



Flat Panel Compact Series

Eutelsat OneWeb LEO User Terminal

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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Disclaimer

The information in this user guide is subject to change without prior notice out the product life cycle. The printed version of the guide is periodically updated, but it may contain inaccuracies or omissions compared to the most recent product information. The most up-to-date information is always available on our website at intelliantech.com.

Table of Contents

Chapter 1. Precautions	8
1.1 Warnings, Cautions, and Notes	8
1.2 General Precautions	9
Chapter 2. Certifications	11
Chapter 3. Introduction	15
3.1 Introduction to OW10Hx	15
3.2 OW10Hx Features	15
Chapter 4. Planning Installation	16
4.1 Installing Mobile Application	16
4.2 Installation Precautions	16
4.3 Selecting Installation Site	17
4.3.1 Installation Location for Antenna	17
4.3.2 Installation Location for Customer Network Exchange (CNX)	17
4.3.3 Minimizing Satellite Blockage	18
4.3.4 Avoid RF Interference (For Maritime UT)	18
4.3.5 RF Hazard Precautions	19
4.4 RF Hazard Sticker Placement	20
4.5 System Package	20
4.5.1 Outdoor Unit (ODU)	20
4.5.2 Customer Network Exchange (CNX)	21
4.5.3 Packing List	22
4.5.4 Installer/Customer Supplied Equipment	25
4.6 System Cables	25
4.6.1 Antenna Power+Data Cable	25
4.7 Unpacking the UT	26
Chapter 5. Product Overview	27
5.1 Antenna Dimensions and Weight	27
5.2 Parts Identification	28
Chapter 6. Installing a Land Fixed UT (OW10HL)	29
6.1 Multiple Mount Types	29
6.2 Mounting Antenna Using Adjustable Mount Adapter	29
6.2.1 Attaching Adjustable Mount Adapter to Pole	29
6.2.2 Mounting Antenna on Adjustable Mount Adapter	31

Chapter 7. Installing Maritime UT (OW10HM)	33
7.1 Antenna Mounting Requirements	33
7.2 Mounting Antenna Using Maritime Mount Adapter (Optional)	33
7.2.1 Attaching Antenna to a Pole Mount	34
7.2.2 Attaching Antenna to a Mast	38
7.2.3 Routing Cable Outside of the Mast (Example Only)	40
7.2.4 Antenna Mounting Hole Pattern (Custom Mount Adapter)	41
Chapter 8. Installing a Land Mobile Mount Adapter (OW10HV)	42
8.1 Mounting Antenna Using Land Mobile Mount Adapter	42
8.1.1 Attaching the Antenna to the Land Mobile Mount Adapter	42
8.1.2 Attaching to Vehicle Crossbars	44
Chapter 9. Connecting Cable to the Antenna	46
9.1.1 Connecting Cable to the Antenna Power & Data Port	46
9.1 Connecting Ground Braid for Land Fixed (OW10HL)	47
9.2 Connecting external GNSS (Optional)	48
Chapter 10. Installing Indoor Unit (IDU)	49
10.1 Selection of Installation Site	49
10.1.1 Selection of CNX-WIFI Installation Site	49
10.1.2 Selection of CNX-BB Installation Site	49
10.2 Dimensions	50
10.2.1 CNX-WIFI Dimensions	50
10.2.2 CNX-BB Dimensions	51
10.3 Antenna System Configuration	52
10.3.1 CNX-WIFI Back Panel Connectors	60
10.3.2 CNX-WIFI Connector Pinout Guide	60
10.3.3 Connecting Power to CNX-WIFI	62
10.3.4 Connecting CNX-WIFI to Antenna	62
10.4 CNX-BB Cable Connection	63
10.4.1 CNX-BB Back Panel Connectors	63
10.4.2 CNX-BB Connector Pinout Guide	63
10.5 CNX-Rack AC/DC Cable Connection	65
10.5.1 CNX-Rack AC/DC Front Panel Connectors	65
10.5.2 CNX-Rack AC/DC Connector Pinout Guide	65
10.4.3 Connecting Power to CNX-Rack AC/DC	67
10.4.4 Connecting CNX-Rack AC/DC to Antenna	67
Chapter 11. Operating the CNX	68
11.1 Front Panel View	68
11.1.1 CNX-WIFI Front Panel	68
11.1.2 CNX-BB Front Panels	69
11.1.3 CNX-Rack AC/DC Front Panels	70
11.2 CNX-WIFI Modes of Operations	71
11.2.1 Bridge Mode	71
11.2.2 Router Mode	72

11.3 CNX-WIFI Settings	72
11.3.1 Upating Wi-Fi Passwords for CNX-WIFI	72
11.3.2 Updating the Country Code for CNX-WIFI	75
11.4 Updating the CNX-WIFI Software	78
11.5 Updating the UT IP Address	80
Chapter 12. Using Local User Interface (LUI)	82
12.1 Introduction	82
12.2 Requirements to Access Eutelsat OneWeb Web Interface	82
12.3 Accessing Webpage	83
12.3.1 Connection through LAN Port	83
12.4 Webpage Layout	84
12.4.1 Navigation bar	84
12.4.2 Home Page	85
12.4.3 Footer	85
12.5 Software	86
12.5.1 Verify Software	86
12.5.2 Downloading the Ephemeris file	87
Chapter 13. Specification	90
13.1 Technical Specification	90
13.1.1 Antenna Specification	90
13.1.2 CNX-WIFI Specification	90
13.1.3 CNX-BB Specification	91
13.1.4 CNX-Rack AC/DC Specification	91
Chapter 14. Warranty	92
Chapter 15. Appendix	93
15.1 Pre-Installation Checklist	93
15.1.1 Pre-Installation Checklist Land Fixed	93
15.1.2 Pre-Installation Checklist Maritime	94
15.1.3 Pre-Installation Checklist Land Mobility	95
15.2 Selecting Pole Mount for Land Fixed (Optional)	96
15.2.1 Installing Non-Pen Mount (NPM) (Optional)	96
15.2.2 Installing a TriMast Mount (Optional)	100
15.2.3 Installing a Quadpod Mount (Optional)	103
15.2.4 Installing Customized Pole Mount	106
15.3 Tightening Torque Specification	108
15.4 Maintenance	109
15.4.1 Fan Replacement	109
15.5 Surface Maintenance Guide	110

List of Figures

Chapter 4. Planning Installation	16
Figure 1: Minimizing Satellite Blockage (example)	18
Figure 2: Potential RF Interference	18
Figure 3: RF Hazard Sticker Placement (Example Only)	20
Figure 4: Compact Flat Panel Antenna	20
Figure 5: Customer Network Exchange (CNX)	21
Chapter 5. Product Overview	27
Figure 6: Antenna Dimension	27
Chapter 6. Installing a Land Fixed UT (OW10HL)	29
Figure 7: Tighten Adjustable Mount Adapter to Pole	29
Figure 8: Loosen Bolts on Adjustable Mount Adapter	30
Figure 9: Using Leveling Tool	30
Figure 10: Moving Antenna Above Adjustable Mount Adapter	31
Figure 11: Antenna on Adjustable Mount Adapter	31
Figure 12: Attach Antenna to Adjustable Mount Adapter	32
Chapter 7. Installing Maritime UT (OW10HM)	33
Figure 13: Routing Cable Through Outside of Mast	40
Figure 14: Antenna Mounting Hole Template	41
Chapter 8. Installing a Land Mobile Mount Adapter (OW10HV)	42
Figure 15: Loosening Clamp Knobs of the Land Mobile Mount Adapter	44
Figure 16: Placing the Plate and Land Mobile Mount Adapter	44
Figure 17: Assembling the M8 U-Clamp	45
Figure 18: Fixing the Land Mobile Mount Adapter on the Cross Bar	45
Chapter 9. Connecting Cable to the Antenna	46
Figure 19: Cable Connection of CNX to Antenna	46
Figure 20: Connecting the Ground Braid	47
Figure 21: Connecting the SMA connector of the external GNSS cable to the GNSS connector	48
Figure 22: Connecting the SMA connector of the external GNSS cable to the GNSS connector	48
Chapter 10. Installing Indoor Unit (IDU)	49
Figure 23: CNX-WIFI Dimensions	50
Figure 24: CNX-BB Dimensions	51
Figure 25: Antenna System Configuration with CNX-WIFI	52
Figure 26: Antenna System Configuration with CNX-BB	53
Figure 27: Antenna System Configuration at DC Power site	54
Figure 28: Antenna System Configuration at DC Power site	55
Figure 33: Single Terminal Configurations	56
Figure 34: Dual Terminal Configurations	56
Figure 29: CNX-WIFI Back Panel Ports	60

Figure 30: Connecting Power to CNX-WIFI.....	62
Figure 31: Connecting Power to CNX-WIFI.....	63
Figure 32: CNX-BB Back Panel Ports.....	63
Chapter 11. Operating the CNX.....	68
Figure 35: Front Panel View of CNX-WIFI.....	68
Figure 36: Front Panel View of CNX-BB.....	69
Figure 37: CNX-WIFI Label.....	72
Chapter 12. Using Local User Interface (LUI).....	82
Figure 38: Back Panel LAN Port Connection with CNX-BB.....	83
Figure 39: Back Panel LAN Port Connection with CNX-WiFi.....	83
Chapter 15. Appendix.....	93
Figure 40: Concrete Blocks Arrangement.....	99
Figure 41: Assembling the Mast Pole and Main Part.....	103
Figure 42: Assembling the Mounting Feet.....	104
Figure 43: Installing the Plastic Cover.....	105
Figure 44: Insert and Tighten the Screws.....	105
Figure 45: Removing Screws.....	109
Figure 46: Unclipping Fan.....	109
Figure 47: Disconnect Fan.....	110

Chapter 1. Precautions

Prior to installation, read this Installation and Operations Guide carefully including the safety warnings and information. Failure to do so could result in serious injury or inoperability of the terminal.

Antenna installation must be provided by a suitably trained professional installation technician or by a qualified antenna installation service. Installation is not to be attempted by someone not trained or experienced in this type of work.

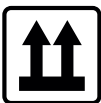
1.1 Warnings, Cautions, and Notes

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.

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

1.2 General Precautions

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

	THIS WAY UP Place the boxes/crates on the floor with the arrow pointing up.
	FRAGILE Since the Radome is fragile, handle it with care. Do not apply excessive pressure or shock. These may cause surface cracking or other damage.
	KEEP DRY - Always make sure the antenna is stored on a dry floor. - The antenna can withstand ordinary rain. However, water resistance cannot be guaranteed if submerged. - Keep the antenna in a dry place with sufficient ventilation. Do not store the antenna wrapped in a tarp, tent, vinyl, and others.
	HANDLE WITH CARE Handle the carton with care.
	STACKING HEIGHT The number of boxes that can be safely stacked is three.
	USE NO HOOKS Absolutely no hand hooks should be attached to pull the parcel.

- Review the general safety measures
- Familiarize yourself with the antenna and mounting instructions prior to climbing any roof or ladder.
- Verify that all safety measures for outdoor or rooftop installation are arranged.
- Verify all requirements before beginning the actual installation to determine if the equipment and necessary items are available and functioning properly.
- Before you begin a site installation, check the appropriate electrical code requirements and other regulations governing this kind of installation within the country of use.
- When installing, replacing, or disconnecting any cable components, ensure that the antenna is grounded correctly before beginning the work.
- Avoid installing antennas near high voltage overhead cables or similar.
- Do not ship by rail.
- Install the grounding system for the antenna and support structure before installing the outdoor unit and before connecting the coaxial cable to the CNX. This protects the system against lightning strikes during installation.
- Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.
- The outdoor antenna and antenna cables are electrical conductors so transients or electrostatic discharges may occur at the antenna during thunderstorms. If the antenna is not installed properly, the electronic equipment may be damaged and/or cause personal injury or death to persons touching the

exposed metal connectors of the electronic equipment.

- Do not touch antennas or antenna cables during a thunderstorm.
- The outdoor unit (ODU) must be properly mounted and secured to the mount. An improperly installed ODU could result in detachment of the unit which could cause disruption in the unit's operation or could result in serious injury or death from a falling unit.
- When installing the antenna:
 - DO NOT use a metal ladder.
 - DO dress properly: wear rubber gloves, shoes with rubber soles and heels, and a long sleeve shirt or jacket.

CAUTION



- Do not connect the power supply to the CNX or connect the power supply to a power source until you are instructed to do so.
- Do not put heavy objects on the equipment to avoid crushing the equipment or reducing the heat dissipation efficiency.



WARNING

The CNX-WIFI can expose you to BPA, which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warning.ca.gov.

Chapter 2. Certifications

Doc Number IT24-DC0703-02



Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709, Korea declare under our sole responsibility that the products below, to which this declaration relates, are in conformity with the *essential requirements* and *other relevant requirements* of the standards listed below for **CE**.

Product Information:

Product Name(s):	OW11Fx (OW11FL, OW11FV, OW11FM)
-------------------------	---------------------------------

Category	Standard(s) Applied in Full	Test Report Number	Result
CE-SAFETY (Art 3.1.a)	EN IEC 62368-1:2020 + A11:2020	MET 132223 ⁽¹⁾	Pass
CE-EMC (Art. 3.1.b)	EN 55032 (2015) /A11(2020)	4493ERM.001 ⁽²⁾	Pass
	CISPR 32:2015+A1:2019		
	EN 55035 (2017) /A11(2020)		
	ETSI EN 301 489-1 V2.2.3 (2019-11)		
	ETSI EN 301 489-12 V3.2.1 (2021-11)		
	EN 61000-3-2		
	EN 61000-3-3		
	EN 62311: 2008	WIR132223-EN62311_50383_50385 ⁽¹⁾	Pass
	EN IEC 62311:2020 per 2014/53/EU RED		
	EN 50385		
CE-RED SPECTRUM (Art. 3.2)	ETSI EN 303 980 V1.2.0 (2021-02)	WIR132223-ETSI303 ⁽¹⁾	Pass
Maritime navigation and radiocommunication equipment and systems	IEC 60945 (2002-08)	4493ERM.002 ⁽²⁾	Pass
Surge Immunity	EN 61000-4-5, Surge Immunity	4493ERM.001 ⁽²⁾	Pass

Supplementary Information:

Testing Organization	(1)Eurofins Electrical and Electronic Testing NA, Inc. 914 West Patapsco Avenue Baltimore, MD 21230 (2)DEKRA Certification, Inc. 405 Glenn Dr. Suite 12, Sterling, VA 20164
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do 17709 Korea

Authority: Dojun Byun / SVP R&D, CTO



Signature: 

Date: July 2, 2024

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Declaration of Conformity (DoC)

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Product Information:

Product Name(s):	OW11Fx (OW11FL, OW11FV, OW11FM)
-------------------------	---------------------------------

The following harmonized standards and other technical specifications were used in support of this declaration:

Standard(s) Applied	Test Items	Clause	Test Report No.	Result
IEC 60529:1989+A1:1999_A2:20 13	Test for protection against access to hazardous parts (IP6X)	Refer to 5.6	OT-246-RRK-029	Pass
	Test for protection against solid foreign objects (IP6X)	Refer to 6.4		
	Test for protection against water (IPX6)	Refer to 7.4		

Supplementary Information:

Testing Organization	ONETECH Corp 43-14, Jinsaegol-gil, Chowol-eup, Gwangju-si, Gyeonggi-do 12735, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-di, Gyeonggi-do 17709 Korea

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Doc Number IT24DC0703-03



Declaration of Conformity (DoC)

We, Intellian Technologies, Inc. located at 18-7, Jinwisandan-ro, Jinwi-myeon (Chungho-ri), Pyeongtaek-si, Gyeonggi-do 17709 Korea declare under our sole responsibility that the products described below, to which this declaration relates, are in conformity with the *essential requirements* and *other relevant requirements* for **FCC Part 15 Subpart B**.

Product Information:

Product Name(s):	OW11Fx (OW11FL, OW11FV, OW11FM)
-------------------------	---------------------------------

Test Result

Standard	Requirement	Rule Section	Test Report Number	Result
- FCC Rules and Regulations CFR 47, Part 15, Subpart B (2023) - ICES-003 Issue 7 (October 2020)	Conducted Emission	ANSI C63.4 - (2014)	4493ERM.003	Pass
	Radiated Emissions	ANSI C63.4 - (2014)		Pass

Supplementary Information:

Testing Organization	DEKRA Certification, Inc. 405 Glenn Dr. Suite 12, Sterling, VA 20164
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-di, Gyeonggi-do 17709 Korea

Authority:

Dojun Byun
/ SVP R&D, CTO

Signature:



Date:

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TCB

GRANT OF EQUIPMENT
AUTHORIZATION

TCB

Certification

Issued Under the Authority of the
Federal Communications Commission

By:

Eurofins Electrical and Electronic Testing
NA, Inc
914 W. Patapsco Avenue
Baltimore, MD 21230-3432

Date of Grant: 06/27/2024

Application Dated: 06/27/2024

Intellian Technologies, Inc.
18-7, Jinwisandan-ro, Jinwi-myeon (Chungho-ri)
Pyeongtaek-si, Gyeonggi-do, 17709
South Korea

Attention: JunHui Lee , Senior Manager

NOT TRANSFERABLE

EQUIPMENT AUTHORIZATION is hereby issued to the named GRANTEE, and is
VALID ONLY for the equipment identified hereon for use under the Commission's Rules
and Regulations listed below.

FCC IDENTIFIER: XXZ-OW10HX

Name of Grantee: Intellian Technologies, Inc.

Equipment Class: Licensed Non-Broadcast Station Transmitter

Notes: Compact User Terminal Antenna

<u>Grant Notes</u>	<u>FCC Rule Parts</u>	<u>Frequency Range (MHZ)</u>	<u>Output Watts</u>	<u>Frequency Tolerance</u>	<u>Emission Designator</u>
	25	14013.0 - 14487.0	0.033	6.654 PM	18M9G7W
	25	14022.9 - 14477.1	0.066	6.654 PM	37M7G7W
	25	14013.0 - 14487.0	0.033	6.654 PM	18M1D7W
	25	14022.9 - 14477.1	0.065	6.654 PM	37M7D7W

Output power listed is conducted. The antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons. Installers must be provided with antenna installation instructions for satisfying RF exposure compliance. This antenna must not be co-located or operating in conjunction with any other antenna or transmitter except in accordance with FCC multi-transmitter product procedures. End users must be provided with transmitter operating conditions for satisfying RF exposure compliance. Antenna must be installed such that main lobe is aimed at 37 degrees elevation from the horizon.

Chapter 3. Introduction

3.1 Introduction to OW10Hx

The OW10Hx is an electronically scanned array (ESA) user terminal (UT) which can be operated in the Eutelsat OneWeb low earth orbit (LEO) satellite constellation. The Eutelsat OneWeb communications network comprises of terrestrial gateways positioned around the globe communicating with Eutelsat OneWeb user terminals. A radio link to the satellites is established using the UT operating in the Ku-band.

The Compact series consists of three product variants, the OW10HL (fixed land), the OW10HM (maritime), and the OW10HV (land mobility). The UTs provide network and internet access via the Eutelsat OneWeb network.

3.2 OW10Hx Features

- Active electronically scanned array.
- Field-of-view: $\pm 55^\circ$ Elevation from zenith, 360° azimuth.
- Receive nominal Gain-over-Temperature (G/T): 9 dB/K at boresight.
- Transmit Effective Isotropic Radiated Power (EIRP) supports Eutelsat OneWeb's dual carrier requirement (+36.6 dBW).
- Dual GNSS receivers provide differential GPS location to support automated true north calibration and highly accurate timing reference.
- The KIM (kinetic inertial module) provides tilt measurement to aid in the installation. Together, the IMX-5 and GPX-1 modules function as an Inertial Navigation System which is responsible for providing roll, pitch, and yaw angles to be used by an Antenna Control Unit for beam pointing compensation. In addition, the INS provides a User Terminal with position, velocity, acceleration, and timing. The combination of the IMX-5 and GPX-1 is known as the Kinetic Interface Module (KIM).
 - This feature aids in the installation of the OW10Hx series as well as supports mobility use cases for the OW10HM and OW10HV.
- Efficient enclosure profile for aesthetics as well as functional rain and snow shedding radome.
- The indoor CNX feeds power and data over a single IFL coax cable for easy installation.
- There are multiple variants to support all use cases and applications.
- User friendly Intellian Mobile Application simplifies installation, maintenance, and troubleshooting.

Chapter 4. Planning Installation



CAUTION

- Be sure to complete the pre-installation checklist before you begin installing the antenna. Refer to [Pre-Installation Checklist on page 93](#)
- Removing the radome voids the warranty.

4.1 Installing Mobile Application

A mobile app for step-by-step installation, troubleshooting, and monitoring is available on Google Play and the Apple App store via a custom link. Scan the appropriate QR to download the mobile app.



The app will walk through the appropriate steps depending on the type of installation. Some key highlights of the Intellian mobile app include:

- Guided installation with step-by-step instructions
- Blockage recognition / tilt check to verify potential installation sites
- Dashboard displays link quality and component health
- Troubleshooting support: Error codes with recovery actions, offline FAQs and knowledge base
- Quick support case registration
- User login / password security

4.2 Installation Precautions

The User Terminal installation requires thorough planning and full knowledge of the safety measures that must be followed for the specific installation environment. Failure to follow the correct installation process may lead to the injury of the installer and/or cause damage to the system. To maximize the performance of the system, review this installation guide and execute the installation process as instructed.

To ensure your own safety and effectively complete the installation, carefully review the safety measures from the ["1.2 General Precautions" on page 9](#).

4.3 Selecting Installation Site

Before installing the antenna system, consider the best place to position the antenna for both performance and safety. Refer ["15.1 Pre-Installation Checklist" on page 93](#) for more details.

4.3.1 Installation Location for Antenna

The antenna should be placed in an area with:

- Safe mounting location
- No radio frequency (RF) signal blockage
- Clear and stable environment



NOTE

When the antenna is transmitting, obstacles in the way of the beam path will decrease the satellite signal strength and interrupt the connection. The antenna unit should have direct line-of-sight within 53° from zenith (or above 37° of elevation from local horizon at all directions) without any obstacles in the beam path.

4.3.2 Installation Location for Customer Network Exchange (CNX)

The CNX should be placed:

- In a dry, cool, and ventilated location.
- Within 1.8 m (1.8 ft) of a power source.

Distance from the antenna is dependent on the cable type used. Refer to ["4.6 System Cables" on page 25](#) for details.

4.3.3 Minimizing Satellite Blockage

The ideal antenna site should have a clear view of the horizon with 360° of clearance. For the antenna to operate effectively, avoid blockages. Examples are listed below. To minimize the influence of obstacles, signal interference, or reflections, note the following guidelines:

- Avoid trees in the signal path. Seasonal changes such as leaves or hanging icicles can impact signal absorption. Obstructions for Land Fixed may include neighboring buildings, bridges, trees, or power lines. Obstructions for Maritime may include masts, antennas, or other structures.
- Make sure there are no obstacles within $\pm 53^\circ$ from zenith.

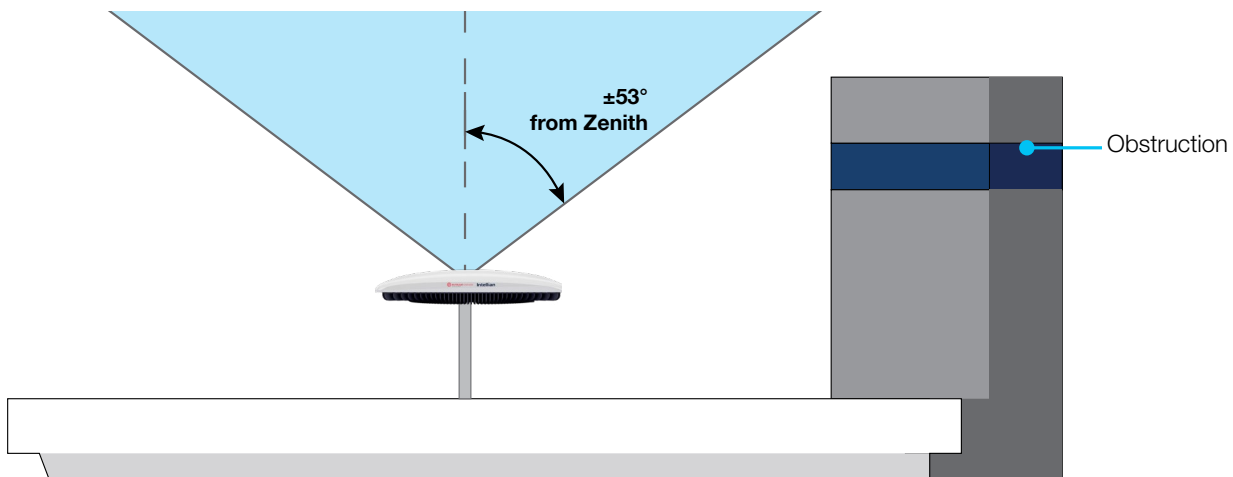


Figure 1: Minimizing Satellite Blockage (example)

4.3.4 Avoid RF Interference (For Maritime UT)

Do not install the antenna near high-power shortwave radars. Most radar transmitters emit RF energy within an elevation range of -10° to $+10^\circ$. It is recommended to position the antenna at least 4.6m Distance(m) away from the radar.

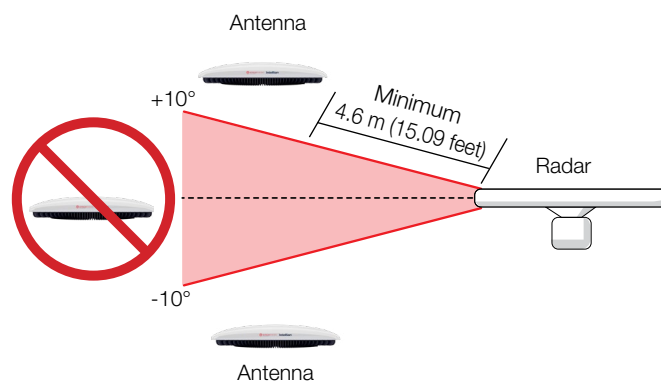


Figure 2: Potential RF Interference



CAUTION

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

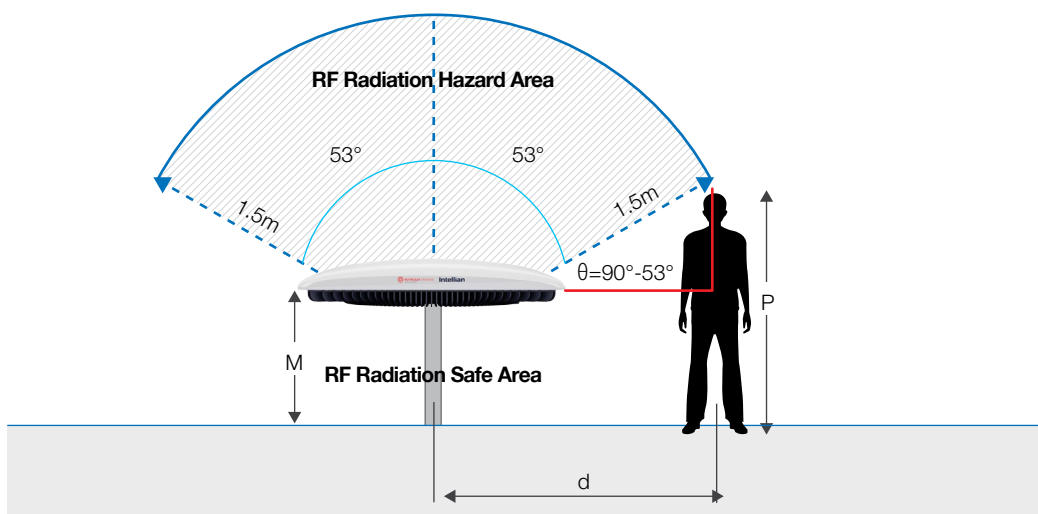
4.3.5 RF Hazard Precautions

The Federal Communications Commission (FCC) has adopted a safety standard for human exposure to RF energy which is below the Occupational Safety and Health Act (OSHA) limits. To comply with current FCC RF exposure limits, the antenna must be installed at or exceeding the minimum safe distance as guided by the antenna manufacturer or supplier.

WARNING



Exposure to RF energy from the antenna may cause thermal injuries including tissue damage from increased heating and body temperature. Keep everyone (operators, pedestrians), including from windows and doors, at a safe distance from the antenna when the system power is ON. Personnel must maintain a minimum distance of “d” (refer to the function below) and installers must place the ODU transmitter in a manner to maintain minimum spacing requirement. Failure to do so could result in exposure to RF energy transmitted from the ODU that could result in serious injury or death.



NOTE

RF Exposure for General population/Uncontrolled Exposure

$$d \cdot \tan\theta + M = P$$

$$d = \frac{P - M}{\tan\theta}$$

Examples

Mount type	Mount Height (M)	Personnel Height	Allowable Distance (d)
Non-Penetrating	62 cm. (2 ft.)	150 cm. (5 ft.)	1.2 m. (4 ft.)
TriMast	71 cm. (2.3 ft.)	150 cm. (5 ft.)	1.1 m. (3.6 ft.)
Quadpod	55 cm. (1.8 ft.)	150 cm. (5 ft.)	1.3 m. (4.3 ft.)

4.4 RF Hazard Sticker Placement

The blue RF sticker, included in antenna packaging, needs to be placed where it does not impact RF performance. The RF sticker must be placed on the UT assembly.



Figure 3: RF Hazard Sticker Placement (Example Only)

4.5 System Package

4.5.1 Outdoor Unit (ODU)

The Flat panel antenna is an active electronically scanned array (AESA) user terminal (UT) which can be operated on the Eutelsat OneWeb low earth orbit (LEO) satellite constellation. The Eutelsat OneWeb communications network comprises terrestrial gateways positioned around the globe communicating with user terminals. A radio link to the satellites is established using the UT operating in the Ku-band. Flat panel antenna series consists of three product variants, the land fixed, the maritime, and the land mobility. The UTs provide network and internet access via the Eutelsat OneWeb network.



Figure 4: Compact Flat Panel Antenna

4.5.2 Customer Network Exchange (CNX)

The CNX portfolio provides users with several options for use case specific requirements.

- **CNX-WIFI:** The CNX-WIFI is a desktop form factor (with an included wall mount) that has four GigE data ports in addition to an embedded Wi-Fi- 6 access point.
 - Embedded WIFI6 AP
 - SME / SOHO
 - Maritime
- **CNX-BB:** There is a CNX-BB option available which is also a desktop form factor and a single GigE data port.
 - Compact only
 - SME / SOHO
 - Maritime
 - Land Mobile
- **CNX-Rack AC/DC:** The CNX-Rack AC/DC design with fully integrated PDMs (power distribution modules), with AC and -48VDC (telco) variants available and supports dual antenna configurations delivering a blockage mitigation solution.
 - Blockage Mitigation
 - Enterprise
 - Telco
 - Maritime
- **CNX-Mobility*:** The CNX-Mobility design is an ideal solution for Land Mobile applications requiring higher IP rating and extended temperature.
 - IP56 rated
 - Land Mobile
 - Maritime
- .



CNX-BB



CNX-WIFI



CNX-Rack AC/DC



CNX-Mobility *

Figure 5: Customer Network Exchange (CNX)

*** Upcoming**

4.5.3 Packing List

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

OW10HL Package list (PS-OW10HF-W)

Item	Q'ty	Size	Description
Antenna Unit	1	56.3 cm x 45 cm x 12.4 cm	User terminal
Quick Installation Guide (QIG)	1	-	Installation Manual
Coax Cable (RG 6)	1	5 m	F-type, For CNX Power & Data connection Belden 1694A
External SMA Cap	1		External SMA Cap
Ground Braid	1	1m	Flexible Grounding Braid (Provide Only for Land Fixed (OW10HL))
Adjustable Plate	1	ø13x15cm	Land Fixed Mount Adapter
Hex-S Bolt_SF_STS316L_Pa	2	M6x12	Grounding Screw
Spring Washer	4	M6	Bolt Kit for Mount Assembly
Flat Washer	4	M6	
Hex Bolt_STS316_Pa	4	M6x12	
RF Hazard Sticker	1		Radiation Safety Distance Label

OW10HM/OW10HV Package list (OS-OW10HF-W / MS-OW10HF-W)

Item	Q'ty	Size	Description
Antenna Unit	1	56.3 cm x 45 cm x 12.4 cm	User terminal
Quick Installation Guide (QIG)	1	-	Installation Manual
Coax Cable (RG 6)	1	5 m	F-type, For UT Power & Data connection Belden 1694A
External SMA Cap	1		External SMA Cap
RF Hazard Sticker	1		Radiation Safety Distance Label

CNX-WIFI Package list w/ AC power (PP-T1A1-250)

Item	Q'ty	Size	Description
Customer Network Exchange (CNX) : WIFI	1		To access to Eutelsat OneWeb services
Quick Installation Guide (QIG)	1		CNX-WIFI compact Installation Manual
Power Adapter (AC-DC)	1	20.3 cm x 9.2 cm x 4.5 cm Weight: 1.2 kg	To convert 100-240 V AC power to +56 V DC for CNX (250W)
AC Power Cord (USA)	1	1.5m	CNX Power Cord (110V)
AC Power Cord (CEE7/7)	1	1.5m	CNX Power Cord (220V)

CNX-WIFI Package list w/ DC-DC converter (PP-T1A1-DC)

Item	Q'ty	Size	Description
Customer Network Exchange (CNX) : WIFI	1		To access to Eutelsat OneWeb services
Quick Installation Guide (QIG)	1		CNX-WIFI Installation Manual
DC-DC Converter	1		12 – 24V DC-DC Converter
Ethernet cable (RJ45)	1	1m	For Ethernet connection

CNX-BB Package list w/ AC (PP-T1A0-250)

Item	Q'ty	Size	Description
Customer Network Exchange (CNX) : BB	1		To access to Eutelsat OneWeb services
Quick Installation Guide (QIG)	1		CNX-BB Installation Manual
Power Adapter (AC-DC)	1	20.3 cm x 9.2 cm x 4.5 cm Weight: 1.2 kg	To convert 100-240 V AC power to +56 V DC for CNX (250W)
AC Power Cord (NA)	1	1.5m	CNX Power Cord (110V)
AC Power Cord (CEE7/7)	1	1.5m	CNX Power Cord (220V)
Ethernet Cable (RJ45 / LAN)	1	1m	For Ethernet connection

CNX-BB Package list w/ DC-DC converter (PP-T1A0-DC)

Item	Q'ty	Size	Description
Customer Network Exchange (CNX) : BB	1		To access to Eutelsat OneWeb services
Quick Installation Guide (QIG)	1		CNX-BB Installation Manual
Power Adapter (AC-DC)	1	20.3 cm x 9.2 cm x 4.5 cm Weight: 1.2 kg	To convert 100-240 V AC power to +56 V DC for CNX (250W)
AC Power Cord (NA)	1	1.5m	CNX Power Cord (110V)
AC Power Cord (CEE7/7)	1	1.5m	CNX Power Cord (220V)
Ethernet Cable (RJ45 / LAN)	1	1m	For Ethernet connection

Maritime Mount Adapter Kit Package list (OW-6019)

The Maritime Mount Adapter can be purchased separately. When this kit is supplied, it is provided in a separate box.

Item	Q'ty	Size	Description
Maritime Mount Adapter	1		Designed to work with a variety of maritime mounting needs
Hex bolt	4	M6X12L	To mount antenna on Adjustable Mount Adapter (M6 Bolt Kit)
Spring Washer	4	M8	
Flat Washer	4	M8	
Hex-S Bolt	4	M8x35L	To mount antenna onto Maritime Mount Adapter (M8 Bolt Kit)
Spring Washer	4	M6	
Flat Washer	4	M6	
Hex Bolt	4	M12x40L	To mount antenna onto Maritime Mast Mount (M12 Bolt Kit)
Spring Washer	4	M12	
Flat Washer	4	M12	
Hex Nut	4	M12	
Hex-S Bolt	8	5/16-18	To mount Maritime Mount Adapter onto Pedestal
Maritime Mount Adapter QIG	1		Installation Manual

Land Mobile Mount Adapter Kit Package list (OW-6018)

The Mount Adapter (Land Mobile) can be purchased separately. When this kit is supplied, it is provided in a separate box.

Item	Q'ty	Size	Description
Land Mobile Mount Adapter Bar	2		Antenna to vehicle cross bar mount adapter
Foot Damper	4		Land Mobile Mount Adapter rubber feet
Rubber Spacer	4		
Clamp Knob	8	M8	Fastening mechanism for vehicle cross bars
Mobility U-Clamp plate	4	-	
Mobility U-Clamp	4	M8	
Hex-S Bolt SF	4	M8x12	Fasteners to secure the antenna and land mobile mount adapter
Lock Washer	8	M8	Lock Washers for M8 fasteners
Hex-S Bolt SF, Standoff	8	M8x25	Antenna standoffs, for land mobile applications and mounting
Land Mobile Mount QIG	1		Installation Manual

4.5.4 Installer/Customer Supplied Equipment

- Grounding system that meets the local electrical code requirements
- Fasteners and other installation tools
- The F-type connector should be tightened with a force of 1 Nm (8 in-lbf).

	M8 Hex Key		Adjustable Wrench (Metric Sizes : 12, 13mm)
	1/2 " wrench		Torque Wrench
	10 mm wrench		

4.6 System Cables

4.6.1 Antenna Power+Data Cable

Intellian provides the Antenna RF Cable (RG6, 5 m) for connecting antenna and CNX. Check the instructions from the cable supplier. For longer cables, refer to the table below for the recommended cable types and maximum cable lengths for the antenna system.

Cable Requirements

Cable Manufacturer	Cable Pt. #	Cable Type	Connector Type	Max Distance w/ Enterprise (m)
Amphenol	011WTBA950EO1UBKXA	RG11	Holland SLCU-11Q	75
Amphenol	011177T04BK401HN10R1	RG11	Holland SLCU-11Q	85
Amphenol	D06AQB7600O21UBK2A	RG6	UNC N-006AT-CP-0	30
Belden	1694A	RG6	UNC N-006AT-CP-0	30
Amphenol	LMR-400-FR-BULK*	LMR400, 50 Ohm	(TMS) Amphenol EZ-400-NMH-X	145
Amphenol	LMR600*	LMR600, 50 Ohm	(TMS) Amphenol EZ-600-NMH-X	260

* LMR adapter required :

- RF solutions, Part # ADP-NF-FM
- Right angle F-port adapter required on Compact Series

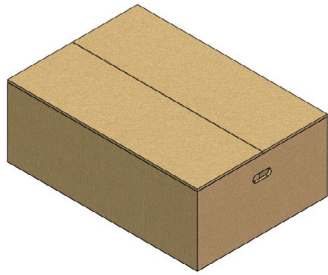


NOTE

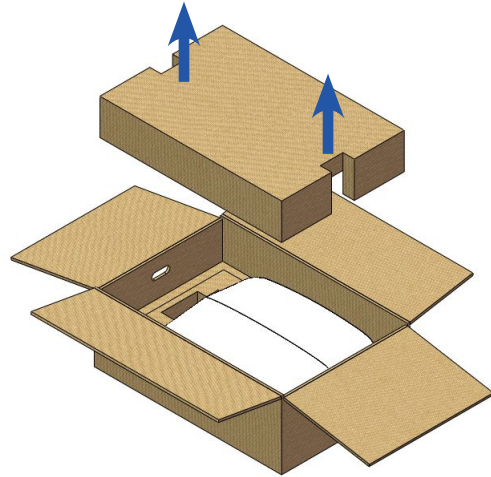
- Optimal tightening torque for RF connector: 1.5Nm (8in-ibf)
- Make sure of the following before installing system cables.
 - All cables with connectors need to be fully secured and protected from physical damage.
 - Don't acutely bend any cables during installation.

4.7 Unpacking the UT

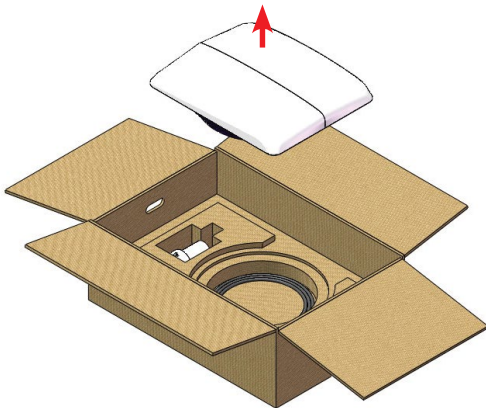
Follow the steps for easy and safe unpacking. The system package consists of two sub-packages including an antenna package and a CNX package.



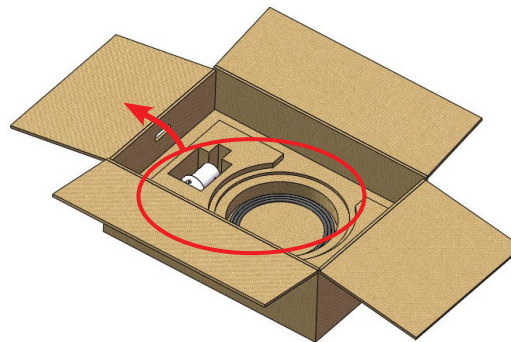
1. Place the package in a safe area.



2. Open the package and remove the protective packing.



3. Take out the Antenna.



4. Take out the items.

- Refer to the Included items "[4.5.3 Packing List](#)" on [page 22](#)



NOTE

- Make sure all the parts under the bottom cover (Step 4) are removed before the packaging is discarded.
- Consider keeping the packaging material in case the terminal may need to be relocated in the future.

Chapter 5. Product Overview

5.1 Antenna Dimensions and Weight

The mounting surface and overall space occupied by the radome must be sufficient for the height and width of the antenna while on top of its mounting base.

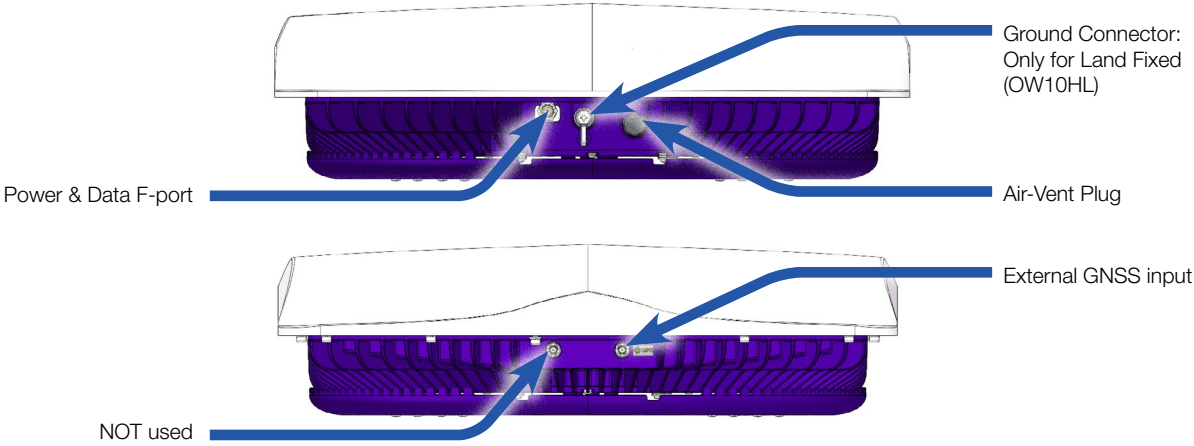
Weight: 12.2 kg (27 lbs)



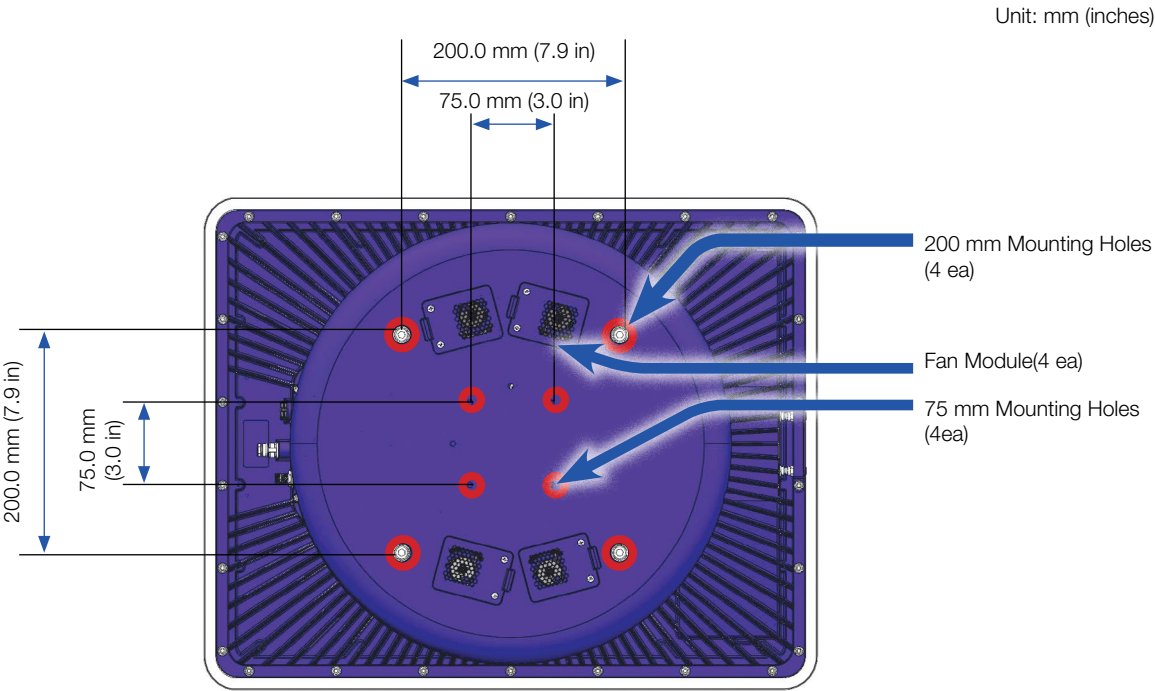
Figure 6: Antenna Dimension

5.2 Parts Identification

Front / Rear



Bottom



Chapter 6. Installing a Land Fixed UT (OW10HL)

6.1 Multiple Mount Types

A range of mount types is offered to meet different environmental conditions. For a Land Fixed UT installation, all mount types share the same 'Adjustable Mount Adapter'. For details of appropriate mount types refer to "[15.2 Selecting Pole Mount for Land Fixed \(Optional\)](#)" on page 96 for more details.

6.2 Mounting Antenna Using Adjustable Mount Adapter

The Land Fixed UT (OW10HL) comes with an adjustable mount adapter. When supplied, it is packaged with the antenna.

6.2.1 Attaching Adjustable Mount Adapter to Pole

1. Select the appropriate pole mount. (NPM mount used in this example. Reference "[15.2 Selecting Pole Mount for Land Fixed \(Optional\)](#)" on page 96)
2. Place the adjustable mount adapter onto the pole.
3. Tighten the three bolts of the Clamp Assy using a 12 mm wrench or socket wrench.

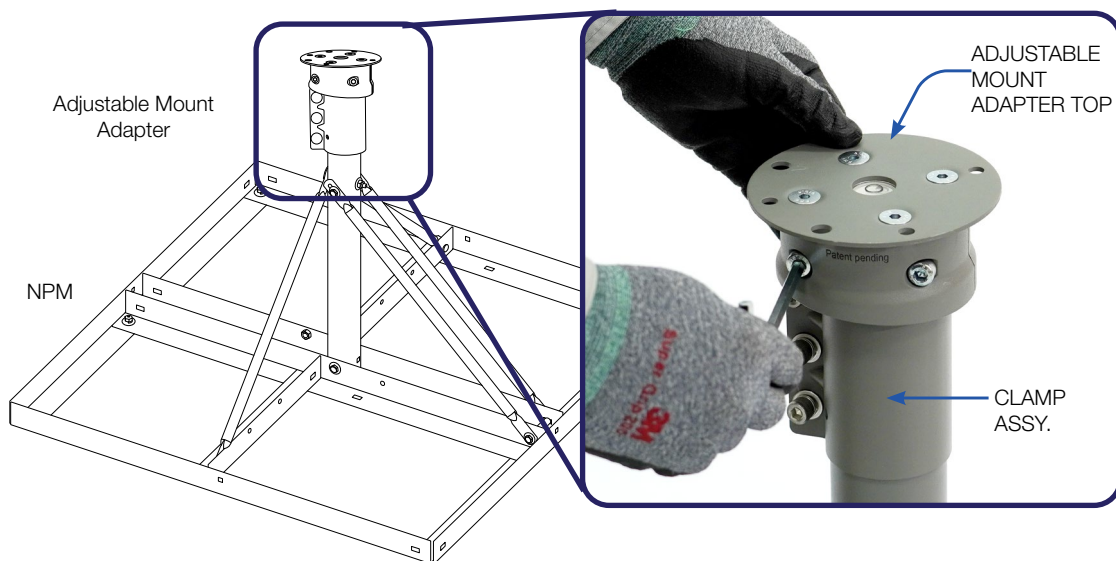


Figure 7: Tighten Adjustable Mount Adapter to Pole

NOTE



If a mount adapter is fabricated or purchased outside of Intellian's recommended list, it shall be no greater than 3 mm. in material thickness on the mounting surface. Additional M6 screws must be used to achieve at least 6mm of thread engagement. The Hex Key for the M6 mounting hardware is 5 mm. A 1.7 cm. clearance below the fans is required for sufficient air flow and cooling.

Levelling the Adjustable Mount Adapter

Check if the adjustable mount adapter is level by viewing the bubble level.

If the bubble is in the center, then it is level. If it is not, proceed to adjust the top in the following steps.

1. Loosen the bolts on the adjustable mount adapter as shown in figure 8.

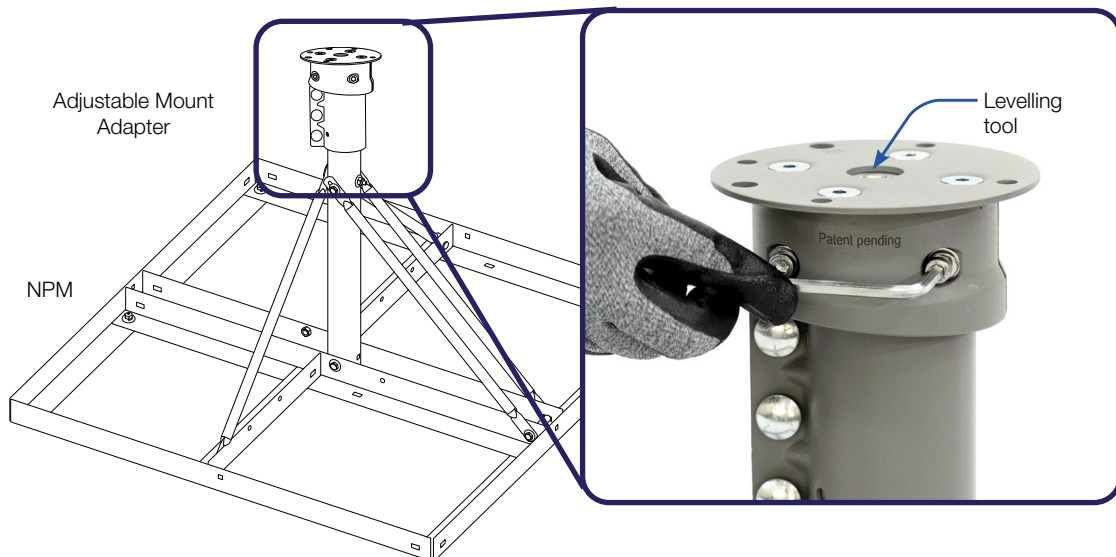
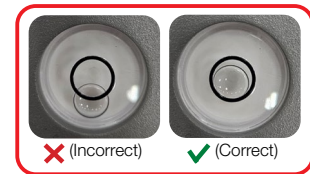


Figure 8: Loosen Bolts on Adjustable Mount Adapter

2. Rotate the top of the Adjustable Mount Adapter rotating top until it is parallel to the ground using the built-in leveling tool.

Verify that the bubble is aligned within the circle guide.

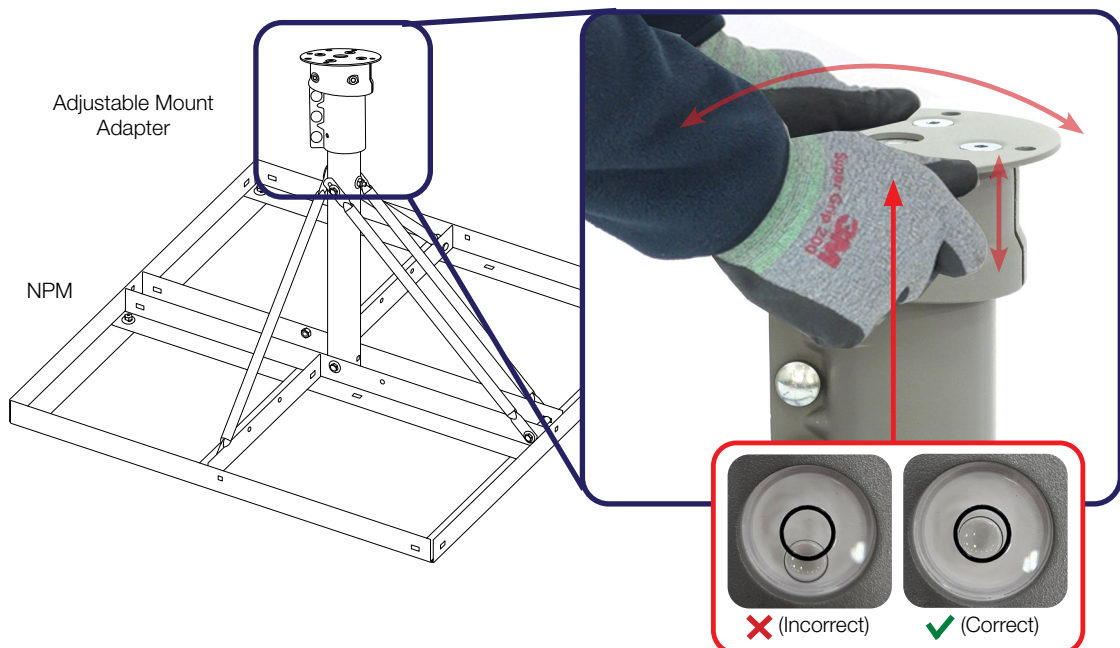


Figure 9: Using Leveling Tool

6.2.2 Mounting Antenna on Adjustable Mount Adapter



NOTE

The Antenna does not need to be aligned to True North because the Dual GNSS receivers provide differential GPS location to support automated true north calibration and highly accurate timing reference. The "N" mark on the top of the Adjustable Mount Adapter top plate should be ignored for this UT type.

1. Move the antenna above the adjustable mount adapter and carefully lower down the antenna toward the adjustable mount adapter.

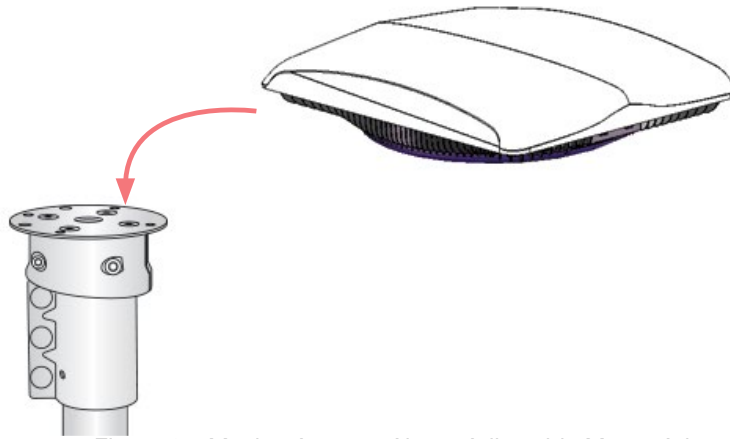


Figure 10: Moving Antenna Above Adjustable Mount Adapter

2. Align the 75 mm holes on the antenna with the mounting holes on the adjustable mount adapter.

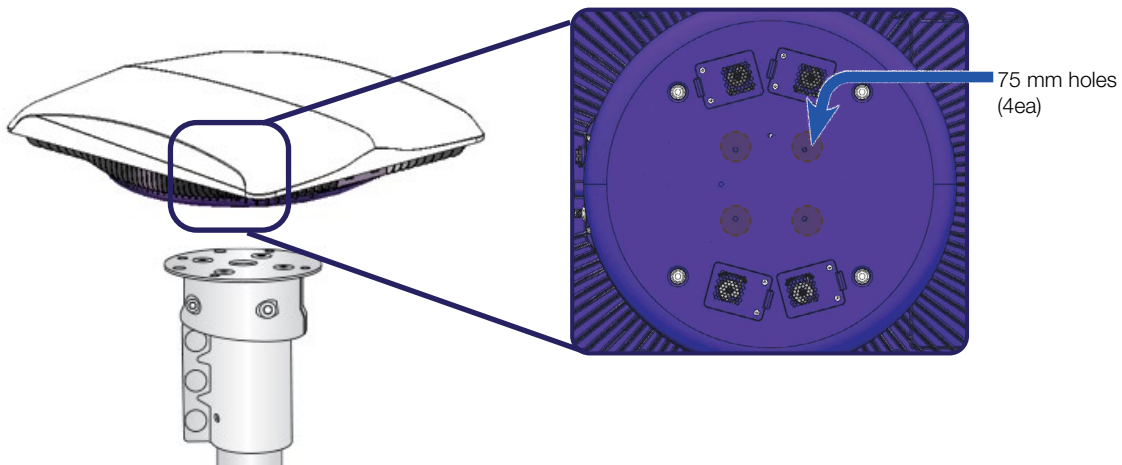


Figure 11: Antenna on Adjustable Mount Adapter

3. Find the M6x12L Hex. Bolt M6 Spring and Flat washer (4 ea) from the OW10HL package.
4. Insert the bolts and washers from under the adjustable mount adapter into the threaded holes on the bottom of the Antenna, and then tighten them.

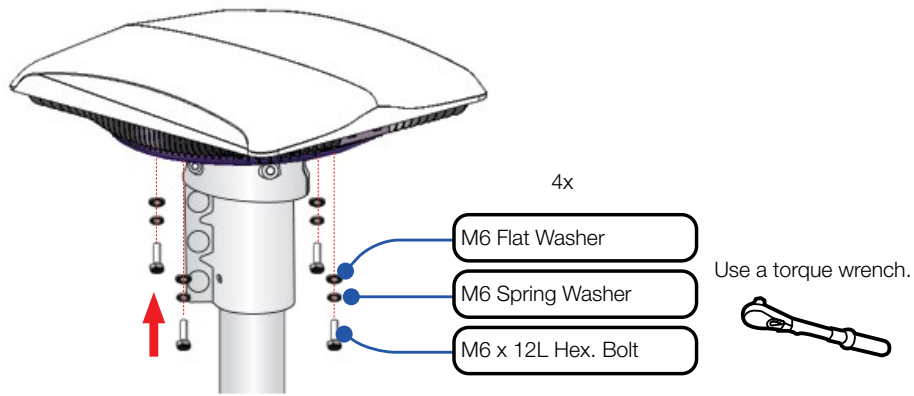


Figure 12: Attach Antenna to Adjustable Mount Adapter

5. After installing all 4 bolts, fully tighten them using a torque wrench. Refer to "[15.3 Tightening Torque Specification](#)" on [page 108](#) for the bolt tightening torque.

Chapter 7. Installing Maritime UT (OW10HM)

7.1 Antenna Mounting Requirements

You need to procure or fabricate a suitable mount to support the Compact UT.

The mounting platform should be rigid and secured tightly to the structure of the vessel for the maritime environment. Also, it should not be subjected to excessive vibration (ETS 300 019) 2–8 Hz frequency, 7.5 mm sine level; 8–500 Hz frequency, 2 G sine level) to ensure full antenna performance and prevention of potential mechanical damage.

Consider the following factors when selecting the mounting method:

- Confirm the physical size and weight of the antenna (see table below).

Size	Weight
56 cm x 45 cm x 12 cm (22 in x 17.7 in x 4.7 in)	12.2 kg (27 lbs)

- The chosen mounting method should withstand wind loads and ensure the safety of people and property.

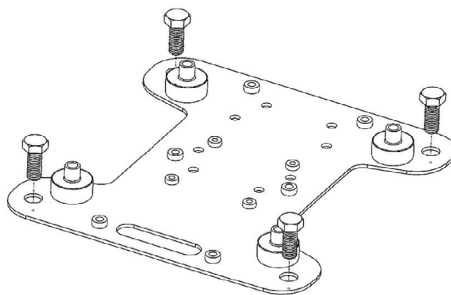


CAUTION

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

7.2 Mounting Antenna Using Maritime Mount Adapter (Optional)

The Maritime UT kit (OW10HM) does not include a maritime mount adapter. It is strongly recommended as an additional accessory. Intellian offers the Maritime Mount Adapter (OW-6019) for the maritime environment to mount the antenna.



If you want to confirm the components of the maritime mount adapter, refer to ["Maritime Mount Adapter Kit Package list \(OW-6019\)" on page 24](#) for more details.

Intellian supports three approaches to mounting the outdoor unit in the maritime environment: Pole Mount, Pedestal Mount, and Mast Mount.

7.2.1 Attaching Antenna to a Pole Mount



NOTE

Intellian offers the Adjustable Mount Adapter Kit to mount the antenna on the pole as a separate accessory kit.

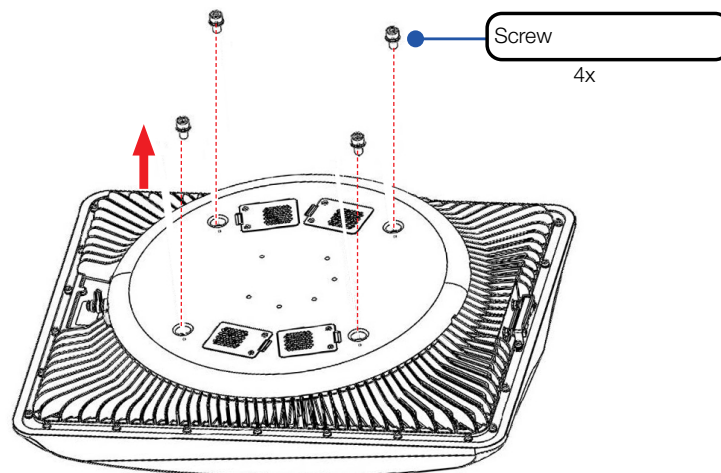
Use of the adjustable mount adapter fastened directly to the antenna is not supported in maritime environments. The adjustable mount adapter must be paired with the maritime mount adapter to ensure performance in a maritime environment.

1. The Maritime Adapter kit includes M6X12L bolts (4 ea) for assembling the adjustable mount, M8x35L bolts (4 ea) for mounting, the antenna, and Maritime Mount Adapter.
2. With the antenna upside down, remove the screws (4 ea) from the common holes.



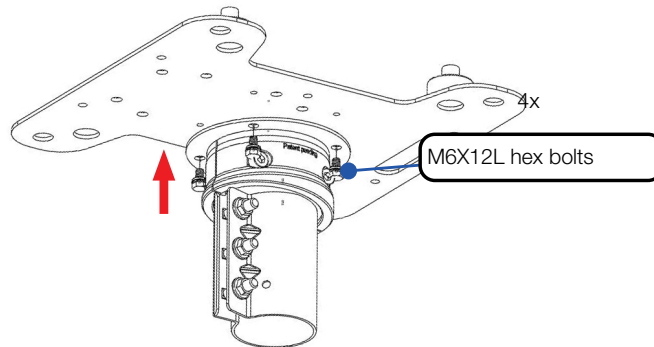
NOTE

When placing the antenna upside down, be sure to place a polishing cloth or bubble wrap on the floor to prevent radome damage.

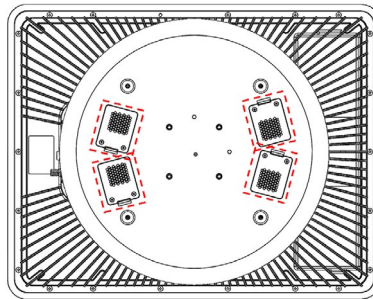


3. Secure the Maritime Mount Adapter Plate at the 75 x 75mm mount points on the top of the adjustable mount adapter using the M6 x 12L hardware provided with Adjustable Mount Adapter. Refer to ["6.2 Mounting Antenna Using Adjustable Mount Adapter"](#) on page 29 details.
4. Align the mounting holes on the maritime mount adapter with the mounting holes on the adjustable mount adapter plate.
5. Apply Loctite #242 to the bolt threads.

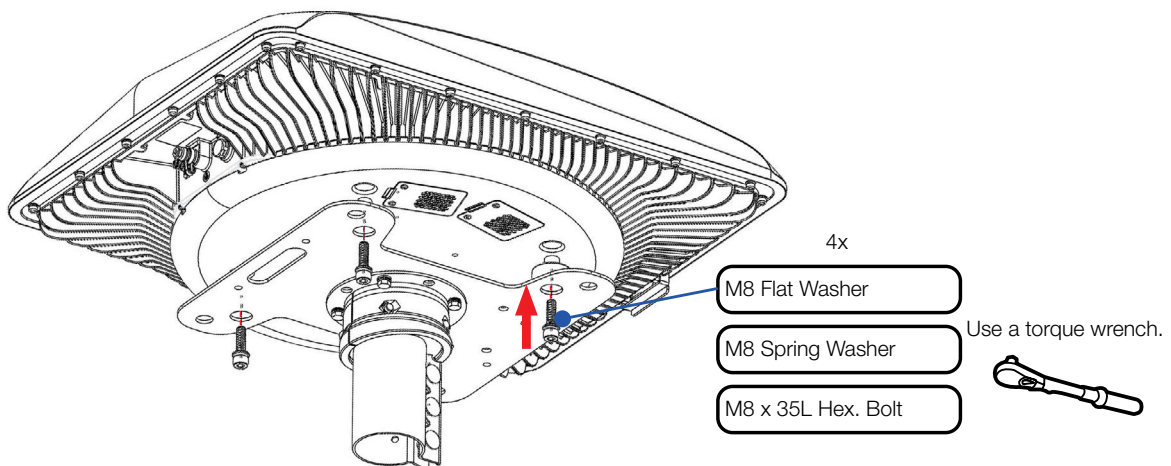
6. Insert the M6X12L hex bolts (4 ea) from under the adjustable mount adapter plate into the mount holes on the bottom of the Mount Adapter, and then lightly tighten them by hand.



7. Place the antenna onto the Maritime Mount Adapter Plate, making sure the pegs fit into the holes and do not cover the fans.



8. Insert the M8x35L hex socket bolts(4ea) and washers from under the antenna mounting holes on the Maritime Mount Adapter into the threaded holes on the bottom of the antenna, and then lightly tighten them by hand.



9. After installing all 8 bolts, tighten them using a torque wrench. Refer to "[15.3 Tightening Torque Specification](#)" on page 108 for the bolt tightening torque.

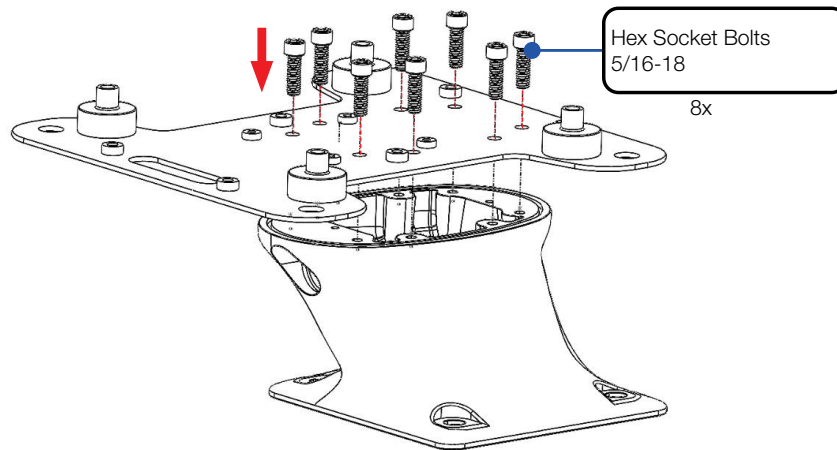


CAUTION

- Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.

10. Attaching Antenna to a Pedestal

1. Place the Maritime Mount Adapter Plate onto the pedestal, ensuring all holes for the pedestal are aligned with the mounting holes for the mount adapter.
2. Apply Loctite #242 to the bolt threads.
3. Insert the hex socket bolts 5/16-18 (8 ea) from above the maritime mount adapter into the mount holes on the top of the pedestal, and then lightly tighten them by hand.

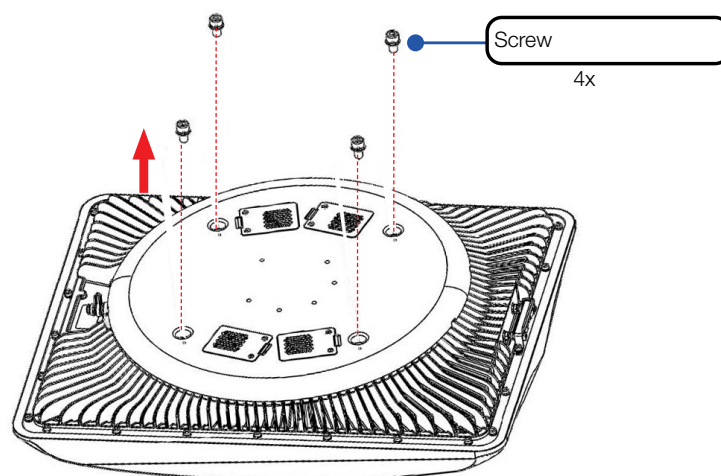


4. Fully tighten the bolts using a torque wrench
5. Bring the hex socket bolts 5/16-18 (8 ea) for assembling the pedestal, M8x30L bolts (4 ea) for mounting the antenna, and the Maritime Mount Adapter from the maritime mount adapter kit.
6. With the antenna upside down, remove the screws (4 ea) from the 200x200mm mount pattern holes.

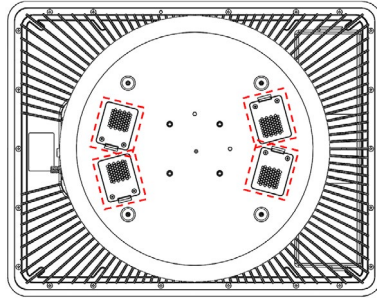


NOTE

When placing the antenna upside down, be sure to place a polishing cloth or bubble wrap on the floor to prevent radome deformation damage.

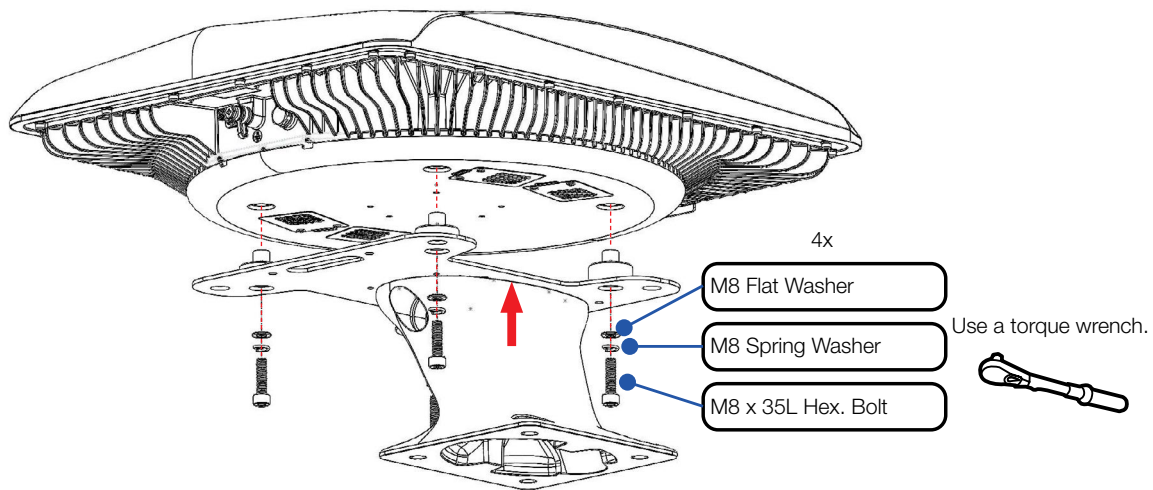


7. Place the antenna onto the Maritime Mount Adapter Plate, making sure the pegs fit into the holes and do not cover the fans.

**NOTE**

When installing the mount adapter plate to the base of the antenna, ensure the fans are not obstructed.

8. Insert the M8x35L hex socket bolts (4ea) and washers from under the antenna mounting holes on the Maritime Mount Adapter into the threaded holes on the bottom of the antenna, and then lightly tighten them.



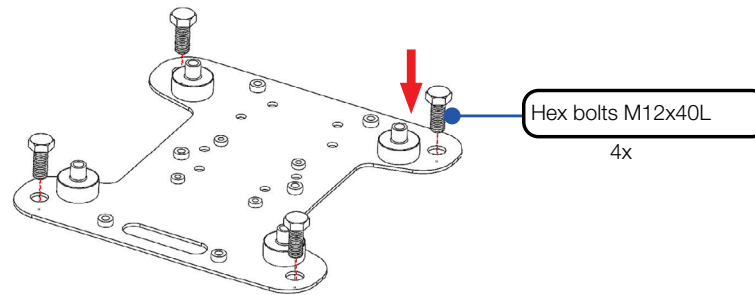
9. After installing all 4 bolts, fully tighten the bolts using a torque wrench. Refer to "[15.3 Tightening Torque Specification](#)" on page 108 for the bolt tightening torque.

**CAUTION**

- Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.

7.2.2 Attaching Antenna to a Mast

1. Bring the hex bolts M12x40L (4 ea) for assembling the mast, M8x35L bolts (4 ea) for mounting the antenna and the Maritime Mount Adapter from the maritime mount adapter kit.
2. Apply Loctite #242 to the bolt threads.
3. Feed the hex bolts M12x40L (4 ea) into the mast holes (large holes in the corners) of the Maritime Mount Adapter Plate. It is recommended to place tape over the bolts temporarily because you will need to turn it over for the next step.

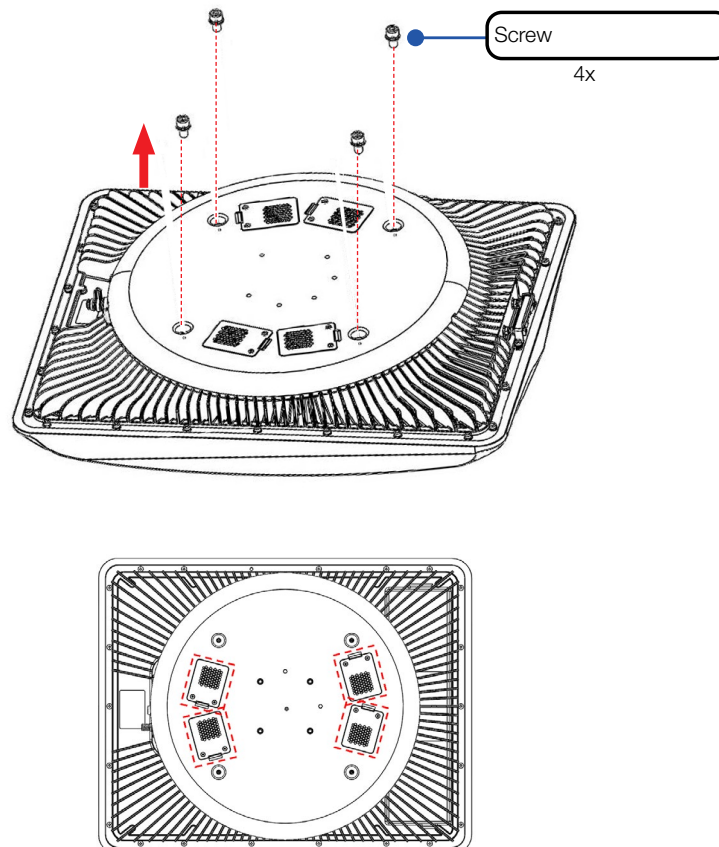


4. Place the Maritime Mount Adapter Plate onto the antenna, making sure the pegs fit into the holes and do not cover the fans.
5. With the antenna upside down, remove the fixing screws (4 ea) from the common holes.

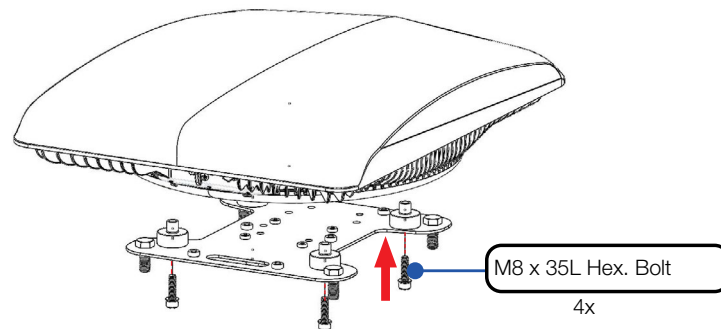


NOTE

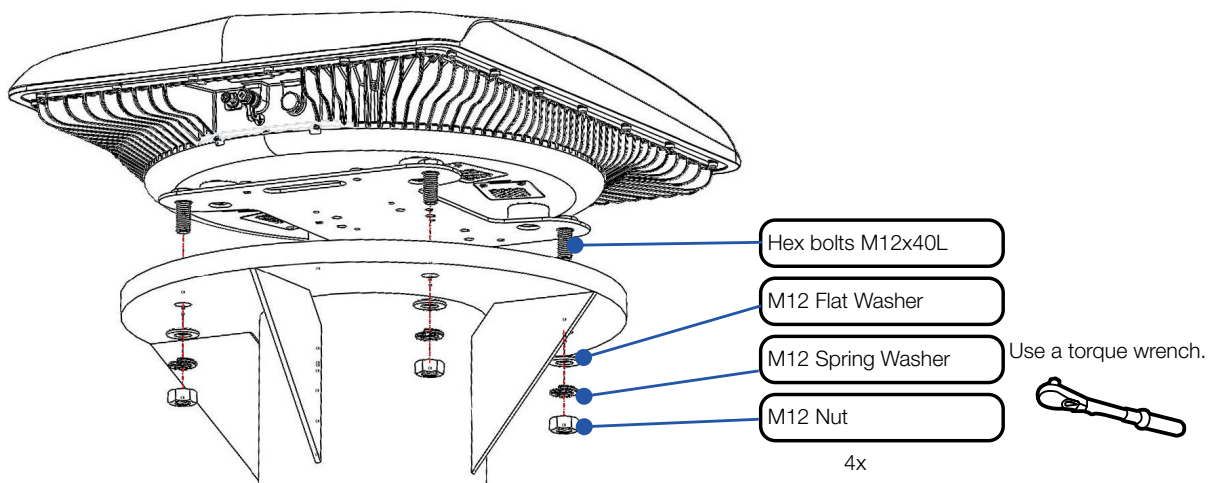
When placing the antenna upside down, be sure to place a polishing cloth or bubble vinyl on the floor to prevent radome deformation and damage.



6. Insert the M8x40L hex socket bolts (4ea) and washers from under the antenna mounting holes on the Maritime Mount Adapter into the threaded holes on the bottom of the antenna, and then lightly tighten them.



7. Fully tighten the bolts using a torque wrench. Refer to ["15.3 Tightening Torque Specification" on page 108](#) for the bolt tightening torque.
8. Align the pre-set M12X40L bolts (4 ea) with the mounting holes on the mast plate.
9. Feed the M12 flat washer, lock washer, and nut onto the pre-set M12X40L bolts and fully tighten the bolts using a torque wrench. Refer to ["15.3 Tightening Torque Specification" on page 108](#) for the bolt tightening torque.



CAUTION

- Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.

7.2.3 Routing Cable Outside of the Mast (Example Only)

The cable must be routed from the antenna and through the ship to the CNX. When pulling the cable in place, avoid sharp bends, kinking, and excessive force. After placement, seal the deck penetration gland and tie the cable securely in place. Cable brackets must be installed on the mast to secure the cable. The gooseneck must be installed on the side of the mast to protect the cable from water.

**NOTE**

- The gooseneck must be installed on the side of the mast to protect the cable from water.
- Ensure that cable has been run through watertight fittings to prevent water entry into the vessel when installation is completed.
- This is a general example of routing cables on the mast. The routing method may differ depending on the ship's environment.

Option 1. Routing Cable on Outside of Mast

This method is recommended.

1. Route the cable from the gooseneck on the deck to the antenna as shown in the picture.
2. Maintain a sufficient cable length (at least 2 m) when routing the cable on the surface of the mast. After connecting the cable to the F-port on the antenna, adjust the length and fix the cable on the cable brackets using cable ties.

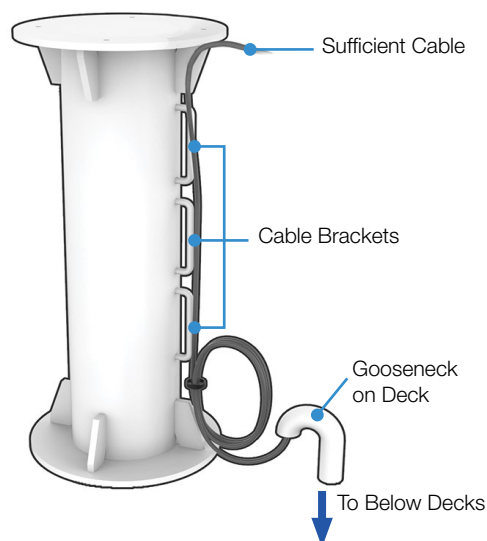


Figure 13: Routing Cable Through Outside of Mast

**NOTE**

Routing the cable through the inside of the mast is not currently supported.

**CAUTION**

- Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.

7.2.4 Antenna Mounting Hole Pattern (Custom Mount Adapter)

Please use the hole pattern for determining mounting points on a custom mount adapter. If a mount adapter is fabricated or purchased outside of Intellian's recommended list, it shall be no greater than 3 mm in material thickness on the mounting surface.

NOTE



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. When reusing an existing mast, make sure the location of the holes on the mast correspond to the hole locations and sizes printed on the mounting template.

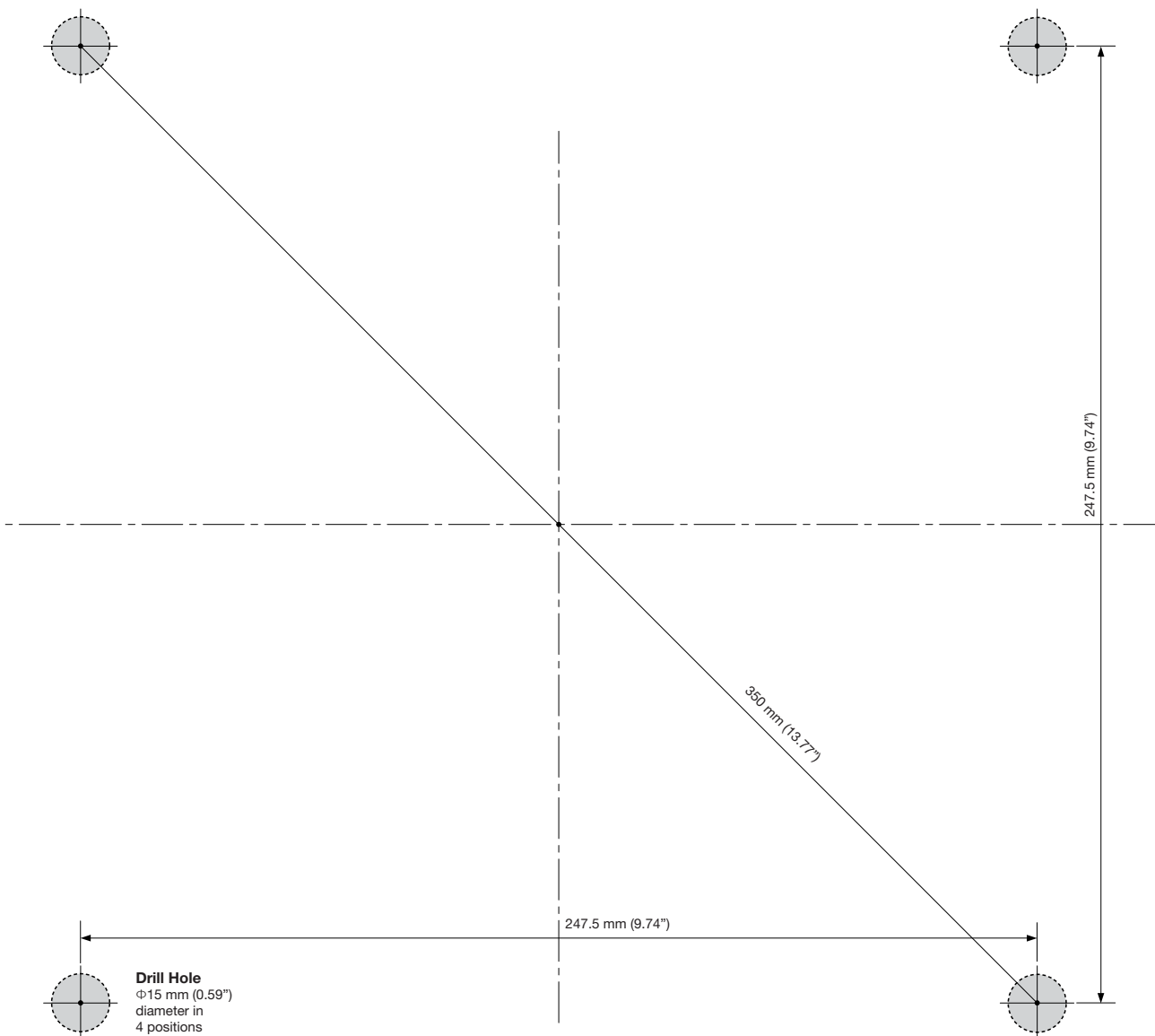


Figure 14: Antenna Mounting Hole Template

Chapter 8. Installing a Land Mobile Mount Adapter (OW10HV)

8.1 Mounting Antenna Using Land Mobile Mount Adapter

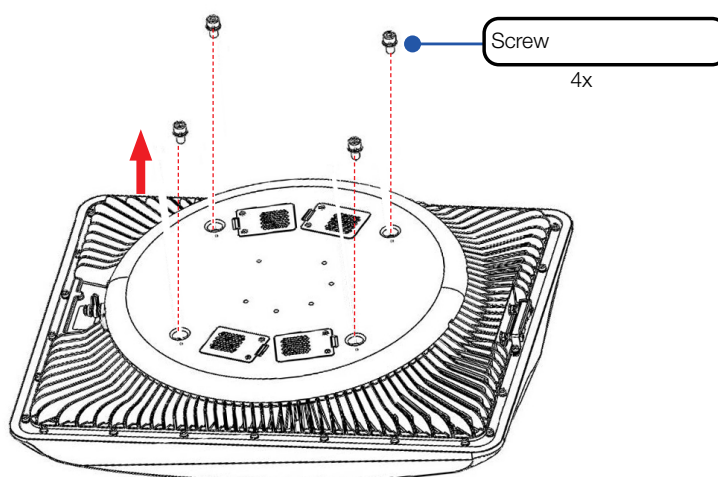
The Land Mobile UT kit (OW10HV) does not include a Land Mobile Mount Adapter, and it is strongly recommended. Intellian offers the land mobile mount adapter kit for land mobile to mount the antenna to be purchased separately. This Land Mobile Mount Adapter kit must be used in conjunction with vehicle roof crossbars.

If you would like to verify the components, refer to "[Land Mobile Mount Adapter Kit Package list \(OW-6018\)](#)" on page 24 for more details.

8.1.1 Attaching the Antenna to the Land Mobile Mount Adapter

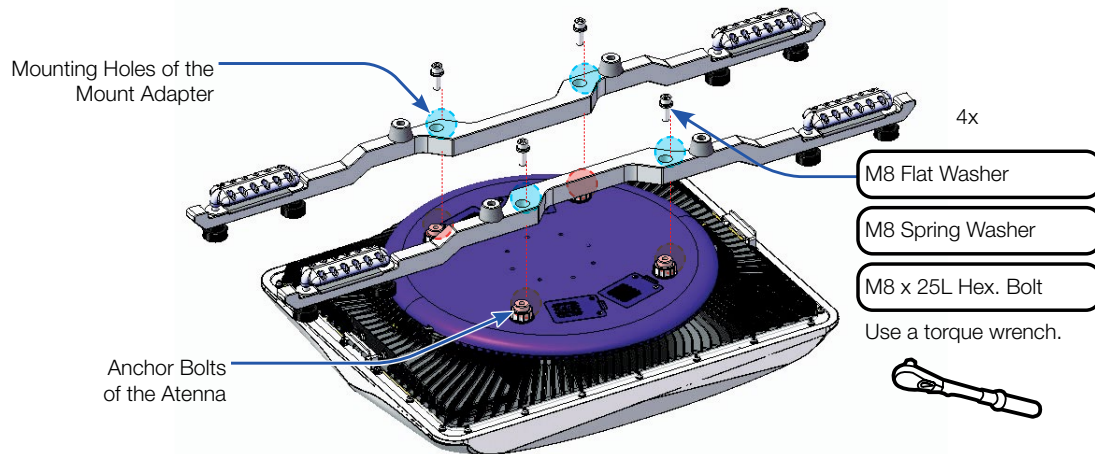
Attach the Land Mobile Mount Adapter to the base on the antenna using the provided hardware.

1. Turn the antenna upside down.
2. Remove the bolts.



3. Install the standoffs/anchor bolts to the 200x200 mm hole mount pattern.
4. Tighten the standoffs/anchor bolts.

7. Bring the M8x25L hex socket bolts (4 ea) for mounting the antenna, and the Land Mobile Mount Adapter from the Land Mobile Mount Adapter kit.
8. Ensure the mounting holes of the Land Mobile Mount Adapter align with the anchor bolts of the antenna.
9. Ensure the antenna and land mobile mount adapter are aligned as shown below. Putting the mount adapter in line with the antenna will lead to difficulty installing them on the vehicle.

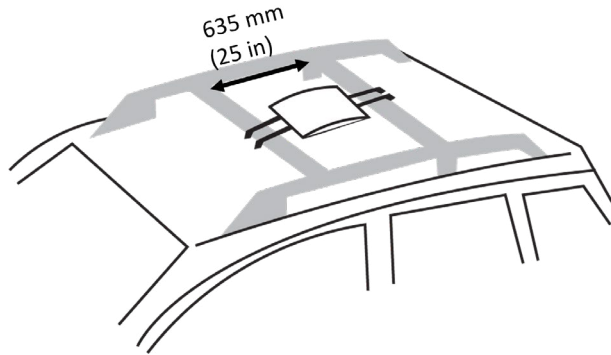


10. Insert the M8x25L hex socket bolts (4ea) and washers into mounting holes of the Land Mobile Mount Adapter, and then tighten them.
11. After installing all 4 bolts, fully tighten the bolts using a torque wrench.

8.1.2 Attaching to Vehicle Crossbars

Ensure your vehicle has a cross bar system installed on the car.

Position the cross bars so that the space between them is 25" (635 mm). The Land Mobile Mount Adapter pieces will run in line with the vehicle. Ensure there will be no interference from other items such as vehicle radio antennas or sunroofs. The coaxial ports should face the rear of the car. Look to your owner's manual for further details and instructions on this process.



CAUTION

- Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.

1. Loosen all clamp knobs of the Land Mobile Mount Adapter by turning them counterclockwise. The assembly will be detached. Components to detach: Clamp knob (8ea), Lock washer (8ea), Plate (4ea), M8 U-Clamp (4ea).

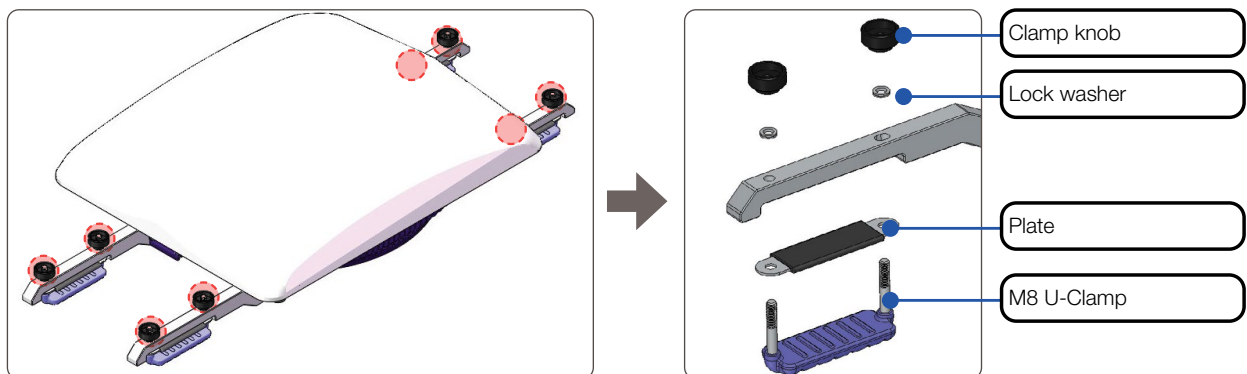


Figure 15: Loosening Clamp Knobs of the Land Mobile Mount Adapter

2. Place the plate and mount adapter in order on the crossbar as shown below.

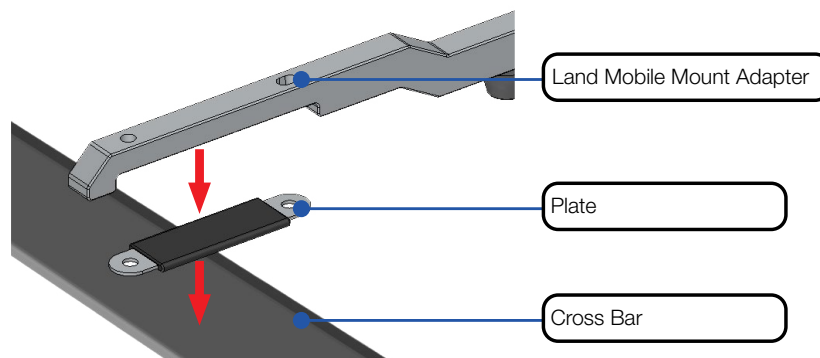


Figure 16: Placing the Plate and Land Mobile Mount Adapter

3. Place the M8 U-Clamp under the crossbar and insert it into the mount hole on the plate and mount adapter.
4. Feed the lock washer and clamp knob in order on the M8 U-Clamp.

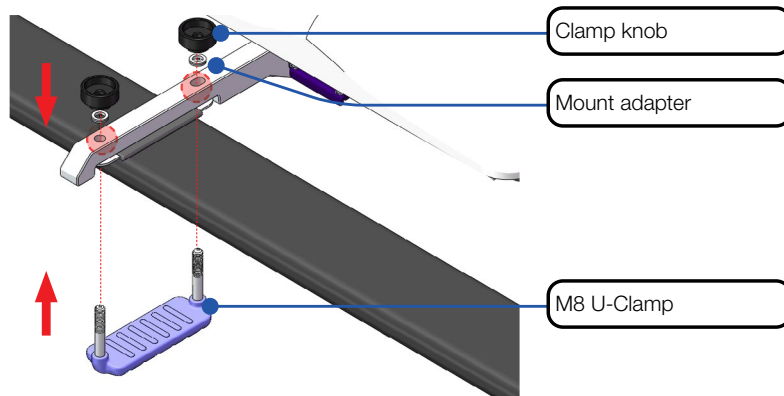


Figure 17: Assembling the M8 U-Clamp

5. Fully tighten the clamp knobs by rotating them clockwise to securely attach the Land Mobile Mount Adapter.
6. Repeat steps 2 through 5 for each remaining assembly.

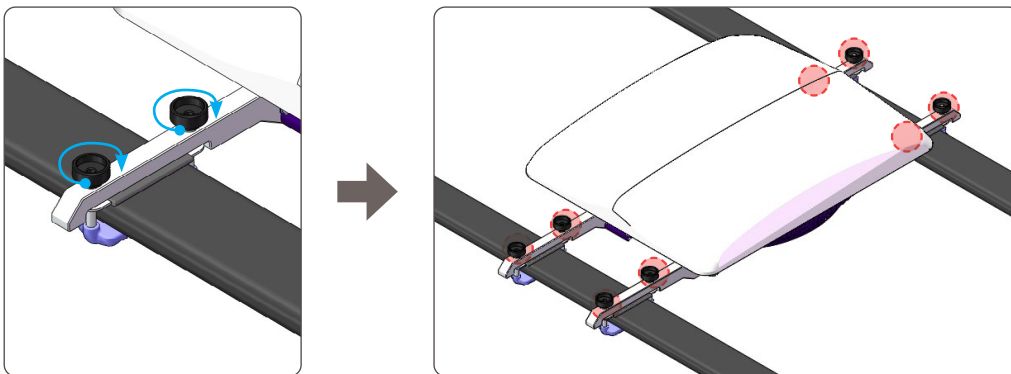


Figure 18: Fixing the Land Mobile Mount Adapter on the Cross Bar

Chapter 9. Connecting Cable to the Antenna



NOTE

Make sure of the following before installing system cables.

1. Only use approved cables and connectors. Refer to "[4.6.1 Antenna Power+Data Cable](#)" on page 25.
2. All cables with connectors need to be fully secured and protected from physical damage.
3. Don't acutely bend any cables during installation.
4. Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.



CAUTION

Do not over-tighten the F-type connector or handle it improperly during installation. It may cause damage to the CNX F-type port. All installers must ensure that no more than 1 Nm (limit for current design: 1 Nm or 8 in.lbf) of torque is applied during the installation process.

Whether the F-type connector is being tightened with appropriate tools or by hand, it needs to be properly secured without over-torquing and risking damage. If applying a force of 1 Nm is challenging with the available tools on site, it is recommended to tighten the F-type connector by hand.

9.1.1 Connecting Cable to the Antenna Power & Data Port

1. Terminate M(Male) Connector on each end of coaxial cable.
2. Connect the coaxial cable to the Power & Data connector (F-port) on the antenna.

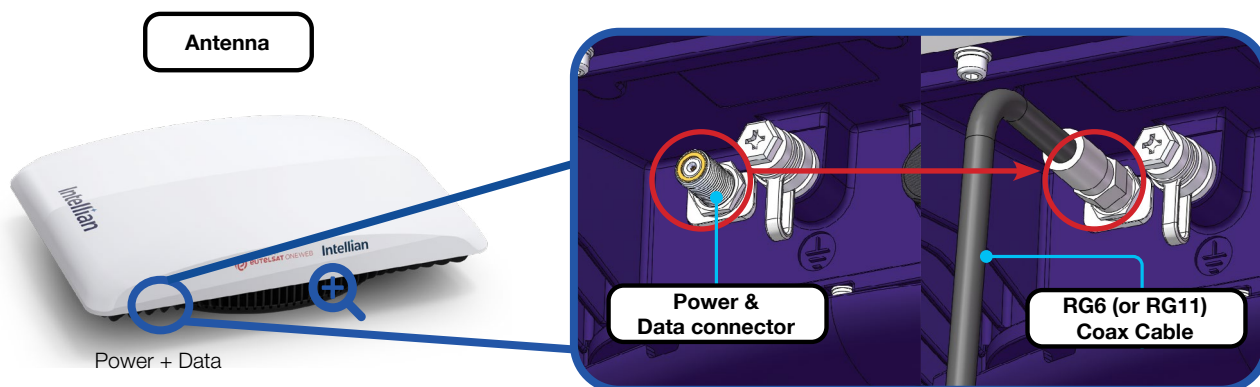


Figure 19: Cable Connection of CNX to Antenna



NOTE

- The 5m RG6 cable for connecting the CNX is supplied in the install kit box.

9.1 Connecting Ground Braid for Land Fixed (OW10HL)

Direct grounding for the antenna is very important for safety. Your antenna hardware must be protected from lightning strikes or static electricity by grounding. When establishing your grounding system, it must comply with the safety standards in your country.

1. Bring the ground braid and M6 x 12L hexagon socket head cap bolt (1 ea) for grounding from the installation kit box.
2. Unscrew the ground screw on the ground connector using a phillips screwdriver.
3. Attach the ring connector of the ground braid to the ground connector and hold it in place.
4. Re-tighten the ground screw to secure the ground braid.

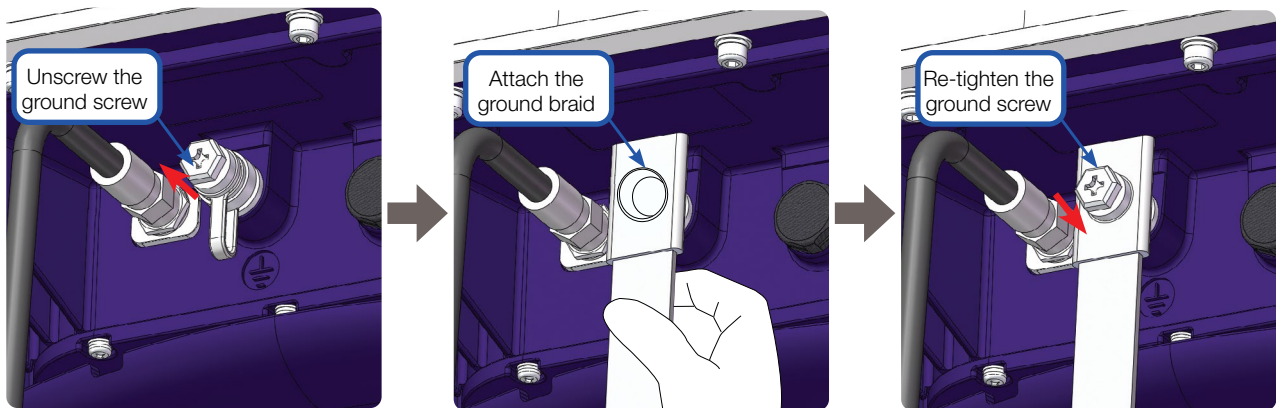


Figure 20: Connecting the Ground Braid

5. Connect the other side of the ground braid to the place marked with the grounding symbol. Secure the ground braid using the supplied M6 x 12L hexagon socket head cap bolt. Refer to "[15.3 Tightening Torque Specification](#)" on page 108.

9.2 Connecting external GNSS (Optional)

Intellian's flat panel series offers the ability for an external GNSS input via an SMA connection. It is ideal for use in GNSS denied environments.

1. Separate purchase of an external GNSS is needed.
2. Remove the pre-installed caps from the SMA connector on the antenna.
3. Connect the SMA connector of the external GNSS cable to the GNSS connector.

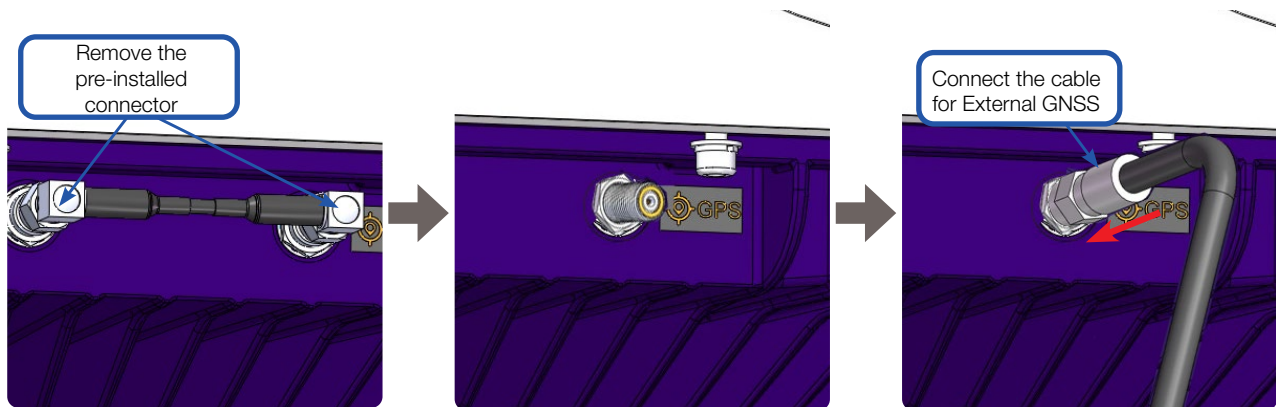


Figure 21: Connecting the SMA connector of the external GNSS cable to the GNSS connector

4. Bring the supplied external SMA cap from the install kit.
5. Use the cap by turning the bolt clockwise to close the other connector (Not supported).

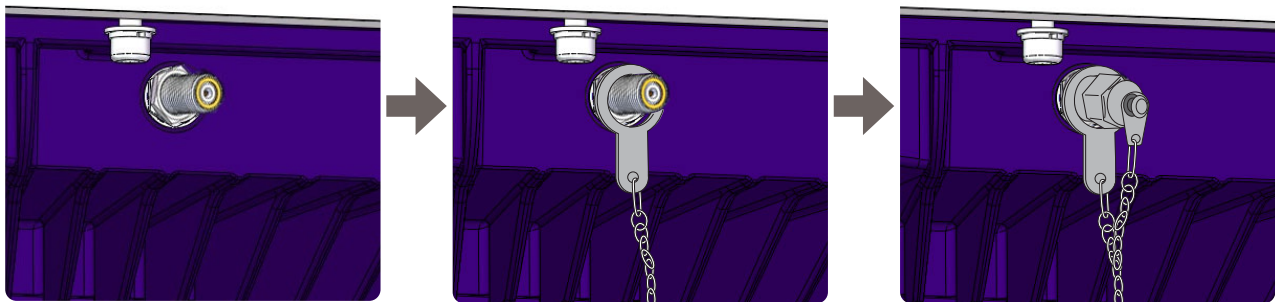


Figure 22: Connecting the SMA connector of the external GNSS cable to the GNSS connector



CAUTION

- The jumper must be reinstalled for proper operation.

Chapter 10. Installing Indoor Unit (IDU)

10.1 Selection of Installation Site

10.1.1 Selection of CNX-WIFI Installation Site

- The CNX-WIFI should be in a clean, dry area where it can be placed vertically.
- Ensure there is adequate space around the CNX-WIFI for cooling.

Position the CNX-WIFI

- Place the CNX-WIFI in its desired location.
- The CNX-WIFI must be placed vertically for optimal performance.



CAUTION

Placing the CNX-WIFI in any other position than vertically may result in overheating.

10.1.2 Selection of CNX-BB Installation Site

- The CNX-BB should be in a clean, dry area.
- Ensure there is adequate space around the CNX-BB for cooling.

Position the CNX-BB

- Place the CNX-BB in its desired location.

10.2 Dimensions

Confirm the dimensions of the CNX before installing it.

10.2.1 CNX-WIFI Dimensions

Unit: mm (inches)

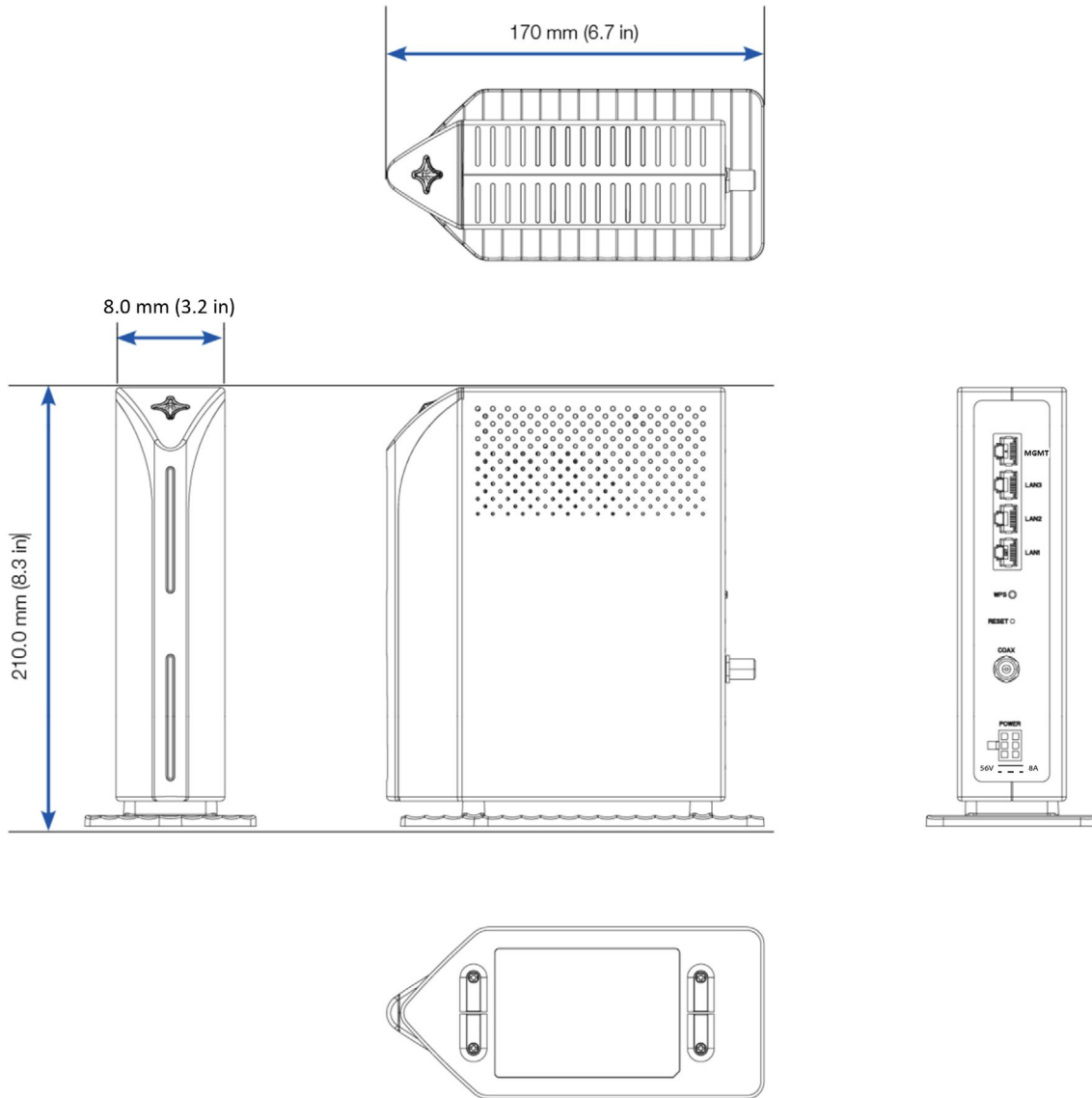


Figure 23: CNX-WIFI Dimensions



CAUTION

- This product is intended to be supplied from Intellian by a Listed Power Adapter, rated 56 V DC, 8 A minimum, if need further assistance, please contact Eutelsat OneWeb for further information.
- Ensure to connect the power cord to a socket-outlet with earthing connection.
- Never open the equipment. This will void the warranty.

10.2.2 CNX-BB Dimensions

Confirm the dimensions of the CNX before installing it.

Unit: mm (inches)

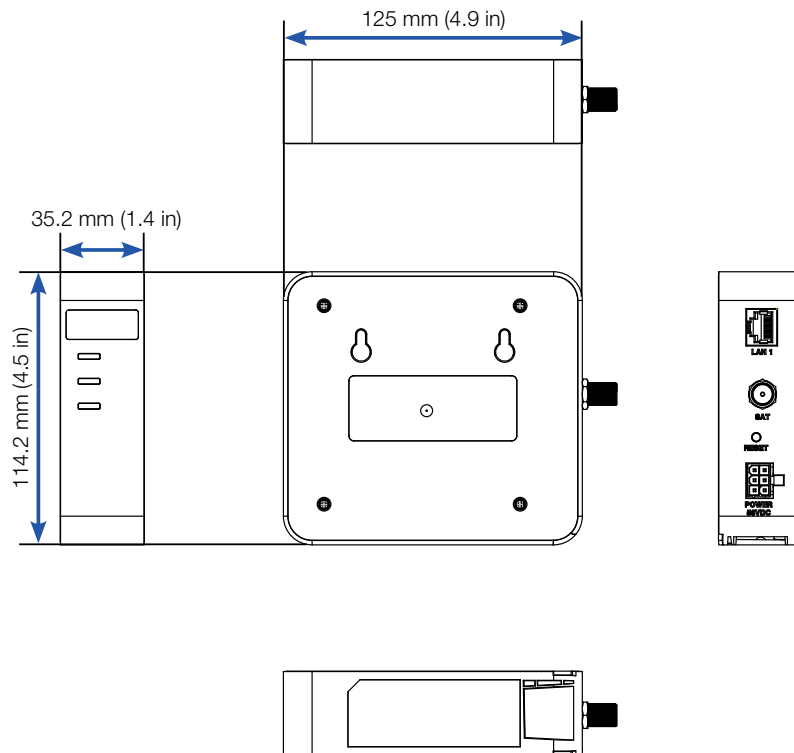


Figure 24: CNX-BB Dimensions



CAUTION

- This product is intended to be supplied from Intellian by a Listed Power Adapter, rated 56 V DC, 8 A minimum, if need further assistance, please contact Eutelsat OneWeb for further information.
- Ensure to connect the power cord to a socket-outlet with earthing connection.
- Never open the equipment. This will void the warranty.
- For Enterprise series applications, an 8A, 56 V minimum is required.



CAUTION

- Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.

10.3 Antenna System Configuration

For the proper operation of your satellite communication system, it must be connected with all the provided components as shown in the figures below.

The basic antenna system consists of the antenna and CNX (CNX-WIFI , CNX-BB, or CNX-Rack AC/DC).

The Antenna Includes the SSM Module, which is capable of controlling and managing the antenna systems simultaneously.

Antenna System Configuration with CNX-WIFI

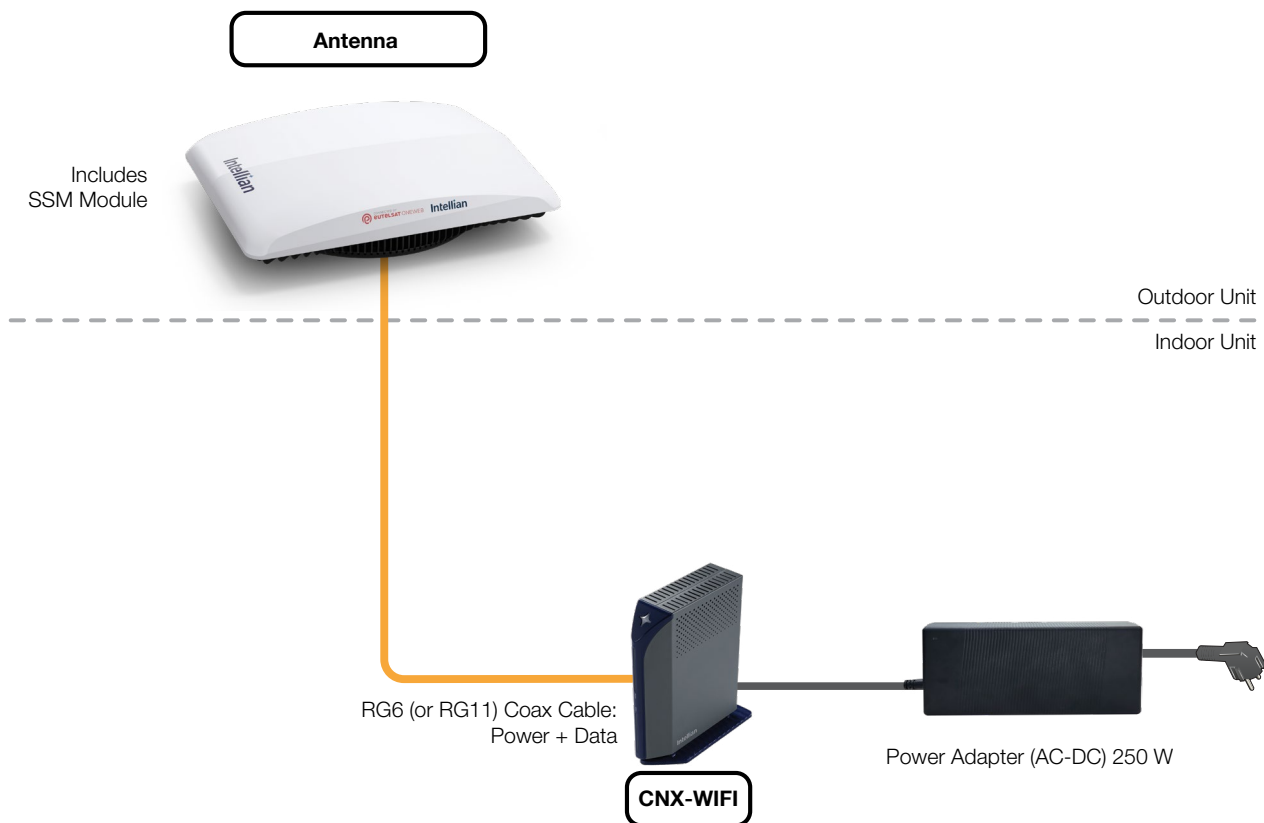


Figure 25: Antenna System Configuration with CNX-WIFI

Antenna System Configuration with CNX-BB

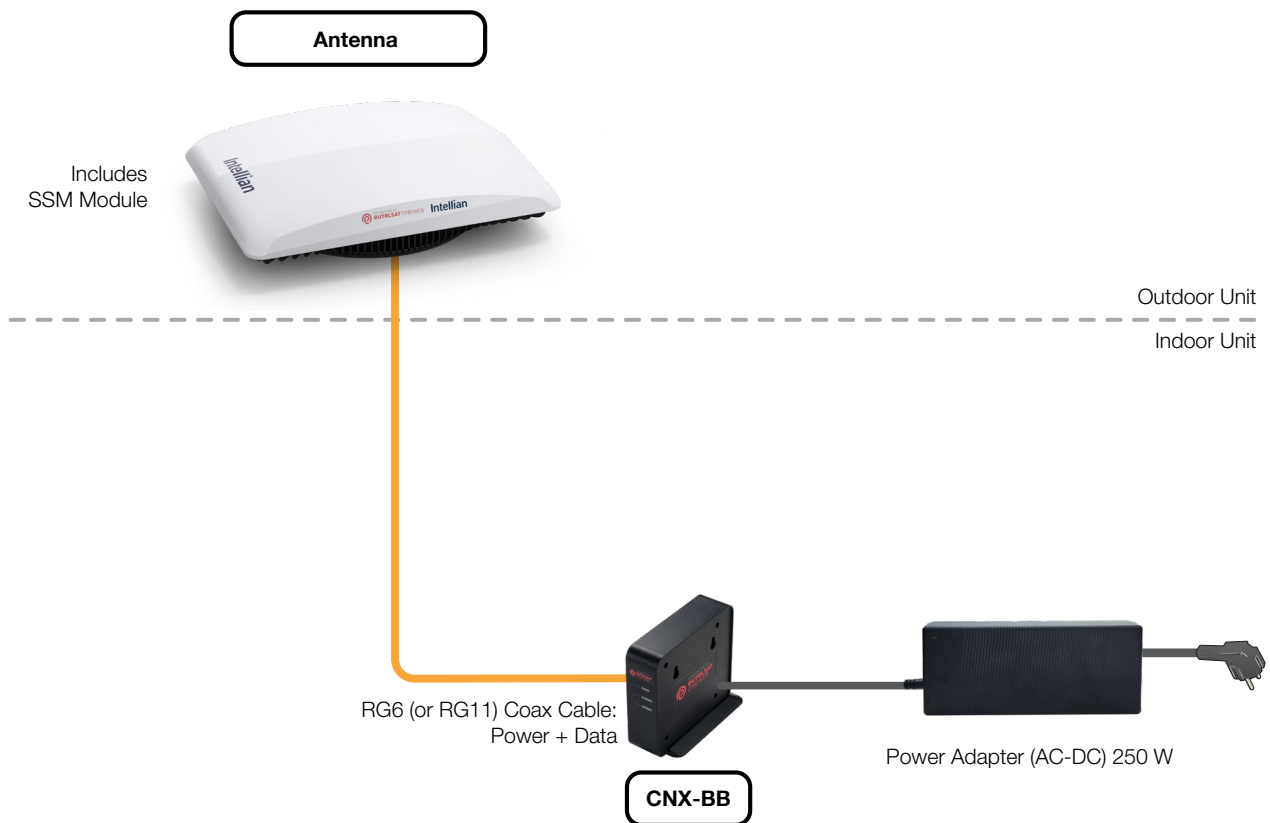


Figure 26: Antenna System Configuration with CNX-BB

Antenna System Configuration with DC-AC Inverter (CNX-BB/CNX-WIFI)

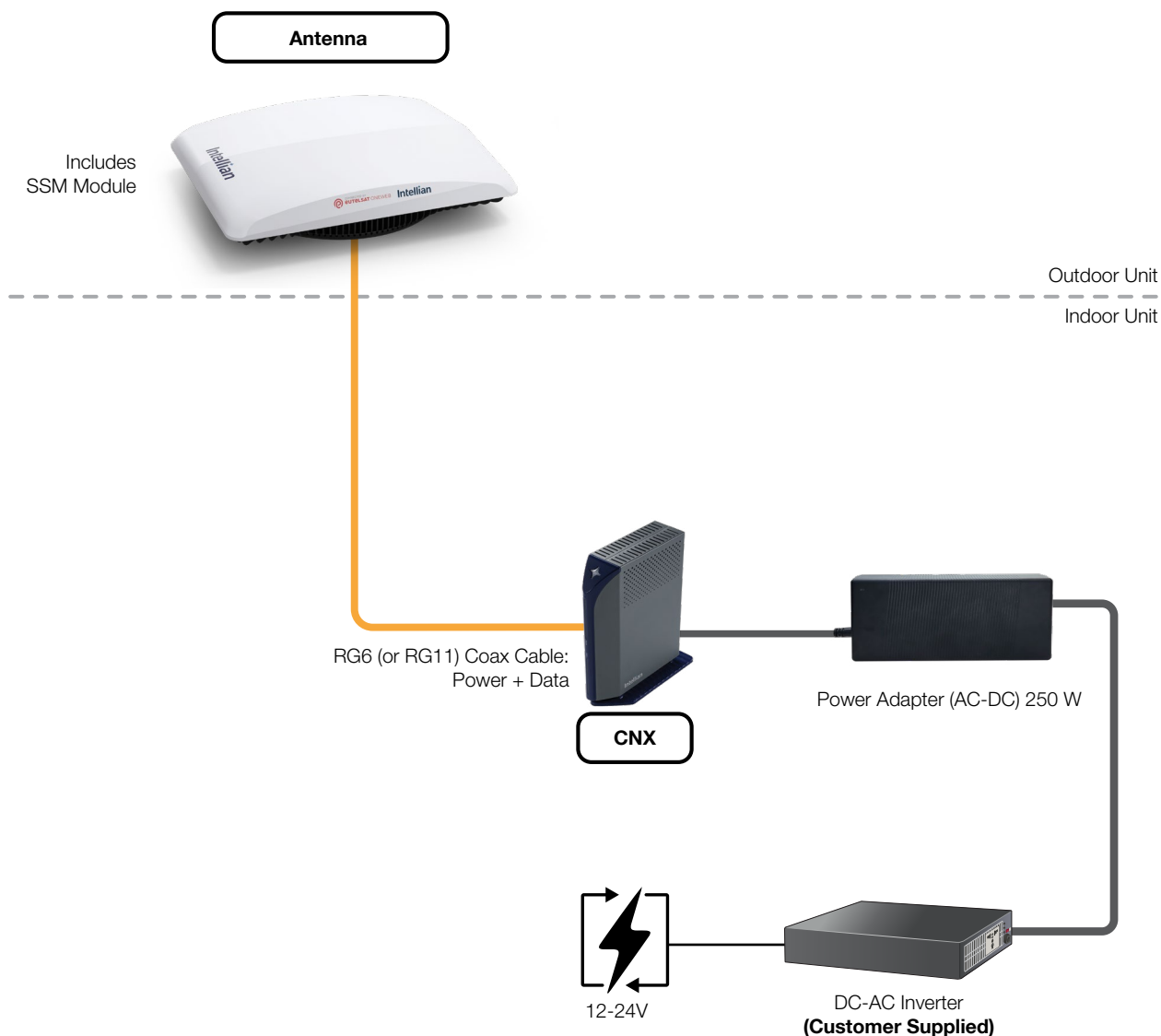


Figure 27: Antenna System Configuration at DC Power site



NOTE

The OW10Hx has been tested and verified by Intellian with the specifications below. The recommended specifications of the DC-AC inverter are as follows:

- Model : Meanwell NTS1200 series
- Output : 230 Vac
- Input : 48 Vdc
- Power : 1200W

Antenna System Configuration with DC-DC Converter for Mobility

To set up the mobility UT, you need to purchase the DC-DC converter spare kit separately. Refer to the following "[Mobility DC Power Connection Procedure](#)" on page 57 for more details.

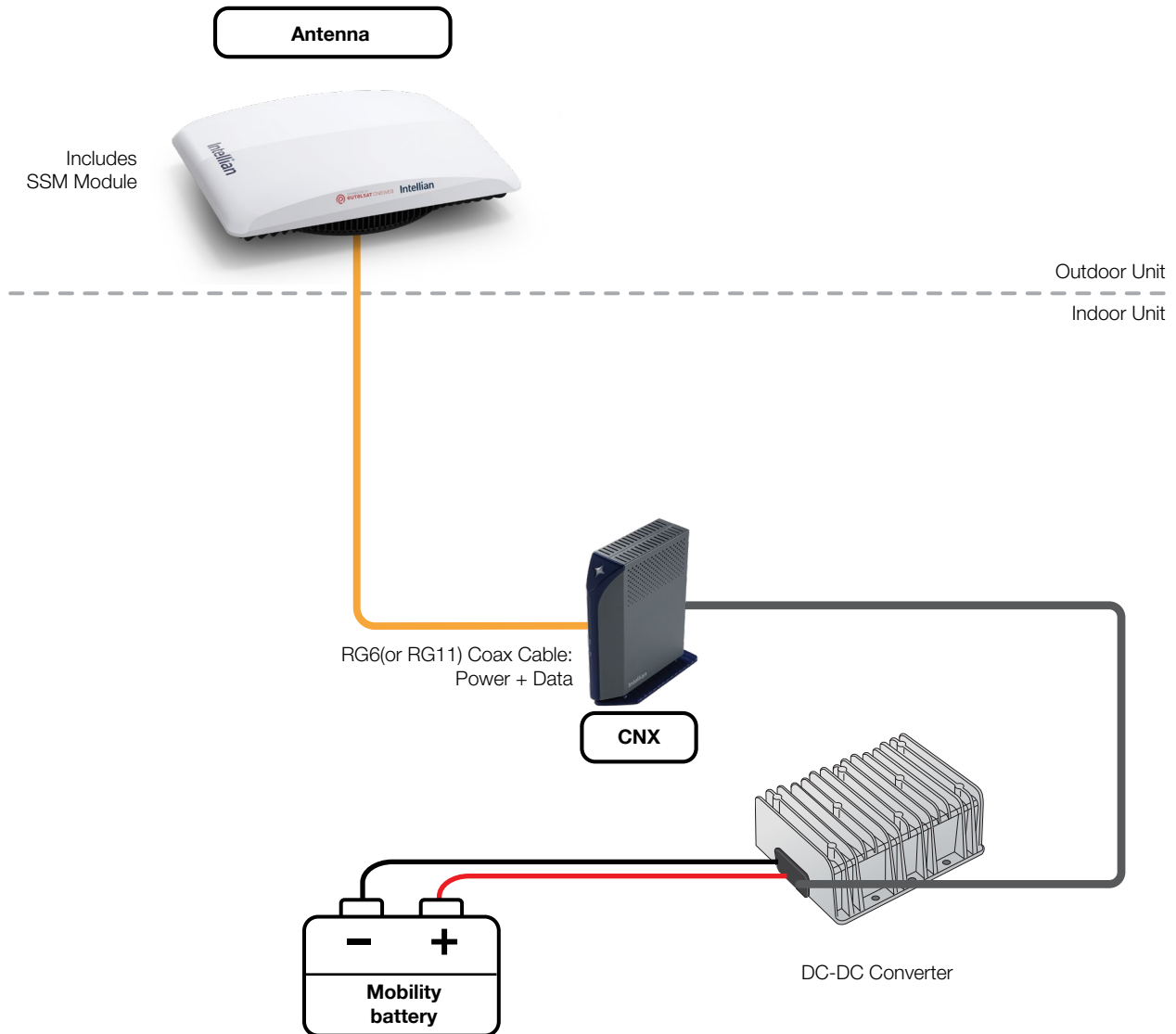


Figure 28: Antenna System Configuration at DC Power site



CAUTION

- Connect the coax connector to the port, then follow with securing any loose cable to the base mount, or any stationary surface relative to the antenna to ensure minimal movement when in motion. This helps prevent damage to the coax port on the antenna.

Antenna System Configuration with CNX-Rack AC/DC (Land Fixed and Maritime only)

Blockage Mitigation

- Primary-Primary blockage mitigation allows seamless connectivity for mobility applications when UT cannot be mounted with 360° of clear line of sight.
- As the active satellite passes behind the blockage, traffic is moved from one antenna to the other to maintain visibility.

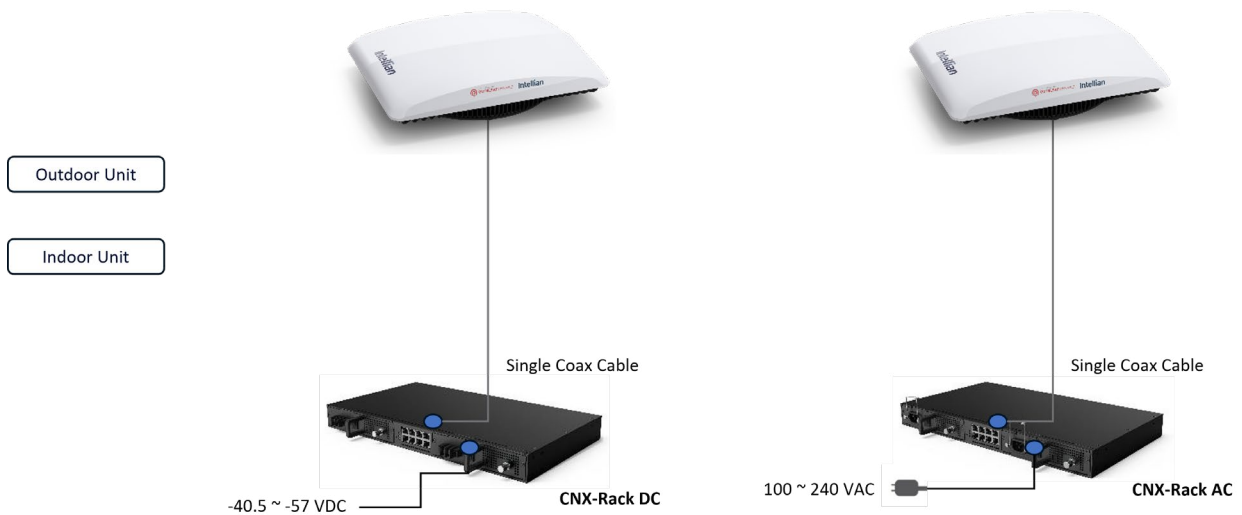


Figure 33: Single Terminal Configurations

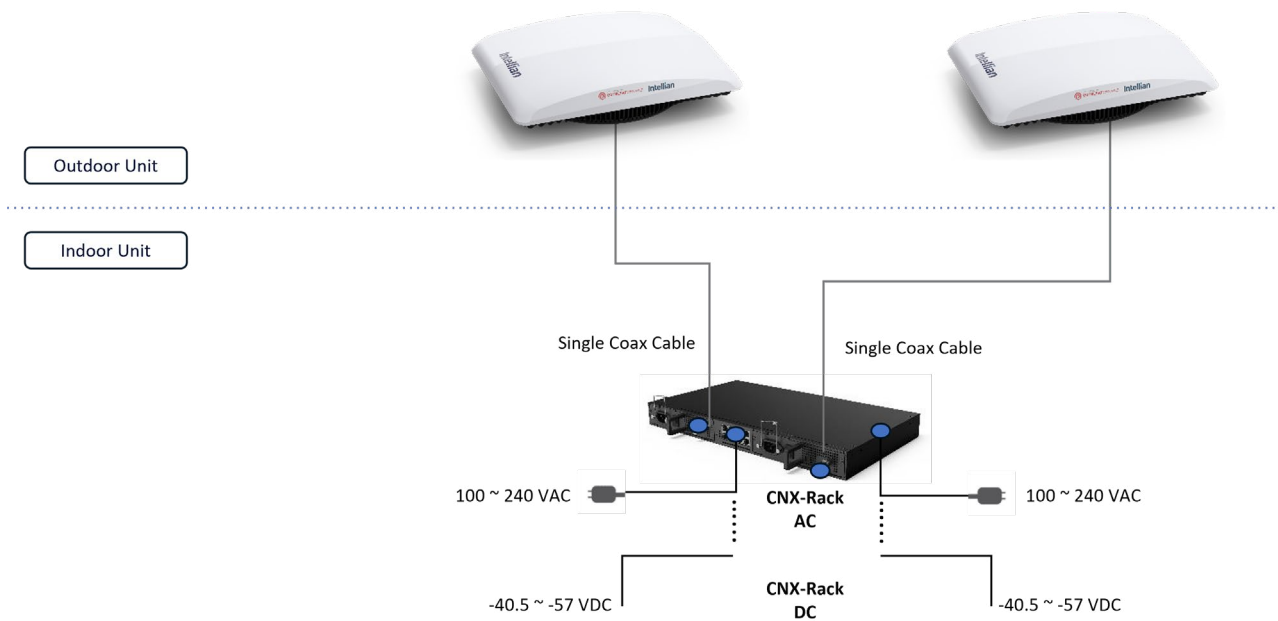


Figure 34: Dual Terminal Configurations

Mobility DC Power Connection Procedure



WARNING

Ensure the vehicle is turned off with a disconnected battery, and remains off during the entirety of the installation until specified to reconnect the battery and turn the vehicle on. Failure to do so can result in personal injury.



WARNING

DC-DC Converter (480W) is only certified for land fixed and land mobile use. Use in a maritime environment is done at the end user's own risk.

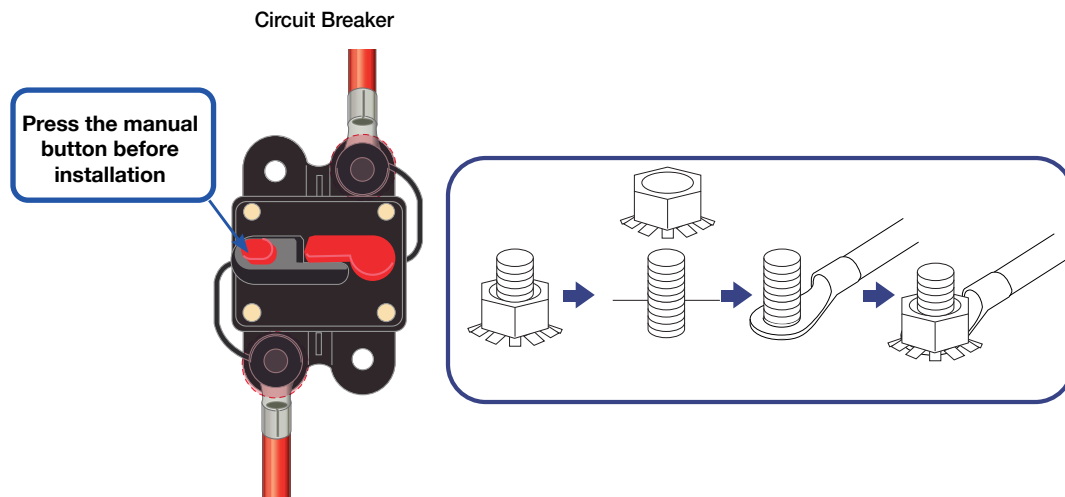
1. Ensure the vehicle is turned off with any work area being cool to the touch.
2. Confirm access to your vehicle's battery
3. Disconnect the negative terminal clamp on the battery. Place it to the side where it will not come into contact with battery terminal.
4. Determine the desired location for the DC-DC converter, outside of the engine bay.
5. Measure the desired length from your car battery, or power access point, to your desired placement location of the DC-DC Converter. Record this value.
6. Cut wires to length based on the above measurements. This will be one (1) red jacketed 10 awg copper wire and one (1) black jacketed 10 awg copper wire.
 - a. Note: it is recommended to cut each wire long by 1-2 meters if you are not certain of length. This can help ensure sufficient length, and slack in the line in later steps.
7. Feed those wires from the battery to the DC-DC converter location.
 - a. Ensure wires are managed in a clean and proper way as to not negatively impact any other components.
 - b. On any externally facing panels such as the firewall, ensure the through hole is adequately sealed.
8. Terminate the wires on the battery side.
 - a. Select the proper ring terminal size for your battery. This will go in line with the terminal clamp screw. Most common sizes are 6mm and 8mm.
 - b. Strip 1cm of jacket off each wire end. Insert the wire into the ring terminal. Then crimp in place using the appropriate crimp tool.
9. Connect ring terminal to the battery terminal clamps.
 - a. Ensure the negative terminal remains disconnected from the battery for safety.
10. Terminate the end of the black wire with an Anderson connector contact.
11. Terminate the end of the red wire with another ring terminal.
12. Connect the red (positive) cable to the circuit breaker.
 - a. Press the manual button on the circuit breaker to disconnect power. This is to prevent personal injury.



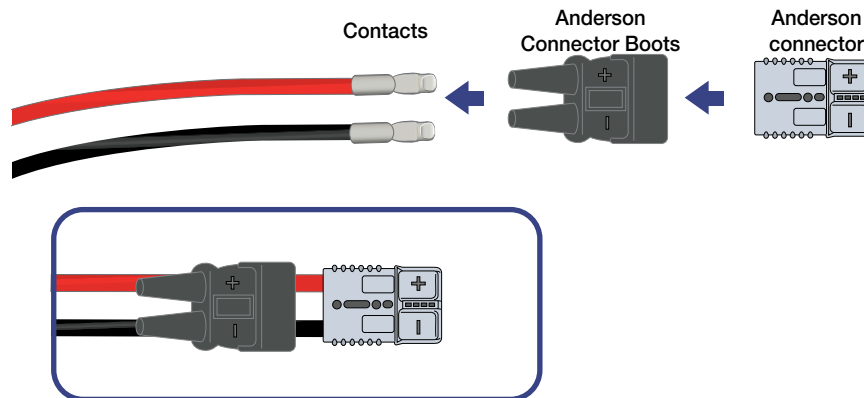
WARNING

Do not press the manual button again to release it before completing the installation of the DC-DC power. It may cause personal injury.

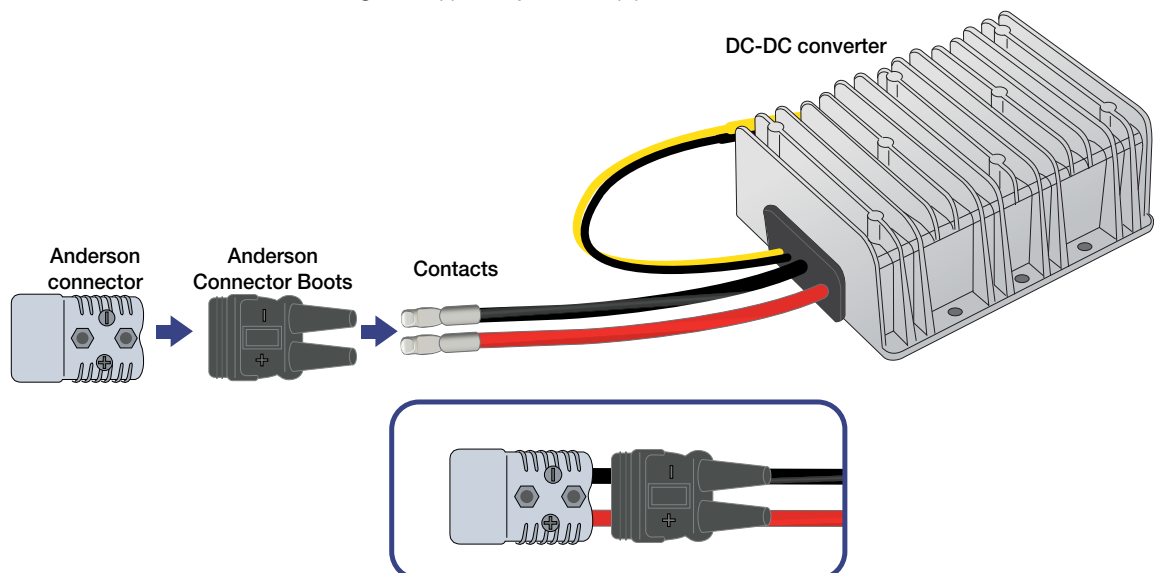
- b. Open the caps on the circuit breaker.
 - c. Unscrew the terminal of the circuit breaker using a wrench. Insert the o-lug of the red (positive) wire into the terminal and tighten the bolt back into the terminal.
13. Create another wire to run from the circuit breaker to the DC-DC Converter.
 - a. Determine the required length, and terminate it with a ring terminal on one end, and a Anderson connector contact on the other.
14. Bring the other red cable. Unscrew the terminal on the other side of the circuit breaker using a wrench. Insert the o-lug of the red (positive) wire into the terminal and tighten the bolt back into the terminal.
15. Close the caps on the circuit breaker.



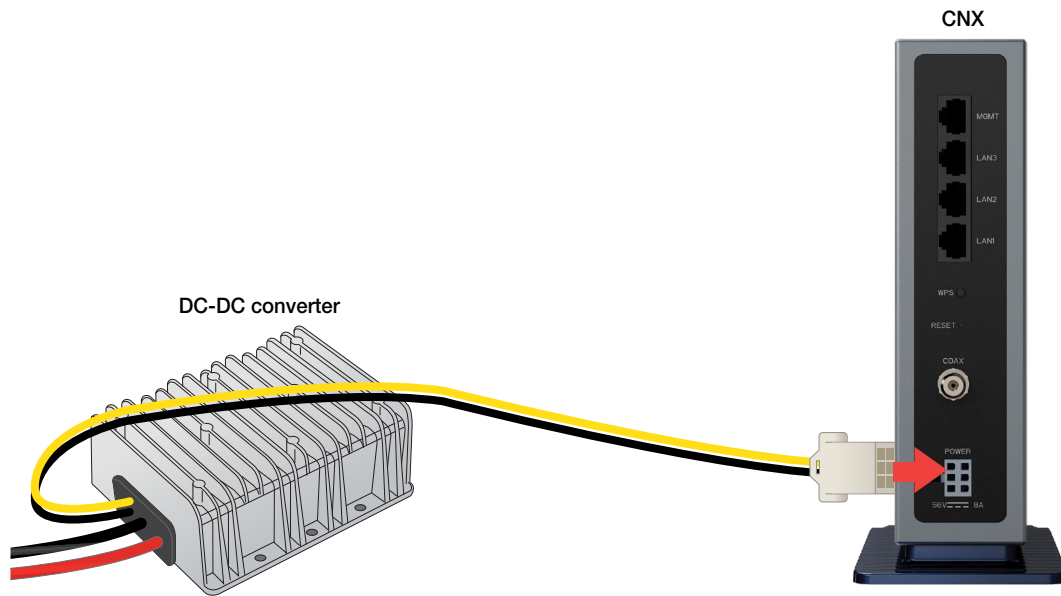
16. Secure the circuit breaker in place with appropriate fasteners.
17. Connect the cables from the car battery to the Anderson connector.
 - a. Pass the cables through the boots. The polarity of the terminal is indicated on the boots with + and - marks. Check the polarity to ensure the cables are inserted correctly.
 - b. Insert the contacts into the negative (-) and positive (+) terminals of the Anderson connector.



18. Connect the cables from the DC-DC converter to the Anderson connector.
 - a. Insert the contacts into the cable conductor for the DC-DC converter and clamp using a crimping tool.
 - b. Pass the cables through the boots. The polarity of the terminal is indicated on the boots with + and - marks. Check the polarity to ensure the cables are inserted correctly.
 - c. Insert the contacts into the negative (-) and positive (+) terminals of the Anderson connector.



19. Connect the CNX power connector to the power port on the CNX



20. Press the manual button on the circuit breaker to release it. Then the power will connect.

21. Plug in the Anderson connectors until a click sound is heard, and then assemble the boots



CAUTION

If you leave the CNX connected, the car battery might discharge. Please take one of the following actions:

- Unplug the Anderson connectors. This completely disconnects the power.
- Disconnect the CNX and DC-DC converter. This puts the system in standby status.
- DC-DC converters generate significant heat, which can cause damage to vehicle seats, etc.

CNX-WIFI Cable Connection

10.3.1 CNX-WIFI Back Panel Connectors

The following figure shows the CNX back panel connectors.

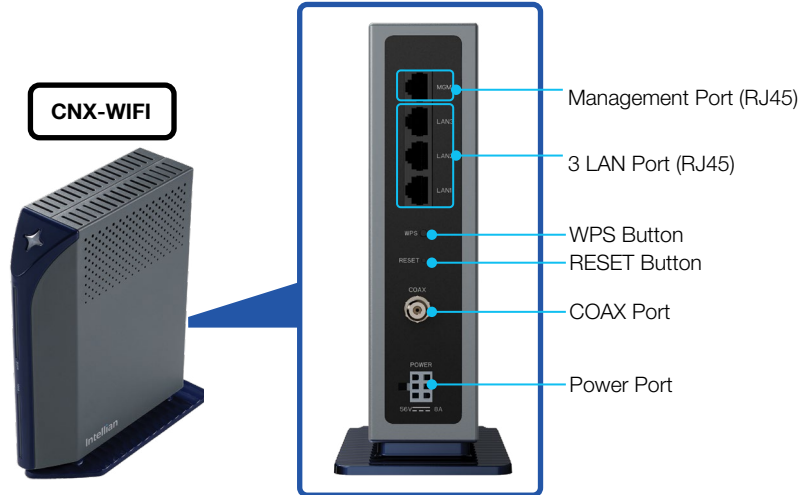
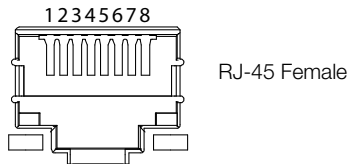


Figure 29: CNX-WIFI Back Panel Ports

10.3.2 CNX-WIFI Connector Pinout Guide

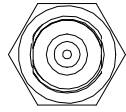
Reference the following connector pinout information for the connection Ports of the CNX.

LAN Connector



Pin	Signal
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC-
5	BI_DC+
6	BI_DB-
7	BI_DD+
8	BI_DD-

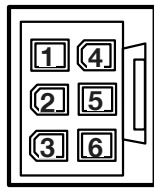
Coax Connectors



RF F Type Female

Conductor	Function
Inner	Power + Data
Outer	GND

Power Connector



6 Contact Power Plug Male
View is from back of
connector

Pin	Signal
1	Return
2	GND
3	Return
4	+56V DC
5	NC
6	+56V DC

10.3.3 Connecting Power to CNX-WIFI

1. Plug the appropriate power cable (AC power cord (NEMA 5-15P) or AC power cord (CEE7/7)) into the power adapter.
2. Connect one end of the power supply unit to the electrical outlet and the other end to the CNX-WIFI.
 - It is recommended that the power cable is plugged into the CNX-WIFI before plugging in the power adapter to an outlet.
 - The power connector can only be plugged into the CNX-WIFI one way. The locking pin is on the left side.
 - Ensure the cable is not subjected to excessive tension or a tight bend radius.

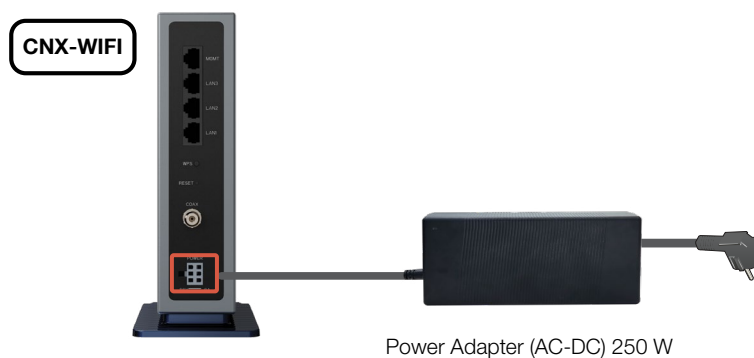


Figure 30: Connecting Power to CNX-WIFI

10.3.4 Connecting CNX-WIFI to Antenna

Connect a coaxial cable from the Coax port of the CNX-WIFI to the Power & Data port of the antenna.



NOTE

- The coaxial cable has already been connected to the antenna.
- Make sure of the following before installing system cables.
 - All cables with connectors need to be fully secured and protected from physical damage.
 - Don't acutely bend any cables during installation.
 - To reduce any damage from water (mist) or Ultraviolet Rays (UV), tape over using waterproof and UV protective tape all the connectors located outside.

- Ensure that each connection is fully tightened with a torque of 1 Nm (8 in.*lbf)
- Ensure the cables are not subjected to excessive tension or in a tight bend radius.



CAUTION

- After connecting the coax cable to the F-Port, ensure the cable is properly secured. The cable shall be secured to any stationary surface relative to the antenna in order to mitigate additional movement and reduce stress on the port. A service loop is also recommended if allowable by the installation.

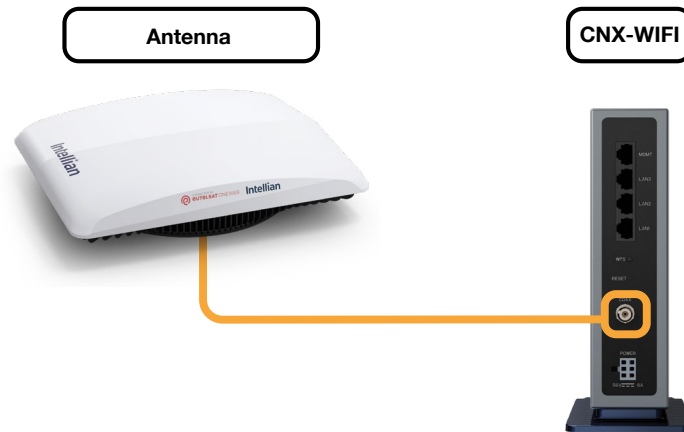


Figure 31: Connecting Power to CNX-WIFI

10.4 CNX-BB Cable Connection

10.4.1 CNX-BB Back Panel Connectors

The following figure shows the CNX back panel connectors.

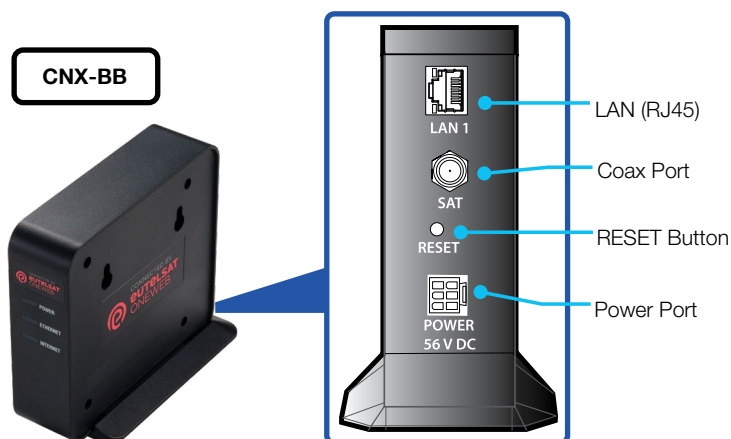
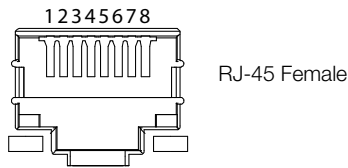


Figure 32: CNX-BB Back Panel Ports

10.4.2 CNX-BB Connector Pinout Guide

Reference the following connector pinout information for the connection Ports of the CNX.

LAN Connector



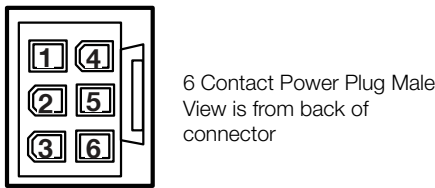
Pin	Signal
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC-
5	BI_DC+
6	BI_DB-
7	BI_DD+
8	BI_DD-

Coax Connectors



Conductor	Function
Inner	Power + Data
Outer	GND

Power Connector

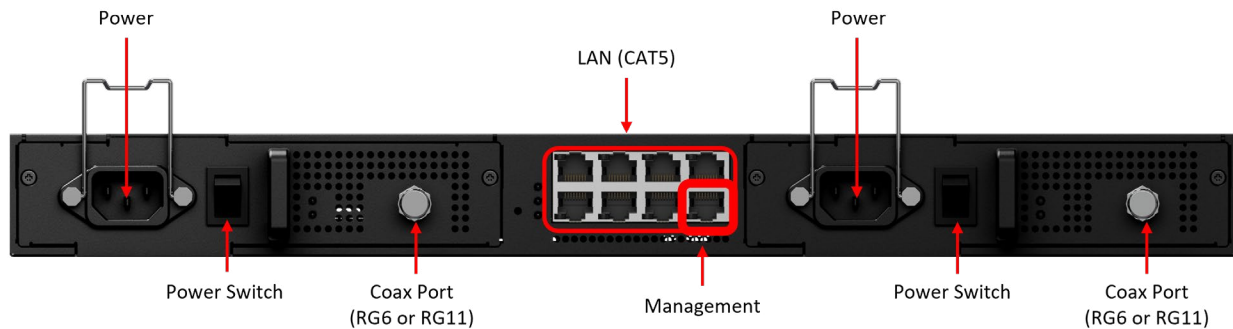


Pin	Signal
1	Return
2	GND
3	Return
4	+56V DC
5	NC
6	+56V DC

10.5 CNX-Rack AC/DC Cable Connection

10.5.1 CNX-Rack AC/DC Front Panel Connectors

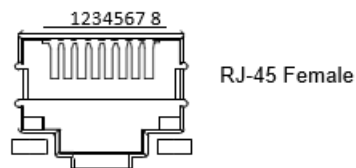
The following figure shows the CNX-Rack AC/DC front panel connectors.



10.5.2 CNX-Rack AC/DC Connector Pinout Guide

Reference the following connector pinout information for the connection Ports of the CNX-Rack AC/DC.

LAN Connector



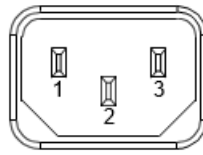
Pin	Signal
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC+
5	BI_DC-
6	BI_DB-
7	BI_DD+
8	BI_DD-

Coax Connectors



Conductor	Function
Inner	Power + Data
Outer	GND

Power Connector

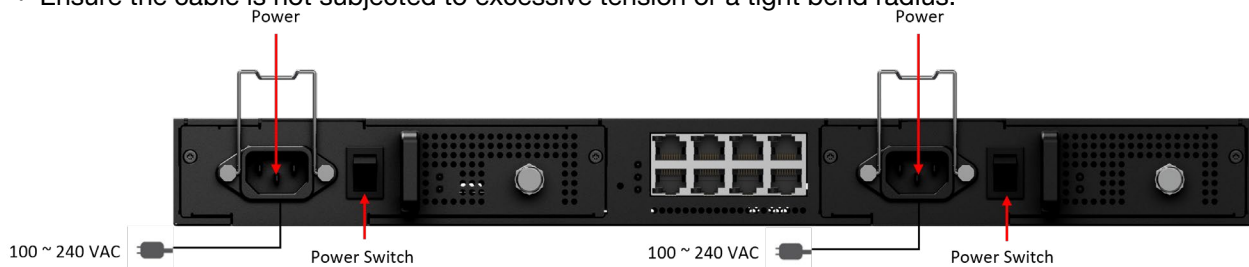


IEC 320 C14 Plug Male

Pin	Signal
1	NEUTRAL
2	FG
3	LIVE

10.4.3 Connecting Power to CNX-Rack AC/DC

1. Plug the appropriate power cable (AC power cord (NEMA 5-15P) or AC power cord (CEE7/7)) into the power adapter.
 2. Connect one end of the power supply unit to the electrical outlet and the other end to the CNX-Rack AC/DC.
- It is recommended that the power cable is plugged into the CNX-Rack AC/DC before plugging in the power adapter to an outlet.
 - The power connector can only be plugged into the CNX-Rack AC/DC one way.
 - Ensure the cable is not subjected to excessive tension or a tight bend radius.



10.4.4 Connecting CNX-Rack AC/DC to Antenna

Connect a coaxial cable from the Coax port of the CNX-Rack AC/DC to the Power & Data port of the antenna.



NOTE

- The coaxial cable has already been connected to the antenna.
- Make sure of the following before installing system cables.
 - All cables with connectors need to be fully secured and protected from physical damage.
 - Don't acutely bend any cables during installation.
 - To reduce any damage from water (mist) or Ultraviolet Rays (UV), tape over using waterproof and UV protective tape all the connectors located outside.

- Ensure that each connection is fully tightened with a torque of 1 Nm (8 in.*lbf)
- Ensure the cables are not subjected to excessive tension or in a tight bend radius.



CAUTION

- After connecting the coax cable to the F-Port, ensure the cable is properly secured. The cable shall be secured to any stationary surface relative to the antenna in order to mitigate additional movement and reduce stress on the port. A service loop is also recommended if allowable by the installation.

Chapter 11. Operating the CNX

11.1 Front Panel View

11.1.1 CNX-WIFI Front Panel

During the installation process and use, it is important to know the elements of the CNX-WIFI. The front panel displays the Wi-Fi and WAN indicators lights. They will light up blue when engaged and display connection status with the LED indicators on the front and back panel of the CNX-WIFI.

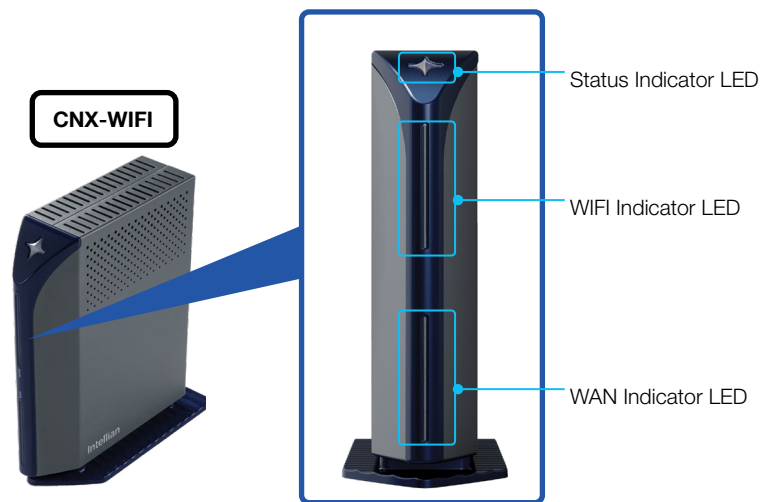


Figure 35: Front Panel View of CNX-WIFI

CNX-WIFI LEDs

The following table shows the status indicators and buttons for the CNX-WIFI.

LED Indicators	Color	Description
Status LED	■ Off	No Power
	■ Solid Blue	Connected to power supply
	■ Solid Red	Fault Condition
Wi-Fi 6 LED	■ Off	5G and 2.4G Disabled
	▢ Blinking Blue	Data Activity
	■ Solid Blue	5G or 2.4G Enabled
INTERNET	■ Off	Coaxial Port Disconnected
	▢ Blinking Blue	Data Activity
	■ Solid Blue	Coaxial Port Connected, but no data activity

11.1.2 CNX-BB Front Panels

During the installation process and use, it is important to know the parts of the CNX-BB. The front panel displays the Ethernet and Internet indicators lights. They will light up green when engaged and are used to check the connection status.

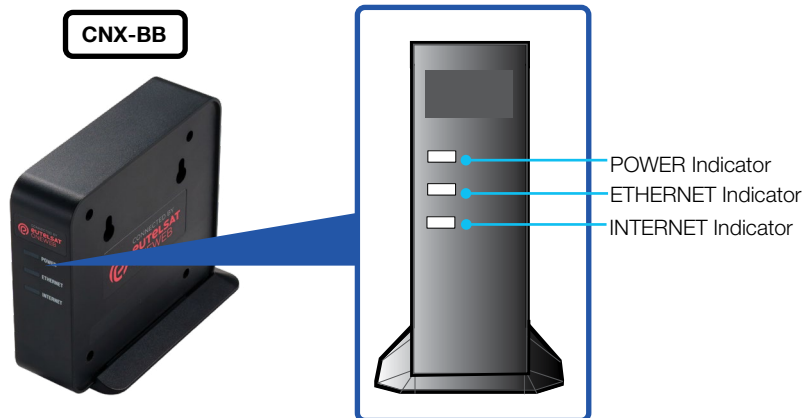


Figure 36: Front Panel View of CNX-BB

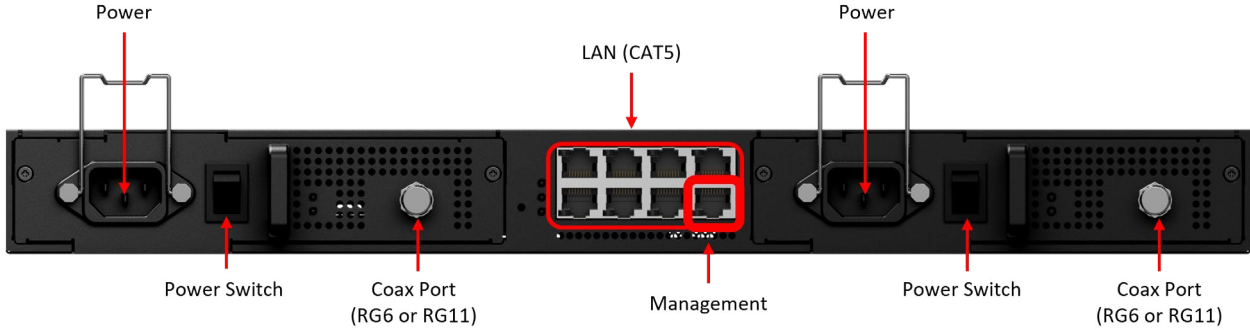
CNX-BB LEDs

The following table shows the status indicators and buttons for the CNX-BB.

LED Indicators	Color	Description
POWER	■ Off	The CNX is powered off.
	■ Steady Green	The CNX is powered on.
ETHERNET	■ Off	The user network is not connected.
	◻ Blinking Green	The user network is connected. There is a physical connection.
	■ Steady Green	The user network is ready. There is a good physical connection and also, running through traffic stably connected.
INTERNET	■ Off	The CNX Coaxial cable is not connected properly. MoCA communication is not properly established.
	◻ Blinking Green	The CNX Coaxial cable is connected. Its blinking frequency changes by the signal traffic. MoCA communication is established.

11.1.3 CNX-Rack AC/DC Front Panels

During the installation process and use, it is important to know the parts of the CNX-Rack AC/DC. The front panel includes the power connections power switches, XCVR ports and the LAN ports.



CNX-Rack AC/DC LEDs

The following table shows the status indicators and buttons for the CNX-BB.

LED Indicators	Color	Description
POWER	■ Off	The CNX is powered on.
	■ Steady Green	The CNX is powered off.
MoCA	■ Off	The user network is not connected.
	◻ Blinking Green	The user network is connected. There is a physical connection.
	■ Steady Green	The user network is ready. There is a good physical connection and also, running through traffic stably connected.

11.2 CNX-WIFI Modes of Operations

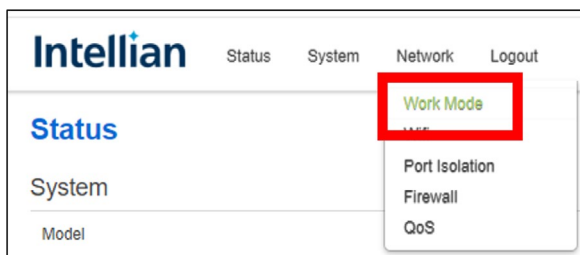
11.2.1 Bridge Mode

In Bridge Mode, the router acts as a bridge or a link between devices within the same network, allowing them to communicate directly.

The CNX-WIFI is in **Bridge** work mode by default. When operating the CNX-WIFI in Bridge mode, the Mgmt port and SSID: Intellian are enabled.

To ensure the CNX-WIFI is in Bridge mode:

1. Connect to ethernet cable the MGMT port on the CNX-WIFI.
2. Type in **192.168.100.3** in the web browser.
3. Set your password upon first log in. A basic recommendation is "admin", but can be changed based on the user preference.
 - If the password is ever lost or forgotten, the CNX can be reset to default by pushing and holding the reset button for 10 seconds.
4. From the **Network** menu, select **Work Mode**.



5. From the **Work Mode** Setting page, select **Bridge** if necessary. By default, it will be in **Bridge** work mode. If you change the setting, select the **Save and Apply** button.

When in Bridge Mode, all traffic (management and user) is accessible via the MGMT port. The SSID “Intellian” is also enabled for all traffic. LAN ports 1-3 and the User SSIDs are disabled.



Do not attempt to enable the other SSIDs or change the configuration to Router mode at this time as user traffic and internet access will be denied.

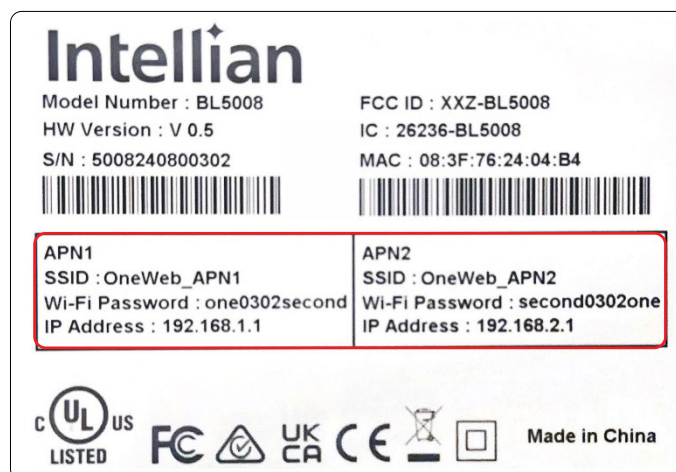
11.2.2 Router Mode

Router Mode is currently not supported.

11.3 CNX-WIFI Settings

11.3.1 Updating Wi-Fi Passwords for CNX-WIFI

The username, password, and SSID information are on a label on the bottom of the CNX-WIFI. The Intellian MGMT network does not have a password. There are two frequency options on the Intellian SSID, 2.5 GHz and 5 GHz. Devices will automatically jump between 2.5 GHz and 5 GHz without any necessary work and end users will only see one.

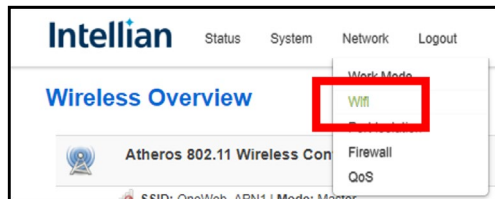


NOTE: This is an example. Passwords are unique to each CNX.

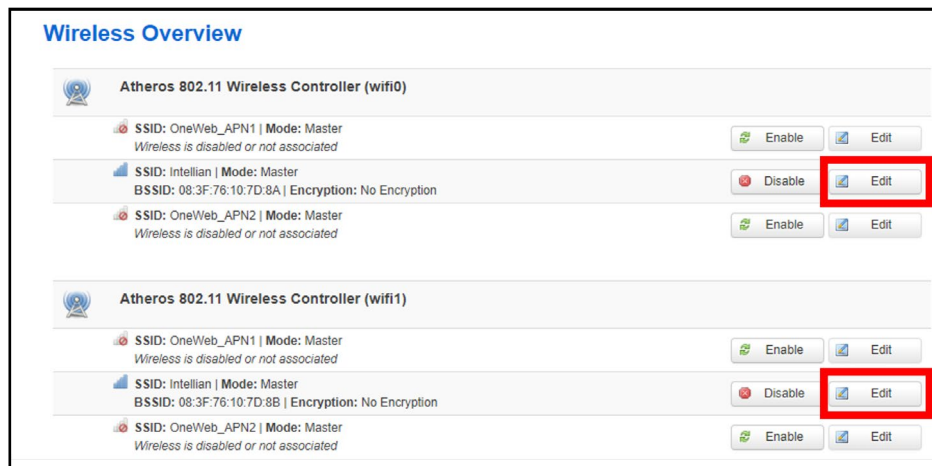
Figure 37: CNX-WIFI Label

In Bridge Mode, only the Intellian SSID is enabled / accessible. To change the SSID name or Password follow the below process.

1. To change the SSID name or password, go to the **Network** menu and select **WIFI**.



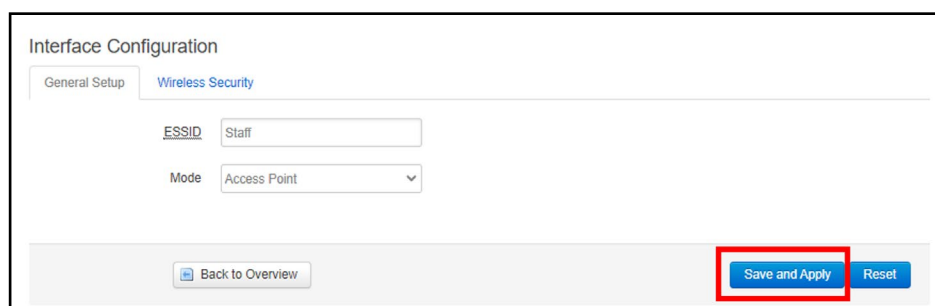
2. Select the **Edit** button to make changes.



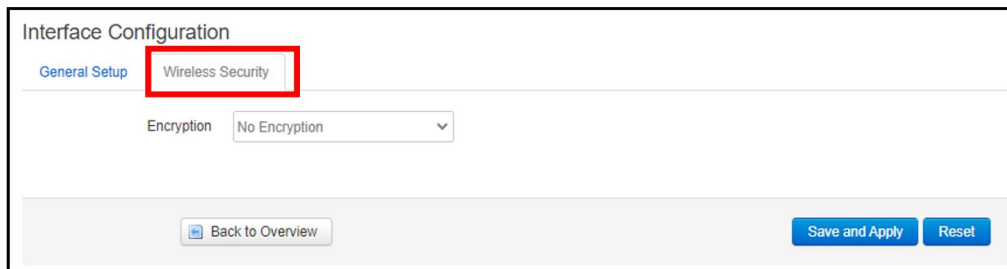
3. To change the SSID name, go to the **Interface Configuration** section, select the **General Setup** tab and type in the new name in the ESSID field.



4. Once the SSID name has been updated, select the **Save and Apply** button.

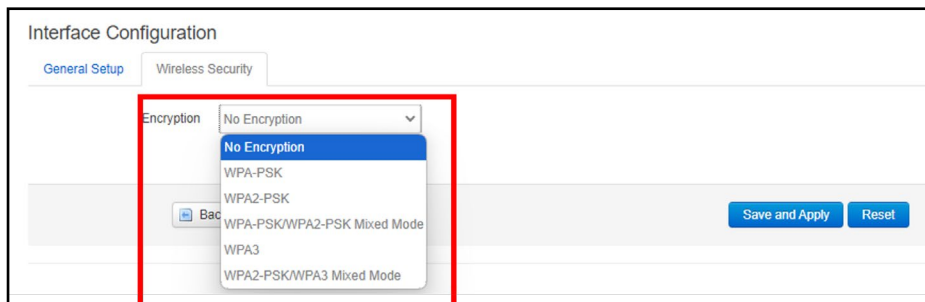


5. To change the password, go to the Interface Configuration section and select the **Wireless Security** tab.



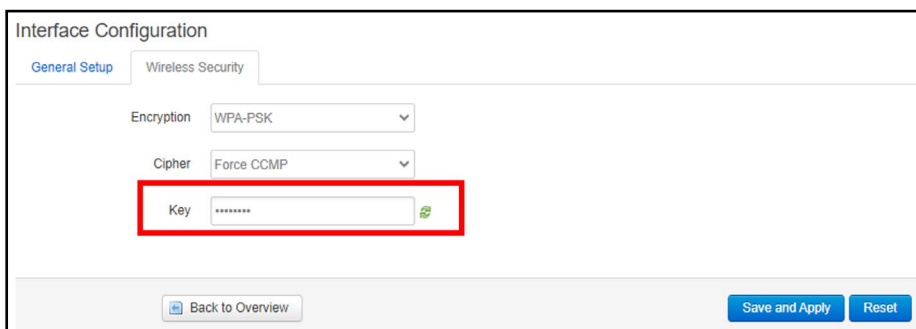
The screenshot shows the 'Interface Configuration' page. The 'Wireless Security' tab is selected and highlighted with a red box. Below the tabs, the 'Encryption' dropdown menu is set to 'No Encryption'. At the bottom, there are three buttons: 'Back to Overview', 'Save and Apply', and 'Reset'.

6. Select the appropriate **Encryption** option from the dropdown box.



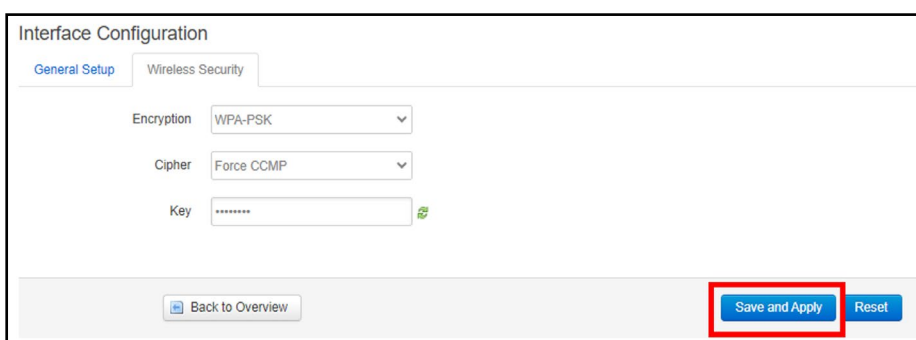
The screenshot shows the 'Interface Configuration' page with the 'Wireless Security' tab selected. The 'Encryption' dropdown menu is open, showing options: 'No Encryption', 'WPA-PSK', 'WPA2-PSK', 'WPA-PSK/WPA2-PSK Mixed Mode', 'WPA3', and 'WPA2-PSK/WPA3 Mixed Mode'. The 'No Encryption' option is highlighted with a blue bar. A red box highlights the dropdown menu. At the bottom, there are three buttons: 'Back to Overview', 'Save and Apply', and 'Reset'.

7. Type in the new password in the **Key** field. By default, it will be the password on the label on the bottom of the CNX-WIFI.



The screenshot shows the 'Interface Configuration' page with the 'Wireless Security' tab selected. The 'Encryption' dropdown menu is set to 'WPA-PSK' and the 'Cipher' dropdown menu is set to 'Force CCMP'. The 'Key' field is highlighted with a red box and contains a masked password (*****). At the bottom, there are three buttons: 'Back to Overview', 'Save and Apply', and 'Reset'.

8. Once the password has been updated, select the **Save and Apply** button.



The screenshot shows the 'Interface Configuration' page with the 'Wireless Security' tab selected. The 'Encryption' dropdown menu is set to 'WPA-PSK' and the 'Cipher' dropdown menu is set to 'Force CCMP'. The 'Key' field contains a masked password (*****). The 'Save and Apply' button is highlighted with a red box. At the bottom, there are three buttons: 'Back to Overview', 'Save and Apply', and 'Reset'.



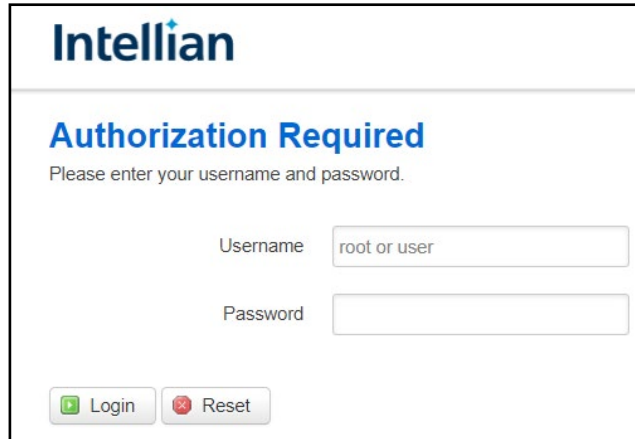
NOTE

The ability to change SSID name and password is only available for SSID Intellian at this time.

11.3.2 Updating the Country Code for CNX-WIFI

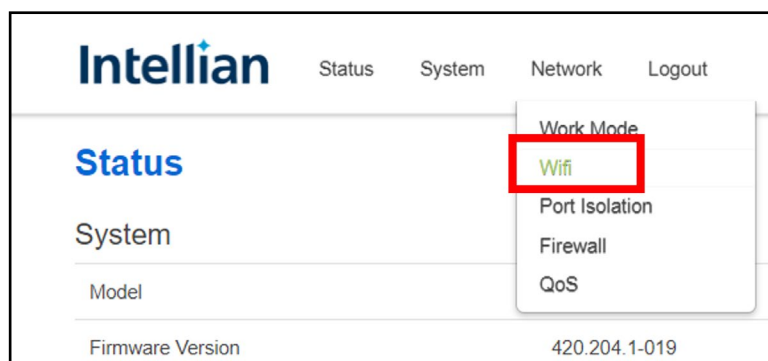
To update the Country Code, follow these steps:.

1. Log into the CNX-WIFI Login page: **192.168.100.3**. The default username is “root” and the password is “admin”.

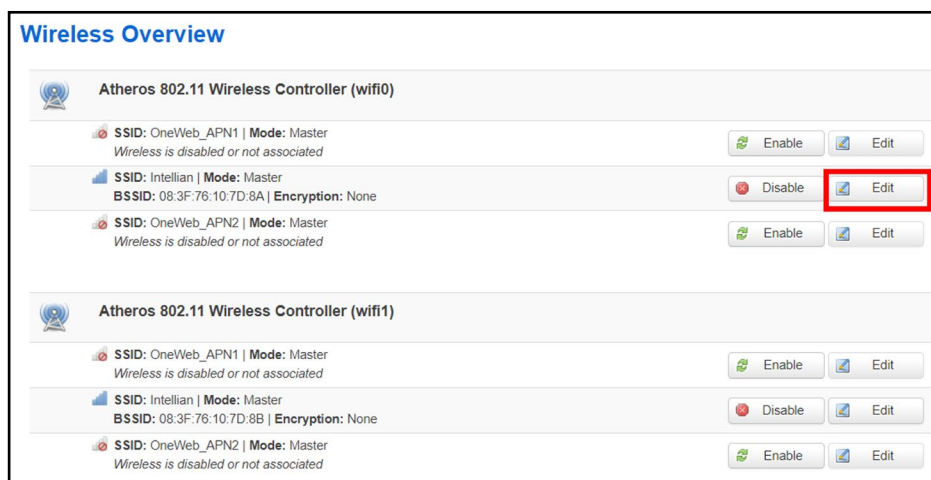


The image shows the Intellian login page. At the top is the Intellian logo. Below it, the text "Authorization Required" is displayed in blue, followed by "Please enter your username and password." There are two input fields: "Username" with the placeholder text "root or user" and "Password". At the bottom, there are two buttons: "Login" with a green arrow icon and "Reset" with a red 'x' icon.

2. From the **Network** menu, select **WIFI**.



3. Select the Edit button on the **SSID: Intellian | Mode: Master** row for 2.5 GHz (wifi0).



4. From the General Setup section, select the appropriate Country Code from the drop down list.

Wireless Network: Master "Intellian" (wlan1)

The *Device Configuration* section covers physical settings of the radio hardware such as channel, transmit power or antenna selection which are shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode are grouped in the *Interface Configuration*.

Device Configuration

General Setup

Status  **Mode:** Master | **SSID:** Intellian
BSSID: 08:3F:76:10:7D:8A | **Encryption:** No Encryption
Channel: 11 (2.462 GHz) | **Tx-Power:** 19 dBm
Bitrate: 573.0 Mbit/s | **Country:** US

Operating frequency **Mode:** AX | **Channel:** auto | **Width:** 40 MHz

Country Code: US (United States)

5. Scroll to the bottom of the page and select the **Save and Apply** button.

Device Configuration

General Setup

Status  **Mode:** Master | **SSID:** Intellian
BSSID: 08:3F:76:10:7D:8A | **Encryption:** No Encryption
Channel: 11 (2.462 GHz) | **Tx-Power:** 19 dBm
Bitrate: 573.0 Mbit/s | **Country:** US

Operating frequency **Mode:** AX | **Channel:** auto | **Width:** 40 MHz

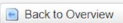
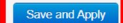
Country Code: US (United States)

Interface Configuration

General Setup **Wireless Security**

ESSID: Intellian

Mode: Access Point

6. The screen will display that changes are being applied.

Wireless Network: Master "Intellian" (wlan1)

The *Device Configuration* section covers physical settings of the radio hardware such as channel, transmit power or antenna selection which are shared among all defined wireless networks (if the radio hardware is multi-SSID capable). Per network settings like encryption or operation mode are grouped in the *Interface Configuration*.

Applying changes

 /etc/config/network

Device Configuration

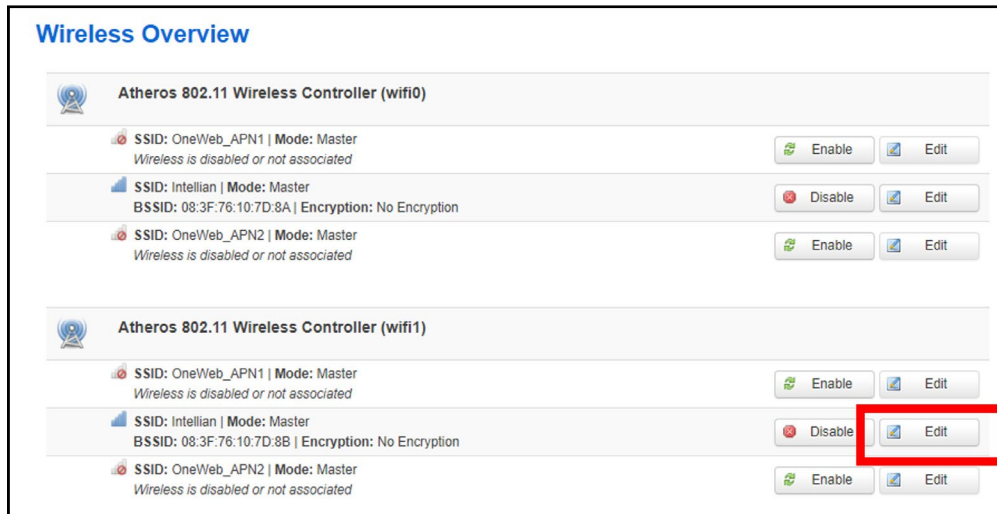
General Setup

Status  **Mode:** Master | **SSID:** Intellian
BSSID: 08:3F:76:10:7D:8A | **Encryption:** No Encryption
Channel: 1 (2.412 GHz) | **Tx-Power:** 19 dBm
Bitrate: 573.0 Mbit/s | **Country:** JP

Operating frequency **Mode:** AX | **Channel:** auto | **Width:** 40 MHz

Country Code: JP (Japan)

7. Once the changes have been applied, the **Wireless Overview** page will display. The 5 GHz row will also need to be updated. Select the **Edit** button on the **SSID: Intellian | Mode: Master** row for 5 GHz (wifi1).



8. Follow steps 1-4 to complete the same procedure.

Based on the country list provided, here are the operating / allowed Wi-Fi frequency across different countries:

The following countries have the same data:

Argentina, Australia, Brazil, Chile, EU (European Union), Indonesia, Mexico, Saudi Arabia, South Africa, South Korea, UK (United Kingdom), and USA.

- 2.4 GHz Band: 2400–2483.5 MHz
- 5 GHz Band:
 - UNII-1: 5150–5250 MHz
 - UNII-2: 5250–5350 MHz
 - UNII-2 Extended: 5470–5725 MHz
 - UNII-3: 5725–5850 MHz

Canada

- 2.4 GHz Band: 2400–2483.5 MHz
- 5 GHz Band:
 - UNII-1: 5150–5250 MHz
 - UNII-2: 5250–5350 MHz
 - UNII-2 Extended: 5470–5725 MHz
 - UNII-3: 5725–5825 MHz

Japan

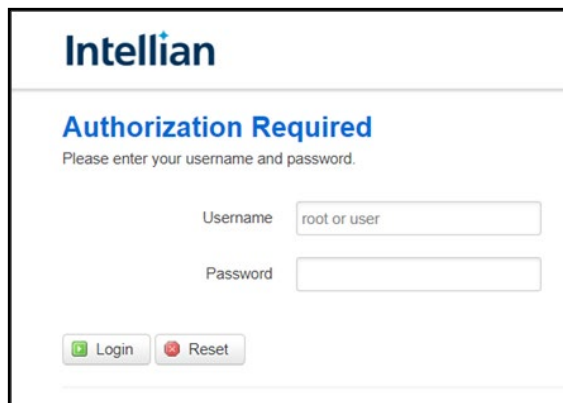
- 2.4 GHz Band: 2400–2483.5 MHz
- 5 GHz Band:
 - UNII-1: 5150–5250 MHz
 - UNII-2: 5250–5350 MHz
 - UNII-2 Extended: 5470–5600 MHz
 - UNII-3: 5650–5850 MHz

- 2.4 GHz Band is universally the same across all these countries (2400–2483.5 MHz).
- 5 GHz Band has variations, especially in the upper ranges and some specific bands.

11.4 Updating the CNX-WIFI Software

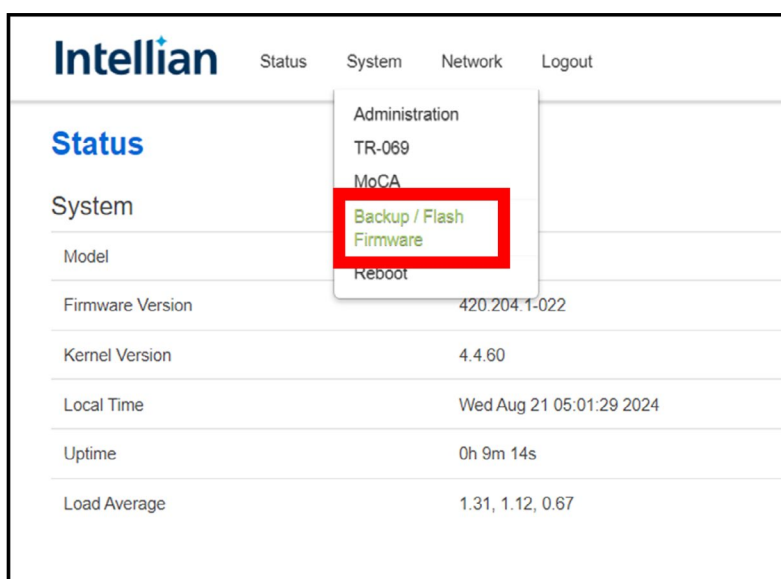
To update the CNX-WIFI software, follow these steps:

1. Log into the CNX-WIFI Login page: **192.168.100.3**. The default username is “root” and the password is “admin”.



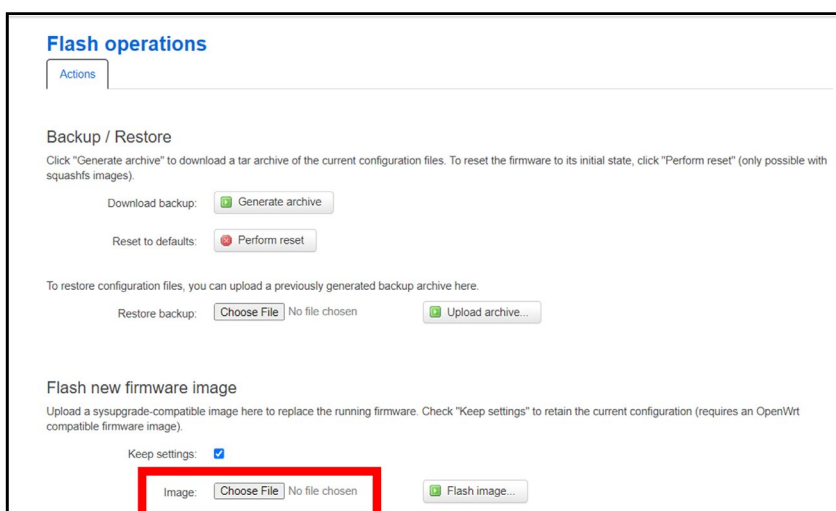
The image shows the Intellian login page. At the top is the Intellian logo. Below it, the heading "Authorization Required" is followed by the instruction "Please enter your username and password." There are two input fields: "Username" with the placeholder text "root or user" and "Password". At the bottom, there are two buttons: "Login" with a green arrow icon and "Reset" with a red circular arrow icon.

2. From the **System** menu, select **Backup / Flash Firmware**.



The image shows the Intellian web interface. At the top, there are tabs: "Status", "System", "Network", and "Logout". The "System" tab is selected, and a dropdown menu is open showing options: "Administration", "TR-069", "MoCA", "Backup / Flash Firmware" (which is highlighted with a red box), and "Reboot". The main content area shows system status information under the "Status" heading, including Model, Firmware Version (420.204.1-022), Kernel Version (4.4.60), Local Time (Wed Aug 21 05:01:29 2024), Uptime (0h 9m 14s), and Load Average (1.31, 1.12, 0.67).

3. Go to the **Flash new firmware image** section and select the **Choose File** button to get the appropriate file.



The image shows the "Flash operations" page. It has a sub-header "Actions". Under "Backup / Restore", there are buttons for "Generate archive" and "Perform reset". Below that, there is a section for restoring backup files with a "Choose File" button (highlighted with a red box) and an "Upload archive..." button. The "Flash new firmware image" section has a "Keep settings" checkbox (checked) and an "Image:" section with a "Choose File" button (highlighted with a red box) and a "Flash image..." button.

4. The file name will display next to the **Choose File** button.

Flash new firmware image

Upload a sysupgrade-compatible image here to replace the running firmware. Check "Keep settings" to retain the current configuration (requires an OpenWrt compatible firmware image).

Keep settings: ☒

Image: nand-ipq501...4.1-022.img

5. Select the **Flash image** button to begin upgrade.

Flash new firmware image

Upload a sysupgrade-compatible image here to replace the running firmware. Check "Keep settings" to retain the current configuration (requires an OpenWrt compatible firmware image).

Keep settings: ☒

Image: nand-ipq501...4.1-022.img

6. The **Flash Firmware - Verify** page displays with the file information. Select the **Proceed** button.

Intellian Status System Network Logout

Flash Firmware - Verify

The flash image was uploaded. Below is the checksum and file size listed, compare them with the original file to ensure data integrity. Click "Proceed" below to start the flash procedure.

- Checksum: 6d3e84b065c8cbbae4df79889845c765
- Size: 45.23 MB
- Configuration files will be kept.

7. The System Flashing screen will display while the updates are being done.

System - Flashing...

The system is flashing now.
DO NOT POWER OFF THE DEVICE!
Wait a few minutes before you try to reconnect. It might be necessary to renew the address of your computer to reach the device again, depending on your settings.

 Waiting for changes to be applied...

8. Once the update is complete, log back into the system and verify that the software has been updated on the **Status** page.

Intellian Status System Network Logout

Status

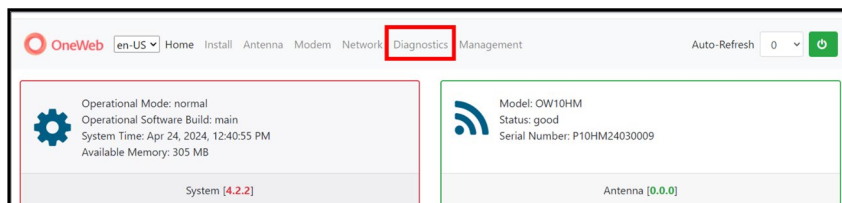
System

Model	CNX WIFI
Firmware Version	420.204.1-022
Kernel Version	4.4.60
Local Time	Wed Aug 21 04:56:48 2024
Uptime	0h 3m 3s
Load Average	1.67, 0.88, 0.35

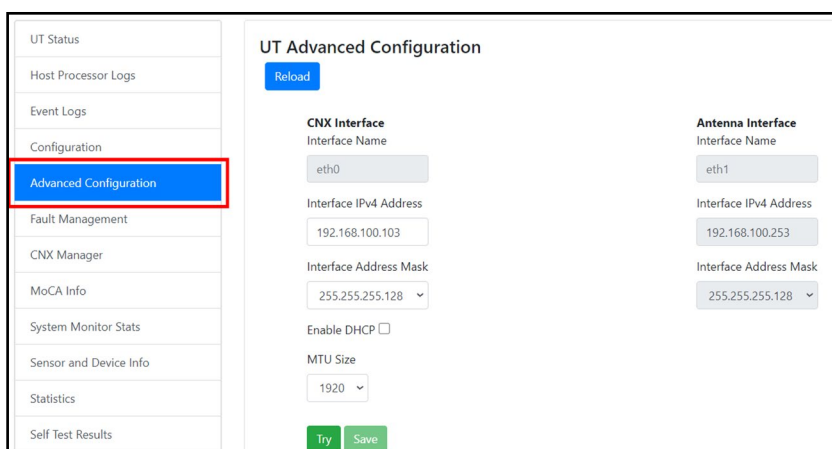
11.5 Updating the UT IP Address

There is an option to update the UT IP address if needed. Customers **should not / must not** change the subnet. Only changing the "x" in the IP address 192.168.100.x is acceptable. This will ensure that the communication does not break between the CNX and the UT. To change the UT IP address, follow these steps:

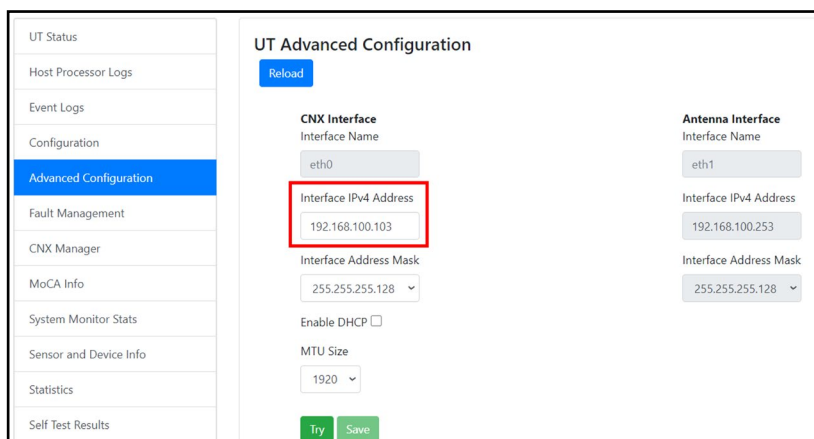
1. Log into UT LUI: **192.168.100.3** and select **Diagnostics** from the menu at the top of the page.



2. Select **Advanced Configuration** from the menu on the left of the page.



3. Go to the **Interface IPv4 Address** field to make the update. Reminder: Only the last section of the IP address should be changed.



1. After changing the UT IP address, select the **Try** button and then the **Save** button.

The screenshot shows the 'UT Advanced Configuration' page. On the left is a sidebar with navigation links: UT Status, Host Processor Logs, Event Logs, Configuration, **Advanced Configuration** (highlighted), Fault Management, CNX Manager, MoCA Info, System Monitor Stats, Sensor and Device Info, Statistics, and Self Test Results. The main content area is titled 'UT Advanced Configuration' and includes a 'Reload' button. It is divided into two columns: 'CNX Interface' and 'Antenna Interface'. The 'CNX Interface' section has fields for Interface Name (eth0), Interface IPv4 Address (192.168.100.103), Interface Address Mask (255.255.255.128), Enable DHCP (unchecked), and MTU Size (1920). The 'Antenna Interface' section has fields for Interface Name (eth1), Interface IPv4 Address (192.168.100.253), and Interface Address Mask (255.255.255.128). At the bottom of the main content area, the 'Try' and 'Save' buttons are highlighted with a red rectangular box.

2. To apply the changes, reboot the system.

The screenshot shows the OneWeb LUI interface. At the top, there is a navigation bar with the OneWeb logo, a language dropdown set to 'en-US', and links for Home, Install, Antenna, Modem, Network, Diagnostics, and Management. On the right of the navigation bar is an 'Auto-Refresh' dropdown set to '0' and a power button icon, which is highlighted with a red rectangular box. Below the navigation bar is a sidebar with navigation links: UT Status, Host Processor Logs, Event Logs, Configuration, **Advanced Configuration** (highlighted), and Fault Management. The main content area is titled 'UT Advanced Configuration' and includes a 'Reload' button. It is divided into two columns: 'CNX Interface' and 'Antenna Interface'. The 'CNX Interface' section has fields for Interface Name (eth0), Interface IPv4 Address (192.168.100.104), and Interface Address Mask (255.255.255.128). The 'Antenna Interface' section has fields for Interface Name (eth1), Interface IPv4 Address (192.168.100.253), and Interface Address Mask (255.255.255.128).

Chapter 12. Using Local User Interface (LUI)

12.1 Introduction

With the embedded Using Local User Interface (LUI) software, the antenna can be monitored, controlled, and diagnosed remotely through a web browser. It saves your time and cost generated by various maintenance activities such as operating firmware upgrades, tracking parameter resets, and system diagnosis, etc.

12.2 Requirements to Access Eutelsat OneWeb Web Interface

The LUI can be accessible by Chrome web browser using the URL 192.168.100.3.



NOTE

Intellian recommends using Chrome web browser when operating **LUI**

12.3 Accessing Webpage

12.3.1 Connection through LAN Port

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

1. Connect an Ethernet cable from the MGMT Port on the back panel of CNX-BB to a LAN Port of a PC, or an ethernet cable can also be connected to the **MGMT** port on the CNX-WIFI. The Data LED indicator will turn Green if CNX is connected.

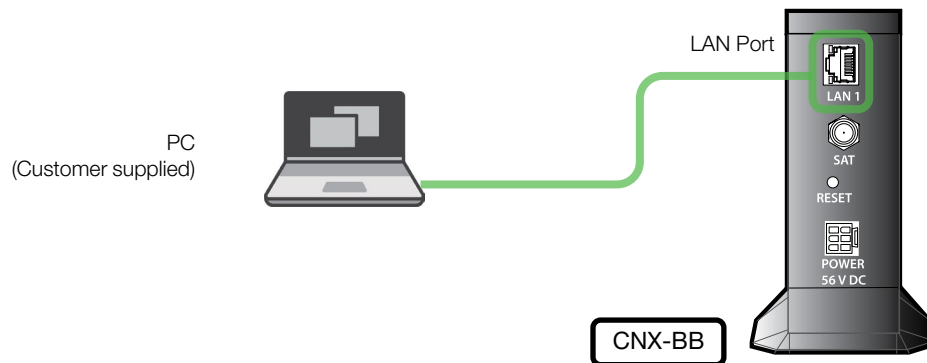


Figure 38: Back Panel LAN Port Connection with CNX-BB

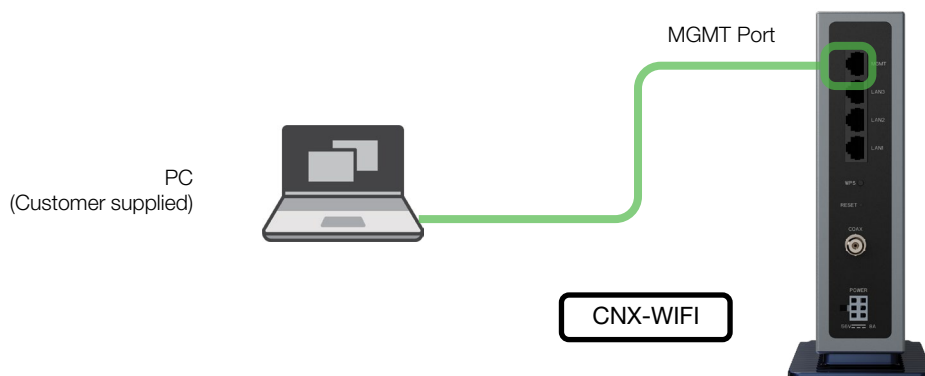


Figure 39: Back Panel LAN Port Connection with CNX-WiFi

2. Enter the IP address into your web browser's address bar to log in to the Local User Interface (LUI).



NOTE

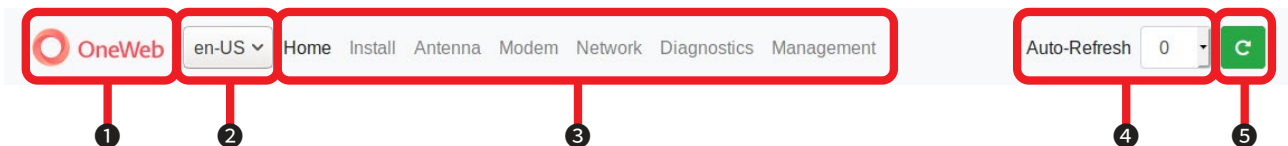
The antenna has to be connected to the CNX and powered up in order to access the webpage. The CNX should be connected to a power adapter before connecting between the antenna and CNX.

12.4 Webpage Layout

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

12.4.1 Navigation bar

The navigation bar as shown below is the primary way being able to navigate the LUI. The navigation bar is persistent across all LUI pages.



No.	Item	Description
①	Logo	This is the banner that displays the branding logo. Clicking on this logo on any given page will return the LUI to the homepage.
②	Language Drop Down Menu	The language drop-down menu lists all supported languages. Picking a language from the drop-down menu will change all text to the specified language immediately.
③	Navigation Items	These are the navigation items on the navigation bar. Clicking on a section will take you to a different part of the LUI. The sections are as follow: • Home: The homepage of the LUI displays a high-level overview of most components via a card layout. • Install: Guides the user through the installation process. Antenna: Displays Antenna Information such as firmware version, configuration and status. • Modem: Displays Modem Information (IMSI, IMEI, Manufacturer, Software Version, etc.), Modem Status (Call Status, Operating mode, etc.), Eutelsat OneWeb Extension Statistics, and GNSS Statistics. • Network: Displays statistics for all the network interfaces on the SSM such as the CNX interface, MGT interface, and WAN interface. • Diagnostics: Contains most of the SSM related statistics and configuration. Displays information such as the UT Status, Sensor Information, Host Processor Logs, and Event Logs. • Management: Displays UT Network Management Information such as SDL Information and UCR Statistics.
④	Auto-Refresh	This is the auto-refresh dropdown. Choosing an interval other than 0 will, refresh the display, fetch the data again at the specified interval.
⑤	Reboot	This is the reboot button. Clicking this button will trigger an SSM reset. While the SSM is rebooting, the reboot button turns from green to red. Upon successful reboot, the LUI will automatically refresh the page and the reboot button will go back to being green.

12.4.2 Home Page

The home page consists of several cards that display a high-level overview of certain components such as the UT System, Antenna, or UT Network Management. Each card has a border that, depending on the status of the subsystem, changes color. If the subsystem has an issue present, the card is outlined in red. If the subsystem is behaving as normal, then the card is outlined in green. Clicking on a card will take you to the webpage where you can find more detailed information about the subsystem.

The screenshot displays the OneWeb LUI Home Page. At the top, there is a navigation bar with the OneWeb logo, a language dropdown set to 'en-US', and links for Home, Install, Antenna, Modem, Network, Diagnostics, and Management. On the right of the navigation bar, there is an 'Auto-Refresh' button set to '1' and a power icon.

The main content area contains six cards, each representing a different subsystem:

- System [0.0.0]**: Displays Operational Mode: normal, Operational Software Build: factory, System Time: Jun 13, 2024, 4:15:54 PM, and Available Memory: 337 MB.
- Antenna [0.0.0]**: Displays Model: OW10Hx, Status: good, and Serial Number: P10HM24060006.
- Modem [0.0.0]**: Displays Operating Mode: Online, Acquisition Status: Procedure Complete, MGT APN Index: 0, and APN Status: APN 0: Connected; APN 1: Connected.
- Fault Management**: Displays Service Availability: 0%, Total Active Statecodes: 5, and Current Recovery Action: Soft Reset AIM and Reset Modem.
- GNSS [0.0.0]**: Displays GNSS Fix Type: 3D, GNSS Fix Quality: GPS fix (SPS), Last 3D Fix Time: Jun 13, 2024, 4:15:54 PM, Satellites in View (GPS): 14, Satellites in View (GLO): 0, and Last ZDA Timestamp: Jun 13, 2024, 4:15:54 PM.
- UT Network Management [0.0.0]**: Displays UT Site ID: ute, UT Management IP Address: 100.64.105.172, Operational Software Bundle: factory, and Software & Configuration Application Status: Invalid Configuration Message.

At the bottom of the page, there is a status bar showing 'SSM_3.2.0.62 (main)' on the left and 'Uptime 1:23:45:55' on the right.

12.4.3 Footer

The footer, like the navigation bar, is persistent throughout all LUI pages. The footer contains two pieces of information.

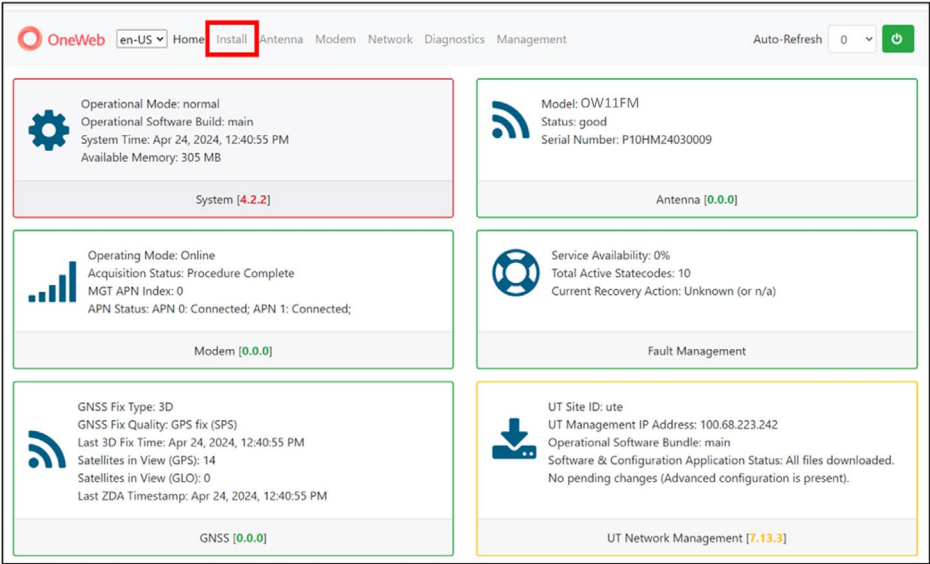
The current software version that is running on the Host Processor (SSM) is displayed on the bottom left of the screen. The operational software mode follows the software version. If the operational software mode is a factory, the text color is red. If the operational software mode is main, the text color is green. Clicking on this will take you to the **UT Status** section of the Diagnostics page.

The system uptime is displayed on the right. It displays how much time has passed since the last reboot. The format is days:hours:minutes:seconds.

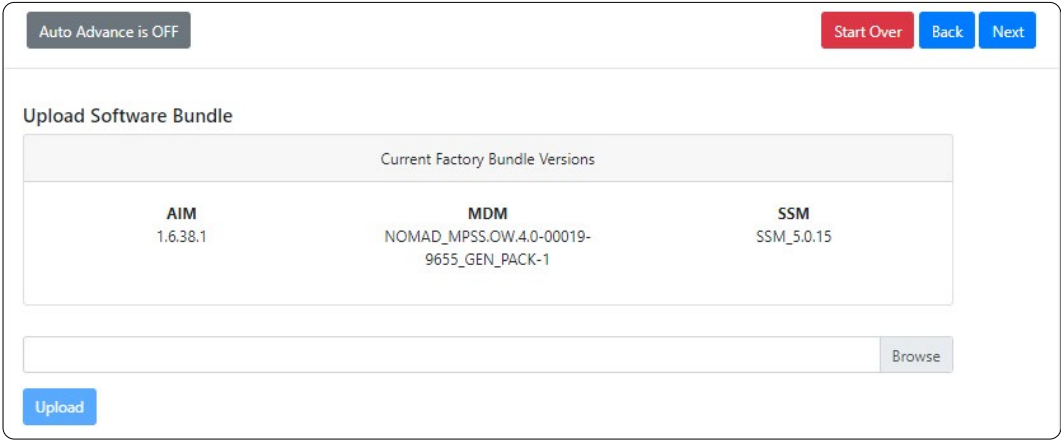
12.5 Software

12.5.1 Verify Software

Go to the Install page from the menu bar to verify the software version.



The Software Bundle page displays the current software versions running on each component.



12.5.2 Downloading the Ephemeris file

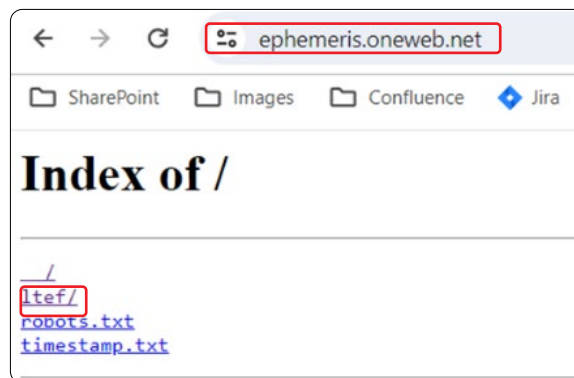
Ephemeris Data contains current information about the orbits of the satellites in the OneWeb constellation. The User Terminal uses ephemeris data to determine the positions of the satellites in the sky at any given time.

The file must have been downloaded within 30 days to be used. Once User Terminal is commissioned this will be updated automatically.

This is only needed if the antenna is set up for the first time or has been off for over 30 days.

Downloading Ephemeris file

1. From a web browser, navigate to <https://ephemeris.oneweb.net/>.
2. Select the **ltef/** directory.

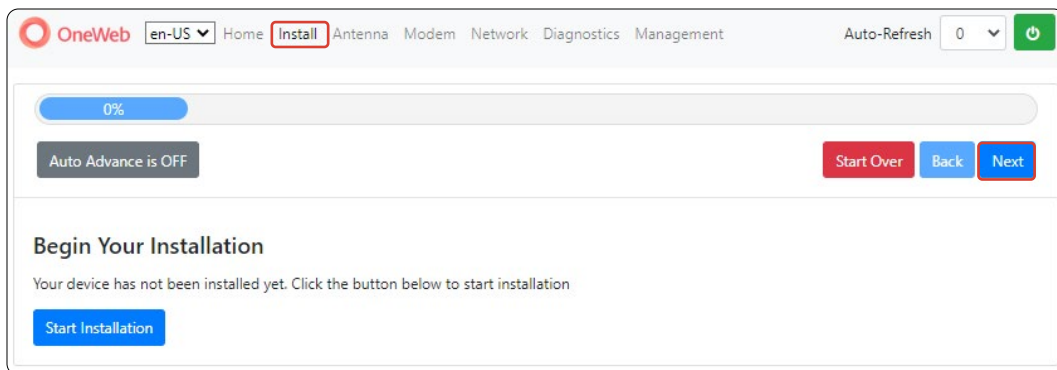


3. Select the **ltef.csv** file to download.

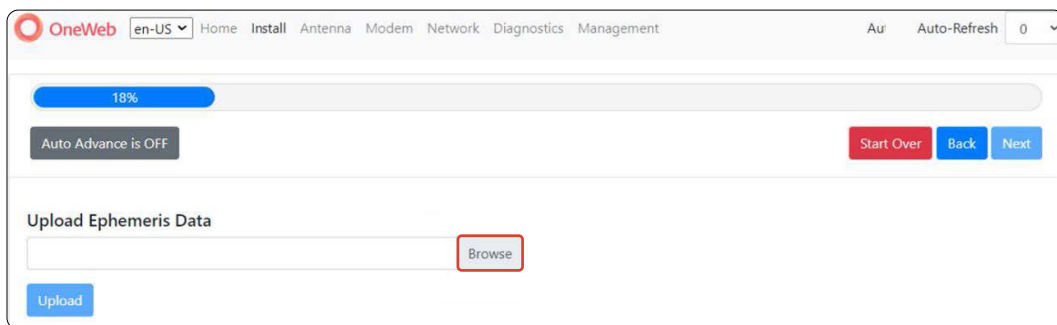


Upload Ephemeris file

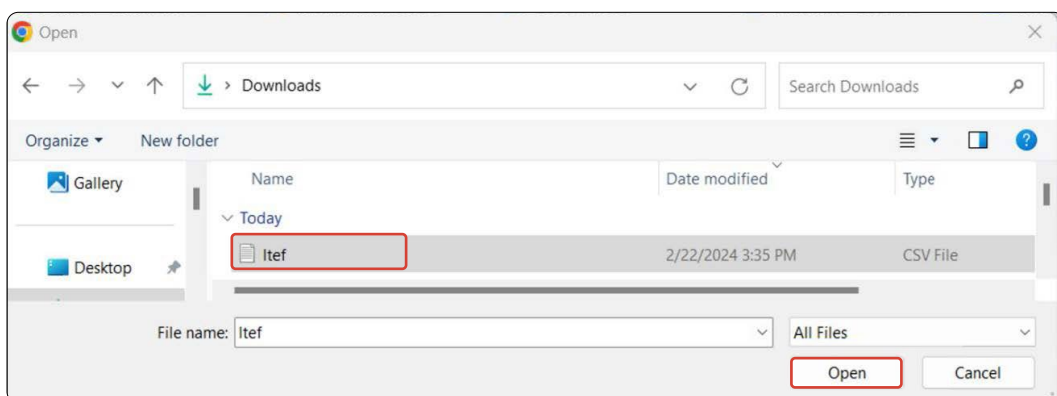
1. Go to the LUI main page and select **Install** from the menu.
2. Click the **Next** button until you reach the Upload Ephemeris page.



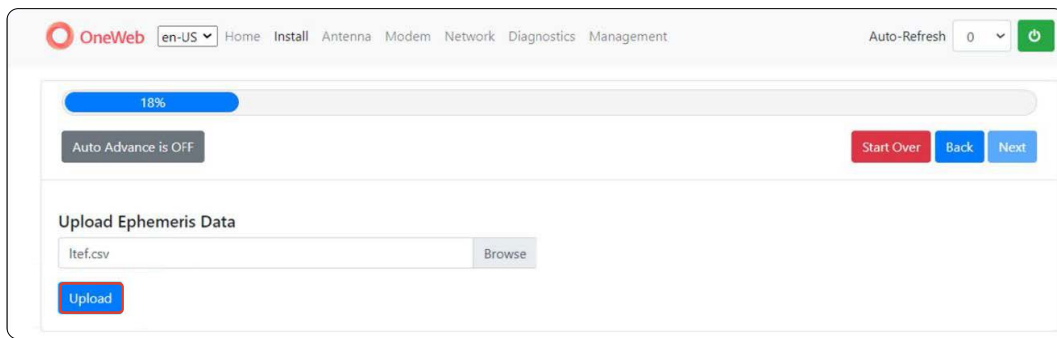
3. Select the **Browse** button on the Upload Ephemeris page.



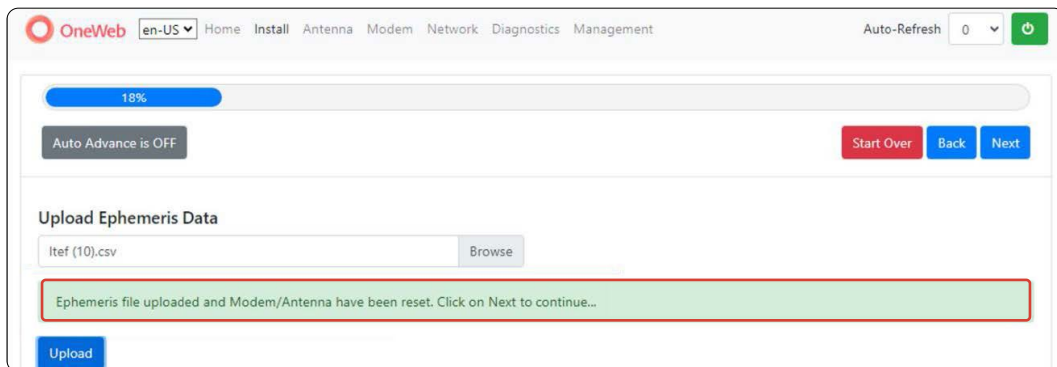
4. Select the **ltef.csv** file and click **Open**.



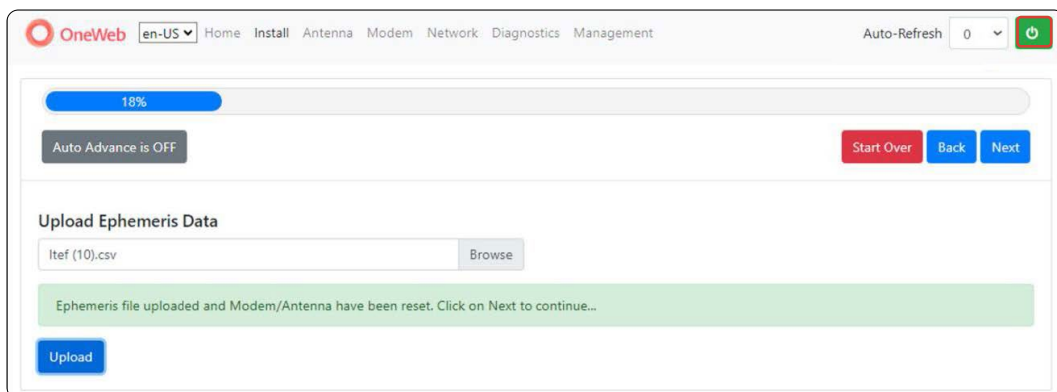
5. Select the **Upload** button.



When the upload has completed, a message will display that it has been reset.



6. The UT will need to be rebooted for the new ephemeris file to take effect. Click the **Reboot** button.



7. On power up, return to the LUI Install menu and complete the remaining installation steps by selecting the **Next** button when prompted.

Chapter 13. Specification

13.1 Technical Specification

13.1.1 Antenna Specification

Item	Specification
Dimensions	56 cm x 45 cm x 12 cm (22 in x 17.7 in x 4.7 in)
Weight	12.2 kg (27 lb)
Power	Max 180 W Avg 165 W
Operating temperature	-40°C to +55°C (-40°F to 131°F)
G/T	9 dB/K
EIRP	+ 33.6 dBW (single carrier) +36.6 dBW (dual carrier)
Field of View	± 55° from zenith 360° azimuth
Ingress	IP66
Interface	F-type port
Ethernet Cable	RJ45 port

13.1.2 CNX-WIFI Specification

Item	Specification
Dimensions	21 cm x 17 cm 8 cm (8.3 in x 7 in x 3 in)
Weight	0.6 kg (1.3 lb.)
Power	Max 18 W, Avg.18W
Operating temperature	0°C to +40°C (32°F to 104°F)
Data Interface	Wi-Fi 6 GigE RJ45 ports
Power Input	Universal AC power (100 – 240V AC) 12-240 DC
Ingress	IP44

13.1.3 CNX-BB Specification

Item	Specification
Dimensions	13 cm x 12 cm 4 cm (5 in x 2.7 in x 1.6 in)
Weight	0.25 kg (0.55 lb)
Operating temperature	0°C to +40°C (32°F to 104°F)
Data Interface	1 GigE RJ45 port

13.1.4 CNX-Rack AC/DC Specification

Item	Specification
Dimensions	44.2 cm x 25 cm x 4.4 cm (19 in x 1 RU chassis)
Weight	6.3 kg (13.9 lb.)
Power	Max 30 W, Avg. 18W
Operating temperature	-25°C to +55°C (-13°F to 131°F)
Data Interface	8-port GigE RJ45 1x USB (Type-A) 1x NMEA0183, 1x NMEA2000
Power Input	Dual 450W PDM AC: 110V- 200VAC DC: -48VDC
Ingress	IP31

Chapter 14. Warranty

Subject to the terms and conditions set forth in this Intellian Standard Global Warranty, the Agreement and/or any other terms and conditions agreed upon by Distribution partners and Intellian, Intellian satellite antenna products are warranted against defects in parts and workmanship for a period of one (1) year in respect of defects in parts and for a period of one (1) year in respect of the factory labor.

Warranty Time Period: Warranty periods commence from the date of shipment from an Intellian facility.

If installation occurs within six months of the date of shipment from an Intellian facility then Intellian will extend the duration of the warranty by the number of days between shipment and installation of the terminal. If installation occurs on or after six months of the date of shipment then the duration of the warranty will not be extended.

This Warranty shall be void for any Product which has been subjected to **"Intellian Standard Global Warranty"**.

Warranty Claim Procedure: Information on Intellian's warranty policy and coverage can be found on the Intellian Partner Portal. Intellian's warranty policy aims to reimburse Distribution partners for a reasonable percentage of costs and time that would be incurred when repairing an Intellian system. Intellian's warranty policy does not cover any other costs including those incurred by Distribution partners to support End Users.

Intellian shall maintain and abide by an industry standard return material authorization (RMA) process to enable the managed return of defective products, warranty assessment, customer communication, and RMA status updates.

To submit a Warranty Claim with Intellian. Please follow the directions in **"Intellian Standard Global Warranty"**.

Chapter 15. Appendix

15.1 Pre-Installation Checklist

15.1.1 Pre-Installation Checklist Land Fixed

This pre-installation checklist describes important considerations before installing the UT. It must be completed by the certified installer to install the UT in a safe location. Please fill out the general information below.

Date of survey					
Date of installation					

Installer information		Customer information		Site Information	
Company's name		Organization's name		The proposed antenna mount type is checked.	
Installer's name		Customer's name			
Contact phone number		Phone number			
Address		Address		The location of the site is checked.	
Email		Email			
		Site location (Lat / Long)			
		UT type being installed (antenna and CNX-WIFI)			

The following Building / site checklist is to be completed by the installer.

Task description	Result
External building wall composition is safe to install mount. (If mounted on the building)	Yes / No / N/A
Line-of-sight of the antenna complies with radiation safety.	Yes / No / N/A
There is no unauthorized access.	Yes / No / N/A
Space is suitable for mount type.	Yes / No / N/A
Lightning protection available.	Yes / No / N/A

Expected Obstructions / Possible Interference checklist

Task description	Result
Line-of-site to satellite constellation is verified.	Yes / No / N/A
No interference with RF transmitters.	Yes / No / N/A
No interference from high voltage lines.	Yes / No / N/A
No other possible sources of interference.	Yes / No / N/A
Map of no obstruction is reviewed and verified. (Also updated into UT configuration as an array of AZ, EL coordinates.)	Yes / No / N/A

15.1.2 Pre-Installation Checklist Maritime

This pre-installation checklist describes important considerations before installing the UT. It must be completed by the certified installer to install the UT in a safe location. Please fill out the general information below.

Date of survey					
Date of installation					

Installer information		Customer information		Site Information	
Company's name		Organization's name		The proposed antenna mount type is checked.	
Installer's name		Customer's name		The location of the site is checked.	
Contact phone number		Phone number			
Address		Address			
Email		Email			
		Site location (Lat / Long)			
		UT type being installed (antenna and CNX-WIFI)			

The following checklist is to be completed by the installer.

Task description	Result
Base material is safe to install mount.	Yes / No / N/A
Line-of-sight of the antenna complies with radiation safety.	Yes / No / N/A
There is no unauthorized access.	Yes / No / N/A
Roof space/floor space is suitable for mount type.	Yes / No / N/A
Roof/soil composition is suitable for mount type.	Yes / No / N/A
Lightning protection available.	Yes / No / N/A

Expected Obstructions / Possible Interference checklist

Task description	Result
Line-of-site to satellite constellation is verified.	Yes / No / N/A
No interference with RF transmitters.	Yes / No / N/A
No interference from high voltage lines, power cables, and telephone cables.	Yes / No / N/A
No other possible sources of interference.	Yes / No / N/A
Map of no obstruction is reviewed and verified. (Also updated into UT configuration as an array of AZ, EL coordinates.)	Yes / No / N/A

15.1.3 Pre-Installation Checklist Land Mobility

This pre-installation checklist describes important considerations before installing the UT. It must be completed by the certified installer to install the UT in a safe location. Please fill out the general information below.

Date of survey			
Date of installation			

Installer information		Customer information		Site Information	
Company's name		Organization's name		The proposed antenna mount type is checked.	
Installer's name		Customer's name		The location of the site is checked.	
Contact phone number		Phone number			
Address		Address			
Email		Email			
		Site location (Lat / Long)			
		UT type being installed (antenna and CNX-WIFI)			

15.2 Selecting Pole Mount for Land Fixed (Optional)

The Land Fixed installation has multiple mount types. Several mounting types are available for the Land Fixed UT to meet specific environmental conditions.

These types are available as accessories and can be purchased separately. When this accessory is supplied, it is provided in a separate box. These mounting types all share the same Adjustable Mount Adapter.

For more information about the Adjustable Mount Adapter, please refer to ["6.2 Mounting Antenna Using Adjustable Mount Adapter"](#) on page 29.

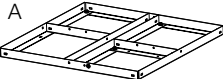
15.2.1 Installing Non-Pen Mount (NPM) (Optional)

This accessory is the generally recommended mount.

Assembling Base Panel of Non-Penetrating Mount (NPM)

Tool required: 13 mm wrench (Not supplied)

FASTENERS				TOOLS	
No	ITEM	DESCRIPTION	Q'ty		
1		5/16"-18*3-1/8" hex-head cap screw	4		
2		5/16"-18*5/8" Round flat head Square screw	2		
3		5/16"-18 washer	10	13 mm wrench	
4		5/16"-18 nylon nut	6		
5		Ø8.5/Ø12.5*L60 Bush	1		
6		5/16"-18x1-1/4" hex flange screw	1		
7		5/16"-18 kepts k-lock nut	2		

DESCRIPTION	Q'ty	DESCRIPTION	Q'ty	DESCRIPTION	Q'ty
Ground Mounting Base(#A)	1	Mast Pole(#B)	1	Side Supporting Rods(#C)	4
					

- Size of assembled NPM: 87 cm x 90 cm x 62 cm



NOTE

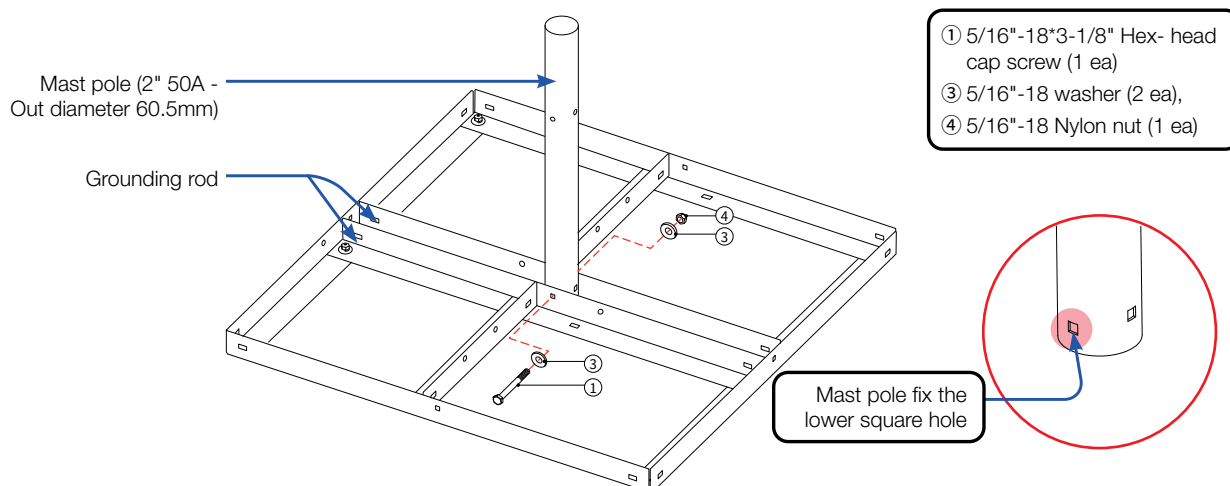
A rubber mat to put under the NPM is optional.

Tighten and Torque Hardware: Tighten all hardware with sufficient force to ensure maximum strength of the installation. Refer to the installation torque figures ["15.3 Tightening Torque Specification"](#) on page 108. If a torque wrench is not available, the installer must use their judgment.

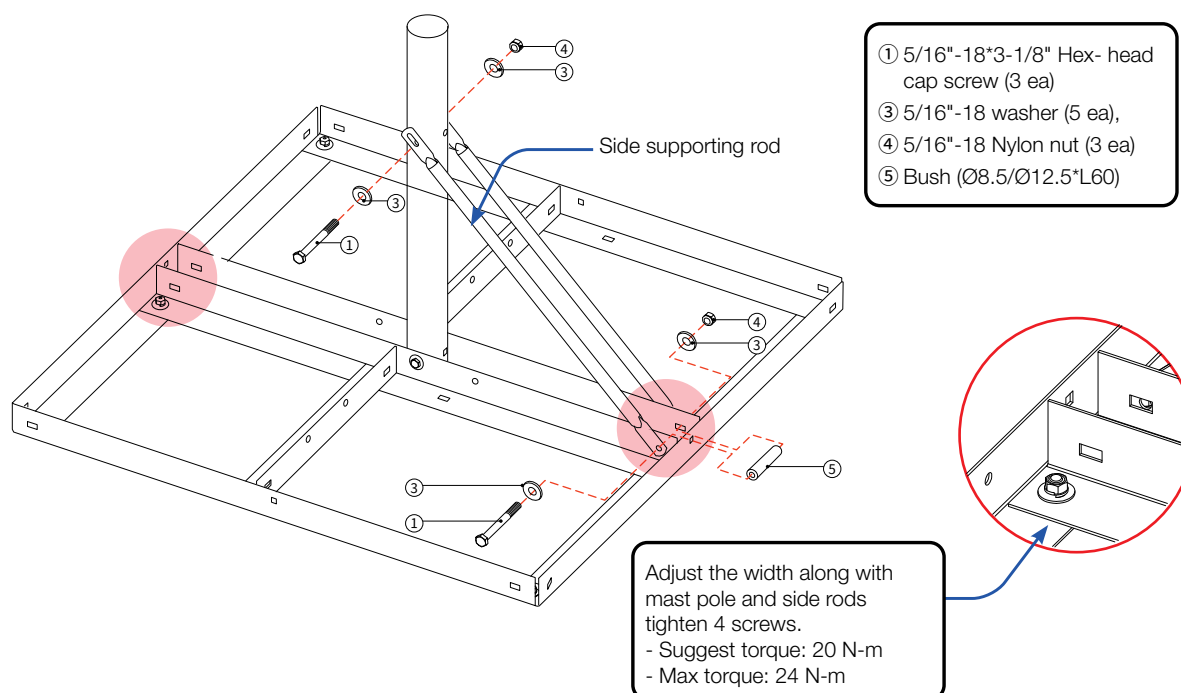
- If a fastener is over-torqued, it may strip or break.
- If a fastener strips or breaks, it must be replaced.

If a mount adapter is fabricated or purchased outside of Intellian's recommended list, it shall be no greater than 3 mm in material thickness on the mounting surface. Additional M6 screws must be used to achieve at least 6mm of thread engagement. The Hex Key for the M6 mounting hardware is 5 mm. A 1.7 cm clearance below the fans is required for sufficient air flow and cooling.

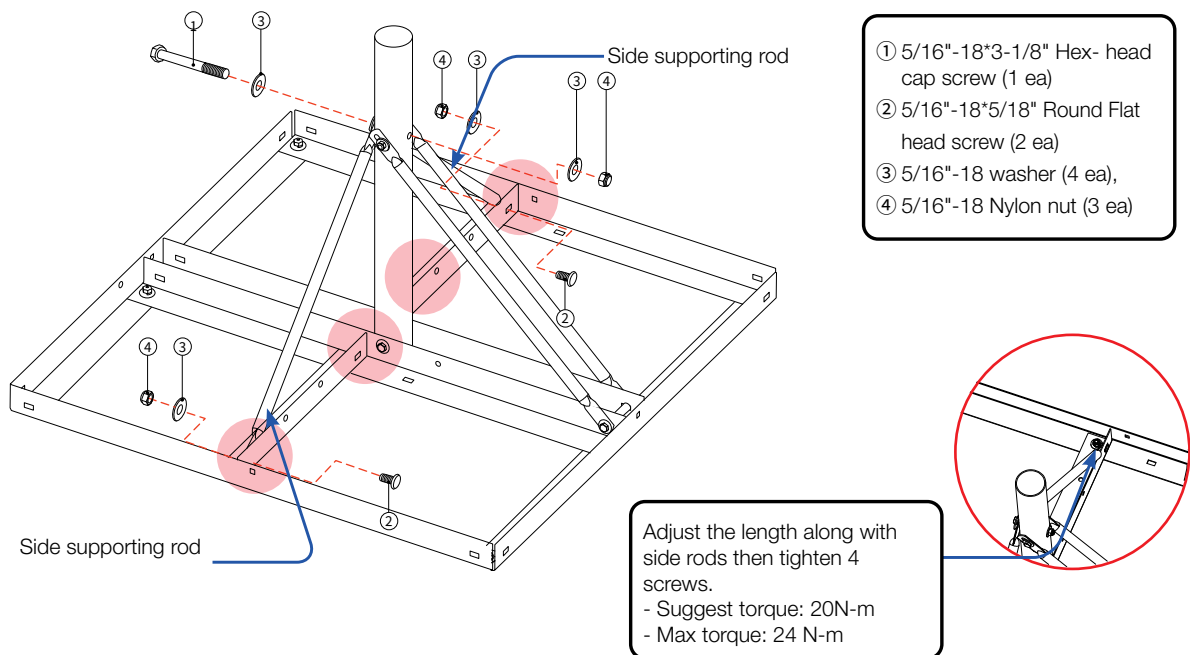
1. Loosen the ground base 8 bolts.



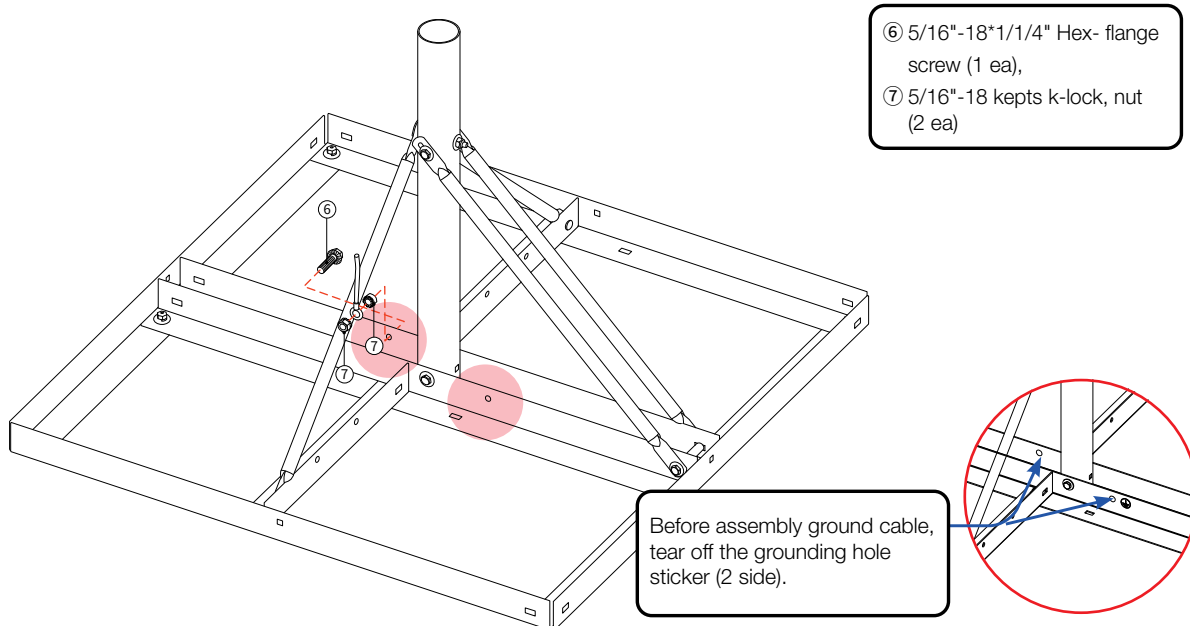
2. Assemble 2 side supporting rods with bolt kits



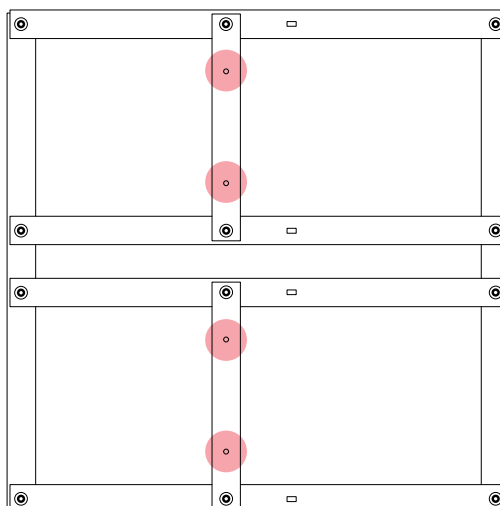
3. Assemble 2 side supporting rods with bolt kits



4. Assemble ground cable with bolt kits.



Penetrating fastener option:
For directly mounting using fasteners,
place appropriately fasteners, at the
locations circled in the below diagram



Placing Concrete Blocks on Base Panels

1. Place the concrete blocks on the base panel to hold the weight of the antenna.
One concrete block is 39 x 19 x 19 cm (15.3 x 7.5 x 7.5 inches) /17.56 kg (38.7 lbs).
The area of the assembled base panel is 200 x 90 cm (78.7 x 35.4 inches).



2. Arrange 8 concrete blocks on the base panel in a single layer.
The total weight of 8 concrete blocks is 140 kg (~ 308.6 lbs.).

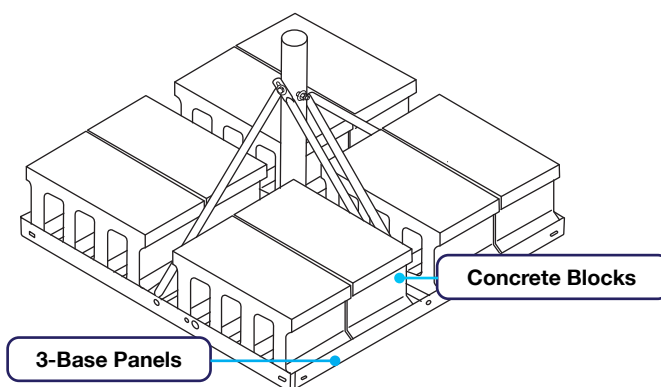


Figure 40: Concrete Blocks Arrangement



NOTE

If you want to use alternative weights instead of concrete blocks as shown above, ensure sure that total weight of the alternative meets required evenly distributed weight, 140 kg. (~ 308.6 lbs.).

15.2.2 Installing a TriMast Mount (Optional)

The TriMast mount is an alternative Mount type. It can be installed on a vertical, horizontal, or inclined surface.

Assembling TriMast Mount

Check the requirement tool before assembling the TriMast Mount.

No.	Item	Description	Q'TY
1		5/16" flange nut	9
2		5/16"*7/8" round-head screw	6
3		5/16"*3-1/8" round-head screw	1
4		5/16"*1-1/8" round-head screw	2
5		5/16"*3" Anchor Bolt	6
6		#12*3/4" METAL TEK SCREW	2
7-10	N/A	N/A	

No.	Item	Description	Q'TY
11		Ø60 Mast	1
12		Mounting Foot (W61)	1
13		Mounting Plate	2
14		Strut Clamp	2
15		Link Bracket (t4)	2
16		Bar, Inner (t1.5*531L)	2
17		Bar, Outer (t1.5*427L)	2

- Size of assembled TriMast: 92 cm x 58 cm x 71 cm
- Weight of assembled TriMast: 5.6 kg (12.5 lbs)

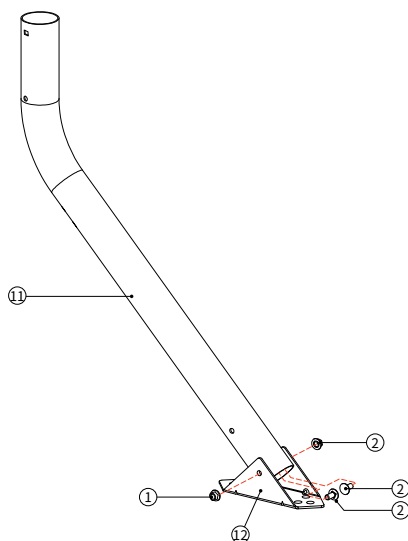


NOTE

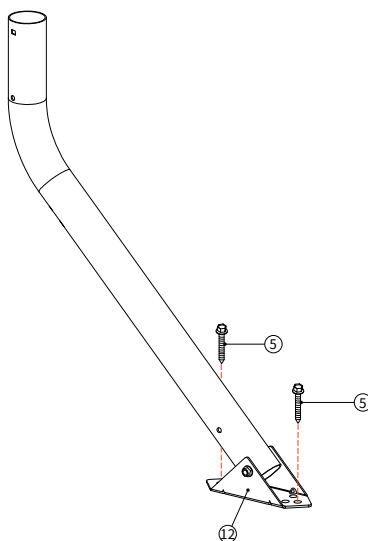
Tighten and Torque Hardware: Tighten all hardware with sufficient force to ensure maximum strength of the installation. Refer to the installation torque figures "[15.3 Tightening Torque Specification](#)" on page 108. If a torque wrench is not available, the installer must use their judgment.

- If a fastener is over-torqued, it may strip or break.
- If a fastener strips or breaks, it must be replaced.

1. Assemble the Mast: Attach the ⑪ mast to the ⑫ mounting foot using two ② 5/16"*7/8" round-head screws and one ① 5/16" flange nut.

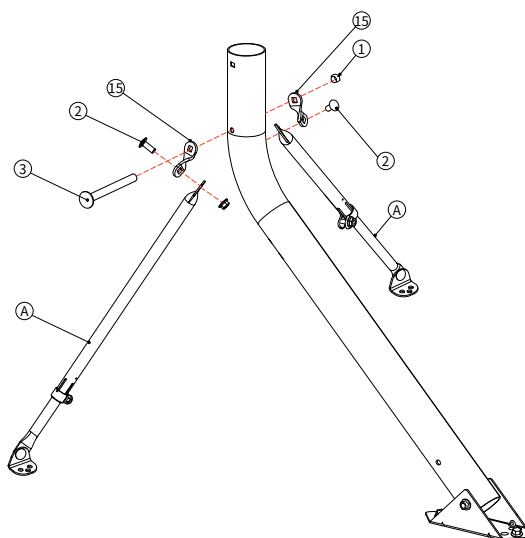


2. Fix Mounting Foot: Secure the ⑫ mounting foot to the ground in the desired azimuth using 2x ⑤ anchor bolts.

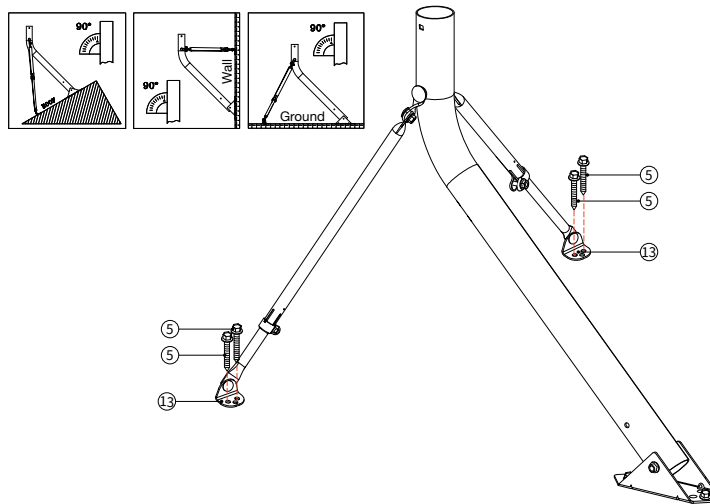


3. Attach ① adjustment strut to the mast:

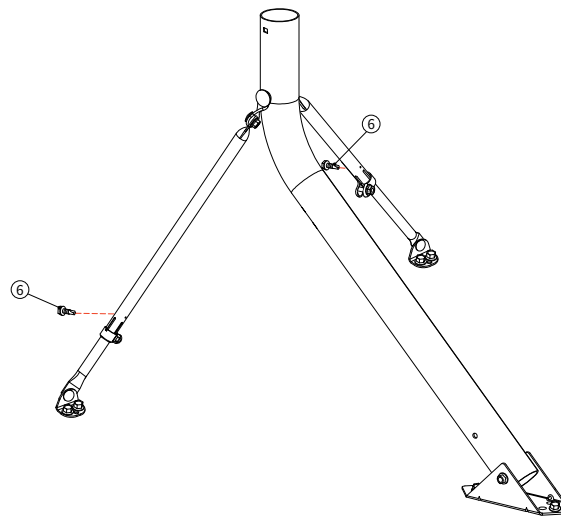
- Assemble the two ⑮ link brackets on the left and right sides of the ⑪ mast using the ③ 5/16"×3-1/8" round-head screws and the ① 5/16" flange nut.
- Attach the ① adjustment strut (2ea) to the left and right sides of the ⑪ mast using the two ② 5/16"×7/8" round-head screws and one ① 5/16" flange nut.



5. Adjust the Mast: Ensure the mast is vertical to the ground and at the optimum angle. Adjust the strut to the proper length, then fix the ⑬ mounting plates to the ground with ⑤ anchor bolts.



6. Secure the TriMast Mount : Secure with the two ⑥ #12*3/4" Metal tek screw on the left and right ① adjustment struts.



15.2.3 Installing a Quadpod Mount (Optional)

This is an optional accessory. Verify the parts in the shipping box.

Assembling Quadpod Mount

Check the requirement tool before assembling the Quadpod Mount.

No.	Description	Q'TY	No.	Description	Q'TY
1	M8x16 Low head screw	4	5	Mast Pole(Ø60X400L)	1
2	M8x16 Hex-head cap screw	1	6	Mounting Foot	4
3	Spring washer	1	7	Mast Base	1
4	Washer	1	8	Plastic Cover	1

- Size of assembled QuadPod: 83 cm x 60 cm x 50 cm
- Weight of assembled QuadPod: 4.2 kg (9.1 lbs)

Tools required: M8 Allen wrench (not supplied)



NOTE

Tighten and Torque Hardware: Tighten all hardware with sufficient force to ensure maximum strength of the installation. Refer to the installation torque figures ["15.3 Tightening Torque Specification" on page 108](#). If a torque wrench is not available, the installer must use their judgment.

- If a fastener is over-torqued, it may strip or break.
- If a fastener strips or breaks, it must be replaced.

1. Assemble the Mast Pole and Main Part: Attach the ⑤ mast pole to the ⑦ die-cast main part. Pinch push tabs in and align as needed until a click is heard and they protrude from their set points.

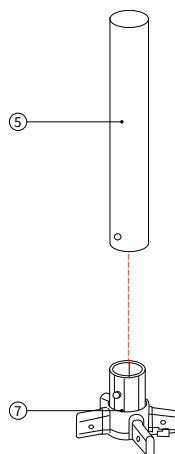


Figure 41: Assembling the Mast Pole and Main Part

2. Assemble the Mounting Feet: Attach the ⑥ mounting foot using ① low-head screws in the sequence of steps 1 to 4. Use a hexagonal wrench to tighten the screws. (Recommended torque: 4.3 Nm)

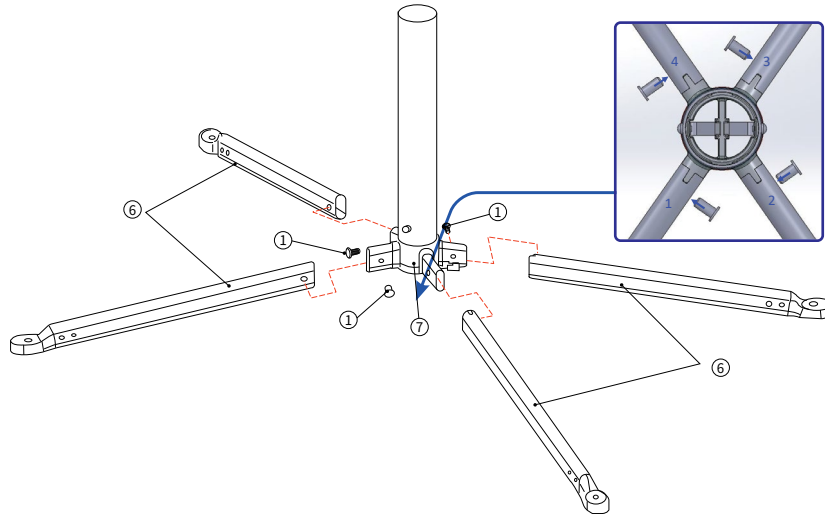


Figure 42: Assembling the Mounting Feet

3. Install the Plastic Cover: Slide the ⑧ plastic cover from the top of the ⑤ mast pole to the bottom. Ensure it fits tightly and snaps into place.

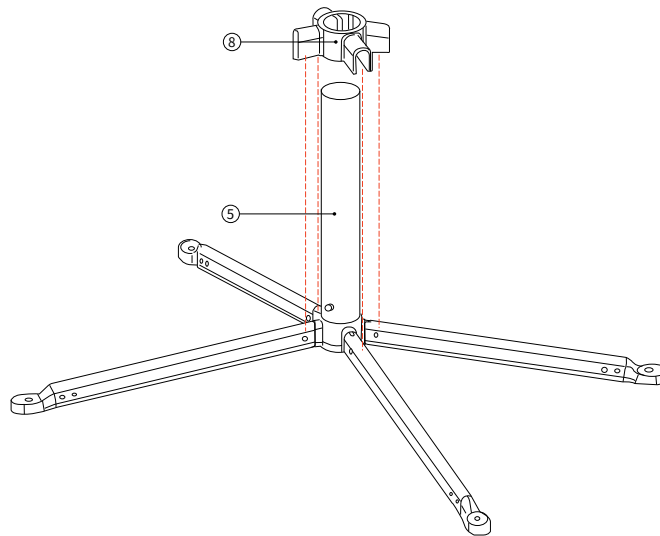


Figure 43: Installing the Plastic Cover

4. Insert and Tighten the Screws: Insert ② M8 hexagonal screws with ③ spring washers and ④ flat washers in sequence. Screw them into the M8 screw holes. Use a 12mm wrench to tighten them. (Recommended torque: 4.3 Nm)

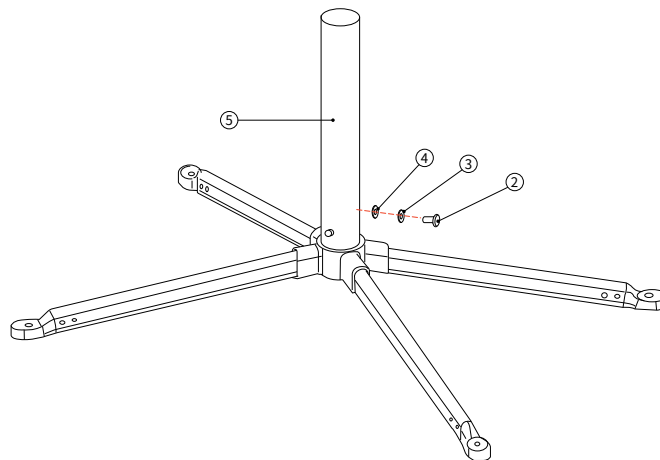
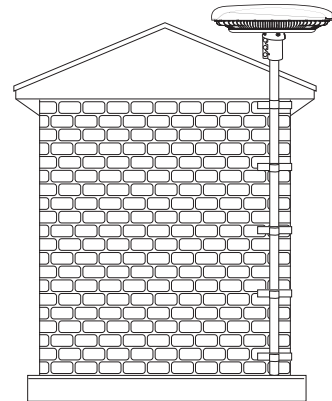


Figure 44: Insert and Tighten the Screws

15.2.4 Installing Customized Pole Mount

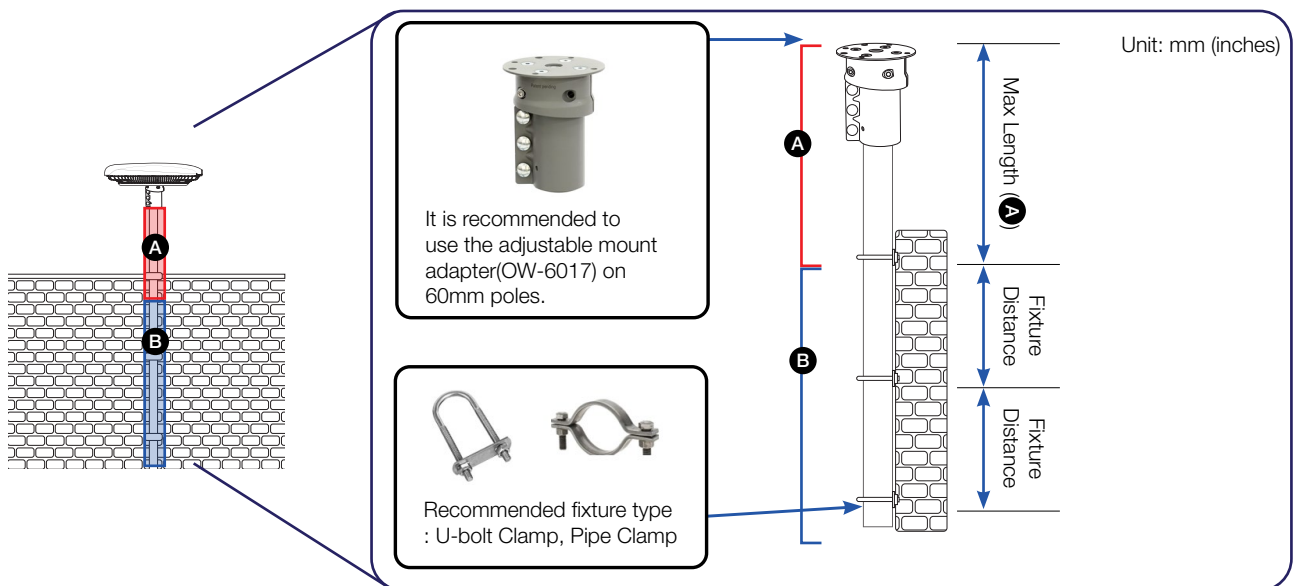
Customized pole mounts must be correctly installed to be robust enough to prevent any flex, vibration, and sway when an external force is exerted with the antenna attached.



Designing the Customized Pole Mount

When designing the pole consider the pole types and their maximum length. The Fixture Distance is the distance between the fixtures. Refer to the following table for more details.

Pole Type	Pole Diameter	Pole Thickness	Max Length (A)	Fixture Distance
50A (Recommended)	60 mm (2.4")	2 mm (0.1")	500 mm (19.7")	400 mm (15.8")



- For example, if using 50A of pole type for the antenna installation, maximum length of **(A)** cannot exceed 500 mm remaining pole, **(B)** should be fixed with minimum 3 pcs of fixtures and the distance among them should be 400 mm.
- The Max Length of **(A)** is the length without the additional **(B)** to use the tilt adjustable mount adapter, it is recommended using a pole type 50A. To use the recommended. To use the recommended **(A)** pole type 50A, the maximum length should be 500mm. If the pole type is different from the recommended type, check the maximum length for a pole type according to the table.

- There are no **B** pole length limits but it must be installed on a place of sufficient structural integrity to prevent any flex, vibration and sway from such wind or external force. The **B** pole can be used as a thicker pole type than the **A** pole. The fixtures should be installed at recommended intervals (see the Fixture Distance from Figure 34: Customized Pole Mount Details). Recommended fixture types are a U-bolt and a pipe clamp.
- We recommend using the adjustable mount adapter to adjust the tilt level. (Refer to "[6.2 Mounting Antenna Using Adjustable Mount Adapter](#)" on page 29.)

15.3 Tightening Torque Specification

This table has the recommended torque values.

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

15.4 Maintenance

15.4.1 Fan Replacement

1. Remove two screws from the fan that is to be replaced.

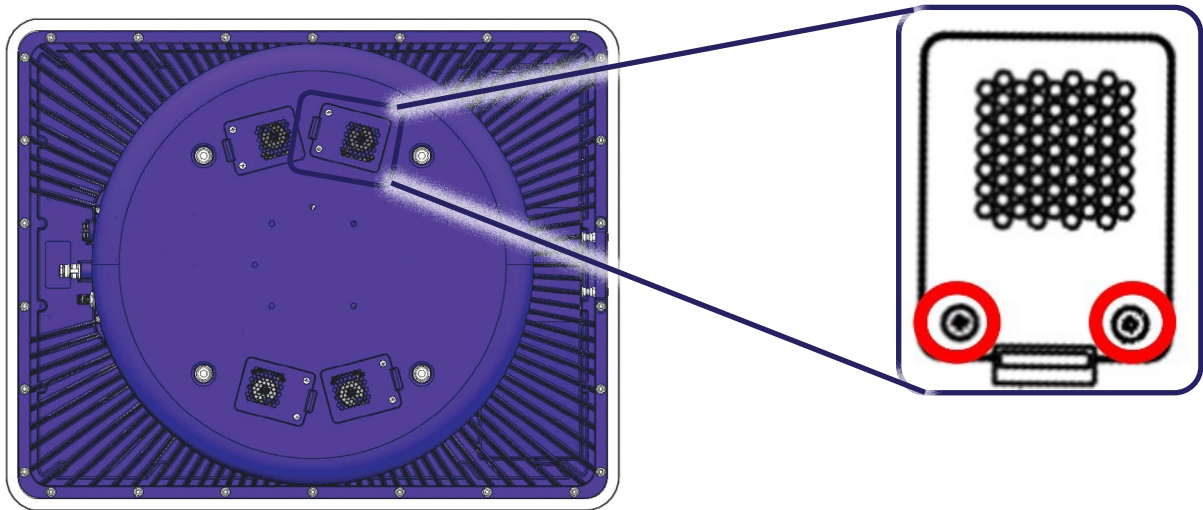


Figure 45: Removing Screws

2. Unclip the fan and remove it from the antenna.

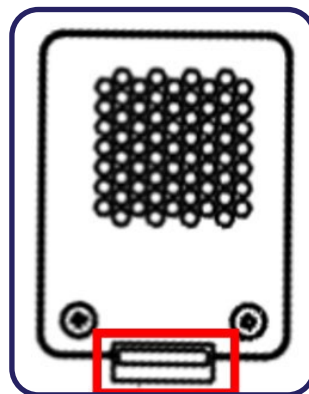


Figure 46: Unclipping Fan

3. Disconnect fan cable from the antenna.

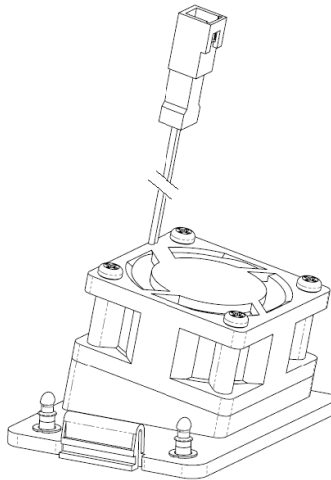


Figure 47: Disconnect Fan

4. Connect the new fan to the cable.
5. Place fan back into the antenna.
6. Reconnect the two screws.

15.5 Surface Maintenance Guide

The antenna surface layer has a superhydrophobic coating. Please read the following statements to maintain the coating for an extended period. By handling the antenna carefully, you can ensure optimal performance for a long time.

1. Due to the natural oils in the skin, excessive handling of treated materials with bare hands can cause a reduction in performance.
2. Excessive abrasion will lessen or eliminate superhydrophobic performance.
3. Soaps and alcohols applied to the surface will cause it to "wet out" until the soap and alcohol are removed using low-pressure water. The surface will lose its properties if treated with detergents, soap, some solvents, or high-pressure water. Cleaning of the surface should be performed using a low-pressure water spray (less than 30 psi or typical garden hose pressure).
4. When washing a car, "do not apply a high-pressure water jet or use an automatic car wash tunnel."
5. Surfaces coated with Ultra-Ever Dry® will not prevent oil-based paints from being applied, due to the solvents in the formulas. It has been shown to be somewhat effective with water-based paints; however, the majority of spray paints are oil-based.
6. Exposure to ultraviolet (UV) light will reduce the coating's longevity to one year or less.