p>The system can be organized in service user groups with a different setup and different access rights. Each service user group has a service profile that determines how users connect to the Inmarsat BGAN network.</p> <p>NOTE: For <b>FB250</b>, the maximum Streaming bit rate is 128 kbps.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                |
| ②   | Service User Group List | <p>Displays the service user group list and information.</p> <ul style="list-style-type: none"> <li>• Edit() button: To edit the profile, click the Edit() button. Then the pop-up window is opened. Enter the details, then click the <b>Update</b> button. <ul style="list-style-type: none"> <li>- Name: Enter the name of service user group.</li> <li>- Status: Set whether to use this group automatically or not(Enabled/Disabled).</li> <li>- Primary Profile: Select the target primary profile from the drop-down list. This profile is used by this service user group as a first choice, when possible.</li> <li>- Secondary Profile: Select the target secondary profile from the drop-down list.</li> </ul> </li> </ul> |

## 8.8.10 Device Registration

**Device Registration**

2 Device Registration List 3/20 +1

| Alias        | MAC Address       | Service User Group |  |
|--------------|-------------------|--------------------|--|
| 1st_laptop_u | 08:00:27:50:73:AD | G2_Default(2)      |  |
| 2nd_laptop   | 00:E0:4B:69:2A:4E | G2_Default(2)      |  |
| 1st_laptop_w | 98:83:89:9C:F7:9E | G2_Default(2)      |  |

**AptusLX**

Alias: 1st\_laptop\_u

MAC Address: 08:00:27:50:73:AD

Service User Group: G2\_Default

Buttons: Delete, Cancel, Update

| No. | Item                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-----|--------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Device Registration      | Register the MAC address of the device for using the data service, and assign a service user group to the device.                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| ②   | Device Registration List | <p>Displays device registration list and information.</p> <ul style="list-style-type: none"> <li>• Edit() button: To edit the profile, click the Edit() button. Then the pop-up window is opened. Enter the details, then click the <b>Update</b> button. Click the <b>Delete</b>() button to delete it on the list. <ul style="list-style-type: none"> <li>- Alias: Enter the device name for the data service.</li> <li>- MAC Address: Enter the MAC address.</li> <li>- Service User Group: Select the service user group from the drop-down list.</li> </ul> </li> </ul> |



## 8.8.11 Traffic Flow Template (TFT)

**Traffic Flow Template**

2 Uplink TFT List

| Packet Filter Identifier | Target Route Service Profile | Remote Address | Subnet Mask | Protocol Number | Source Port Range | Destination Port Range | Type of Service | Type of Service Mask |
|--------------------------|------------------------------|----------------|-------------|-----------------|-------------------|------------------------|-----------------|----------------------|
| 1                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 2                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 3                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 4                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |

1

Download TFT List

| Packet Filter Identifier | Target Route Service Profile | Remote Address | Subnet Mask | Protocol Number | Source Port Range | Destination Port Range | Type of Service | Type of Service Mask |
|--------------------------|------------------------------|----------------|-------------|-----------------|-------------------|------------------------|-----------------|----------------------|
| 1                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 2                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 3                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 4                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 5                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 6                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 7                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |
| 8                        | None                         |                |             | 255             | 0-0               | 0-0                    |                 |                      |

**AptusLX**

Packet Filter Identifier: 1

Target Route Service Profile: Strm8

Remote Address:

Subnet Mask:

Protocol Number: 255

Source Port Range:  0

Destination Port Range:  0

Type of Service:

Type of Service Mask:

| No. | Item                     | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-----|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Traffic Flow Template    | <p>By the Traffic Flow Template (TFT), set up each type of traffic differently for the best performance.</p> <p>When you need more than one type of traffic, use both primary and secondary profiles. Use the traffic template to classify information received from an external network as the service profile for the BGAN network and your terminal.</p> <p>When using a secondary profile, assign specific addresses, protocols, and ports for the system transmission and reception by traffic filtering.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ②   | Uplink/Downlink TFT List | <p>Displays Uplink/Downlink TFT list and information.</p> <ul style="list-style-type: none"> <li>• Edit() button: To edit the profile, click the Edit() button. Then the pop-up window is opened. Enter the details, then click the <b>Update</b> button. <ul style="list-style-type: none"> <li>- Packet Filter Identifier: Displays the filter ID.</li> <li>- Target Route Service Profile: Select the target route service profile from the drop-down list.</li> <li>- Remote Address: Enter the remote address (IPv4 IP). Enter a source address for Downlink TFT and a target address for Uplink TFT.</li> <li>- Subnet Mask: Enter the subnet mask.</li> <li>- Protocol Number: Enter an unique number to assign to the protocol used. TCP is set to 6, and UDP is set to 17. The protocol number determines which protocol is used by TFT.</li> <li>- Source Port Range: Enter from and to ports of the range.</li> <li>- Destination Port Range: Enter from and to ports of the range.</li> <li>- Type of Service /Type of Service Mask: Set the value between 0 and 255. Type of Service (TOS) is used to define Quality of Service with an associated mask.</li> </ul> </li> </ul> |

## 8.8.12 USIM

| No. | Item              | Description                                                                                                                                                                                                                                                                                                                                                                                                          |
|-----|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | USIM              | Sets the use of a PIN to access the terminal.                                                                                                                                                                                                                                                                                                                                                                        |
| ②   | PIN Configuration | <p>Select Enabled or Disable to use a PIN.</p> <ul style="list-style-type: none"> <li>• Enable: You must enter a PIN before you can change settings or make calls or data sessions.</li> <li>• Disable: You can access and use the terminal without entering a PIN.</li> </ul> <p>Click the <b>Apply</b> button to apply the settings to the system. The new PIN settings will take effect at the next power on.</p> |
| ③   | Change PIN        | <p>Changes the PIN used to access the terminal.</p> <ul style="list-style-type: none"> <li>• Old PIN: Type in the old PIN.</li> <li>• New PIN: Type in the new PIN.</li> <li>• Confirm new PIN: Retype in the new PIN.</li> </ul> <p>Click the <b>Apply</b> button to apply the settings to the system. The new PIN settings will take effect at the next power on.</p>                                              |
| ④   | Mobile Number     | <p>Enters the mobile number.</p> <p>The mobile number is not available at delivery. The user has to enter the number received from the Airtime provider.</p> <p>Click the <b>Apply</b> button to apply the settings to the system.</p>                                                                                                                                                                               |

**NOTE**

The Number is for your information.

### 8.8.13 External GPIO

The screenshot shows the 'External GPIO' configuration page. On the left sidebar, the 'External GPIO' option is highlighted with a callout '1'. The main content area has a title 'External GPIO' with a callout '3'. Below the title, there are two sections: 'Inputs' with a callout '2' and 'Outputs' with a callout '3'. Each section contains two rows of settings, each with a dropdown menu currently set to 'Disable'. An 'Apply' button is located at the bottom of the 'Outputs' section.

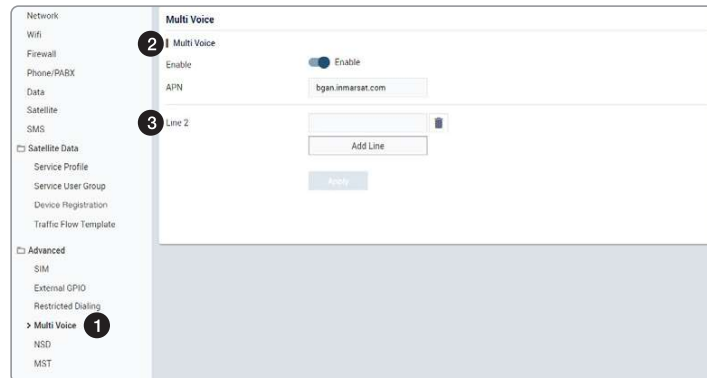
| No. | Item          | Description                                                                                 |
|-----|---------------|---------------------------------------------------------------------------------------------|
| ①   | External GPIO | Select the external General Purpose Inputs/Outputs (GPIO) settings from the drop-down list. |
| ②   | Inputs        | Select the input settings from the drop-down list.                                          |
| ③   | Outputs       | Select the outputs settings from the drop-down list.                                        |

## 8.8.14 Restricted Dialing

| No.         | Item                                                              | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                  |            |                                                     |            |                                                       |             |                                                                   |
|-------------|-------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|------------|-----------------------------------------------------|------------|-------------------------------------------------------|-------------|-------------------------------------------------------------------|
| ①           | Restricted Dialing                                                | Set up the terminal for restricted dialing.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |          |                  |            |                                                     |            |                                                       |             |                                                                   |
| ②           | Restricted Dialing                                                | Set whether to use restricted dialing or not (Enable/Disable).<br>Click the <b>Apply</b> button to apply the settings to the system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |          |                  |            |                                                     |            |                                                       |             |                                                                   |
| ③           | Allowed Dialing List                                              | <div>Displays the allowed dialing list.</div> <div><ul style="list-style-type: none"><li>• Add(+) button: To create a new restricted dialing rule, click the Add(+) button. Then the pop-up window is opened. Enter the allowed numbers or masks in the entry box. The numbers or masks must be max. 32 digits. The masks may start or end with + that positions the first or last part of a phone number, and it covers all numbers. No other special characters are allowed. See the example below.</li></ul></div> <table><thead><tr><th>Mask (+)</th><th>Numbers Accepted</th></tr></thead><tbody><tr><td>+123456789</td><td>Any number ending with 123456789<br/>ex) 00123456789</td></tr><tr><td>123456789+</td><td>Any number starting with 123456789<br/>ex) 12345678900</td></tr><tr><td>+123456789+</td><td>Any number including 123456789 in the middle<br/>ex) 0012345678900</td></tr></tbody></table> <div>Click the <b>Update</b> button. The created dialing rule is displayed on the list.</div> | Mask (+) | Numbers Accepted | +123456789 | Any number ending with 123456789<br>ex) 00123456789 | 123456789+ | Any number starting with 123456789<br>ex) 12345678900 | +123456789+ | Any number including 123456789 in the middle<br>ex) 0012345678900 |
| Mask (+)    | Numbers Accepted                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |                  |            |                                                     |            |                                                       |             |                                                                   |
| +123456789  | Any number ending with 123456789<br>ex) 00123456789               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |                  |            |                                                     |            |                                                       |             |                                                                   |
| 123456789+  | Any number starting with 123456789<br>ex) 12345678900             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |                  |            |                                                     |            |                                                       |             |                                                                   |
| +123456789+ | Any number including 123456789 in the middle<br>ex) 0012345678900 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |          |                  |            |                                                     |            |                                                       |             |                                                                   |
| ④           | Extension Status                                                  | Set whether outgoing calls of each extension should be limited to the numbers or not (Enabled/Disabled).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |          |                  |            |                                                     |            |                                                       |             |                                                                   |

## 8.8.15 Multi Voice

This function works for FB250 depending on network availability. It is not available for the Fleet One model.



| No. | Item        | Description                                                                                                                                                                                                                                                                                                                                                                                               |
|-----|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Multi Voice | <b><u>This function is not available for Fleet One model.</u></b><br>For each FB system, the BGAN normally supports one call at a time. If you wish to have more simultaneous voice calls, you can add multi-voice to your airtime subscription.                                                                                                                                                          |
| ②   | Multi Voice | Sets the multi-voice service function. <ul style="list-style-type: none"> <li>• Activate: Sets the multi-voice service by toggling the activation button (Enabled/Disable).</li> <li>• APN (Access Point Name): Displays the VoIP APN used for Multi-voice automatically. You can change the APN if necessary. You can find the Multi-voice APN in the documentation of your service provider.</li> </ul> |
| ③   | Line        | Add voice service line by clicking the <b>Add Line</b> button if you have a subscribed multi-voice service. You may need to enable the multi-voice function in your system.                                                                                                                                                                                                                               |

## 8.8.16 NSD

This function is available in the Satellite Only mode of the Routing Config.

| No. | Item                   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-----|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | NSD                    | <b><u>This function is available in the Satellite Only mode of the Routing Config.</u></b><br>Set the Routing Config in the “8.8.5 Data” on page 77.<br><br>Network Service Device (NSD) is used to manage and control the data traffic over both GX and BGAN terminals when an L-band BGAN terminal is used as a backup to a Global Xpress (GX) service.                                                                                                                                                                                                             |
| ②   | Network Service Device | Select the terminal type of NSD to connect to the antenna from the drop-down list. Click the <b>Apply</b> button to apply the settings to the system.                                                                                                                                                                                                                                                                                                                                                                                                                 |
| ③   | Fleet Edge Support     | <ul style="list-style-type: none"> <li>• Fleet Edge: Activates the function to support Fleet Edge. The IP assigned from the satellite is assigned to the device connected to the Ethernet port below.</li> <li>• Ethernet Port: In case Fleet Edge is enabled, specify the Ethernet port to which the device to receive the IP assigned from the satellite is connected.</li> <li>• APN: Enter the APN name of the Fleet Edge.</li> <li>• Username: Enter the username of the APN.</li> <li>• Password: Enter the password corresponding to the user name.</li> </ul> |

### NOTE 1.

If Fleet Edge support is activated, the satellite data connection is not available in dashboard. In that case, the satellite data connection for Fleet Edge support is only available. Voice service using the satellite network is always available regardless of Fleet Edge support activation.

### NOTE 2.

If Fleet Edge support is activated, the existing firewall rules at **SETUP > Firewall** menu are disabled and not used.

### NOTE 3.



If Fleet Edge support is activated, the existing port forwarding rules at **SETUP > Data** menu are disabled and not used.

### NOTE4.

If Fleet Edge support is activated, you can see the status in the dashboard.

## 8.8.17 MST

**MST**

**2 | Maritime Safety Terminal**

MST Connection ☒ Enabled

Listening port in FB terminal's JSON-RPC

Server

**3 | MST Handset Configuration**

Incoming Distress Call Alert ☒ Enabled

Incoming Normal Call Alert ☐ Disabled

**4 | Service Profile List**

| Name        | Traffic Class | Max Bitrate Downlink | Max Bitrate Uplink | Guaranteed Bitrate Downlink | Guaranteed Bitrate Uplink | APN                             |
|-------------|---------------|----------------------|--------------------|-----------------------------|---------------------------|---------------------------------|
| SafetyVoice | Background    | 0                    | 0                  | 0                           | 0                         | ipvoice.bgan.inmarsat.com       |
| SafetyP5    | Background    | 0                    | 0                  | 0                           | 0                         | priority-mods.bgan.inmarsat.com |
| SafetyP6    | Background    | 0                    | 0                  | 0                           | 0                         | priority-mods.bgan.inmarsat.com |
| SafetyP9    | Background    | 0                    | 0                  | 0                           | 0                         | priority-mods.bgan.inmarsat.com |
| SafetyP11   | Background    | 0                    | 0                  | 0                           | 0                         | mods.bgan.inmarsat.com          |

**AptusLX**

Name

Traffic Class

Max Bitrate Downlink

Max Bitrate Uplink

Guaranteed Bitrate Downlink

Guaranteed Bitrate Uplink

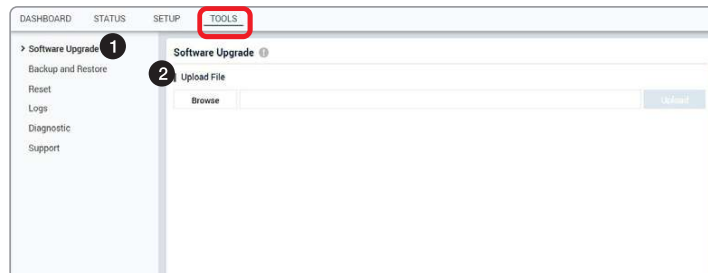
User Defined APN

| No. | Item                      | Description                                                                                                                                                                                                                                                                                                                                                          |
|-----|---------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | MST                       | The Maritime Safety Terminal (MST) performs all mariner interactions with the Maritime Safety Data Service (MSDS), including the processing of vessel generated Distress Alerts that are initiated by the dedicated distress button.                                                                                                                                 |
| ②   | Maritime Safety Terminal  | <p>Sets the maritime service function.</p> <ul style="list-style-type: none"> <li>MST Connection: Set the maritime service by toggling the activation button (Enabled/Disabled).</li> <li>Server: Enter the listening port number in the JSON-RPC server.</li> </ul>                                                                                                 |
| ③   | MST Handset Configuration | <ul style="list-style-type: none"> <li>Incoming Distress Call Alert: This function is not available for setting activation button because it is fixed as Enabled.</li> <li>Incoming Normal Call Alert: Set the normal call alert by toggling the activation button (Enabled/Disabled). Click the <b>Apply</b> button to apply the settings to the system.</li> </ul> |
| ④   | Profile List              | <p>Displays the profile list for safety service using MST.</p> <p>Refer to the “8.8.8 Service Profile” on page 81 to edit details.</p>                                                                                                                                                                                                                               |

## 8.9 Tools

This menu sets and displays the Software Upgrade, Backup & Restore, Reset, Logs, Diagnostic, and Support function.

### 8.9.1 Software Upgrade



| No. | Item             | Description                                                                                                                                                                                                                                                                                                                                                                                        |
|-----|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Software Upgrade | Upgrades antenna software firmware.                                                                                                                                                                                                                                                                                                                                                                |
| ②   | Upload File      | Browse and select the package firmware file to upload and click the <b>Upload</b> button. The update may take a few minutes to complete. The upload time may vary due to a variety of factors such as the speeds of your network. Uploading an incorrect firmware file may cause serious damage to your antenna and BDU. Refer to the following "Package Update Procedures" page for more details. |

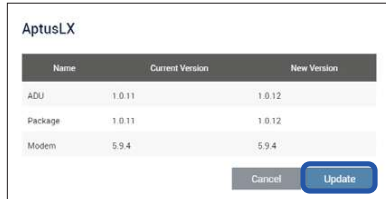


### Package Firmware Update Procedures:

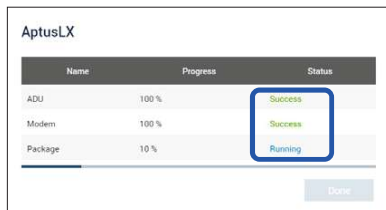
1. Browse and select the upgrade package file to upload. Click on the **Upload** button to transfer the Firmware package file (\*.bin) to the BDU module.



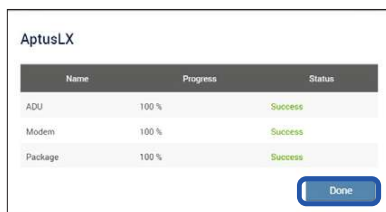
2. The antenna firmware state will appear in the pop-up window. Check the current version and the new version. Click the **Update** button.



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



4. If the firmware is successfully upgraded, it will display as **Success**. Click the **Done** button to close the pop-up window.

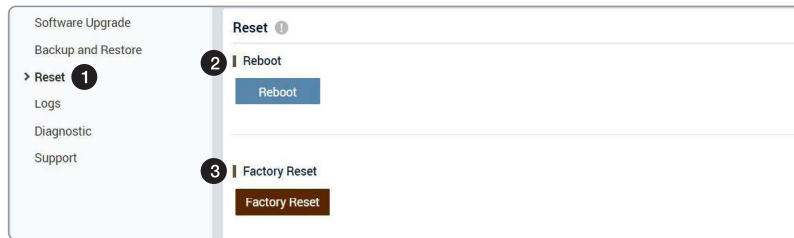


## 8.9.2 Backup and Restore

The screenshot shows a web interface for 'Software Upgrade'. On the left is a sidebar menu with options: 'Backup and Restore' (marked with a circled 1), 'Reset', 'Logs', 'Diagnostic', and 'Support'. The main content area is titled 'Backup and Restore' (marked with a circled 1). It contains two sections: 'Backup' (marked with a circled 2) which has a blue 'Backup' button, and 'Restore' (marked with a circled 3) which has a 'Browse' button, a text input field, and a blue 'Upload' button.

| No. | Item               | Description                                                                                                                                     |
|-----|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Backup and Restore | Backs up user configuration files to PC and Restores the antenna settings.                                                                      |
| ②   | Backup             | Saves user configuration files to PC. Click the <b>Backup</b> button to apply the settings to the system.                                       |
| ③   | Restore            | Restores the antenna setting by using the setting files saved from the PC. Click the <b>Restore</b> button to apply the settings to the system. |

### 8.9.3 Reset



| No. | Item          | Description                                                                                                    |
|-----|---------------|----------------------------------------------------------------------------------------------------------------|
| ①   | Reset         | Resets the antenna system and factory reset.                                                                   |
| ②   | Reboot        | Click the <b>Reboot</b> button to reset the antenna system. The user configuration is not reinitialized.       |
| ③   | Factory Reset | Click the <b>Factory Reset</b> button to initialize the antenna system. The user configuration is initialized. |

## 8.9.4 Logs

The screenshot shows a web interface with a sidebar on the left containing the following menu items: Software Upgrade, Backup and Restore, Reset, Logs (highlighted with a circled '1'), Diagnostic, and Support. The main content area is titled 'Logs' with a circled '2' next to the 'Log Download' section. Below this title, there are two date input fields labeled 'From' and 'To', both containing the date '7/26/2021'. To the right of these fields is a blue button labeled 'Download Log File'.

| No. | Item         | Description                                                                                                                                                                                   |
|-----|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Logs         | Downloads the antenna log data.                                                                                                                                                               |
| ②   | Log Download | Displays the antenna log list. <ul style="list-style-type: none"><li>• Download Log File: Any log data (.tgz) within a month can be downloaded. Click the Download Log File button.</li></ul> |

## 8.9.5 Diagnostic

The screenshot shows the 'Diagnostic' menu in the AptusLX interface. The left sidebar contains links for 'Software Upgrade', 'Backup and Restore', 'Reset', 'Logs', 'Diagnostic' (highlighted), and 'Support'. The main content area is titled 'Diagnostic' and contains five numbered steps:

- 1** Diagnostic (selected in the sidebar)
- 2** Hardware Test Mode Status: Shows 'Operation Mode' with a toggle switch set to 'Active'.
- 3** Self Test: Contains a 'Start' button.
- 4** Self Test Result: Displays 'No Test Result'.
- 5** ADU Diagnostic: Contains a table with columns 'Test', 'Result', and 'Reason'. The table lists various components and their status.

| Test            | Result | Reason |
|-----------------|--------|--------|
| Comms           | Idle   | -      |
| IMU Sensor      | Idle   | -      |
| AZ Motor        | Idle   | -      |
| EL Motor        | Idle   | -      |
| MPU Temperature | Idle   | -      |
| FEM Temperature | Idle   | -      |
| MoCA PHY        | Idle   | -      |
| MPU PHY         | Idle   | -      |
| Modem PHY       | Idle   | -      |

A 'Start' button is located at the bottom of the ADU Diagnostic section.

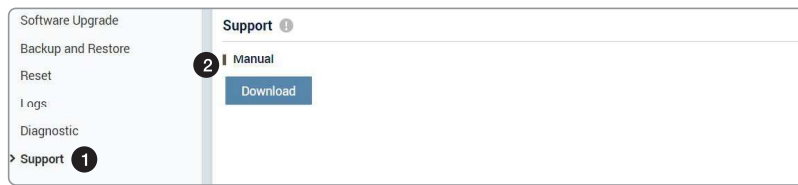
| No. | Item                      | Description                                                                                                                                                                                             |
|-----|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ①   | Diagnostic                | Executes antenna diagnosis test to check the antenna status.                                                                                                                                            |
| ②   | Hardware Test Mode Status | Sets the hardware test function by toggling the activation button (Active/Inactive).                                                                                                                    |
| ③   | Self Test                 | The activation button must be selected to the "Active" in the previous step.<br>Click the <b>Start</b> button to run the self-test.                                                                     |
| ④   | Self Test Results         | Displays the self-test result.                                                                                                                                                                          |
| ⑤   | ADU Diagnostic            | Executes the ADU diagnosis test to check each part of ADU status.<br>Select the ADU part to test by toggling the activation button (Enabled/Disable).<br>Click the <b>Start</b> button to run the test. |



### WARNING

While selecting the **Active** button in the Hardware Test Mode Activate menu, the system is in the hardware test mode. Select the **Inactive** button for normal operation.

## 8.9.6 Support



| No. | Item    | Description                                                                     |
|-----|---------|---------------------------------------------------------------------------------|
| ①   | Support | Downloads the User Guide.                                                       |
| ②   | Manual  | The user guide file (.pdf) can be downloaded. Click the <b>Download</b> button. |

# Chapter 9. Specification

## 9.1 Technical Specification

| Above Decks Unit (ADU)               |                                                 |                                            |
|--------------------------------------|-------------------------------------------------|--------------------------------------------|
| ADU Height                           |                                                 | 295 mm (11.61")                            |
| ADU Diameter                         |                                                 | Ø 291 mm (11.45")                          |
| ADU Weight                           |                                                 | 4.9 kg (10.80 lbs)                         |
| Rx                                   | Frequency                                       | 1518.0 ~ 1559.0 MHz L-Band                 |
|                                      | Gain                                            | 10 dB                                      |
| Tx                                   | Frequency                                       | 1626.5 ~ 1675.0 MHz L-Band                 |
|                                      | Gain                                            | 10 dB                                      |
| Polarization                         |                                                 | RHCP (Rx and Tx)                           |
| G/T                                  |                                                 | -15.5 dB/K                                 |
| EIRP                                 |                                                 | 15.1 dBW                                   |
| Axial Ratio                          |                                                 | <4 dB                                      |
| Antenna Motion                       |                                                 | - 25 ~ 115°                                |
| Ship's Motion                        | Roll                                            | ± 30° / 4 s                                |
|                                      | Pitch                                           | ± 15° / 3 s                                |
|                                      | Yaw                                             | ± 10° / 5 s                                |
|                                      | Turning Rate                                    | 36°/sec and 12°/s <sup>2</sup>             |
|                                      | Headway                                         | 30 knots                                   |
| ADU to BDU Cable (Antenna Cable)     |                                                 | Single RF Cable                            |
| Antenna Power                        |                                                 | 48 V DC supplied from BDU over RF Cable    |
| Below Decks Unit (BDU)               |                                                 |                                            |
| BDU Size                             |                                                 | 315 x 190 x 42 mm (12.4" x 7.48" x 1.655") |
| BDU Weight                           |                                                 | 1.5 kg (3.3 lbs) (Stand-alone Type)        |
| LED Indicator                        |                                                 | 3 LEDs for Power, Tracking, Event          |
| GNSS                                 |                                                 | GPS, GLONASS                               |
| SIM                                  | 1 ea, 2FF Push-Push type with locking structure | User Authentication                        |
| Ethernet for <b><i>FB250</i></b>     | 4 ea, RJ45 Female                               | TCP/ IP Connection, including 2 Port PoE   |
| Ethernet for <b><i>Fleet One</i></b> | 2 ea, RJ45 Female                               | TCP/ IP Connection with 2 Port PoE         |
| RF Interface                         | 1 ea, TNC Female                                | Sub-System Connection to ADU               |
| Analog                               | 1 ea, RJ14 Female                               | Analog Phone                               |
| GPIO                                 | 1 ea, (16 pins)                                 | General Purpose I/O                        |
| Wi-Fi                                | 1 ea, SMA Female                                | External Wi-Fi Antenna                     |
| On/Off switch                        | 1 ea, Power Switch                              | System Power Switch                        |
| Reset                                | 1 ea                                            | System Reset                               |
| Ground                               | 1 ea                                            | Grounding                                  |
| BDU Power Input                      | 10.8 ~ 30 V DC, 120 W                           |                                            |

## 9.2 Environmental Specification

| Test                 | Intellian Standard                                                                                                     |                                                                       |
|----------------------|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|
| Temperature (ADU)    | Operational                                                                                                            | IEC-60945 (-25 °C to + 55 °C / Power On)                              |
|                      | Survival                                                                                                               | IEC-60945 (-40 °C to + 80 °C / Powered On and a non-functional state) |
|                      | Storage                                                                                                                | IEC-60945 (-40 °C to + 85 °C / Power off)                             |
| Temperature (BDU)    | Operational                                                                                                            | IEC-60945 (-25 °C to + 55 °C)                                         |
|                      | Survival                                                                                                               | IEC-60945 (-40 °C to + 80 °C)                                         |
|                      | Storage                                                                                                                | IEC-60945 (-40 °C to + 85 °C)                                         |
| Humidity             | IEC-60068-2-30<br>Upper test Temp.: + 40 °C (-3), Humidity 98 %<br>Lower test Temp.: +15 °C (+3), Humidity 71 % ~ 78 % |                                                                       |
| Vibration            | Operational                                                                                                            | IEC-60945<br>Random 1.05 g RMS                                        |
|                      | Survival                                                                                                               | IEC-60721-3-6 Class 6M3<br>Random 1.7 g RMS                           |
| Shock (ADU)          | Operational                                                                                                            | Half sine, 20g / 11 ms                                                |
| Shock (BDU)          | Operational                                                                                                            | IEC-60068-2-27<br>10 g/11 ms, 20 g/7 ms                               |
|                      | Survival (Transient)                                                                                                   | IEC-60721-3-6 Class 6M3<br>(10 g/11 ms, 30 g/6 ms, 50 g/3 ms)         |
|                      | Survival (Bump)                                                                                                        | IEC-60721-3-6 Class 6M3<br>(25 g/6 ms)                                |
| Salt Mist            | Saline solution: 5 % NaCl, PH 6.5 to 7.2 at 20 °C ± 2 °C<br>Storage period: 7 Days (IEC-60945)                         |                                                                       |
| Wind Load            | 200 km/hr                                                                                                              |                                                                       |
| Ingress Rating (ADU) | IP56 (Water Proofing: IEC-60529)                                                                                       |                                                                       |
| Ingress Rating (BDU) | IP31                                                                                                                   |                                                                       |



## Chapter 10. Warranty Policy

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

Warranty periods commence from the date of shipment from Intellian facility, or date of installation which is come sooner. Providing maximum 6 months Warranty additionally if submission of authorized form which is described installation occurs within 6 months from the shipment date.

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

# Chapter 11. Appendix

## 11.1 Appendix A. Tightening Torque Specification

This table shows the recommended values of tightening torques.

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