

OW50M-Rac

OneWeb Maritime Antenna System



Installation & Operation User Guide

Serial number of the product

--

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



© 2023 Intellian Technologies, Inc. All rights reserved. Intellian and the Intellian logo are trademarks of Intellian Technologies, Inc., registered in the U.S. and other countries. The OW50M is a trademark of Intellian Technologies, Inc. Intellian may have patents, patent applications, trademarks, copyrights, or other intellectual property rights covering subject matter in this document. Except as expressly provided in any written license agreement from Intellian, the furnishing of this document does not give you any license to these patents, trademarks, copyrights, or other intellectual property. All other logos, trademarks, and registered trademarks are the property of their respective owners. Information in this document is subject to change without notice. Every effort has been made to ensure that the information in this manual is accurate. Intellian is not responsible for printing or clerical errors.

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	10
Chapter 3. Introduction	14
3.1 Introduction to OW50M-Rac	14
3.2 OW50M-Rac Features	14
Chapter 4. Planning Installation	15
4.1 Installation Precautions	15
4.2 Selecting Installation Site	16
4.2.1 Installation Location for Antenna	16
4.2.2 Installation Location for CNX	16
4.2.3 Avoid RF Interference	17
4.2.4 RF Hazard Precautions	18
4.3 System Package	19
4.3.1 Above Deck Unit (ADU)	19
4.3.2 Customer Network Exchange (CNX)	20
4.3.3 Packing List	21
4.4 System Cables	23
4.4.1 Antenna Power+Data Cable	23
4.4.2 Gyrocompass Cable (Customer Supplied)	23
4.4.3 AC Power Cables (Customer Supplied, Only for Heater Module)	23
4.5 Installer/Customer Furnished Equipment	24
4.6 Unpacking System Package	25
Chapter 5. Installing Above Deck Unit (ADU)	26
5.1 General Requirements	26
5.1.1 Antenna Mounting Requirements	26
5.2 Antenna Dimensions	27
5.3 Antenna Mounting Hole Pattern	28
5.4 Designing Mast (Example Only)	29
5.5 Routing RF Cable on Mast (Example Only)	33
5.6 Removing Antenna from Wooden Pallet	35
5.7 Moving Antenna Above Mast	36
5.8 Inserting Waterproof Foam	37
5.9 Mounting Antenna on Mast	39
5.10 Connecting RF Cable to Antenna	40
5.10.1 Connecting RF Cable	40
5.11 Connecting power cable for Heating Module (Optional)	42
5.11.1 Connecting cable for Heating Module	42

Chapter 6. Installing Below Deck Unit (BDU)	45
6.1 Selecting BDU Installation Site	45
6.2 CNX Dimensions	45
6.2.1 CNX Dimensions	45
6.3 Antenna System Configuration	46
6.4 CNX Cable Connection	48
6.4.1 CNX Front Panel View	48
6.4.2 CNX Back Panel View	49
6.4.3 CNX Connector Pinout Guide	49
6.4.4 Connecting CNX to Ship Gyrocompass	51
6.4.5 Connecting to a Wi-Fi network through the Wi-Fi Dongle	52
Chapter 7. Starting Dual Antenna System	53
7.1 Configuration of Dual Antenna System	53
7.2 Configuring Primary & Secondary Role	53
7.2.1 Setting the Compound UT#2 (Secondary)	54
7.2.2 Setting the Compound UT#1 (Primary)	55
7.3 Configuring VLAN, APN, NMEA and CUC IP Address	57
7.3.1 Installation	57
7.3.2 Main Page	58
7.3.3 Configuration	59
7.3.4 Installation	59
7.3.5 Control	60
7.3.6 Monitoring	60
7.4 Completing Installation via Install Wizard	61
7.5 Monitoring Dual Antenna System	66
Chapter 8. Using Local User Interface (LUI)	67
8.1 Introduction	67
8.2 Turning On System	67
8.3 Accessing Webpage	67
8.3.1 TCP/IP Connection through LAN Port	67
8.4 Webpage Layout	68
8.4.1 Navigation bar	68
8.4.2 Home Page	69
8.4.3 Footer	70
8.5 Antenna	71
8.5.1 Antenna Info	71
8.5.2 Message Stats	72
8.5.3 Modem ↔ Antenna Latency	72
8.5.4 Blockage Zones	73
8.5.5 Antenna Status	73

8.5.6 Antenna Setup	74
8.5.7 Sensor Offset	77
8.5.8 Installation	78
8.5.9 RF cable setup	78
8.5.10 Blockage zone	78
8.5.11 RCM	79
8.5.12 Product Information	79
8.5.13 Software Version	80
8.5.14 RF Gain Offset	80
8.5.15 True North Calibration	81
8.5.16 Download Complete Logs	81
8.5.17 Download AIM Logs	81
8.6 Modem	82
8.6.1 Antenna Info	82
8.6.2 APN Info	82
8.6.3 Modem status	83
8.6.4 Modem Control Panel	83
8.6.5 Modem Control Panel	84
8.6.6 OneWeb Extension	85
8.6.7 Modem Control Panel	86
8.6.8 PPS Status	87
8.7 Network	88
8.7.1 Network info	88
8.7.2 Packet Graphs	89
8.8 Diagnostic	90
8.8.1 UT status	90
8.8.2 Host Processor Logs	91
8.8.3 Event Logs	91
8.8.4 UT Configuration	92
8.8.5 UT Advanced Configuration	93
8.8.6 Fault Management	94
8.8.7 CNX Manager	95
8.8.8 MoCA Info	96
8.8.9 System Monitor status	97
8.8.10 System Monitor status	98
8.8.11 System Monitor status	99
8.8.12 Self Test Results	100
8.8.13 TWAMP	101
8.9 Management	102
8.9.1 Management Status	102
8.9.2 Switch UT Software	103

Chapter 9. Specification	104
9.1 Antenna Specification	104
9.2 RF Specification	105
9.3 Packing Specification	105
9.4 Customer Network Exchange (CNX) Specification	105
9.5 Environmental Specification	106
Chapter 10. Warranty	107
Chapter 11. Appendix	108
11.1 Tightening Torque Specification	108
11.2 Using Theodolite Application	109
11.2.1 Installing Mobile Application	109
11.2.2 Using the Theodolite Application	109

List of Figures

Chapter 4. Planning Installation	15
Figure 1: Minimizing Satellite Blockage (example)	16
Figure 2: Potential RF Interference	17
Figure 3: RF Radiation Hazard Area	18
Figure 4: Radomes and Pedestal	20
Figure 5: Front Panel of CNX	20
Figure 6: Back Panel of CNX	20
Chapter 5. Installing Above Deck Unit (ADU)	26
Figure 7: Antenna Side View	27
Figure 8: Antenna Bottom View	27
Figure 9: Antenna Mounting Hole Template	28
Figure 10: Recommended Size of Mast (Option 1)	30
Figure 11: Recommended Size of Mast (Option 2)	31
Figure 12: Routing Cable Through Outside of Mast	33
Figure 13: Routing Cable Through Inside of Mast	34
Figure 14: Attaching Position of Waterproof Foam	37
Figure 15: Installing Sequence of Bolts	39
Figure 16: Installing Bolts for Antenna-Mast Assembly	39
Chapter 6. Installing Below Deck Unit (BDU)	45
Figure 17: CNX Dimensions	45
Figure 18: Dual Antenna System Configuration (Standard)	46
Figure 19: Dual Antenna System Configuration with Heating Module	47
Figure 20: Front Panel View	48
Figure 21: Back Panel View	49
Figure 22: Ship's Gyrocompass Cable Connection	51
Figure 23: NMEA 0183 Gyrocompass Cable Connection	51
Figure 24: Back Panel Wi-Fi Dongle Connection	52
Figure 25: Setting up a Wi-Fi network on a PC	52
Chapter 7. Starting Dual Antenna System	53
Figure 26: Front Panel LAN Port Connection with CNX	53
Chapter 8. Using Local User Interface (LUI)	67
Figure 27: Front Panel LAN Port Connection with CNX	67

Chapter 1. Precautions

Prior to installation, read this Installation 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.

* **DO NOT SHIP VIA RAIL:** Ensure not to ship any system via rail.

* **DO NOT STORE THE ANTENNA WRAPPED IN A TARP, TENT, VINYL, OR OTHERS:**

To avoid damage to radome paint, do not use a cover on the radome. Using any type of cover may cause paint damage. Intellian radomes are designed to withstand exposure to rain, humidity, and sun/UV rays when assembled according to Intellian instructions, and when the supplied approved hardware and sealants are used. Under no circumstances should an Intellian radome be covered by any protective covering that adheres, bonds, or clings to the surface, whether by self-adhesion or tension.

Chapter 2. Certifications

This device complies with Part 15 of the FCC Rules [and with Industry Canada license-exempt RSS standard(s)].

Operation is subject to the following two conditions:

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

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

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

WARNING

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

Radiofrequency radiation exposure Information:

This equipment complies with RED and FCC, IC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance of 9.2 m between the radiator and your body.

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

- The ADE should be mounted more than 0.6 meters/2 feet from 2kW (24 km) X-band radars.
- The ADE should be mounted more than 2 meters/8 feet from 10kW (72 km) X-band radars.
- The ADE should be mounted more than 4 meters/12 feet from 160kW (250km) X-band radars.
- The ADE should be mounted more than 2.5 meters/8 feet from any high power MF/HF antennas (<400W).
- The ADE should be mounted more than 4 meters/12 feet from any high power MF/HF antennas (1000W).
- The ADE should also be mounted more than 4 meters/12 feet from any short-range (VHF/UHF) antennas.
- The ADE should be mounted more than 2.5 meters/8 feet away from any L-band satellite antenna.
- The ADE should be mounted more than 3 meters/10 feet away from any magnetic compass installations.
- The ADE should be mounted more than 2.5 meters/8 feet away from any GPS receiver antennae.

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

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

FCC Part 15 Subpart B 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 product(s) described in the below to which this declaration relates is in conformity with the requirement of the FCC Part 15 Subpart B.

Product Information:

Product Name(s):	OW50M
------------------	-------

Test Result

Standard	Requirement	Rule Section	Test Report Number	Result
FCC Part 15, Section 15.101 (Class B) Canadian Standard ICES-003:Issue 7.	Conducted Emission	ANSI C63.4:2014	OT-234-RED-082	Pass
	Radiated Emissions	ANSI C63.4:2014	OT-234-RED-082	Pass

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
Place and Date of issue:	Gyeonggi-do, Korea on 25 April, 2023

Authority: Dojun, Byun
/ CTO

Signature:  _____

Date: 3rd, May, 2023

APAC

Headquarter/Innovation Center
18-7, Jinwisandan-ro, Jinwi-myeon
Pyeongtaek-si, Gyeonggi-do
17709 Korea
T +82 31 379 1000

EMEA

Rotterdam Office
Sheffieldstraat 18, 3047AP, Rotterdam,
The Netherlands
T +31 1 0820 8655

AMERICAS

Irvine Office
11 Studebaker
Irvine, CA 92618 U.S.A.
T +1 949 727 4498

RED 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 product(s) described in the below to which this declaration relates is in conformity with the *essential requirements* and *other relevant requirements* of the Radio Equipment Directive (2014/53/EU).

Product Information:

Product Name(s):	OW50M
-------------------------	-------

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

2014/53/EU Article	Standard(s) Applied in Full	Test Report Number	Result
SAFETY (Art 3.1.a)	EN 62368-1:2014+A11:2017 IEC 60529:1989+A1:1999+A2:2013 EN 62311: 2008	OT-232-RSD-015 OT-233-RRK-014 OT-234-RWD-029	Pass
EMC (Art. 3.1.b)	EN 60945: 2002 (Clause 9 and Clause 10) EN 55032: 2015+A11:2020 EN IEC 61000-3-2:2019 EN 61000-3-3:2013/A1:2019 EN 301 489-1 V1.9.2 EN 301 489-12 V3.2.1 EN 55035: 2017+A11:2020	OT-234-RED-081 OT-234-RED-080 OT-234-RED-080 OT-234-RED-080 OT-234-RED-080 OT-234-RED-080 OT-234-RED-080	Pass
SPECTRUM (Art. 3.1)	EN 303 980 V1.2.1	OT-234-RWD-028	Pass

Supplementary Information:

Testing Organization	Onetech Co., Ltd. 24, Giheungdanji-ro 141beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-di, Gyeonggi-do 17709 Korea
Place and Date of issue:	SAFETY- Gyeonggi-do, Korea on 21 st April, 2023 EMC- Gyeonggi-do, Korea on 25 th April, 2023 SPECTRUM- Gyeonggi-do, Korea on 21 st April, 2023

Authority: Dojun Byun
/ CTO

Signature: 

Date: May 3rd, 2023

HQ
Pangyo Office
Intellian Technologies, Inc.
5F IDIS Tower, 344, Pangyo-ro
Bundang-gu, Seongnam-si, Gyeonggi-do,
17709 Korea

UK 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 product(s) described in the below to which this declaration relates is in conformity with the essential requirements and other relevant requirements according to UK legislation Electrical Equipment (Safety) Regulations 2016 (S.I. 2016/1101).

Product Information:

Product Name(s):	OW50M
------------------	-------

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

2014/53/EU Article	Standard(s) Applied in Full	Test Report Number	Result
SAFETY (Art 3.1.a)	EN 62368-1:2014+A11:2017 IEC 60529:1989+A1:1999+A2:2013 EN 62311: 2008	OT-232-RSD-015 OT-233-RRK-014 OT-234-RWD-029	Pass
EMC (Art. 3.1.b)	EN 60945: 2002 (Clause 9 and Clause 10) EN 55032: 2015+A11:2020 EN IEC 61000-3-2:2019 EN 61000-3-3:2013/A1:2019 EN 301 489-1 V1.9.2 EN 301 489-12 V3.2.1 EN 55035: 2017+A11:2020	OT-234-RED-081 OT-234-RED-080 OT-234-RED-080 OT-234-RED-080 OT-234-RED-080 OT-234-RED-080 OT-234-RED-080	Pass
SPECTRUM (Art. 3.1)	EN 303 980 V1.2.1	OT-234-RWD-028	Pass

Supplementary Information:

Testing Organization	Onetech Co., Ltd. 24, Giheungdanji-ro 141beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do, Korea
Technical/Compliance File Held by:	Intellian Technologies, Inc. 18-7, Jinwisandan-ro, Jinwi-myeon, Pyeongtaek-di, Gyeonggi-do 17709 Korea
Place and Date of issue:	SAFETY- Gyeonggi-do, Korea on 21 st April, 2023 EMC- Gyeonggi-do, Korea on 25 th April, 2023 SPECTRUM- Gyeonggi-do, Korea on 21 st April, 2023

Authority: Dojun Byun
/ CTO

Signature: 

Date: May 3rd, 2023

HQ
Pangyo Office
Intellian Technologies, Inc.
5F IDIS Tower, 344, Pangyo-ro
Bundang-gu, Seongnam-si, Gyeonggi-do,
17709 Korea

Chapter 3. Introduction

3.1 Introduction to OW50M-Rac

The OW50M-Rac is a dual parabolic terminal with a 53 cm reflector size based on a 9.3 dB/K G/T which can be operated in the OneWeb low earth orbit (LEO) satellite constellation.

A radio link to the satellites is established using the User Terminal (UT) operating in the Ku-band, with uplink frequencies between 14.0 and 14.5 GHz, and downlink between 10.7 and 12.7 GHz. The OW50M enables global coverage, including both poles and ensures steady performance in extremely low temperature with the purpose built heating device (supplied as an optional extra).

3.2 OW50M-Rac Features

- LEO satellite pointing and tracking algorithm.
- 3-axis stabilization platform with ship motion compensation solutions.
- Dual-dome operation for seamless connectivity.
- Designed specifically for maritime operation
- Satellite blockage mitigation
- Embedded Radar Rejection Filter for interference prevention
- Single cable connection between Below Deck Unit and each Above Deck (Antenna) Unit
- Remote monitoring, diagnostics and troubleshooting to resolve issues on site, via the local management interface
- Ability to store multiple software versions to fallback to a known good or factory version in case of errors in the current working version of software
- Factory pre-assembled heating module (optional)

Chapter 4. Planning Installation

**CAUTION**

- Be sure to complete the pre-installation checklist before you begin installing the antenna.
- DO NOT OPERATE THE ANTENNA WITHOUT THE RADOME. THIS WILL RESULT IN DAMAGE TO THE ANTENNA AND ABNORMAL OPERATION.

4.1 Installation Precautions

The User Terminal installation requires extreme precaution and safety measures given the installation environment. Failure to follow the correct installation process may lead to injury of the installer and/or cause damage to the system. To maximize the performance of the system, a thorough review of this installation guide is strongly recommended. In addition, you should execute the installation process as it is noted in this manual.

To ensure your own safety and convenience of installation, note the following precautions.

- Review the general safety precautions in the Safety Precautions chapter.
- Verify all requirements before beginning the actual installation to determine if the equipment and necessary items are available and functioning properly.
- Install the grounding system for the antenna support structure, radio hardware, and surge arrestor before connecting the cable from the equipment to the surge arrestor. This protects the system against lightning strikes during installation.

4.2 Selecting Installation Site

The mounting location and mounting post must be robust enough that it will not flex or sway in ship motion and well re-enforced to prevent flex and vibration forces from being exerted on the antenna and radome.

The mounting post must also be rigid enough to withstand the forces exerted by full rated wind load on the radome.

4.2.1 Installation Location for Antenna

For optimal performance, it is preferable that the user terminal has an unobstructed view of the horizon or satellite in all directions. Although the user terminal itself can mitigate blockages, it is ideal to have no obstacles within a 53-degree range from the zenith (or 78 degrees if considering a ship in motion).

To utilize the basic antenna system, two antennas must be installed with a minimum distance of 3.5 meters (11.5 feet) between them to facilitate blockage mitigation.

During antenna installation, it is essential to input the values of every blockage zone, including elevation and azimuth angles, in the “configure blockage zones” for seamless blockage mitigation. Intellian recommends following these guidelines for best results.

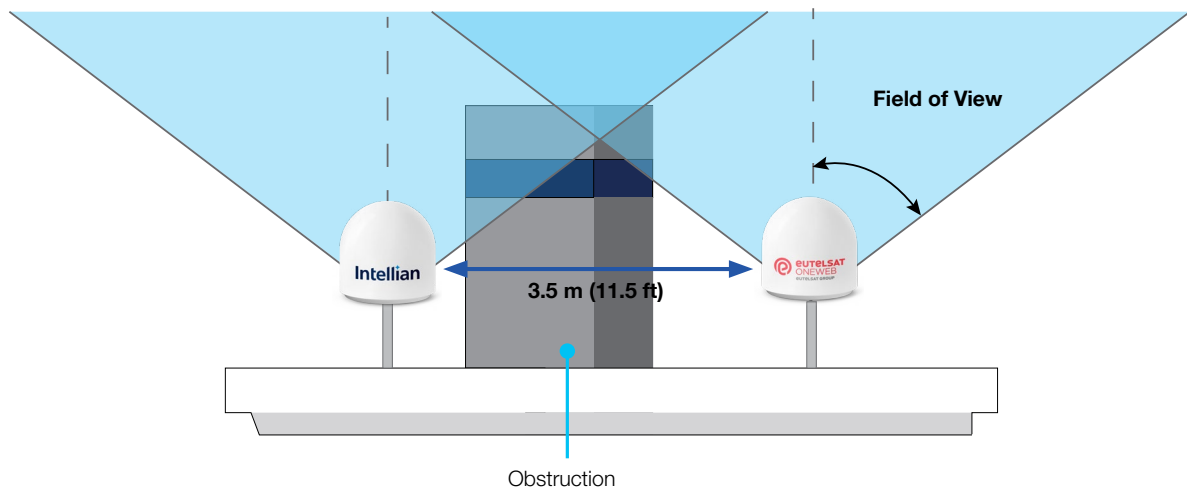


Figure 1: Minimizing Satellite Blockage (example)

4.2.2 Installation Location for CNX

An ideal location for the CNX should be:

- The room climate controlled.
- Adequate ventilation on each side of the rack
- Adequate room behind the rack
- Within 30 m (98 ft) of the antennas with RG6 coax cable
- Within 100 m (328 ft) of the antennas with RG11 coax cable
- Within 1.5m from AC Power Source (100-240 VAC, 50-60 Hz)

4.2.3 Avoid RF Interference

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

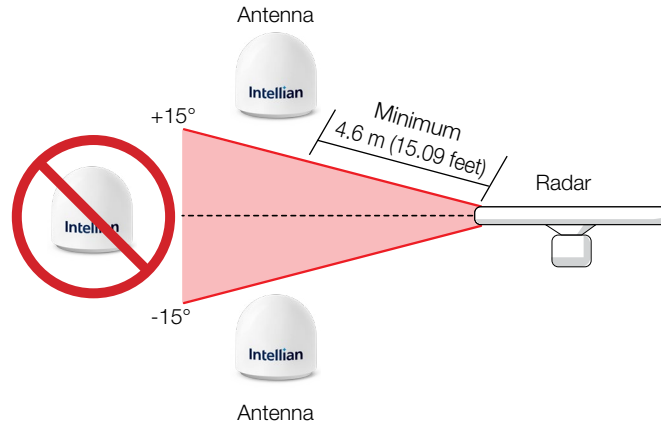


Figure 2: Potential RF Interference



WARNING

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.

4.2.4 RF Hazard Precautions

The Federal Communications Commission has adopted a safety standard for human exposure to RF (Radio Frequency) energy, which is below the OSHA (Occupational Safety and Health Act) 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.

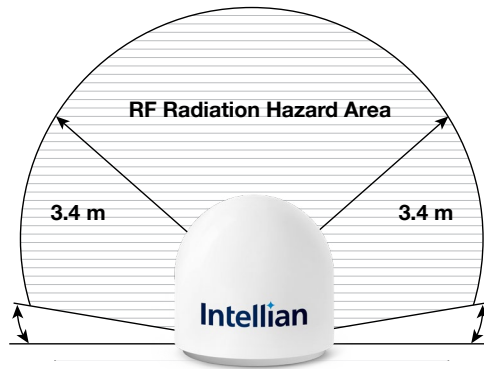


Figure 3: RF Radiation Hazard Area



NOTE

This RF hazard is calculated using the following calculation.

$$S_t = \frac{4\eta P_t R_{nf}}{AR} \quad R_{nf} = \frac{D^2}{4\lambda} \quad R_{nf} \leq R \leq R_{ff}$$

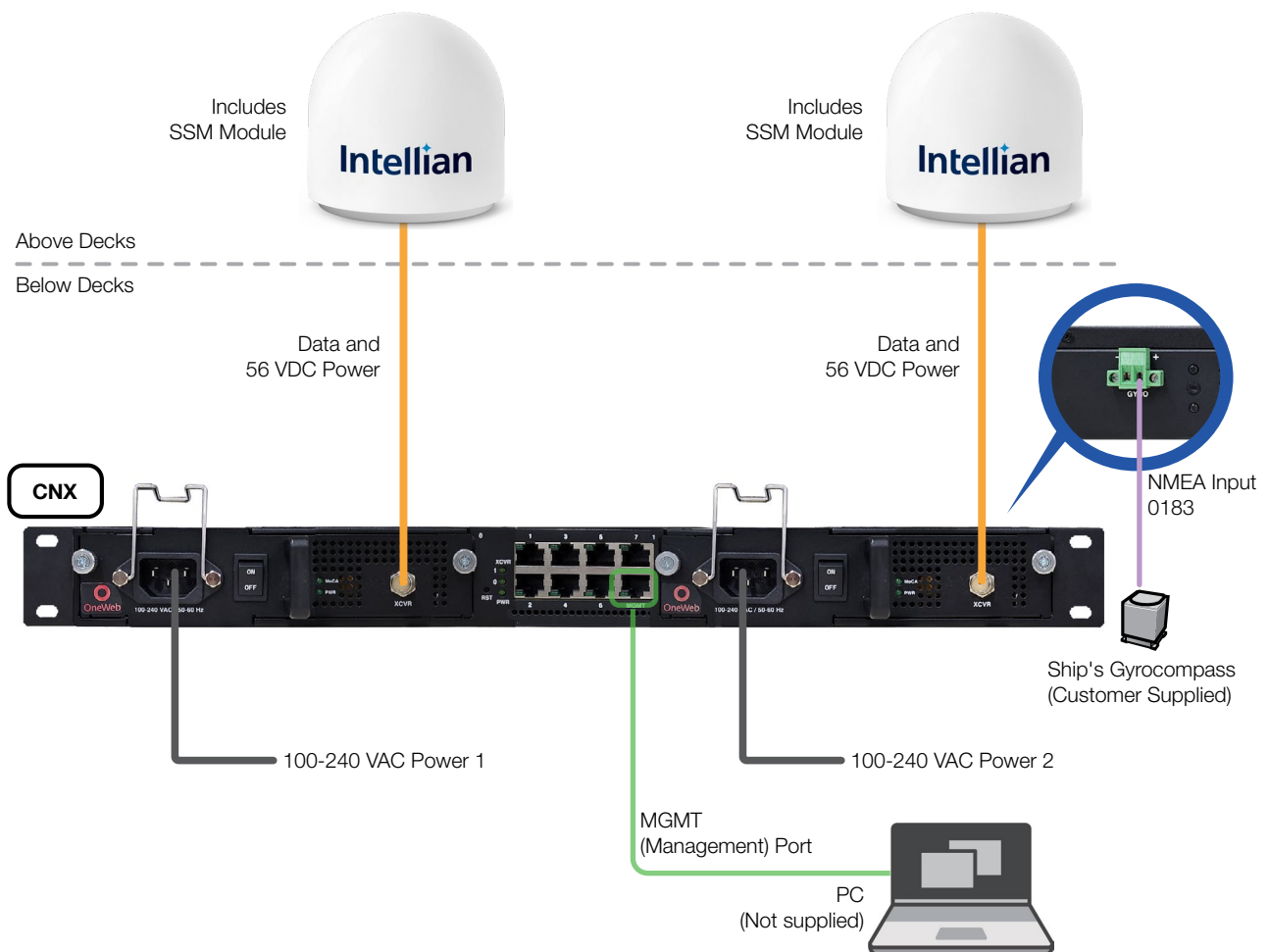
- S_t : Power density in the transition region in W/m^2
- P_t : Power fed to the antenna feed horn in W
- A : Physical (geometrical) area of the aperture antenna in m^2
- R_{nf} : Extent of near-field in m
- R_{ff} : Distance to beginning of near field in m
- R : Distance to the point of interest in m
- D : Maximum dimension of antenna (Diameter if circular) in m
- η : Aperture efficiency (typically 0.5-0.75 for circular apertures)
- λ : Wavelengths in m

4.3 System Package

4.3.1 Above Deck Unit (ADU)

The OW50M operate in Primary-Primary configuration.

- The modem supports a duplexed OneWeb UT configuration called the “Primary-Primary” or “Compound” UT configuration, in which two identical parabolic antennas are independently connected to the CNX indoor unit (Below Deck Unit) via a coaxial cable. One antenna will be active on the OneWeb network at any given time with the active antenna changing based on satellite availability and blockage mitigation settings.



The antenna is constructed with a 3-axial stabilized platform, which compensates for the position of the antennas during ship motion.

The antenna system comprises a reflector, OMT, a feeder, and RCM, which convert satellite signals into IF bands for forward-link satellite signals. Each antenna also includes a modem module referred to as SSM, which facilitates signal transmission and reception, as well as communication and direction commands to the antenna.

The antenna interface module, called AIM, controls the antenna's motion by interfacing with the modem and RF modules.

A Radome protects the antenna from a maritime environment.



Figure 4: Radomes and Pedestal

4.3.2 Customer Network Exchange (CNX)

The Customer Network Exchange (CNX) must be installed in a weather-protected area. It interfaces with user equipment and provides power and data interconnection to the above deck unit. The CNX connects to two antennas while providing a secure GigE connection to the Baseband Unit.

Front/Back Panel of CNX



Figure 5: Front Panel of CNX



Figure 6: Back Panel of CNX

4.3.3 Packing List

OW50M-Rac Packing list

The ADU Packages (2 ea) and CNX Package (1 ea) are provided in each package box.

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

The components are packaged in each package box as listed in the tables below.

OW50M (without Heating Module)

Antenna Package (Without Heating Module)			
Item	Q'ty	Size	Description
Antenna Unit	1		User Terminal
Quick Installation Guide (QIG)	1		Installation Manual
RG-6 Coaxial Cable F(M) - F(M)	1	30 m	Coaxial Cable F(M)-F(M) for CNX Power & Data Connection
Ethernet Cable (RJ45 / LAN)	1	1 m	
AC Power Cord (CEEE7/7)	1	1.5m	CNX Power Cord (220 V)
Hex Bolt	4	M12 x 80L	Bolt kit for antenna-mast assembly
Flat Washer	4	M12	
Spring Washer	4	M12	
Waterproof Foam	1		With an x-shaped cable hole
Antenna Mounting Template	1	24.75 cm x 24.75 cm	Real size drawing of antenna mounting hole pattern
RF Hazard Sticker	1		Radiation Safety Distance Label

OW50M (with Heating Module)

Antenna Package (With Heating Module)			
Item	Q'ty	Size	Description
Antenna Unit	1		User Terminal
Quick Installation Guide (QIG)	1		Installation Manual
Leaflet	1		Leaflet for Heating device
RG-6 Coaxial Cable F(M) - F(M)	1	30 m	Coaxial Cable F(M)-F(M) for CNX Power & Data Connection
Heater Power Housing	1		3P Waterproof Housing (23003231-02)
Ethernet Cable (RJ45 / LAN)	1	1 m	
AC Power Cord (CEE7/7)	1	1.5m	CNX Power Cord (220 V)
Hex Bolt	4	M12 x 80L	Bolt kit for antenna-mast assembly
Flat Washer	4	M12	
Spring Washer	4	M12	
Waterproof Foam	1		With an x-shaped cable hole
Antenna Mounting Template	1	24.75 cm x 24.75 cm	Real size drawing of antenna mounting hole pattern
RF Hazard Sticker	1		Radiation Safety Distance Label

**NOTE**

The Heating Module is assembled and tested at the antenna during production.

CNX Package (1 ea)			
Item	Q'ty	Size	Description
Customer Network Exchange (CNX)	1	442 mm x 250 mm x 44.4 mm	To access to OneWeb services
CNX-E Wifi dongle	1		For Wi-Fi connection (TL-WN823N)
Rackmount Plate	2		Kit for Rackmount Plate
Pan Head Screw (with Spring & Flat Washer)	8	M4 x 16 L	

4.4 System Cables

4.4.1 Antenna Power+Data Cable

Intellian recommends using the RG6 or RG11 cable types to connect the antenna and CNX. If you need a cable that runs longer than the maximum cable length recommended, contact Intellian Technical Support for assistance.

Cable Requirements

Cable Type	Cable Length
RG6 (Supplied)	UP to 30m
RG 11 (Customer Supplied)	UP to 100m



NOTE

- Optimal tightening torque for N type RF connector: 1.5 N-m
- Maximum RF loss at 700Mhz: 20 dB including connectors

4.4.2 Gyrocompass Cable (Customer Supplied)

The following general types of gyrocompass cables are recommended for compatible connection to Intellian antennas used in various vessel environments.

Standard	NMEA 0183
Connector Type	2 pins terminal block connector
Cable Type	2-Wires Twisted Pair Shielded Cable
Heading Information	Supports \$HEHDT, baud rate 4800, update rate 10Hz(100msec)

4.4.3 AC Power Cables (Customer Supplied, Only for Heater Module)

The recommended specifications and length of the power cable are listed in the table below. If you need a power cable that runs longer than the maximum cable length recommended, contact Intellian Technical Support for assistance.

Cable Length	UP to 100m
Input Power	220 VAC Heater power function
Power Consumption	400 W
AWG(American Wire Gauge)	14 ~ 18
Cable Cross-Sectional Area(Nominal Area)	3C(0.75 ~ 2.0 mm ²)
Cable Overall Diameter(mm)	6.5 ~ 9.5
Designation	IEC 60227

4.5 Installer/Customer Furnished Equipment

- Country specific power cable and socket for power adaptors
- Grounding system that meets the local electrical code requirements
- Waterproofing materials to withstand a variety of maritime conditions (such as waterproof seal and glands etc.)
- Tape or wraps to attach the antenna cable to the support structure
- Fasteners and other installation tools

4.6 Unpacking System Package



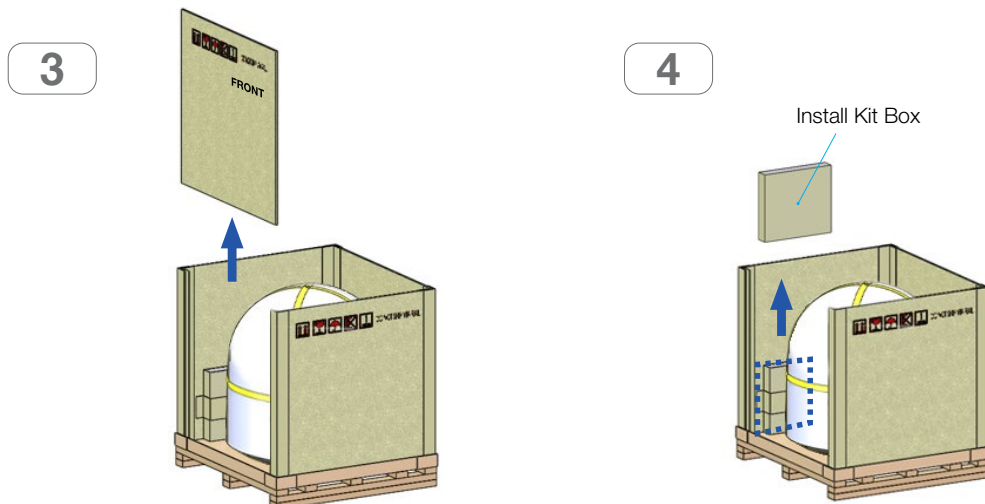
CAUTION

- The package box on the pallet should be lifted by a forklift.
- Follow the steps in order for easy and safe unpacking.

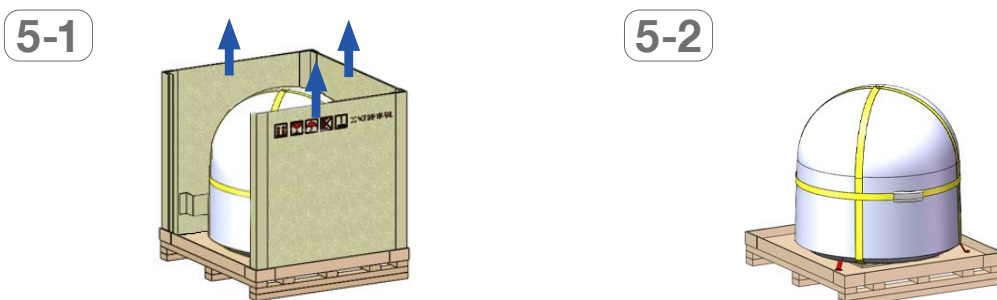
1. Position the “FRONT” marked side of the box to the front, then remove all the plastic straps securing the box to the pallet using a cutter.
2. Open the top cover.



3. Lift up and remove the “FRONT” marked panel.
4. The install kit box is located inside the side panel. Take out the box with both hands.



5. Lift up and remove the rest of the side panels.



Chapter 5. Installing Above Deck Unit (ADU)

5.1 General Requirements

5.1.1 Antenna Mounting Requirements

You need to procure or fabricate a suitable mounting plate and pole to support the Dual ADU (Above Deck Unit).

The mounting platform should be rigid enough and secured tightly to the structure of the vessel. Also it should not be subjected to excessive vibration (0.7G in 13.2 to 100 Hz) to ensure full antenna performance and prevention of potential mechanical damage.

Note: An ideal location for the CNX should be within 100 m (300 ft) from Dual ADUs (Antennas)

Consider the following factors to select the mounting method:

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

Size	Weight
• Height: 850 mm (33.5 inches)	• about 52 kg (114.6 lbs)
• Diameter: Ø856 mm (33.7 inches)	• Heater type: 55 kg (121.3 lbs)

- The chosen mounting method must maintain the antenna's pointing calibration while withstanding wind loads and ensuring the safety of people and property

5.2 Antenna Dimensions

Before installing the antenna unit, confirm its height and diameter (see figure below). The mounting surface and overall space occupied by the radome must be sufficient for the height and diameter of the fully constructed radome on top of its mounting base. The radome dimensions are the same.

Antenna Dimensions

Unit: mm (inches)



Figure 7: Antenna Side View

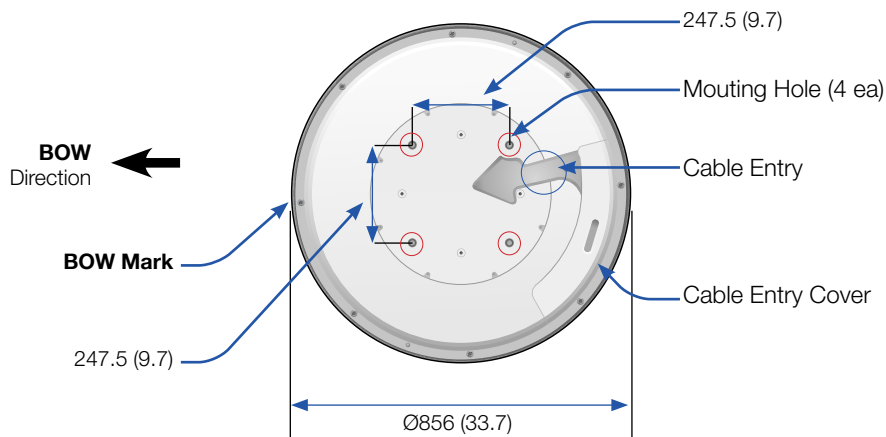


Figure 8: Antenna Bottom View



NOTE

Position the antenna with the BOW direction parallel to the center line of the ship.

5.3 Antenna Mounting Hole Pattern

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

**WARNING**

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.

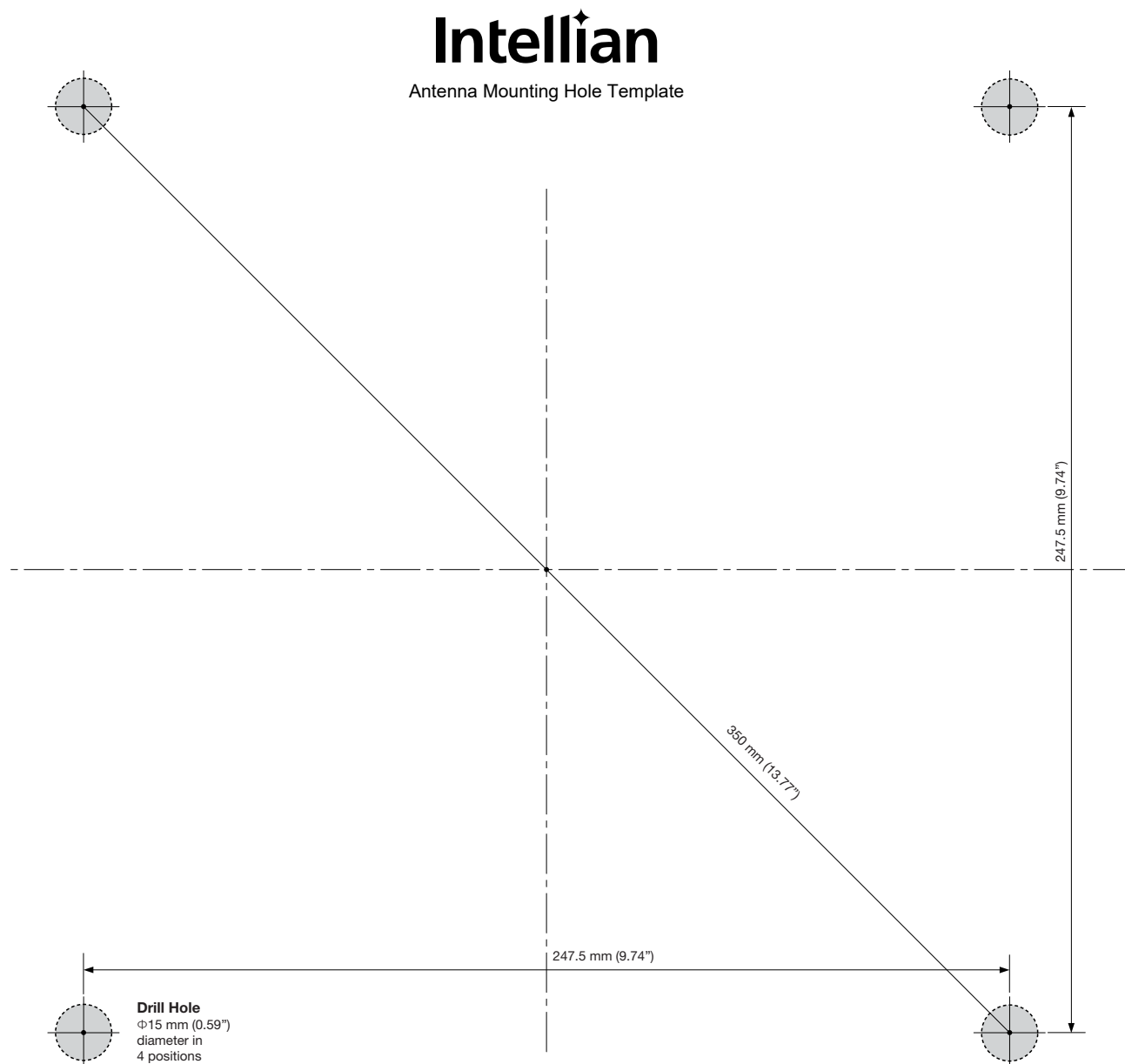


Figure 9: Antenna Mounting Hole Template

5.4 Designing Mast (Example Only)

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



NOTE

- This is a general example of designing a mast. The shape of mast may differ depending on the ship's environment.
- Follow the Intellian installation recommendations for safety.



WARNING

- When designing a mast, consider the minimum and maximum thickness of the mast plate marked on the diagram. If the thickness of the mast plate is different from the recommended size (Min. 10.0 mm/ Max. 20.0 mm), choose the bolt size for mounting the antenna on the mast according to the table below.

Mast Plate Thickness	Recommended Bolt Size
10 ~ 28 mm	M12 x 80L (Supplied)
28 ~ 35 mm	M12 x 90L

Option 1. When Installing Cable on Outside of Mast

This method is generally recommended.

Unit: mm (inches)

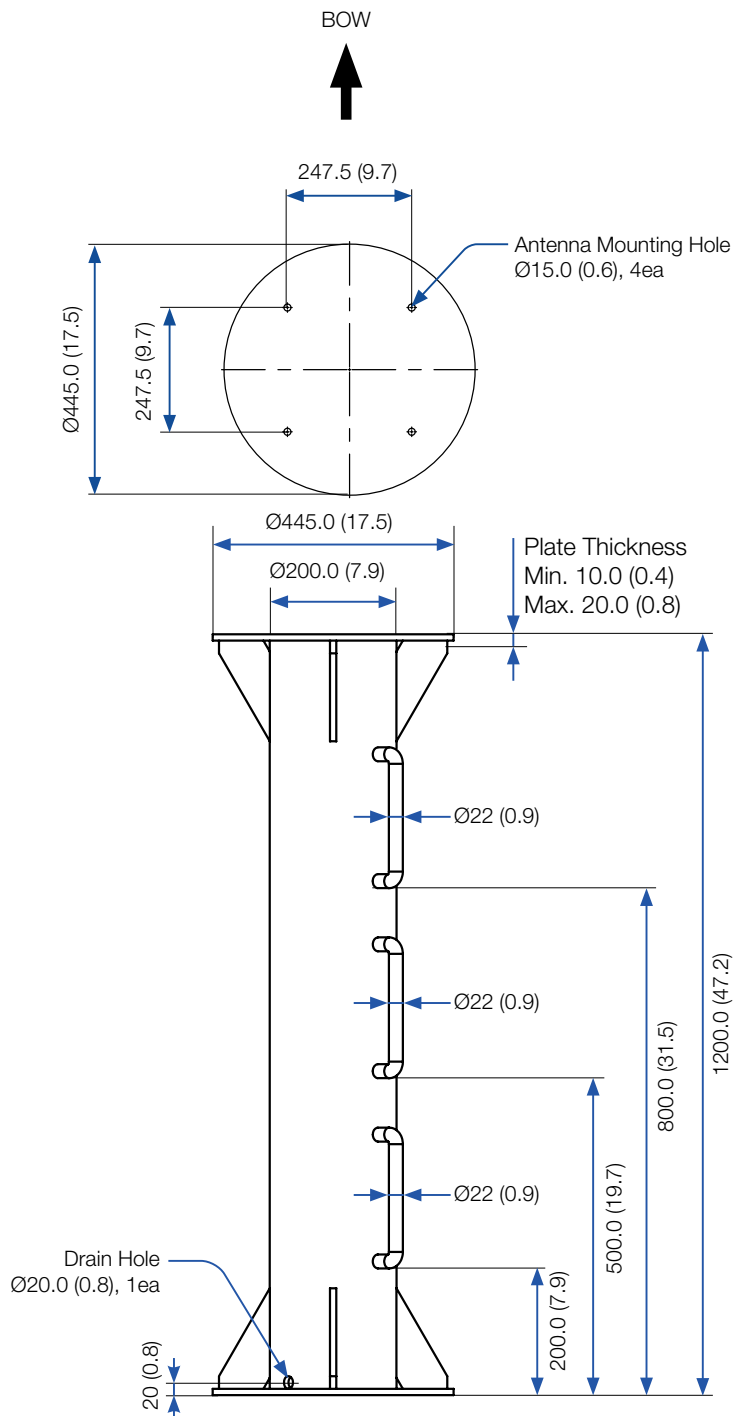


Figure 10: Recommended Size of Mast (Option 1)

Option 2. When Installing Cable Through Inside Mast

Unit: mm (inches)

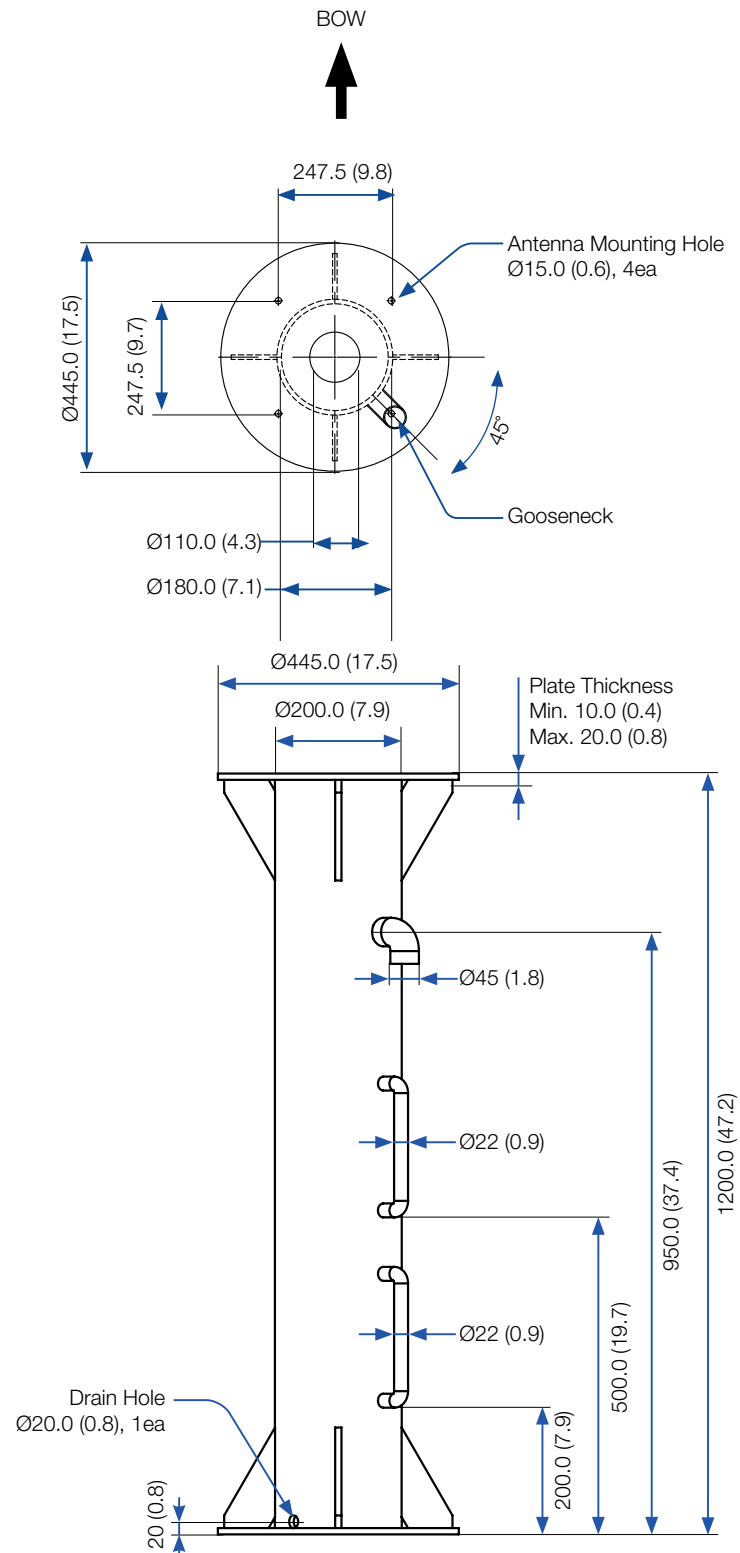
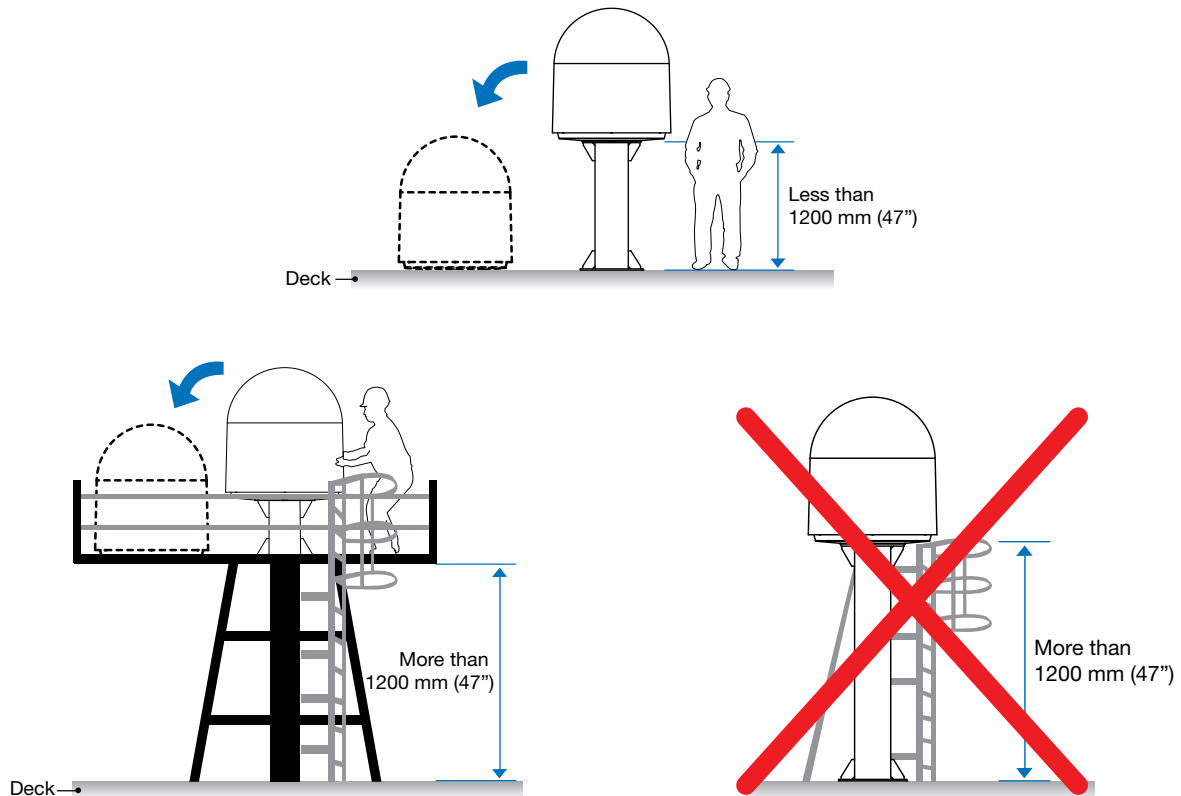


Figure 11: Recommended Size of Mast (Option 2)



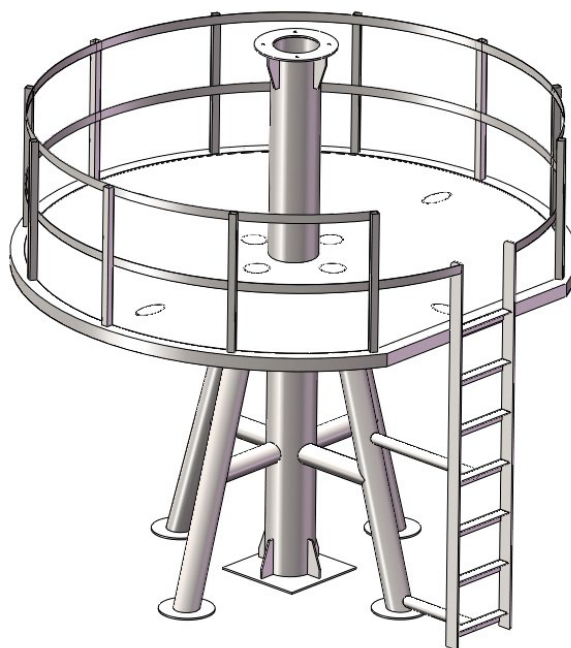
WARNING

Intellian strongly recommends installing the antenna less than 1200 mm (47") above the deck for safe access and maintenance. When installing the antenna more than 1200 mm (47") above the deck, make sure to have enough working space around the mast for the installers to move around and put the radome down.



WARNING

If the antenna is installed on the mast over 1.2m high, the mast design should include a mast platform.



<Example>

5.5 Routing RF Cable on Mast (Example Only)

The cable must be routed from the antenna and through the ship to end up at the antenna control unit. 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.



WARNING

Ensure that cable has been run through watertight fittings to prevent water entry into the vessel when installation is completed.



NOTE

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 generally 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 connector on the radome, adjust the length and fix the cable on the cable brackets using cable ties.

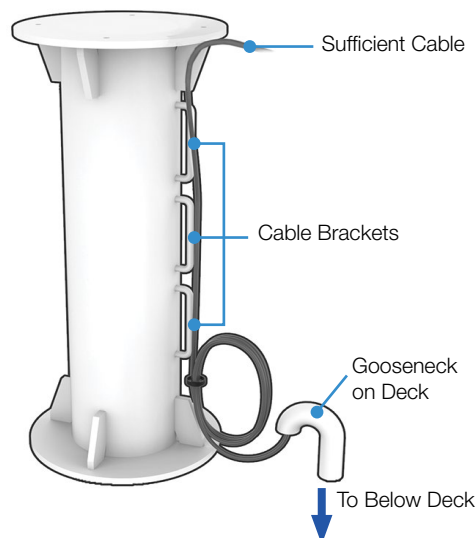


Figure 12: Routing Cable Through Outside of Mast

Option 2. Routing Cable Through Inside Mast

1. Before placing the radome on the mast, route the cable through the gooseneck on the deck and the built-in gooseneck on the mast for easier placing of the RF cable through the inside of the mast as shown in the picture.
2. Maintain a sufficient cable length (at least 2 m) when routing the cable on the surface and inside of the mast. After connecting the cable to the connector on the radome, adjust the length and fix the cable on the cable brackets using cable ties.

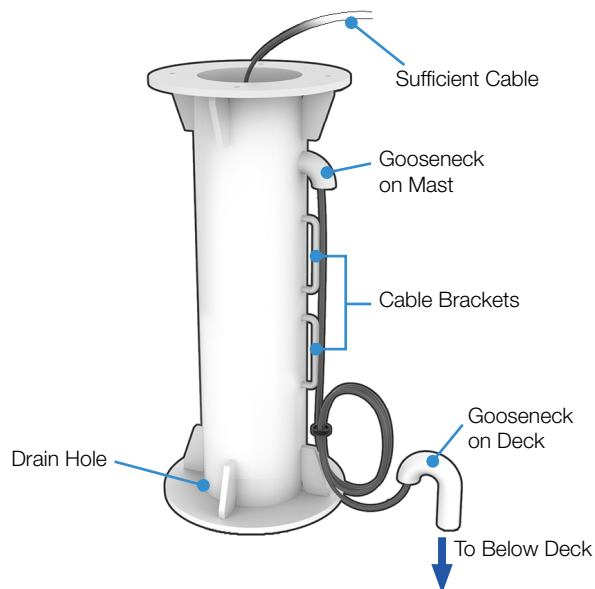


Figure 13: Routing Cable Through Inside of Mast



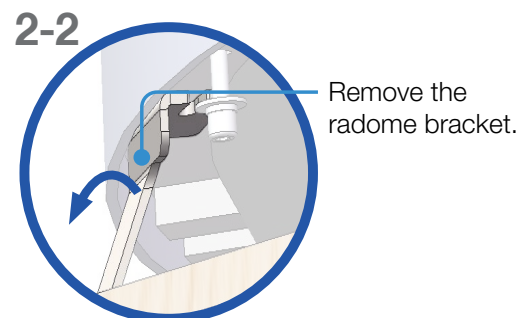
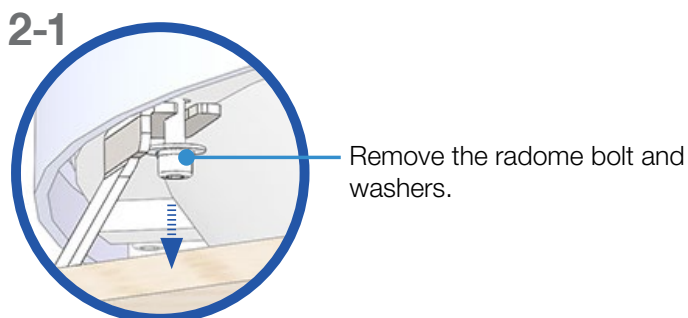
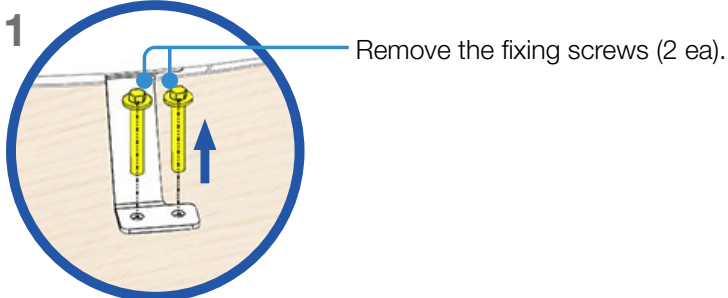
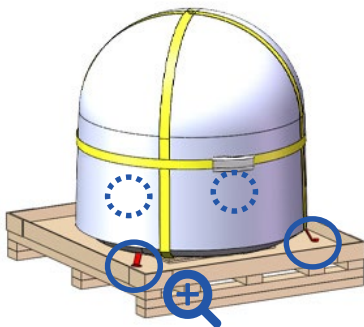
CAUTION

Do not leave the cables on the top surface of the mast. When putting down the antenna on the mast, there is a risk of damage to the cable connector if the cable is located on the top surface of the mast.

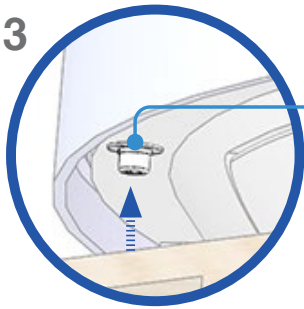
5.6 Removing Antenna from Wooden Pallet

Four radome brackets secure the antenna to the pallet. To remove the radome from the pallet and the brackets from the radome, use the following procedure.

1. Remove the fixing bolts (2 ea) on the radome bracket that secures the antenna to the pallet using a wrench.
2. Remove the radome bolt (1 ea) that secures the radome bracket on the radome with a wrench. Then detach the radome bracket from the radome.
3. After removing the radome bracket, install the radome bolt (1 ea) back into the radome using a wrench. To fasten the bolt firmly, apply Loctite #243 to bolt threads before installing.
4. Repeat steps 2 through 3 for each remaining radome bracket.

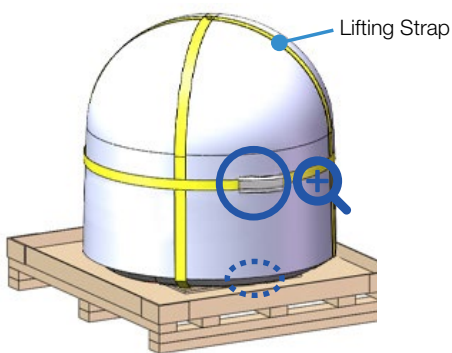


3

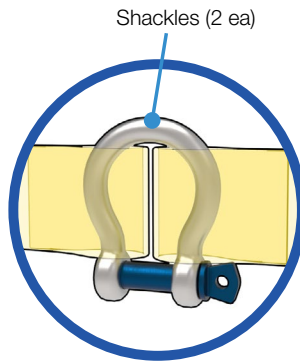


Install the radome bolt back into the radome bolt and washers.

5. Check the condition of the lifting strap to make sure the shackles (2 ea) are tightened. After checking the shackles, re-wrap them with the existing protection to avoid radome damage.



Lifting Strap



Shackles (2 ea)



WARNING

Make sure to remove the radome brackets that secure the radome to the pallet before lifting the antenna using the lifting straps.

5.7 Moving Antenna Above Mast

The Intellian antenna comes from the factory with the lifting straps pre-mounted.

1. Check the condition of the lifting strap and ensure the shackle is tightened up.
2. Lift the antenna above the mast using a crane and carefully lower down the antenna toward the mast. Maintain sufficient space (at least 150 mm) between the bottom of the radome and the mast for cabling work.



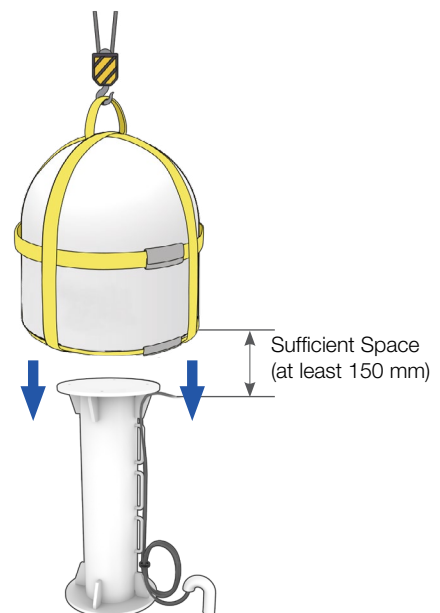
WARNING

The antenna may sway in the wind when suspended by a crane. Be careful when handling the antenna.



NOTE

Position the antenna with the BOW direction parallel to the center line of the ship.



5.8 Inserting Waterproof Foam

The supplied waterproof foam must be inserted to prevent water penetration into the radome before mounting the radome on the mast. Make sure the waterproof foam is positioned where the following picture shows.

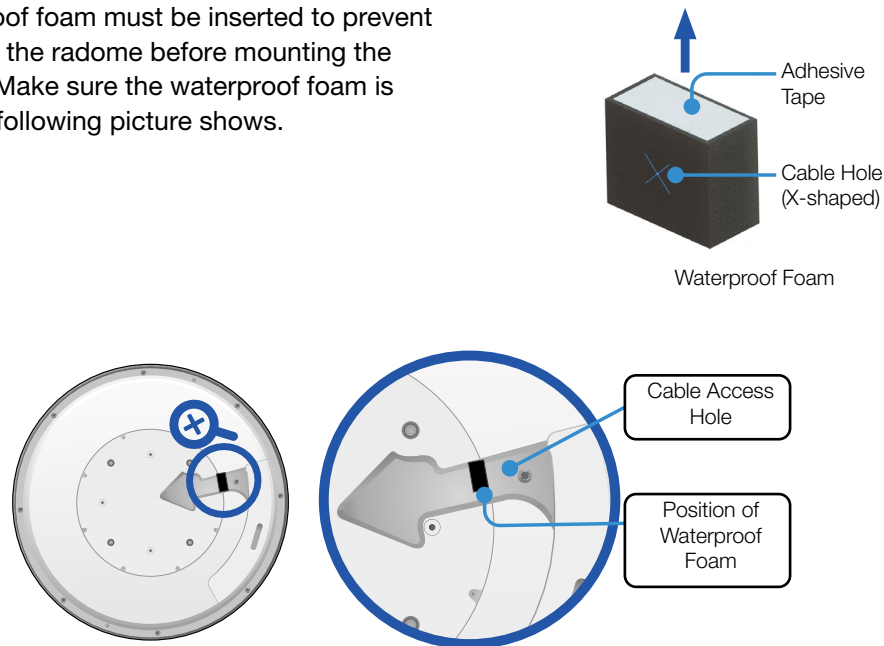
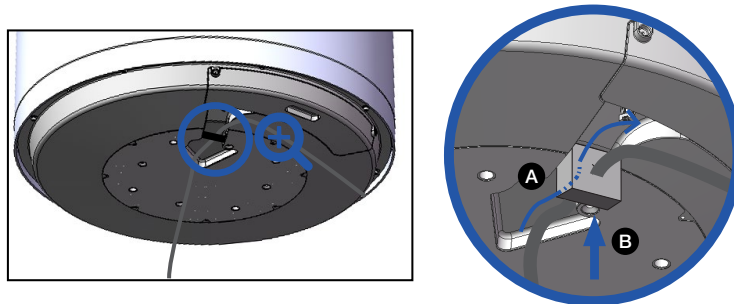


Figure 14: Attaching Position of Waterproof Foam

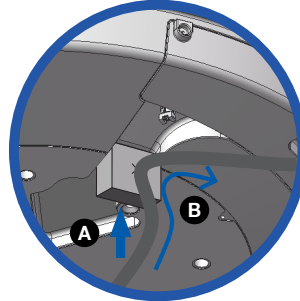
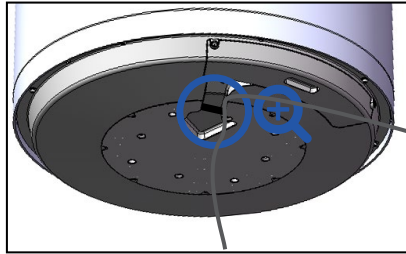
Option 1. When Installing Cable Through Inside Mast

1. Peel off the paper backing of the adhesive tape from the waterproof foam.
2. Extend the RF cable up to the radome from the mast, and pass the cable through the cable hole (X-shaped) of the waterproof form.
3. Then attach the adhesive side of waterproof foam firmly onto the surface of the cable access hole. When moving the radome, be careful with the waterproof foam and cable not to be detached.



Option 2. When Installing Cable on Outside of Mast

1. Peel off the paper backing of the adhesive tape from the waterproof foam.
2. Attach the adhesive side of waterproof foam firmly onto the surface of the cable access hole.
3. Extend the RF cable up to the radome from the mast.



5.9 Mounting Antenna on Mast

1. Bring the M12x80L hex bolts (4 ea) for antenna-mounting plate assembly.
2. Lower the antenna onto the mast using the crane, making sure the mounting holes of the antenna are aligned with those of the mast. Make sure the cable from the mast is aligned with the cable entry on the bottom of the antenna for stable connection.
3. Apply Loctite #263 to the bolt threads, insert the bolts and washers from under the mast into the built-in nuts on the bottom of the radome (see Figure 16), and then lightly tighten them by hand. Use a crisscross sequence as shown in Figure 15.
4. After installing all 4 bolts, fully tighten the bolts using a torque wrench in the crisscross sequence. Refer to **“11.1 Tightening Torque Specification” on page 108** for the bolt tightening torque.

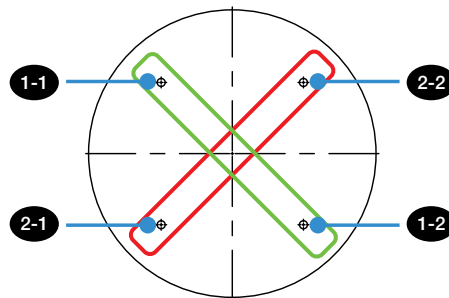


Figure 15: Installing Sequence of Bolts

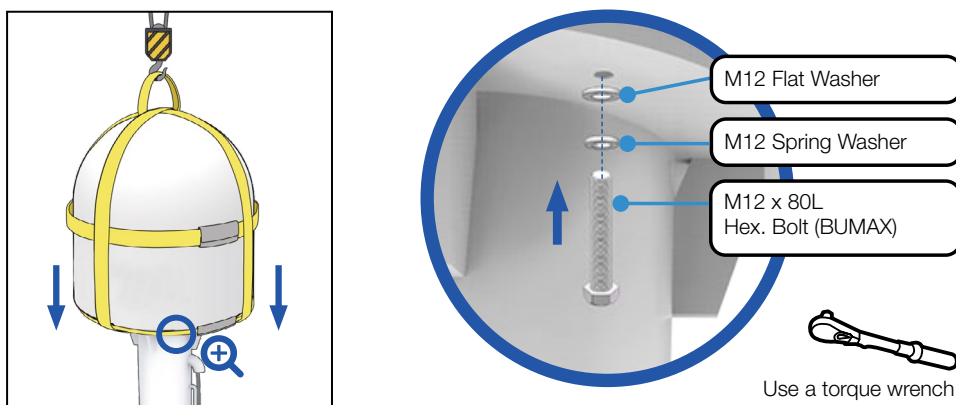


Figure 16: Installing Bolts for Antenna-Mast Assembly



NOTE

- Make sure the cable from the mast is aligned with the cable entry on the bottom of the antenna for stable connection.
- Refer to **“11.1 Tightening Torque Specification” on page 108** for the bolt tightening torque.



WARNING

If a bolt does not fit into the mounting hole when installing the bolt by hand, stop installing and check the bolt size. DO NOT tighten the bolts forcefully. Forceful tightening can damage the inner threads of the antenna mounting holes. This type of damage is not covered by the warranty.

5.10 Connecting RF Cable to Antenna

Connect the RF Cable (customer supplied) from the **XCVR** port of the CNX to the RF connector inside the cable entry of the radome. Both sides of the connection cable should be terminated using suitable tools. After the connection, securely fix the cable in place using cable ties.



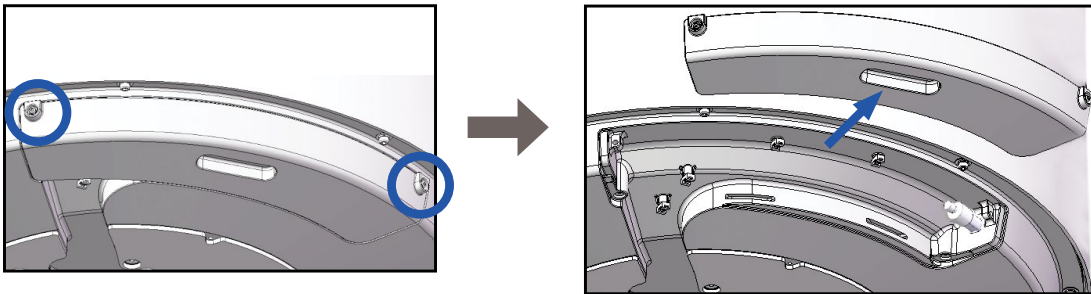
NOTE

Make sure of the following before installing system cables.

1. All cables need to be well clamped and protected from physical damage and exposure to heat and humidity.
2. Don't use any acutely bent cable.
3. Use watertight glands or swan neck tubes at exposed bulkheads or deck heads where the cable passes through.

5.10.1 Connecting RF Cable

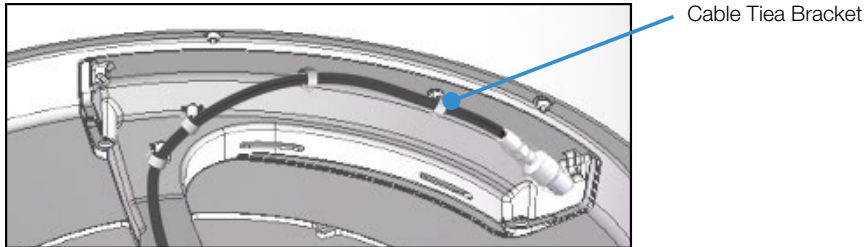
1. Loosen the M4 x 15L wrench bolts by using the wrench set then open the cable entry cover.



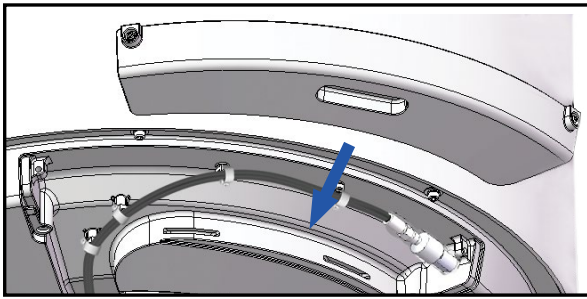
NOTE

After removing the M4x15L Wrench Bolt from the cover of cable entry, Keep it in a safe place for the next step. When closing the cover of the cable entry, this bolt must be used.

2. Terminate F(M) Connector Connector on the end of the RF Cable. Intellian recommends using a genuine cable connector and tools. Refer to the cable termination instructions provided by the manufacturer to terminate the F connector.
3. Connect the terminated RF cable to the connector of the radome as shown in the figure below. Ensure the cable is firmly fastened to the connector. Fix the cable position along the routing path using cable ties, cable mounts or cable clamps.



4. After completing cable connection, put the cover in the right place and close it by tightening the M4 x 15L wrench bolts by using a wrench set.



5.11 Connecting power cable for Heating Module (Optional)

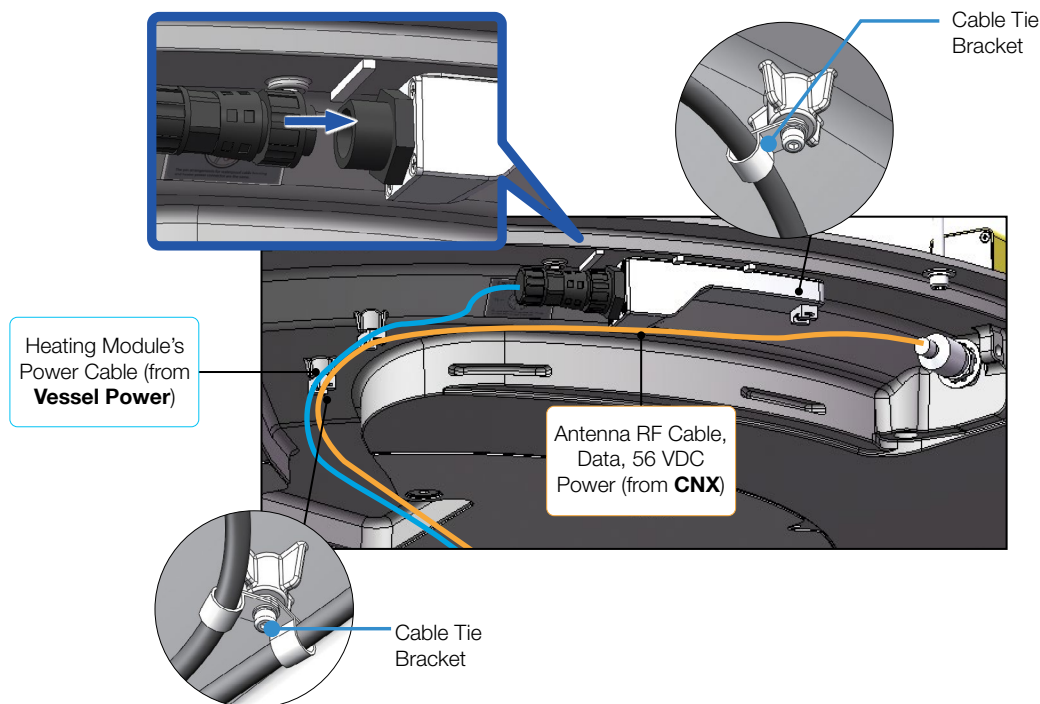
The heating module is provided as an option as pre-fitted condition. The cabling should be carried out when installing the antennas.

The heater module was set temperature to -10°C on and shipped from the factory. The heater module starts operating at a temperature from -10°C . If you need to change the operating temperature, contact Intellian Technical Support for assistance.

5.11.1 Connecting cable for Heating Module

The below steps are described for connecting cable for Heating Module.

1. Connect the RF cable to the connector of the radome. Follow the steps 1 through 3 of **“5.10.1 Connecting RF Cable” on page 40**. Close the cable entry cover after you finish installing all the cables.
2. Terminate the heating module's power cables with waterproof cable housing. Intellian recommends using genuine cable connectors and tools. Refer to the following **“Termination the Waterproof Cable Housing on Heating Module's Power Cable”** page for more details.
3. Connect the waterproof cable housing of the heating module's power cables to the heating module connector inside the radome. Thread the 3 pin panel of waterproof cable housing onto the heating module connector inside the radome, and fully tighten the tail cover of waterproof cable housing.



NOTE

Align the U-slot with the waterproof cable housing and the heater power connector. The Pin arrangement for both the waterproof cable housing and the heater power connector should be the same. Make sure the connection is correct.



4. After completing cable connection, put the cover in the right place and close it by tightening the M4 x 15L wrench bolt by using a wrench set.

Termination the Waterproof Cable Housing on Heating Module's Power Cable

To terminate the supplied waterproof cable housing on the end of heating module's power cable, follow the steps below.

1. Prepare the supplied waterproof cable housing and heating module's power cable. Peel off the outer skin of the cable to approximately 10 mm in length.



2. Unscrew the waterproof cable housing to separate. It consists of a tail cover, barrel and 3 pin panel.



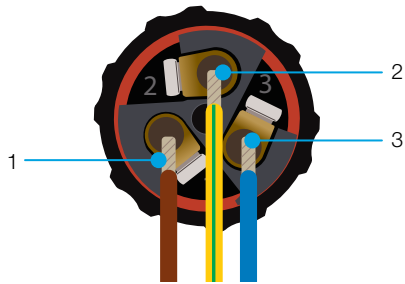
3. Pass the heating module's power cable through the tail cover and barrel in the order shown in the figure.



4. Screw out the screws on the 3 pin panel groove using a Phillips screwdriver.



5. Thread the wires into the 3 pin panel groove as shown in the figure below.



Waterproof Cable Housing

1	Live (Brown)
2	PE (Yellow-Green)
3	Neutral (Blue)

6. Tighten the screws fully using a Phillips screwdriver.



7. Thread the barrel onto the 3 pin panel, and then tighten the barrel.



Chapter 6. Installing Below Deck Unit (BDU)

6.1 Selecting BDU Installation Site

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

6.2 CNX Dimensions

Confirm the dimensions of the CNX before installing it.

6.2.1 CNX Dimensions

Unit: mm (inches)

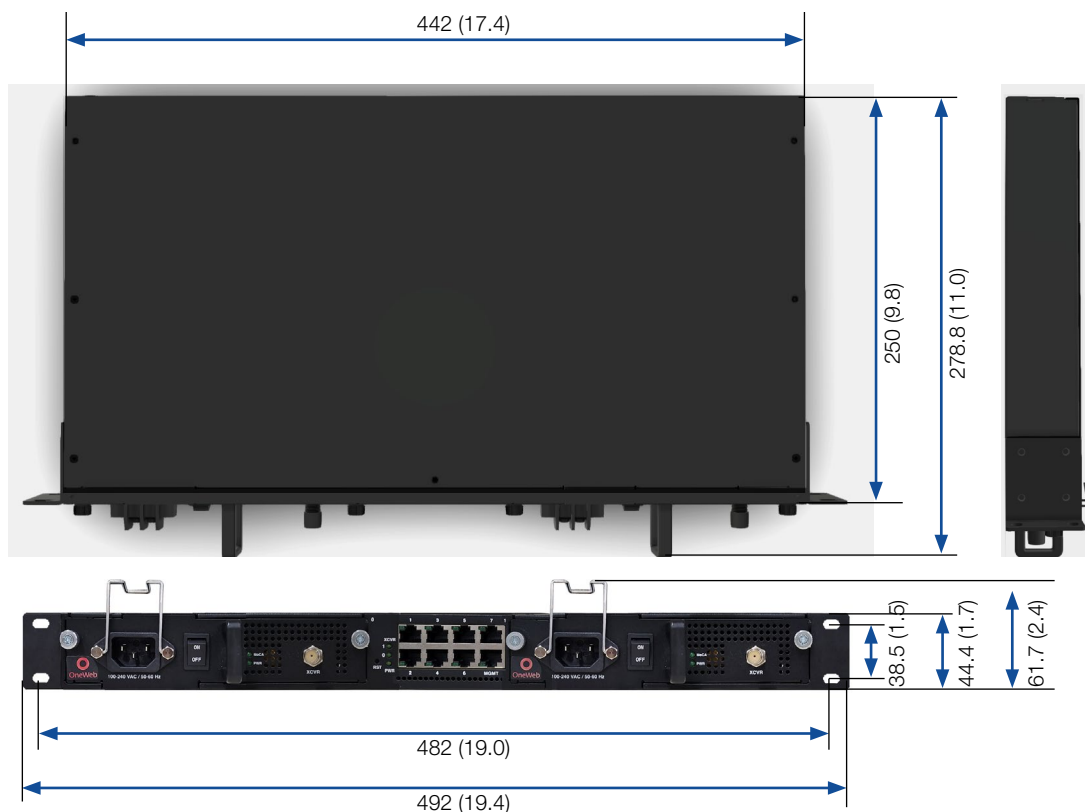


Figure 17: CNX Dimensions



CAUTION

- This equipment design typically applies to commercial or industrial equipment expected to be installed in locations where only adults are normally present.
- This product is intended to be supplied from Intellian by a rated 56V DC, 4.48 A maximum, if need further assistance, please contact OneWeb for further information.
- Never open the equipment. For safety reasons, the equipment should be opened only to qualified service personnel. This appliance classification of use by a Skilled person.

6.3 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 User Terminal consists of two antennas and a CNX.

The antenna includes the SSM module, which is capable of controlling and managing two antenna systems simultaneously.

Antenna System Configuration with CNX

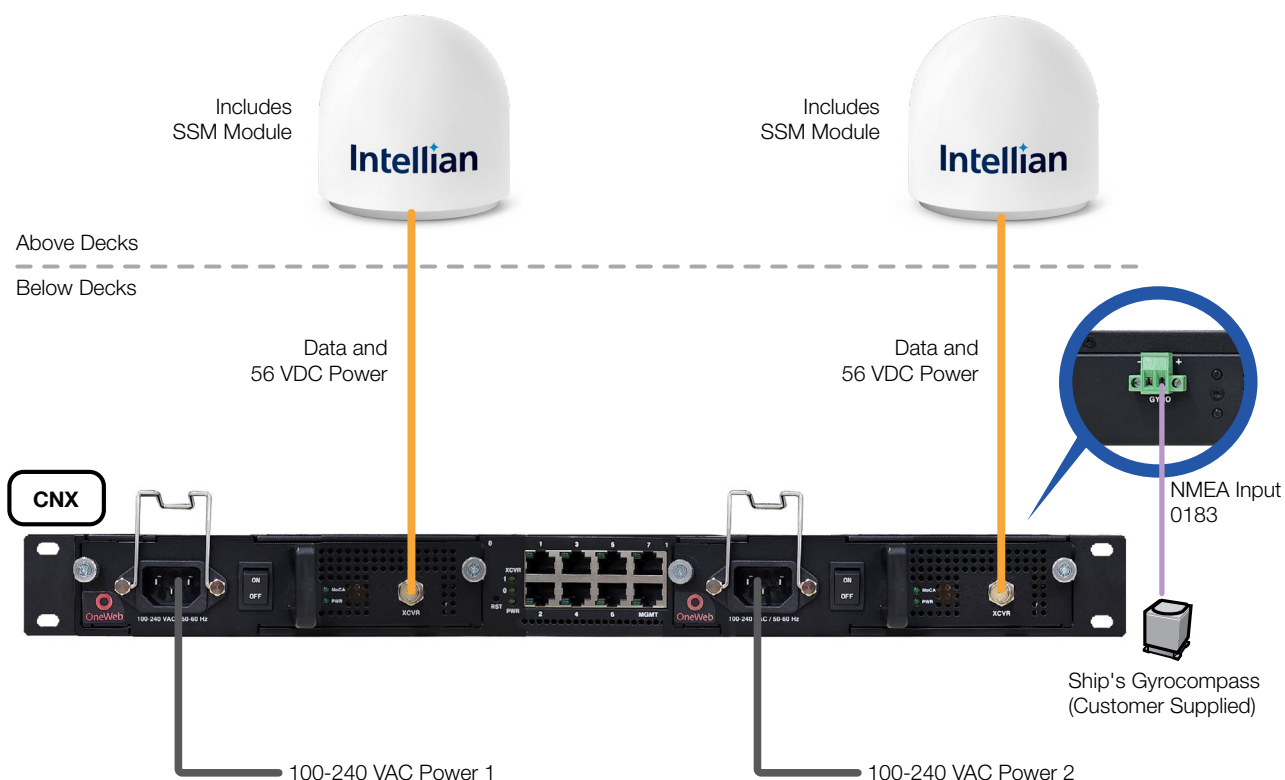


Figure 18: Dual Antenna System Configuration (Standard)



NOTE

Choose between the RG6 or RG11 coax cable for connecting the CNX according to the cable length.
 - RG6: within 30m (98.43ft), RG 11: within 100m(328.08ft)

Antenna System Configuration and Heating Module with CNX

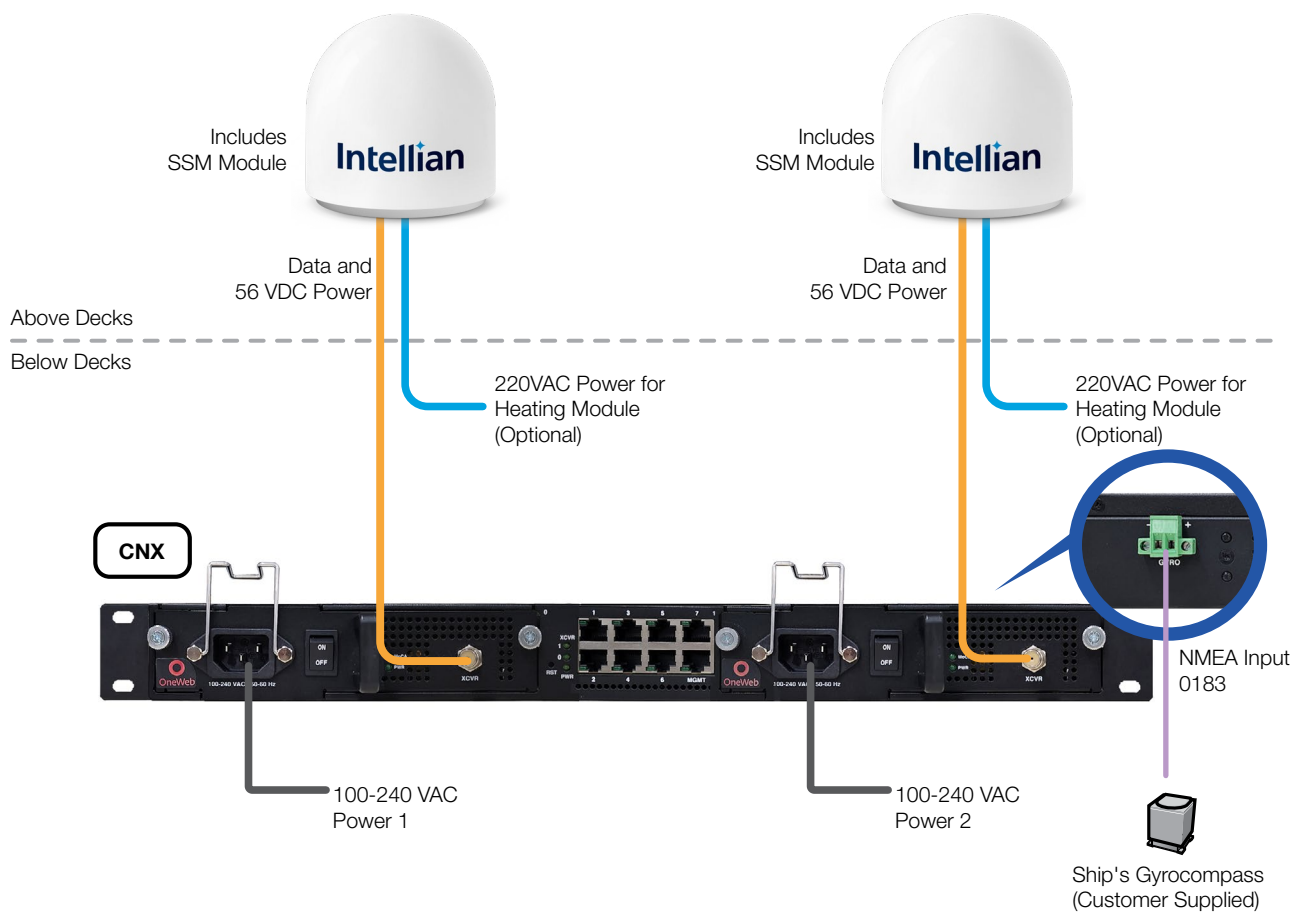


Figure 19: Dual Antenna System Configuration with Heating Module

**NOTE**

- Choose between the RG6 or RG11 coax cable for connecting the CNX according to the cable length.
- RG6: within 30m (98.43ft), RG 11: within 100m(328.08ft)
- Refer to the **“5.11 Connecting power cable for Heating Module (Optional)”** on page 42 for more details.

6.4 CNX Cable Connection

6.4.1 CNX Front Panel View

The following figure shows the CNX Front panel connectors.

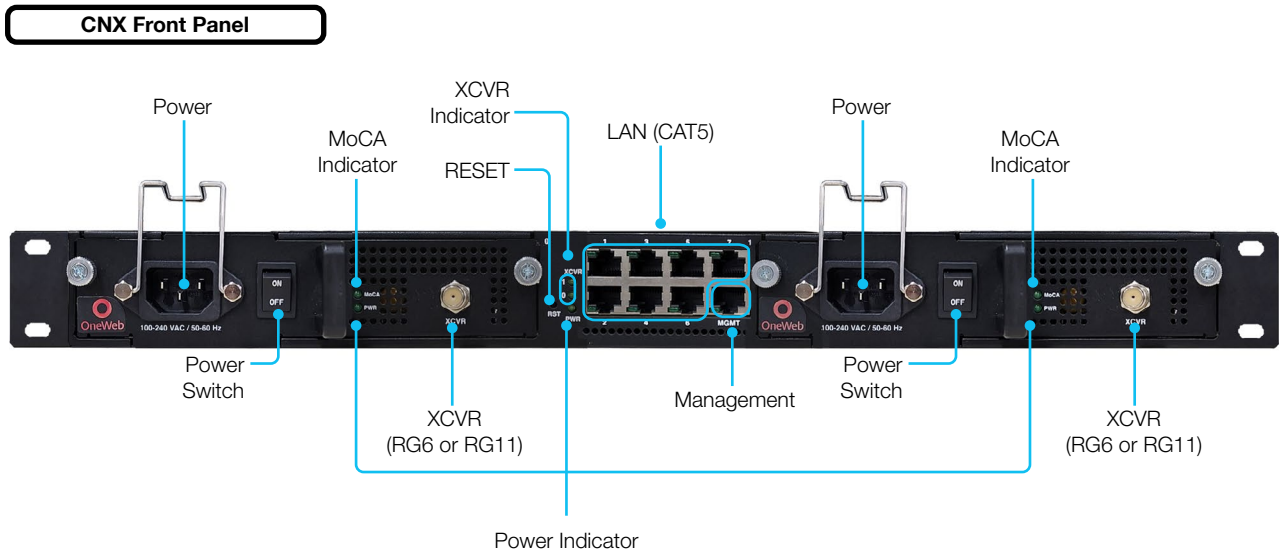


Figure 20: Front Panel View

The following table shows status indicators on the CNX.

LED Display	Color	Description
POWER	■ Steady Green	The CNX is powered on.
	■ Off	The CNX is powered off.
MoCA	■ Steady Green	The user network is ready.
	■ Blinking Green	The user network is connected.
	■ Off	The user network is not connected.
XCVR	TBD	TBD

6.4.2 CNX Back Panel View

The following figure shows the CNX Front panel.

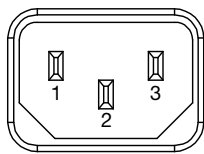


Figure 21: Back Panel View

6.4.3 CNX Connector Pinout Guide

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

Power Connector for CNX



IEC 320 C14 Plug Male

Pin	Signal
1	NEUTRAL
2	FG
3	LIVE

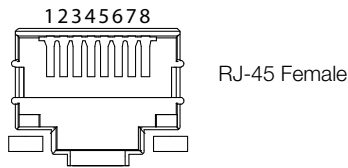
Coax Connectors



RF F Type Female

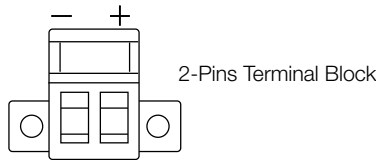
Conductor	Function
Inner	Power + Data
Outer	GND

LAN Connector



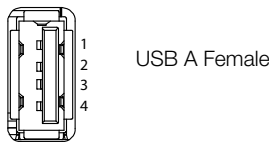
Pin	Signal
1	BI_DA+
2	BI_DA-
3	BI_DB+
4	BI_DC-
5	BI_DC+
6	BI_DB-
7	BI_DD+
8	BI_DD-

NMEA 0183 Heading Input (Gyrocompass)



Pin	Signal
-	HEADING GND
+	HEADING IN

WiFi Dongle USB Connector



Pin	Signal
1	+5 V
2	DATA-
3	DATA+
4	GND

6.4.4 Connecting CNX to Ship Gyrocompass

For satellite tracking, connect the ship's gyrocompass to the antenna system through the gyrocompass interface of the CNX and then make sure of the HEHDT protocol for the CNX.

The CNX supports NMEA 0183 gyrocompass inputs. If the gyrocompass has step-by-step or synchro output standard, a NMEA converter should be used to convert the input to NMEA 0183.

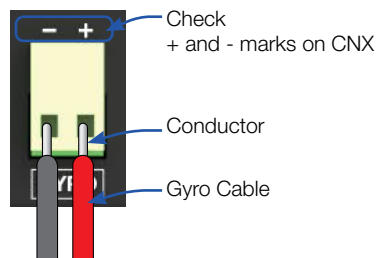


Figure 22: Ship's Gyrocompass Cable Connection

How to Connect NMEA 0183 Gyrocompass Cable

Before installing the CNX in a rack, you must connect the NMEA gyrocompass cable to the **GYRO** port of CNX.

1. Using a Phillips screwdriver, loosen the two screw terminals on top of the terminal block by rotating them counterclockwise.
2. Strip wires up to 5 mm (0.2"). Do not solder the cables.
3. Insert the conductor and gyro cable wires into the – (negative) and + (positive) terminals, respectively, of the terminal block. The polarity of the terminal is indicated on the CNX with + and - marks. Check the polarity to make sure the wires are inserted correctly.



4. Fully tighten the terminal block screws by rotating them clockwise to clamp the wires securely.

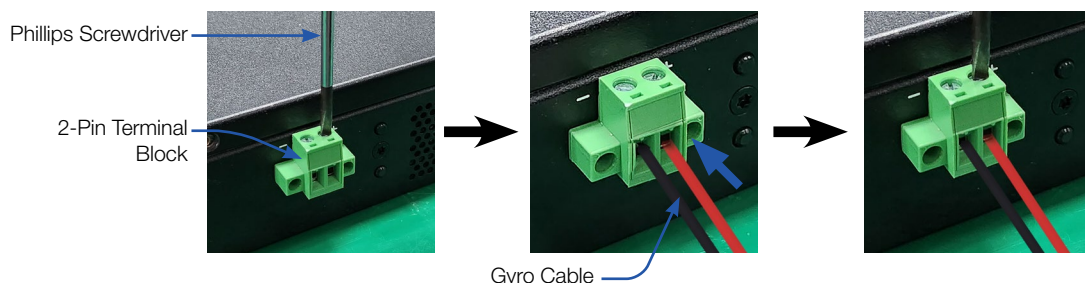
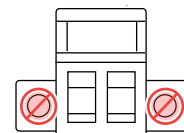


Figure 23: NMEA 0183 Gyrocompass Cable Connection



CAUTION

Don't loosen the screw on both sides of the terminal block or detach the terminal block. It may cause CNX failures.



Don't loosen the screw

6.4.5 Connecting to a Wi-Fi network through the Wi-Fi Dongle

We provide the Wi-Fi Dongle for Wi-Fi connection to LUI. You can connect a PC to the CNX via Wi-Fi for easy management and control whenever you are on the vessel.

Setting up the CNX to access Wi-Fi

1. Connect an Ethernet cable from the Management LAN port on the front panel of CNX to a LAN port of a PC. The network connection is established automatically. (This step is not strictly needed.)
2. Find the Wi-Fi Dongle in the accessory box, and then insert the Wi-Fi Dongle into the USB port on the back panel of CNX.



Figure 24: Back Panel Wi-Fi Dongle Connection

Setting up the PC in order to access Wi-Fi

1. Select the Network icon (🌐/📶) on the taskbar.
2. Choose the **cnxaabb** (Default), then select **Connect**.
("aabb" means the last 4 digits of the CNX MAC address)
3. Type the network security key and then select **Next**.
 - **Key: cnx_aabb(Default)** ("aabb" means last 4 digits of the CNX MAC address)

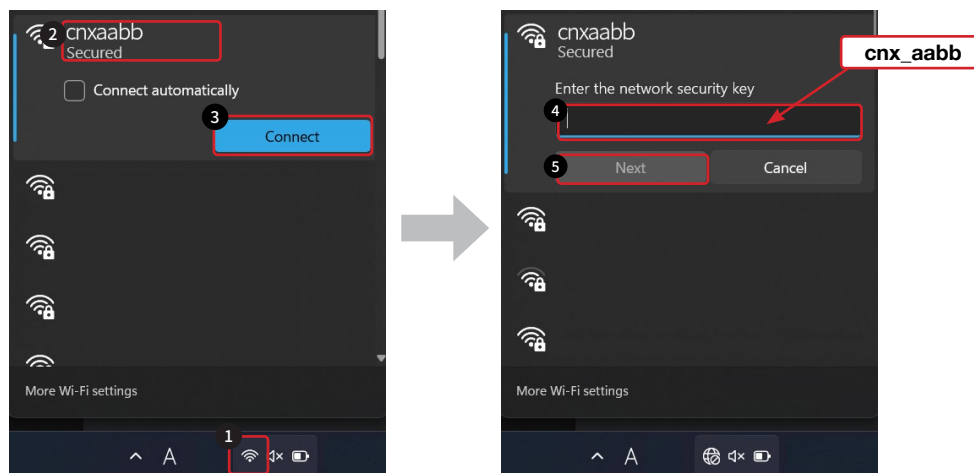


Figure 25: Setting up a Wi-Fi network on a PC

4. Make sure you can open the IP address **192.168.100.1 (Default)**



NOTE

There are two ways to obtain a MAC address.

- The Mac address can be obtained on the CNX printed label.
- Before connecting to a Wi-Fi network, the MAC address can be found using the LUI (Refer to the "**8.7.1 Network info**" on page 88 for more information.).

Chapter 7. Starting Dual Antenna System

The OW50M has the embedded dual antenna mediator function, which is used to instantly switch between two antenna systems. When one antenna loses line of sight to a satellite, the other antenna will immediately provide a fail-safe operation to maintain the highest levels of system performance and reliability. This ensures always-on broadband service by reducing the out of service time.

7.1 Configuration of Dual Antenna System

To use the Dual Antenna System, make sure the antenna system components are properly installed. Refer to “6.3 Antenna System Configuration” on page 46 for more details.

7.2 Configuring Primary & Secondary Role

To establish Dual Antenna System communication between the compound UT#1 (operate as the primary) and the compound UT#2 (operate as the secondary), follow the steps below.

Connect an ethernet cable from the **MGMT** (Management) port on the front panel of CNX to a LAN port of a PC.

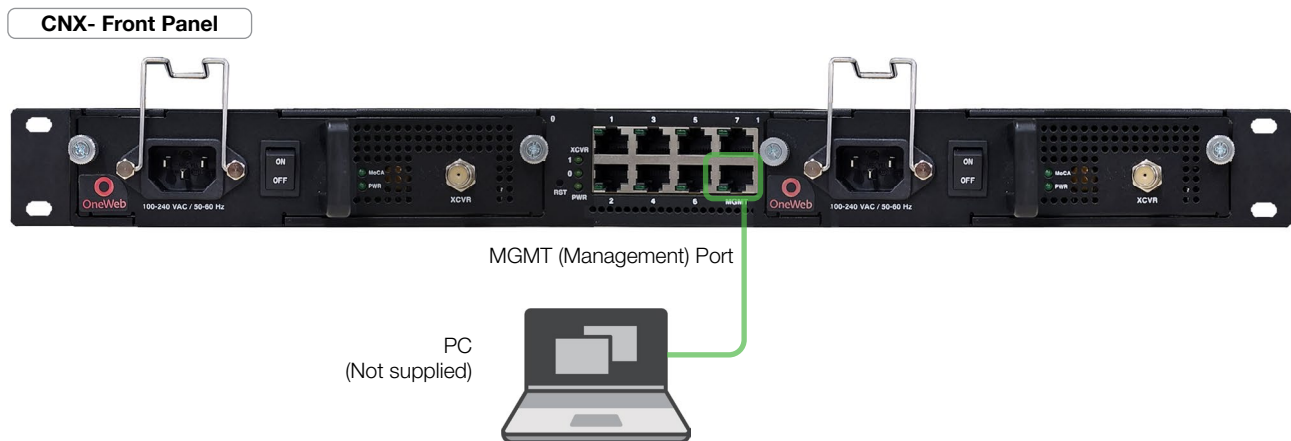


Figure 26: Front Panel LAN Port Connection with CNX

7.2.1 Setting the Compound UT#2 (Secondary)

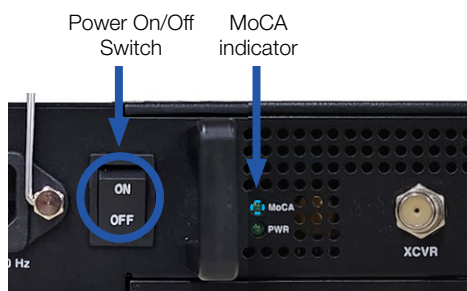
First, the Compound UT#2 (Secondary) should be set and then the Compound UT#1 (Primary).

1. Turn on the UT#2's POWER switch on the front panel of the CNX, and then wait a few seconds for system startup. The MoCA indicator light on the CNX display will turn green.



NOTE

If the MoCA indicator does not turn on after five minutes during step 1, check the cable connection status and try to turn the CNX power off and on again.



2. Use the following IP address to access the LUI page.

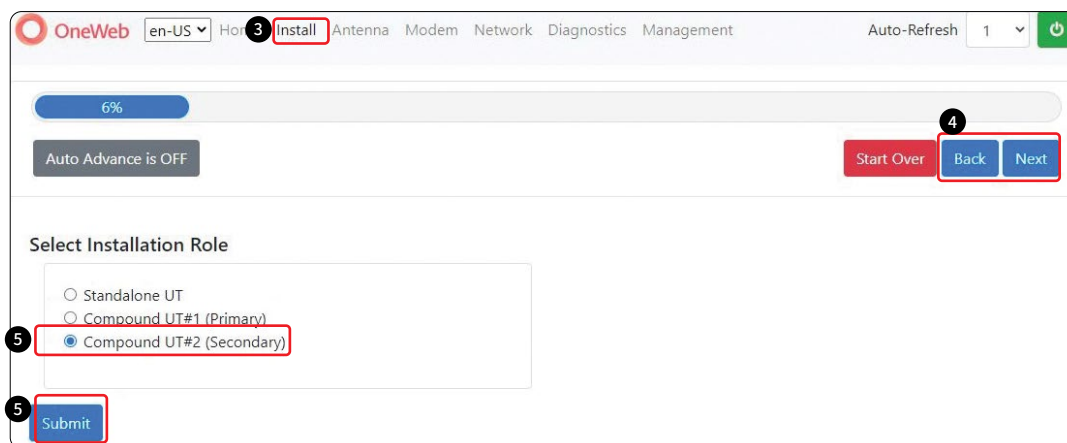
- **IP Address: 192.168.100.1 (Default)**



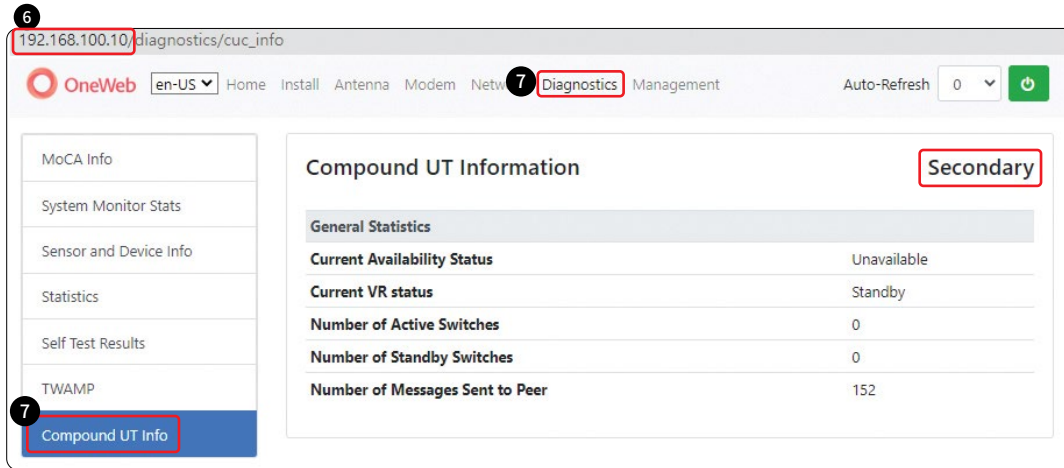
NOTE

The **LUI** should be accessed by Chrome web browser when setting a CUC (Compound UT Controller) role.

3. Select **Install** on the navigation bar, and then go to the **Installation Navigation**.
4. Press **Back** or **Next** button on the Installation Navigation until the **Select Installation Role** reach.
5. Select **Compound UT#2 (Secondary)** on the **Select Installation Role** option to activate the function. Then click the **Submit** button to apply the settings to the system. LUI will automatically reboot.



- Try to access the LUI again using the changed **Compound UT#2 (Secondary)** ip address (**192.168.100.10**).
- Go to **Diagnostics** → **Compound UT Info** to verify the **Secondary** of CUC (Compound UT Controller) role on the Compound UT Info.

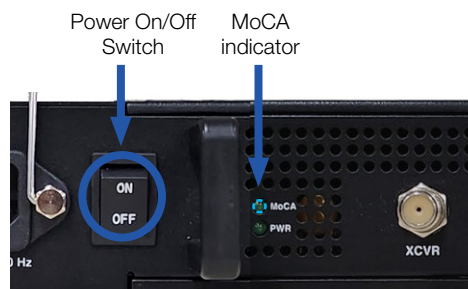
**NOTE**

If you cannot see “Compound UT Info” menu on “Diagnostics” in the 6th step, check the CUC role’s settings and try to start the first process again.

7.2.2 Setting the Compound UT#1 (Primary)

The Compound UT#1 (Primary) should be set after setting the Compound UT#2 (Secondary).

- Turn on the UT#1’s POWER switch on the front panel of the CNX, and then wait a few seconds for system startup. The MoCA indicator light on the CNX display will turn green.

**NOTE**

If the MoCA indicator does not turn on after five minutes during step 1, check the cable connection status and try to turn the CNX power off and on again.

- Use the following IP address to access the LUI page.

- IP Address: 192.168.100.1 (Default)**

**NOTE**

The **LUI** should be accessed by Chrome web browser when setting a CUC (Compound UT Controller) role.

- Select **Install** on the navigation bar, and then go to the **Installation Navigation**.
- Press **Back** or **Next** button on the Installation Navigation until the **Select Installation Role** reach.

5. Select **Compound UT#1 (Primary)** on the **Select Installation Role** option to activate the function. Then click the **Submit** button to apply the settings to the system. LUI will automatically reboot and then display the Diagnostics page.

6. Go to **Diagnostics** → **Compound UT Info** to verify the **Primary** of CUC (Compound UT Controller) role on the Compound UT Info.

Received Messages		Path Usability Updates	
Blockage Prediction Request	68	Cancel Track Request	67
Cancel Track Request	67	Data Service Available	1
Data Service Available	1	Intersatellite Handover Complete	4
Intersatellite Handover Complete	4	Intersatellite Handover Pending	4



NOTE

If you cannot see “Compound UT Info” menu on “Diagnostics” in the 6th step, check the CUC role’s settings and try to start the first process again.

Please proceed to section “7.3 Configuring VLAN, APN, NMEA and CUC IP Address” on page 57 to install and execute the Maritime, Primary/Primary UT Installer. After section 7.3, please proceed to 7.4 to complete the installation via the Install Wizard.

7.3 Configuring VLAN, APN, NMEA and CUC IP Address

This is a SW tool that allows you install, configure, control and monitor maritime and primary/primary UTs after the Primary/Secondary role has been configured as shown in the previous section.



NOTE

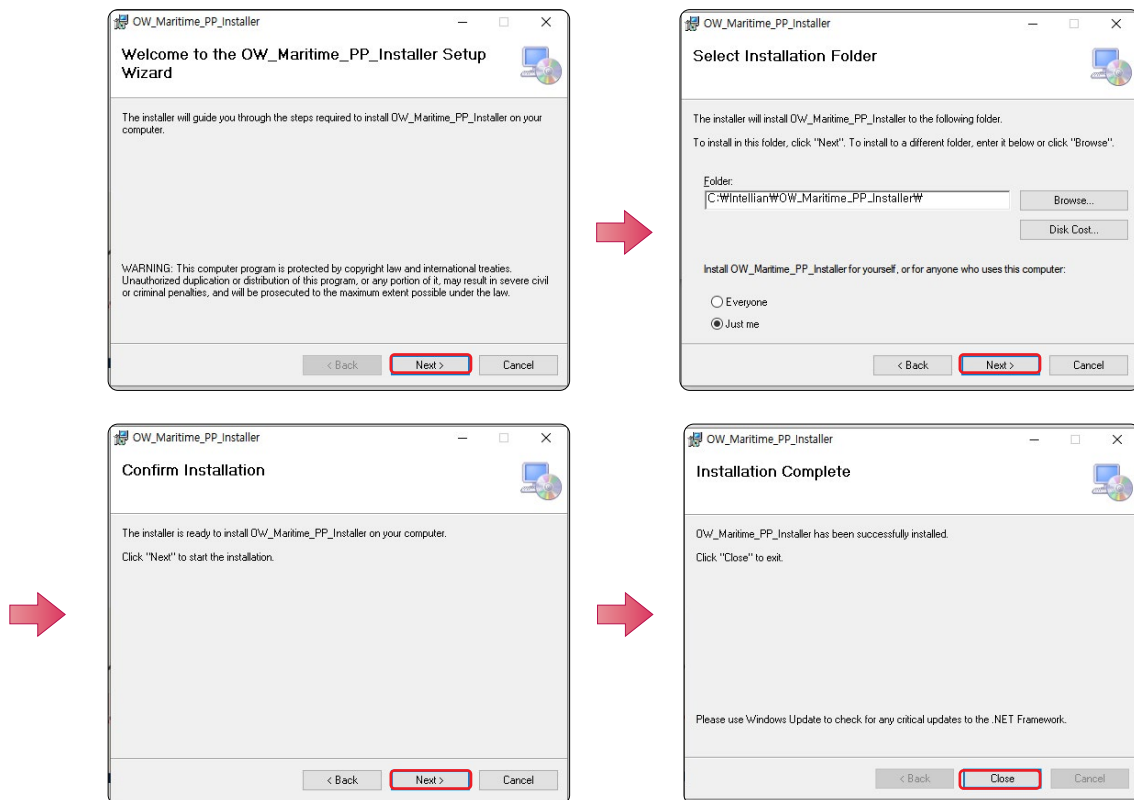
If you want to run the SW tool on your PC, here's what it takes:

- PC with Windows 7 or higher
- 1 x Ethernet port (100 Mbps or 1 Gbps)
- 4 GB of RAM
- 1 GB of free disc space

7.3.1 Installation

✓ Installing the SW tool

1. Select the installer file (OneWeb_Maritime_Installer_0.x.x.msi) to execute. The installer is displayed on the pop-up window.
2. Click the **Next** button on the pop-up window until the **Installation Complete** reach. Follow the steps below to complete the installation.
3. After the Installation is completed, click the **Close** button to close the pop-up window.



✓ Configuring the IP Address

1. Click the  (Setting) on the upper right corner of the main page.



2. Enter the IP address of the primary UT, secondary UT and CNX, and then click the **Save** button. Please note that the IP address configuration here does not actually configure the IP address of each UT. It is just used by the Installer tool to connect to each UT.

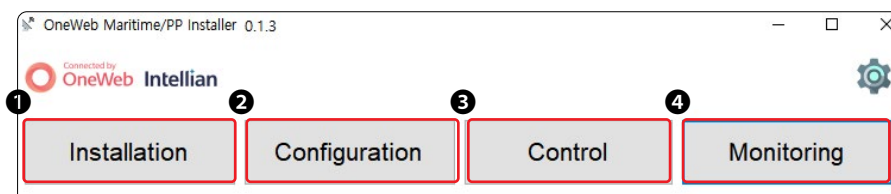
- ① Primary UT IP Address: 192.168.100.1
- ② Secondary UT IP Address: 192.168.100.10
- ③ CNX IP Address: 192.168.100.3



7.3.2 Main Page

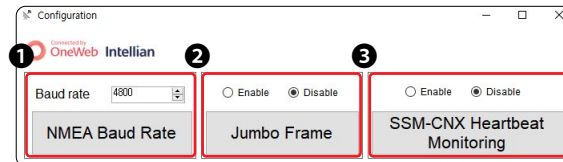
Select the desired function and click the corresponding button.

- ① Installation: Runs the installation.
- ② Configuration: Configures the NMEA baud rate, jumbo frame and SSM heartbeat.
- ③ Control: Controls the UTs connected to the CNX such as resetting UT.
- ④ Monitoring: Monitors the status such as the NMEA Output. Please note that the monitoring is limited to the features provided by this installer SW.



7.3.3 Configuration

- ① NMEA Baud Rate: It should be changed to match the heading device's baud rate of the vessel. This parameter is not applicable to land UTs.
 - ② Jumbo Frame: If enabled, 2K MTU* is used over the MoCA between the CNX and the UTs. If disabled, 1.5K MTU is used. Default is disabled.
- *Please note that 2K MTU setting should also be enabled through Device Hub
- ③ SSM-CNIX Heartbeat Monitoring: If enabled, CNX resets both UTs if messages are not received from any of the UTs for 15 seconds (3 strikes with 5 second timeout).



7.3.4 Installation

Click the **Start** button to configure VLAN, APN, static route for forwarding NMEA to the Secondary UT, and CUC peer IP address.



Once the Installation starts, the page will indicate the status. It will take a few minutes to complete.

- a. The following static routes are added to the SSM configuration.
 - "if_v4_next_hop": "192.168.100.254",
 - "if_v4_subnet_address": "192.168.100.16",
 - "if_v4_subnet_mask": "255.255.255.255"
- b. CUC peer IP address is set on each UT.
- c. The following APN configuration is set in the SSM configuration

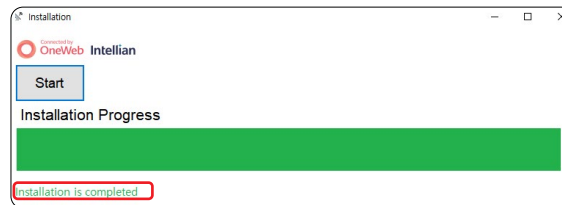
```

"apn_info": {
  "0": {
    "apn_name": "oam.oneweb",
    "call_ip_mode": "ipv4",
    "management_apn": true,
    "vlan_id": 0
  },
  "1": {
    "apn_name": "fov-1",
    "call_ip_mode": "ipv4",
    "management_apn": false,
    "vlan_id": 111,
    "wan_mode": "transparent"
  }
},
"multi_user_apns_enabled": true

```

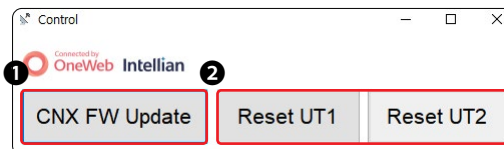
- d. VLAN 111 and 222 are configured on port 1 and port 2 of the CNX-E/T

If all of the above configuration are successfully configured, “Installation is completed” will be displayed on the page.



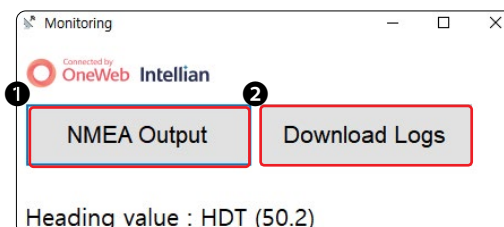
7.3.5 Control

- ① CNX FW Update: Upgrades the CNX firmware package (not supported yet).
- ② Reset UT1/UT2: Resets the antenna (UT1/2) system.



7.3.6 Monitoring

- ① NMEA Output: When there is valid NMEA output, you will see NMEA HDT value at the bottom of this page.
- ② Download Logs: Downloads the logs of the installer SW.



7.4 Completing Installation via Install Wizard

This section assumes the Primary/Secondary role has been configured in section “7.2 Configuring Primary & Secondary Role” on page 53.

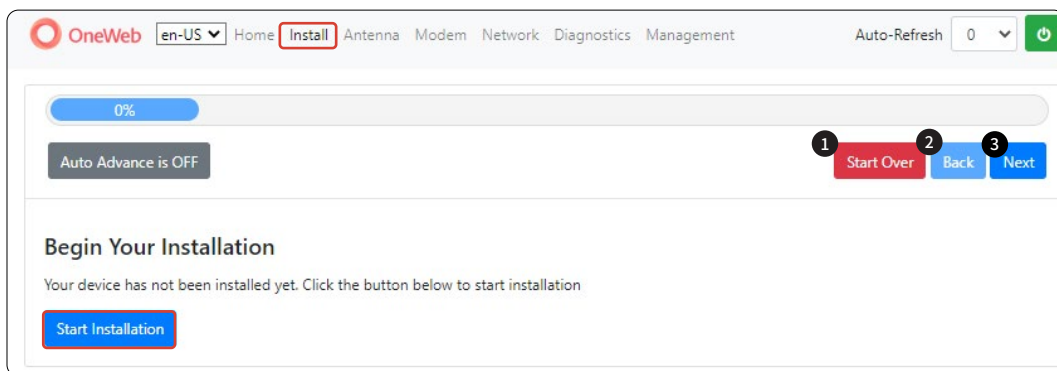
Click Install and execute the following steps for each UT to complete the remaining installation procedure.

✓ Initial Install Page

The first page of the installation process is a splash screen that states that the UT has not yet been installed. To proceed with the installation to the next step, click on **Start Installation**.

On the right are three buttons:

- **Start Over** button: Brings you back to the first step of the installation.
- **Back** button: Steps one step back in the installation.
- **Next** button: Advances to the next step in the installation.

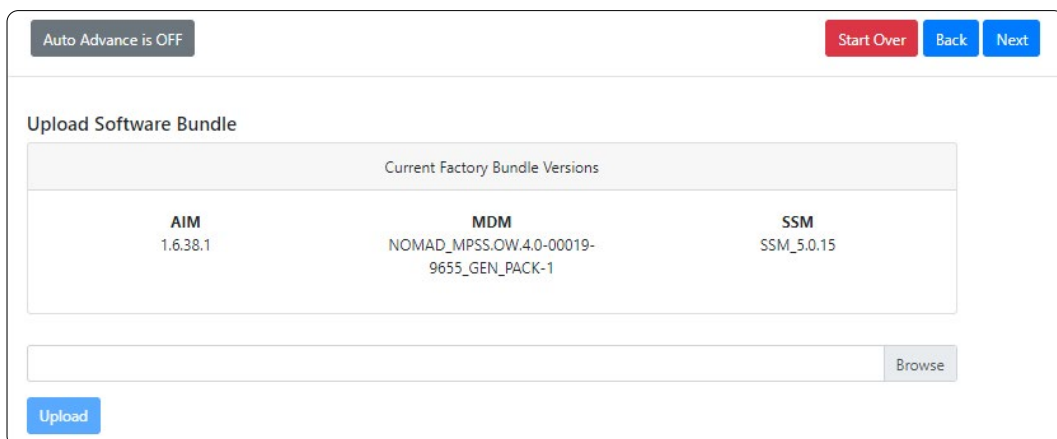


✓ Step 1: Upload Software Bundle

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

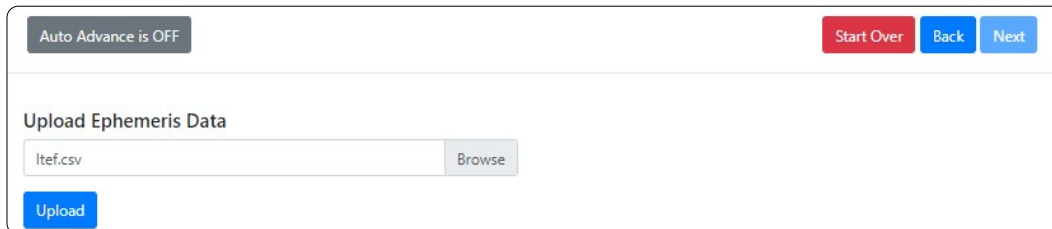
When uploading a software bundle, the software mode should be factory. (Refer to “8.9.2 Switch UT Software” on page 103 for more details.)

1. Clicking on the empty text box or the **Browse** button allows the upload of a Software Bundle.
2. Until a bundle has been uploaded, the **Upload** button is greyed out. If the upload is not successful, a status error message will be displayed.



✓ Step 2: Upload Ephemeris Data

The Upload Ephemeris Data page is a simple file upload page. Simply click on the empty text box or the **Browse** button to upload an Ephemeris file. Until a file has been uploaded, the upload button is greyed out. Upon a successful upload, a success status message will be displayed, and the state can be advanced. Click on **Next**.



NOTE

What is Ephemeris Data?

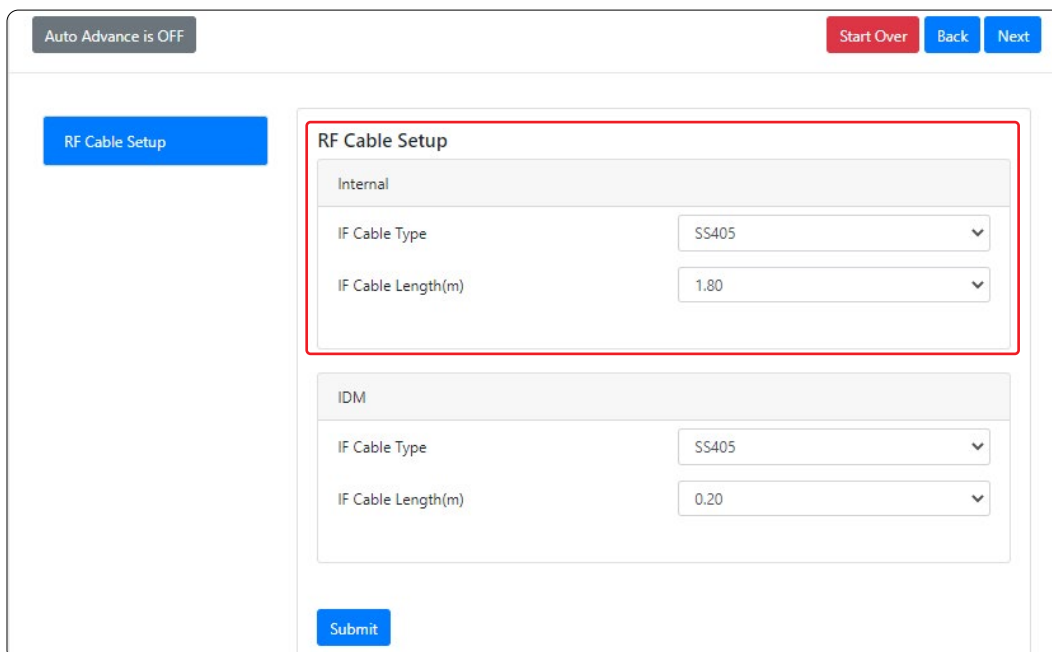
Ephemeris Data contains current information about the orbits of the satellites in the OneWeb constellation. The User Terminal uses ephemeris data to determine the positions of the satellites in the sky at any given time.

Remark: Every 30days, this data file is updated. Once the User Terminal is commissioned this will be updated automatically.

✓ Step 3: RF Cable Setup

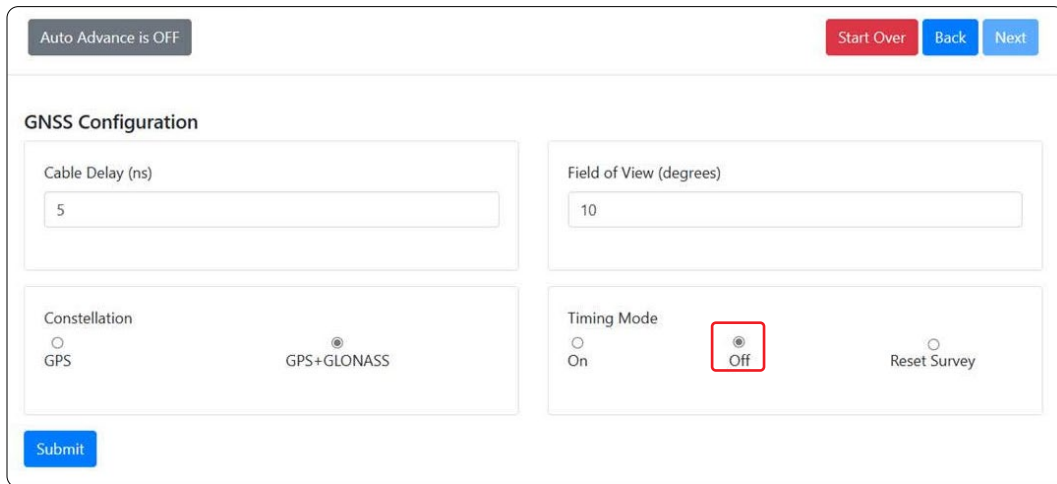
The **IF Cable Type** and **IF Cable Length(m)** on the Internal is pre-set with a default value depending on the RF cable. Make sure that is the same with the following default values. Click the **Next** button to go to the next step.

- **IF Cable type : SS405**
- **IF Cable Length(m) :1.80**



✓ Step 4: GNSS Configuration

Make sure the **Timing Mode** is **Off** when the **GNSS Configuration** page appears. Click the **Next** button to go to the next step.



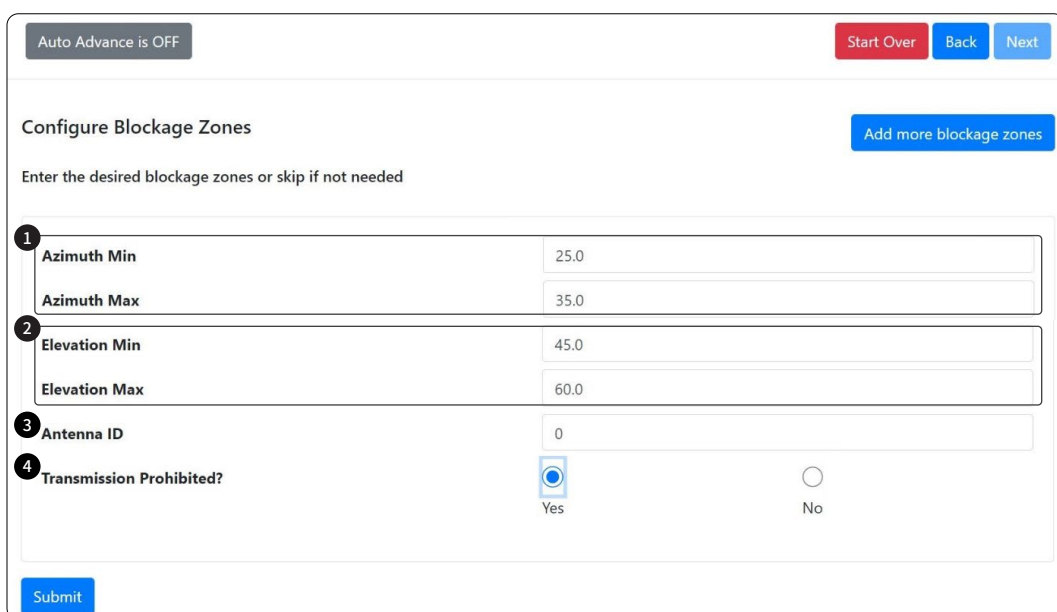
The screenshot shows the 'GNSS Configuration' page. At the top, there's a status bar with 'Auto Advance is OFF' and buttons for 'Start Over', 'Back', and 'Next'. The main content area has four sections: 'Cable Delay (ns)' with a value of 5, 'Field of View (degrees)' with a value of 10, 'Constellation' with radio buttons for 'GPS' and 'GPS+GLONASS' (selected), and 'Timing Mode' with radio buttons for 'On', 'Off' (selected and highlighted with a red box), and 'Reset Survey'. A 'Submit' button is at the bottom left.

✓ Step 5: Configure Blockage Zones

It is optional to set up the blockage zones for the system. Each antenna can be configured up to 10 blockage zones with transmission muted. Click the **Add more blockage zones** to configure additional blockage zones.

- Azimuth Min/ Max : The Azimuth Min is the relative azimuth angle where the blockage starts, and the Azimuth Max is the relative azimuth where the blockage ends (Range: 0 ~ 360).
- Elevation Min/Max: The Elevation Min/Max is the elevation angle where the blockage is set (Range: 0 ~ 90). The blockage is activated below the elevation angle.
- Antenna ID: Enter the value of 0.
- Transmission prohibited? : Set whether to activate a TX mute or not (Yes/No).

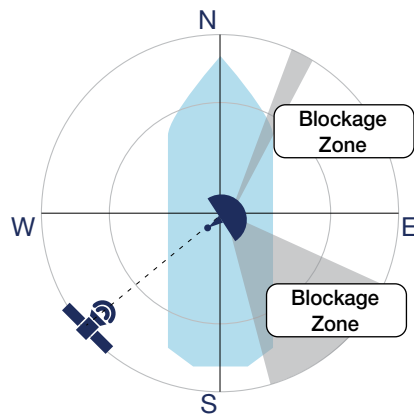
Click the **Submit** button to apply the settings to the system.



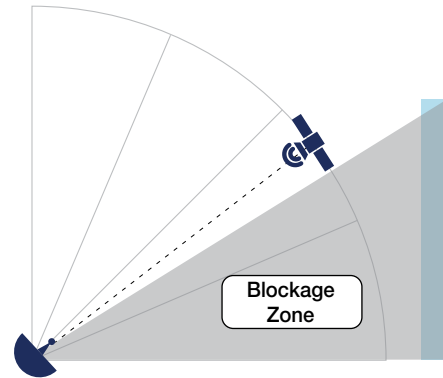
The screenshot shows the 'Configure Blockage Zones' page. At the top, there's a status bar with 'Auto Advance is OFF' and buttons for 'Start Over', 'Back', and 'Next'. The main content area has a title 'Configure Blockage Zones' and a button 'Add more blockage zones'. Below the title, it says 'Enter the desired blockage zones or skip if not needed'. There are four numbered sections: 1. Azimuth Min (25.0) and Azimuth Max (35.0); 2. Elevation Min (45.0) and Elevation Max (60.0); 3. Antenna ID (0); 4. Transmission Prohibited? with radio buttons for 'Yes' (selected) and 'No'. A 'Submit' button is at the bottom left.

**NOTE**

- When setting a blockage zone, both “Blockage zones” and “No transmit zones” should be considered.
 - Blockage zones : Zones where obstructions can inhibit or degrade satellite communication
 - No transmit zones : Areas where transmit power is potentially dangerous for persons



Blockage Zone with no-transmit zones,
azimuth (example)



Blockage Zone with no-transmit zones,
Elevation (example)

- If Blockage zone is set, you can see the status at **LUI > Antenna > Blockage Zones** menu.
- To get a blockage zone value, you should install the **Theodolite** application on an iOS device. Intellian recommends using the **Theodolite** application. Refer to “**11.2 Using Theodolite Application**” on **page 109** for more details.

✓ Step 6: Antenna Levelling

Click the **Next** button to go to the next step.

Auto Advance is OFF

Start Over
Back
Next

Antenna Leveling

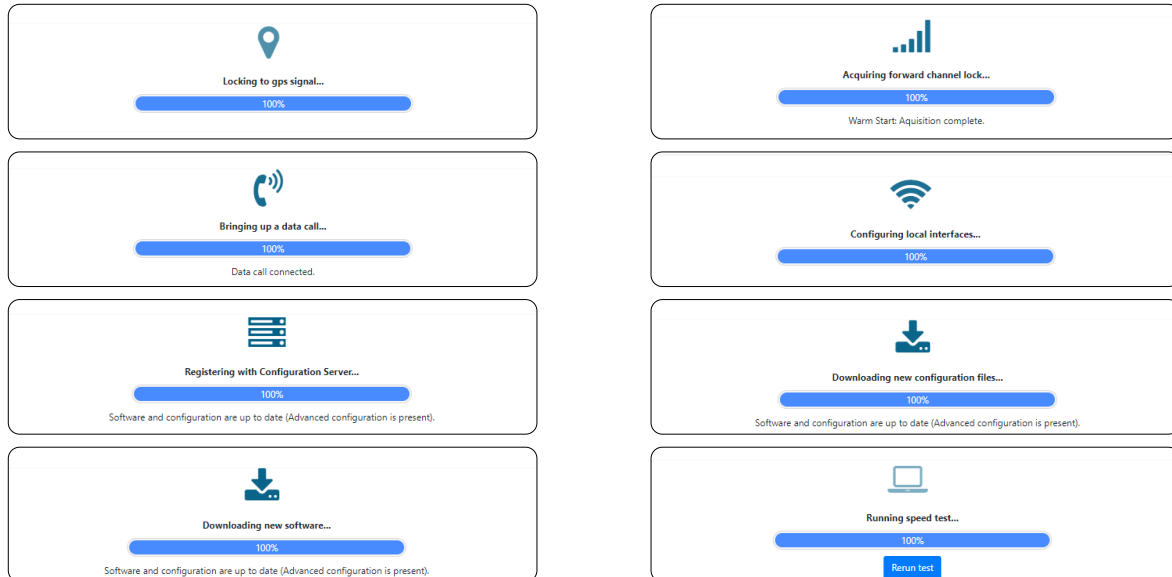
Antenna Tilt Pitch:0.0°

Antenna Tilt Roll:0.0°

Primary Antenna

✓ Step 7: Autonomous States

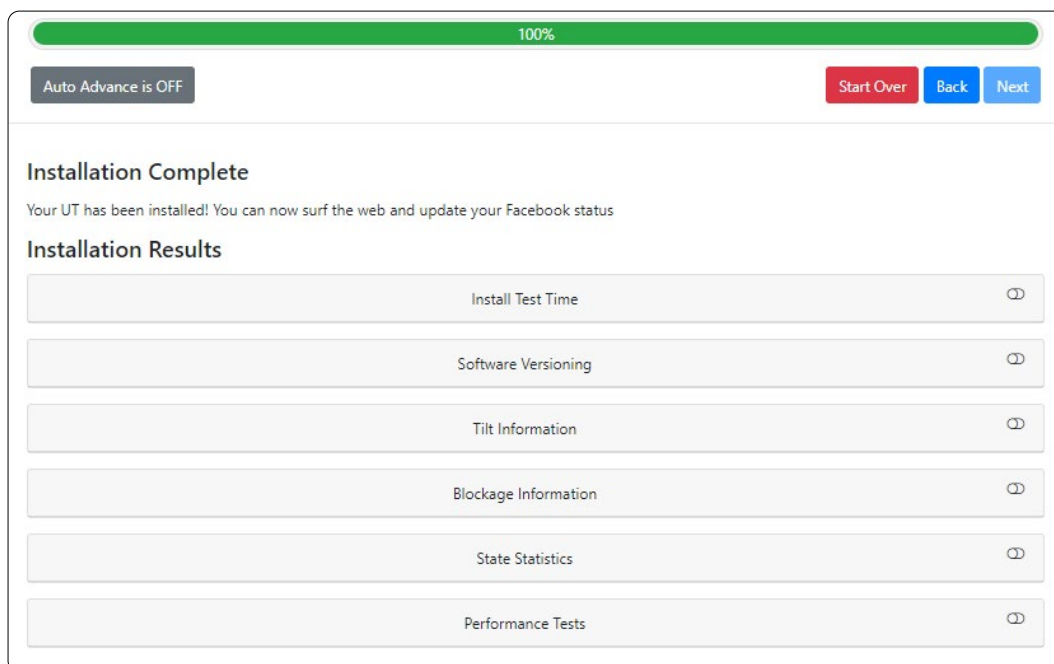
Autonomous states all display a progress bar of its progress. The following states require no action from the user aside from proceeding to the next state. All installation states are displayed, or some installation status is displayed underneath the progress bar.



✓ Step 8: Installation Complete & Result

The configuration result is displayed. Toggle activation button to the right position on each result row to see the results.

This completes the steps of the wizard.

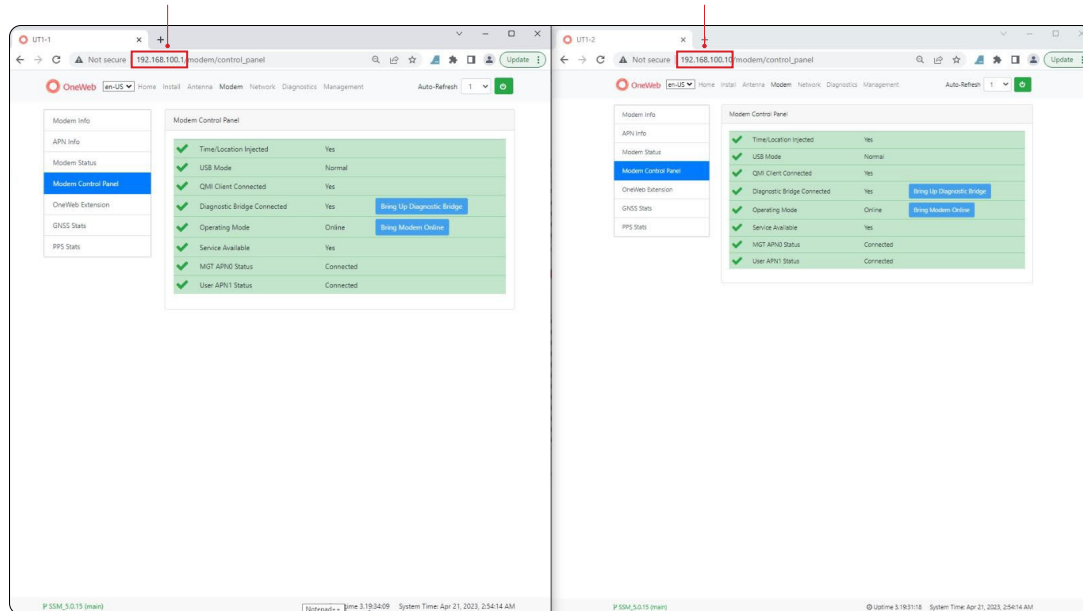


7.5 Monitoring Dual Antenna System

You should monitor the performance of the dual system via LUI. To monitor the dual system, position two windows side-by-side and then access LUI using ip address for each compound UT.

Compound UT#1
(Primary)

Compound UT#2
(Secondary)



Chapter 8. Using Local User Interface (LUI)

8.1 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 time and cost generated by maintenance activities such as operating firmware upgrades, tracking parameter resets, and system diagnosis, etc.

8.2 Turning On System

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.

8.3 Accessing Webpage

8.3.1 TCP/IP 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** (Management) Port on the front panel of CNX to a LAN Port of a PC. The Data MoCA indicator will turn Green if CNX is connected.
2. Enter the IP address into your web browser's address bar to log in to the Local User Interface (LUI).
 - **Compound UT#2 (Secondary): 192.168.100.10**
 - **Compound UT#1 (Primary): 192.168.100.1**

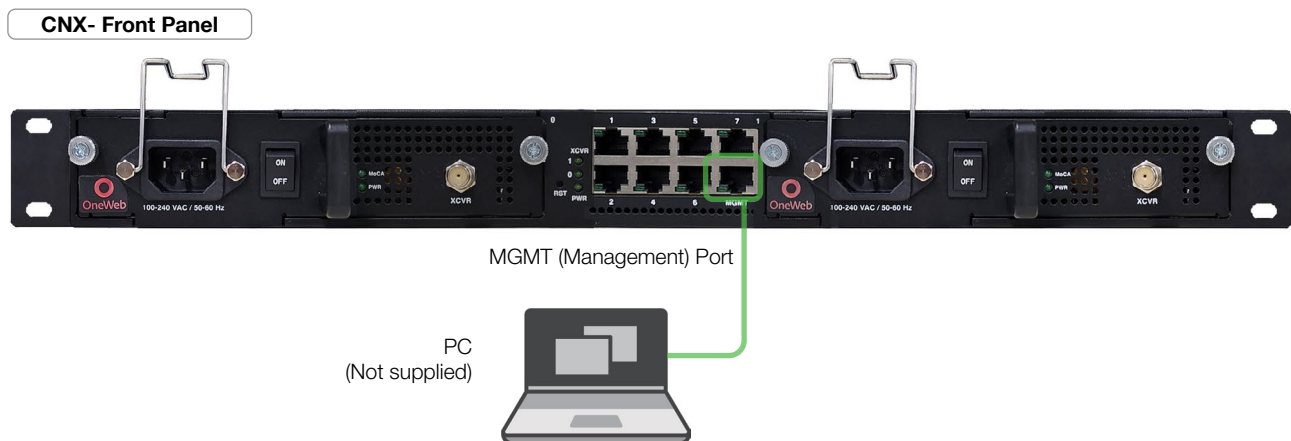


Figure 27: Front Panel LAN Port Connection with CNX



NOTE

To access the LUI, you should set the CUC (Compound UT Controller) role. Refer to the **“Chapter 7. Starting Dual Antenna System” on page 53** for more details.

8.4 Webpage Layout

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

8.4.1 Navigation bar

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



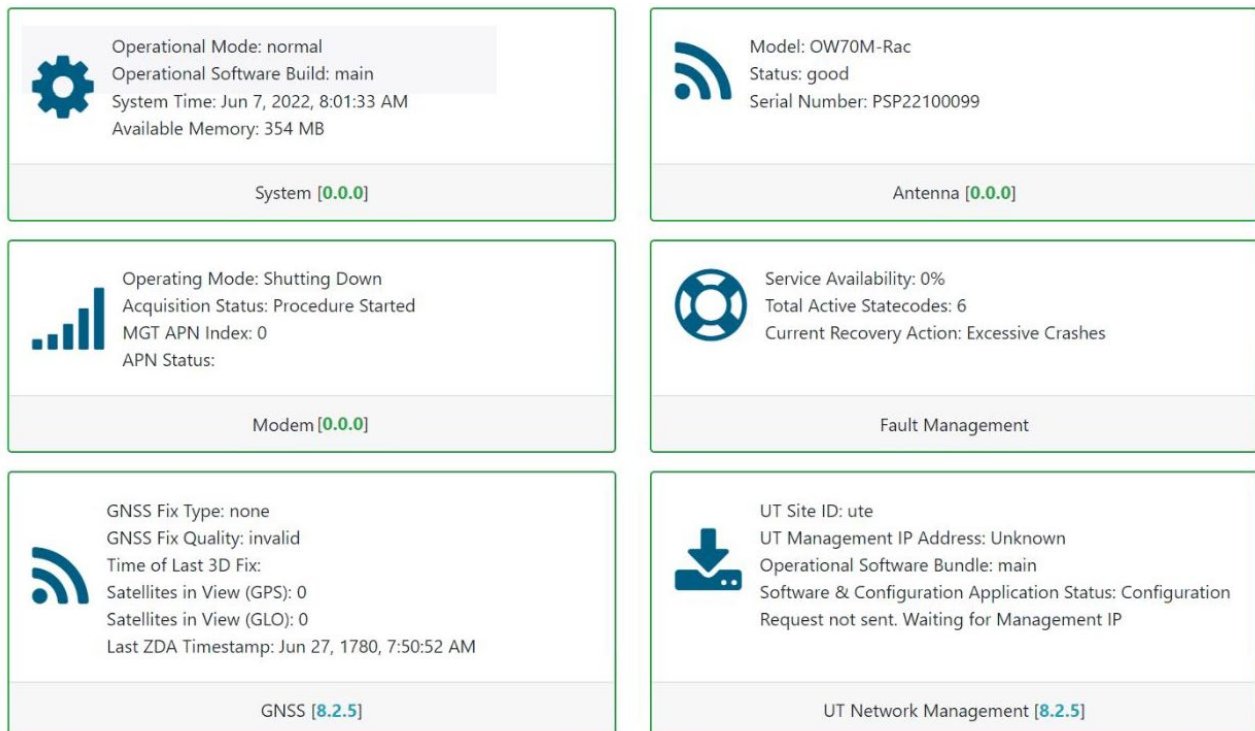
No.	Item	Description
①	Logo	This is the banner that displays the branding logo. Clicking on the logo on any given page will return the LUI to the homepage.
②	Language Drop Down Menu	The language drop-down menu lists all supported languages. Picking a language from the drop-down menu will change all text 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. More information on the installation process can be found in the “7.4 Completing Installation via Install Wizard” on page 61. • Antenna: Displays Antenna Information such firmware version, configuration and status. • Modem: Displays Modem Information (IMSI, IMEI, Manufacturer, Software Version, etc.), Modem Status (Call Status, Operating mode, etc.), 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 drop-down. 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.

8.4.2 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.

- Green: The system is behaving as normal.
- Orange: The system might cause errors. You should take precautions to prevent the occurrence of the errors or any situation.
- Red : The system is abnormal or incorrect (Error). In this case, follow the steps below.
 - a. Check the state code on each card.
 - b. Download the antenna logs. (Diagnostics → Host Processor Logs → download all)
 - c. Check the cable connection status. If the cable connection is incorrect, try to connect a cable again.
 - d. Click the reboot button on the navigation bar, and then turn the CNX power off and on again.
 - e. If the same state code error(red) persists after rebooting, you should contact Intellian Technical Support for assistance.

Clicking on a card will take you to the webpage where you can find more detailed information about the subsystem.



8.4.3 Footer

The footer, like the navigation bar, is persistent throughout all LUI pages. The footer contains two pieces of information: one on the left and one on the right.

The current software version that is running on the Host Processor is displayed on the left. The operational software mode follows the software version. The text on the footer changes color depending on the operational software mode.

- Green: The operational software mode is main.
- Red: The operational software mode is factory. There are two ways to change the factory mode to main mode.
 - Set all managed components to false and reboot
 - a. Go to Diagnostics → Configuration and search the term “manage”.
 - b. Click the word true in the value column to make the checkbox appear for each of the values not currently displaying false. Uncheck the checkboxes for each.
 - c. Click Save and Reload.
 - d. Ensure that the values remain false. Any changed values will be highlighted in red.
 - e. Click the reboot button on the navigation bar to reboot. The reboot will take a few minutes.
 - f. Ensure that all the changed items are now showing false in the value column.
 - Switch to the Factory Partition
 - a. Go to Management → Switch UT Software.
 - b. Select main, and then click Submit.

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.

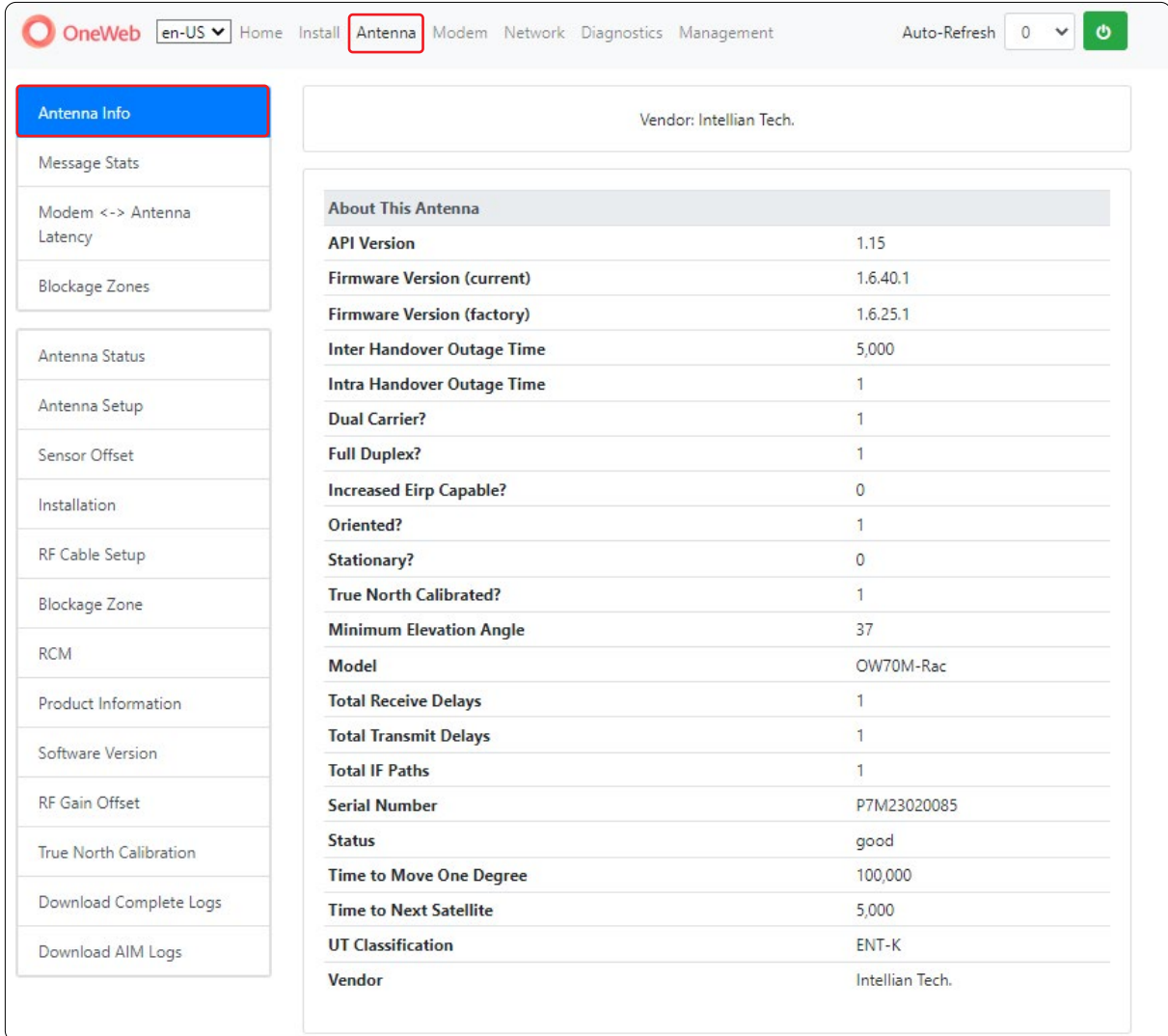
SSM_3.2.0.62 (main)

Uptime 1:23:45:55

8.5 Antenna

This menu sets and displays the Antenna Info, Message stats, Modem↔Antenna Latency, Blockage zones, Antenna status, Antenna Setup, Sensor Offset, RF cable setup, RCM, Product Information, Software Version, RF Gain Offset, True North Calibration, Download Complete Logs and Download AIM Logs.

8.5.1 Antenna Info



The screenshot shows the OneWeb web interface. The top navigation bar includes the OneWeb logo, a language dropdown set to 'en-US', and links for Home, Install, Antenna (highlighted with a red box), Modem, Network, Diagnostics, and Management. On the right of the top bar are an 'Auto-Refresh' dropdown set to '0' and a green power button icon.

The left sidebar contains a list of navigation items. 'Antenna Info' is highlighted with a blue box. Other items include Message Stats, Modem <-> Antenna Latency, Blockage Zones, Antenna Status, Antenna Setup, Sensor Offset, Installation, RF Cable Setup, Blockage Zone, RCM, Product Information, Software Version, RF Gain Offset, True North Calibration, Download Complete Logs, and Download AIM Logs.

The main content area displays 'Vendor: Intellian Tech.' at the top. Below this is a section titled 'About This Antenna' which contains a table of antenna specifications.

About This Antenna	
API Version	1.15
Firmware Version (current)	1.6.40.1
Firmware Version (factory)	1.6.25.1
Inter Handover Outage Time	5,000
Intra Handover Outage Time	1
Dual Carrier?	1
Full Duplex?	1
Increased Eirp Capable?	0
Oriented?	1
Stationary?	0
True North Calibrated?	1
Minimum Elevation Angle	37
Model	OW70M-Rac
Total Receive Delays	1
Total Transmit Delays	1
Total IF Paths	1
Serial Number	P7M23020085
Status	good
Time to Move One Degree	100,000
Time to Next Satellite	5,000
UT Classification	ENT-K
Vendor	Intellian Tech.

Displays the antenna information.

8.5.2 Message Stats

Antenna Info	Requests Sent / Received	Clear Stats	Notifications
Message Stats	Total	845 / 798 (-47)	Antenna Calibration Complete
Modem <-> Antenna Latency	API Version Info	51 / 4 (-47)	Blockage Indication
Blockage Zones	Blockage Clear	0 / 0	Fault
	Blockage Prediction	4 / 4	Fault Clear
	Blockage Set	1 / 1	Gain Update
Antenna Status	Cancel Receive Tune	3 / 3	DRX Wakeup Time
Antenna Setup	Cancel Track	3 / 3	Forward Channel Acquisition Status
Sensor Offset	Error	0 / 0	Forward Channel Status
Installation	Forward Channel Status Control	1 / 1	Forward Channel Status Ready
RF Cable Setup	Gain Update Control	6 / 6	Satellite Network Switch
Blockage Zone	Power on Self Test Results	4 / 4	
RCM	Reset	3 / 3	
Product Information	Run Diagnostic Test	0 / 0	
Software Version	Sensor Information	121 / 121	
RF Gain Offset	System Info	4 / 4	
True North Calibration	System Status	96 / 96	
Download Complete Logs	Time Sync	415 / 415	
Download AIM Logs	Timestamp Header Request	0 / 0	
	Track	66 / 66	
	Track Advisory	4 / 4	
	True North Set	0 / 0	
	Tune Receive Channel	39 / 39	
	Tune Transmit Channel	29 / 29	

Provides the tables of a variety of information at once.

- Clear Status: Click the **Clear status** button to clear the shown page.

8.5.3 Modem ↔ Antenna Latency

Antenna Info	Modem <-> Antenna Latency	Reset Max Latencies
Message Stats	Maximum Incoming (Antenna->Modem) Latency (ms)	13.513 ms
Modem <-> Antenna Latency	Maximum Outgoing (Modem->Antenna) Latency (ms)	2.072 ms
Blockage Zones	Maximum Roundtrip (Modem->Antenna->Modem) Latency (ms)	16.588 ms

Displays the latency between modem and antenna.

- Reset Max Latencies: Resets the maximum latencies.

8.5.4 Blockage Zones

Antenna Info

Message Stats

Modem <-> Antenna Latency

Blockage Zones

Antenna ID	Azimuth Min	Azimuth Max	Elevation Min	Elevation Max	Transmission Prohibited?
0	0	0	0	0	false

Displays the set blockage zones.

8.5.5 Antenna Status

Antenna Info

Message Stats

Modem <-> Antenna Latency

Blockage Zones

Antenna Status

Antenna Setup

Sensor Offset

Installation

RF Cable Setup

Blockage Zone

Primary

Status

Initialized

True

Mode

Track

Motion Mode

Warm Start Home

Track ID

131230

True North Pointing Status

Completed

Position

Azimuth

82.89

Elevation

66.07

Cross Level

-0.49

Sensor Information

Temperature

22.10

Fri Apr 14 10:14:53 2023 Pt Assist completed

Displays the antenna status, position and sensor information.

8.5.6 Antenna Setup

Antenna Info	Antenna Setup
Message Stats	
Modem <-> Antenna Latency	
Blockage Zones	
Antenna Status	
Antenna Setup	
Sensor Offset	
Installation	
RF Cable Setup	
Blockage Zone	
RCM	
Product Information	
Software Version	
RF Gain Offset	
True North Calibration	
Download Complete Logs	
Download AIM Logs	

1 True North Pointing

Run Pt Assist at Every Reboot

2 Coarse Search

Maximum Elevation

Range

Step

Stop Condition

3 Fine Search

Maximum Elevation

BFS

4 Primary Bow Offset

Azimuth

BFS Azimuth

BFS Elevation

5 Heading

Offset

6 Debug Log Level

Log Flags

Download Log Duration

P-Log Interval

7 Mis-point Alarm

Threshold Time

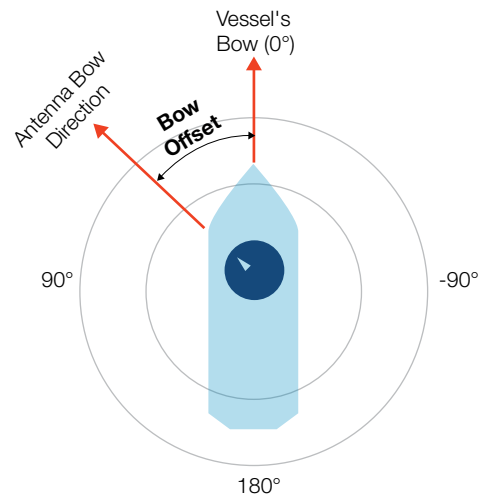
Set the antenna. Click the **Submit** button to apply the settings to the system.

①	True North Pointing	Set the TN calibration. Run Pt Assist at Every Reboot : Run the Pt assist at every reboot. Choose the False / True from the drop-down list.
②	Coarse Search	Set the current antenna elevation, rang, step and stop condition. Searches the satellite signal from around the target angle. - Maximum Elevation: Set the completion condition for coarse search. If the SINR is higher than the stop condition and the antenna EL angle is lower than max. EL, the coarse search will be completed. - Range: Set the search range. - Step: Set the search step. - Stop Condition: If the SINR receives more than the stop condition value, the stop condition will be completed.
③	Fine Search	Set the current antenna elevation and BFS (Background Fine Search):. Searches the target satellite with the azimuth full scan (360°). - Maximum Elevation: Set the completion condition for fine search. If the SINR is stable and the antenna EL angle is lower than max. EL, the fine search will be completed. - BFS (Background Fine Search): Choose whether to use the function (False / True) after TN calibration is completed.
④	BOW offset	For setting the Bow Offset, you need to select a satellite which is trackable in satellite information. When the antenna tracks the selected satellite, bow offset can be calculated. - Offset (Range: 0° ~ 360°): - If the antenna is positioned with the BOW direction parallel to the centerline of the ship, you should enter the 0° on the Bow offset. - If it is difficult to position with the BOW direction parallel to the centerline of the ship, you should calculate the Bow offset and enter on the Bow offset. - When TN calibration is completed, the bow offset value will be displayed automatically



NOTE

The bow offset is based on the vessel's bow (vessel's bow:0°). Please refer to the figure on the right to see how the bow offset value is calculated.



⑤	Heading	Heading is set automatically by the vessel's movement. The values should not be arbitrarily changed. • Offset: Displays the received heading information (0~360)
⑥	Debug Log Level	Set the debug log level. • Log Flags: • Download Log Duration: Set the date range for which you want to download files. • P-Log Interval: Set the P-Log interval
⑦	Mis-Point Alarm	If the miss point maintains for more than setting time(sec), it will report the Mis-Point Alarm. • Threshold Time: Set the current threshold timeout (sec).

8.5.7 Sensor Offset

The screenshot shows the 'Sensor Offset' configuration interface. On the left is a vertical menu with options: Antenna Info, Message Stats, Modem <-> Antenna Latency, Blockage Zones, Antenna Status, Antenna Setup, **Sensor Offset** (highlighted), Installation, RF Cable Setup, Blockage Zone, RCM, Product Information, Software Version, RF Gain Offset, True North Calibration, Download Complete Logs, and Download AIM Logs. The main content area is titled 'Sensor Offset' and is divided into three numbered sections:

- 1 External IMU Sensor**: Contains 'Tilt EL Offset' (0.00) and 'Tilt CL Offset' (0.00).
- 2 Internal IMU Sensor**: Contains 'Tilt EL Offset' (0.56) and 'Tilt CL Offset' (-0.12).
- 3 Home Sensor**: Contains 'AZ Offset' (0.00), 'EL Offset' (0.07), and 'CL Offset' (-6.37).

The tilt values of the elevation and cross-level axes were calibrated to the optimal condition at the factory prior to shipment. **The values should not be arbitrarily changed.**

①	External IMU Sensor	Displays the reflector sensor value. • Tilt EL Offset : Displays the tilt EL offset value. • Tilt EL Offset : Displays the tilt CL offset value.
②	Internal IMU Sensor	Displays the calibrated value for the main sensor. • Tilt EL Offset : Displays the tilt EL offset value. • Tilt EL Offset : Displays the tilt CL offset value.
③	Home Sensor	Displays the AZ, EL, CL for the square one sensor. • AZ Offset : Displays the tilt AZ offset value. • EL Offset : Displays the tilt EL offset value. • CL Offset : Displays the tilt CL offset value.

8.5.8 Installation

Antenna Status	Installation <table border="1"> <tr> <td rowspan="2">Primary</td> <td>Roll</td> <td>0.0</td> </tr> <tr> <td>Pitch</td> <td>0.0</td> </tr> </table>		Primary	Roll	0.0	Pitch	0.0
Primary				Roll	0.0		
			Pitch	0.0			
Antenna Setup							
Sensor Offset							
Installation							
RF Cable Setup							

Displays the installation roll. ***This function is not supported for OW50M model.***

8.5.9 RF cable setup

Antenna Status	RF Cable Setup Internal <table border="1"> <tr> <td>IF Cable Type</td> <td>SS405</td> </tr> <tr> <td>IF Cable Length(m)</td> <td>1.80</td> </tr> </table> IDM <table border="1"> <tr> <td>IF Cable Type</td> <td>SS405</td> </tr> <tr> <td>IF Cable Length(m)</td> <td>0.20</td> </tr> </table>	IF Cable Type	SS405	IF Cable Length(m)	1.80	IF Cable Type	SS405	IF Cable Length(m)	0.20
IF Cable Type		SS405							
IF Cable Length(m)		1.80							
IF Cable Type		SS405							
IF Cable Length(m)		0.20							
Antenna Setup									
Sensor Offset									
Installation									
RF Cable Setup									
Blockage Zone									
RCM									
Product Information									
Software Version									
RF Gain Offset									

The **IF Cable Type** and **IF Cable Length(m)** on the Internal is pre-set with a default value depending on the RF cable. Make sure that is the same with the following default values. ***The values should not be arbitrarily changed.***

- IF Cable type : Displays the cable type (**SS405**).
- IF Cable Length(m) : Displays the cable length (**1.80**).

8.5.10 Blockage zone

Installation	Blockage Zone <table border="1"> <tr> <td rowspan="2">Primary</td> <td>Count</td> <td>0</td> </tr> <tr> <td>Zone</td> <td></td> </tr> </table>	Primary	Count	0	Zone	
Primary			Count	0		
		Zone				
RF Cable Setup						
Blockage Zone						
RCM						
Product Information						
Software Version						

Displays the set blockage zones.

8.5.11 RCM

Antenna Info

Message Stats

Modem <-> Antenna Latency

Blockage Zones

Antenna Status

Antenna Setup

Sensor Offset

Installation

RF Cable Setup

Blockage Zone

RCM

Product Information

Software Version

RF Gain Offset

True North Calibration

Download Complete Logs

Download AIM Logs

RCM

DSA Table

Primary TX12

Primary RX10

Primary

Connection

StatusConnected

Product Information

VendorMTI

ModelRCM-3.0W_A-07

Serial NumberA000181B244

TX Status

Frequency10.075

Attenuator14.0

Temperature30.5

TXOff

KEYLINEOn

PLL LOCKLocked

LO LOCKLocked

RX Status

Frequency9.100

Attenuator13.0

Temperature23.5

RXOn

PLL LOCKLocked

LO LOCKLocked

Displays the current RCM status (DSA Table(Primary Tx/Rx), Connection (Status), Product Information (Vendor, Model, Serial Number) Tx/ Rx status (Frequency, Attenuator, Temperature, TX or RX, KEYLINE, PLL Lock, , LO Lock).

8.5.12 Product Information

RCM	Product Information		
Product Information	Primary	Part Number	OS-OW50PP-H
Software Version		Serial Number	P7M23020085
RF Gain Offset			

Displays the product information (Part Number, Serial Number).

8.5.13 Software Version

RCM	Software Version		
Product Information	Primary	Factory	1.6.25.1
Software Version		SYS0	1.6.38.1
RF Gain Offset		SYS1	1.6.40.1
True North Calibration		Current Partition	SYS1
Download Complete Logs		PCU Version	1.6.40

Displays the software version. (Factory, SYS0, SYS1, Current Partition, PCU version)

8.5.14 RF Gain Offset

Antenna Info	RF Gain Offset	
Message Stats	Primary	
Modem <-> Antenna Latency	1 Transmit Channel 1 0.00 Channel 2 0.00 Channel 3 0.00 Channel 4 0.00	
Blockage Zones	2 Receive Channel 1 0.00 Channel 2 0.00 Channel 3 0.00 Channel 4 0.00 Channel 5 0.00 Channel 6 0.00 Channel 7 0.00 Channel 8 0.00	
Antenna Status		
Antenna Setup		
Sensor Offset		
Installation		
RF Cable Setup		
Blockage Zone		
RCM		
Product Information		
Software Version		
RF Gain Offset		
True North Calibration		
Download Complete Logs		
Download AIM Logs		

Updates the RF gain values in real time.

①	Transmit	To increase or decrease TX gain, enter the values. • Channel: Adjust the Tx gain values for each channel.
②	Receive	To increase or decrease Rx gain, enter the values. • Channel: Adjust the Rx gain values for each channel.

8.5.15 True North Calibration

Software Version	True North Calibration Pointing Assist Control Start ▼ Submit
RF Gain Offset	
True North Calibration	
Download Complete Logs	
Download AIM Logs	

Set the TN calibration.

- Pointing Assist Control: Choose the **Start** from the drop-down list to run the true north calibration and then click the **Submit** button.

8.5.16 Download Complete Logs

RF Gain Offset	Complete Logs Download
True North Calibration	
Download Complete Logs	
Download AIM Logs	

Click the Download button to download the complete log.

8.5.17 Download AIM Logs

RF Gain Offset	AIM Logs Download
True North Calibration	
Download Complete Logs	
Download AIM Logs	

Click the Download button to download the AIM log.

8.6 Modem

This menu sets and displays the Modem Info, APN Info, Modem status, Modem Control Panel, OneWeb Extension, GNSS status, PPS status.

8.6.1 Antenna Info

About This Modem	
Manufacturer	QUALCOMM INCORPORATED
Revision ID	NOMAD_MPSS.OW.4.0-00019-9655_GEN_PACK-1 1 [Oct 16 2022 22:00:00]
EID	89033023312170000000024169446035
Hardware Revision	10001
ICCID	89901600000000019072
IMEI	351235870000772
IMSI	901600000001907
Current Software Version	NOMAD_MPSS.OW.4.0-00019-9655_GEN_PACK-1

Displays the modem information.

8.6.2 APN Info

	APN0	APN1
APN Name	oam.oneweb	
Call IP Mode	ipv4	
Management APN	Yes	
PDP Context	1	
PDP Type	0 (0-IPV4, 1-PPP, 2-IPV6, 3-IPV4V6)	
Profile Index	0	
Profile Name	APN0	
Profile Type	0 (0-3GPP, 1-3GPP2, 2-EPC)	
Rmnet Device	0	
VLAN ID	0	

Displays the APN0/1 information.

8.6.3 Modem status

Displays the modem status.

①	Modem status	Displays the current modem status.
②	QMI Errors	Displays the current modem error.

8.6.4 Modem Control Panel

The color shows the modem status.(Green: The modem is behaving as normal./Red: The modem is abnormal or incorrect (Error).)

- Bring Up Diagnostic Bridge: Try to connect the diagnostic bridge to check the modem status.
- Bring Modem Online: Converts the modem to online status.

8.6.5 Modem Control Panel

Modem Control Panel		
✓	Time/Location Injected	Yes
✓	USB Mode	Normal
✓	QMI Client Connected	Yes
✓	Diagnostic Bridge Connected	Yes Bring Up Diagnostic Bridge
✓	Operating Mode	Online Bring Modem Online
✓	Service Available	Yes
✓	MGT APN0 Status	Connected
✓	User APN1 Status	Connected

The color shows the modem status.(Green: The modem is behaving as normal./Red: The modem is abnormal or incorrect (Error).)

- Bring Up Diagnostic Bridge: Try to connect the diagnostic bridge to check the modem status.
- Bring Modem Online: Converts the modem to online status.

8.6.6 OneWeb Extension

The screenshot displays the OneWeb Extension LUI interface. On the left is a sidebar menu with options: Modem Info, APN Info, Modem Status, Modem Control Panel, **OneWeb Extension** (highlighted in blue), GNSS Stats, and PPS Stats. The main content area is titled 'QMI Client Connected' in a green header. It is divided into three numbered sections:

- 1 Requests / Responses**: A table showing various modem statistics and a 'Clear Stats' button.

Requests / Responses	
Total	13,251 / 13,251
Acquisition Status	4 / 4
Cancel Receive Channel	7 / 7
Cancel Track	7 / 7
Data Service Available	1 / 1
Get Supported Fields	0 / 0
Get Supported Messages	0 / 0
Get UT Capabilities	1 / 1
Intersatellite Handover Complete	7 / 7
Intersatellite Handover Pending	14 / 14
Register Event	1 / 1
Send Modem Fault Report	7 / 7
Send Modem-to-Host Report	0 / 0
Set True North Calibration	0 / 0
SINR Measurement	12,679 / 12,679
SINR Measurement Status	1 / 1
Track	277 / 277
Track Advisory	8 / 8
Tune Receive Channel	123 / 123
Tune Transmit Channel	114 / 114
- 2 Indications**: A table showing tracking progress.

Indications	
Total	16,013
Calibration Complete	0
Gain Update	16,012
Start/Stop SINR	1
UT Fault Report	0
- 3 Faults**: A table showing tracking faults.

Faults	
Total	7
Cold Start Fail	0
Bad Ephemeris	0
Missing Gain Update	7
Invalid Fault	0
Location Sync Lost	0
Location Sync Missing	0
Invalid Parameter	0
Missing Response	0
SINR Reporting Not Started	0
Time Sync Lost	0
Time Sync Missing	0
Unsupported UT Capability	0

Make sure of the satellite connection status. (satellite signal, tracking etc.)

①	Request / Response	Displays the request and response for the SSM. • Clear Status: Click the Clear status button to clear the shown page.
②	Indication	Displays the tracking progress.
③	Faults	Displays the tracking faults.

8.6.7 Modem Control Panel

Modem Info
APN Info
Modem Status
Modem Control Panel
OneWeb Extension
GNSS Stats
PPS Stats

Clear Stats

Click here to see your current location...

1 GNSS Receiver Info

Manufacturer	TRIMBLE INC.
Model	EGR-2.0
Software Version	1.0.0

2 Generic Sentence Counts

Bad NMEA sentences	14
Invalid serial lines	6
Missed NMEA sentences	22
Proprietary NMEA sentences	1,520
Total NMEA sentences	17,582
Unsupported NMEA sentences	0
NMEA sentences withheld from modem	114

3 Individual Sentence Counts

GGA	1,520
GLL	1,520
GSA (GPS/SBAS)	1,534
Empty GSA (no satellites tracked)	0
GSA (Galileo)	0
GSA (GLONASS)	1,506
GSV (GLONASS)	1,520
GSV (GPS)	1,520
PTNLRGPS	1,520
RMC	0
VTG	1,506

Displays the GNSS status.

- Clear Status: Click the **Clear status** button to clear the shown page.

①	GNSS Receiver Info	Displays the GNSS receiver information.
②	GNSS Sentence Counts	Displays the GNSS sentence counts.
③	Individual Sentence Counts	Displays the individual sentence counts .

8.6.8 PPS Status

Modem Info

APN Info

Modem Status

Modem Control Panel

OneWeb Extension

GNSS Stats

PPS Stats

PPS Stats

Consecutive Pulses Missed

0

Consecutive Pulses Received

1376

Missed Pulse Count

117

Pulse Count

1376

PPS Statecode

0.0.0

Displays the PPS status.

8.7 Network

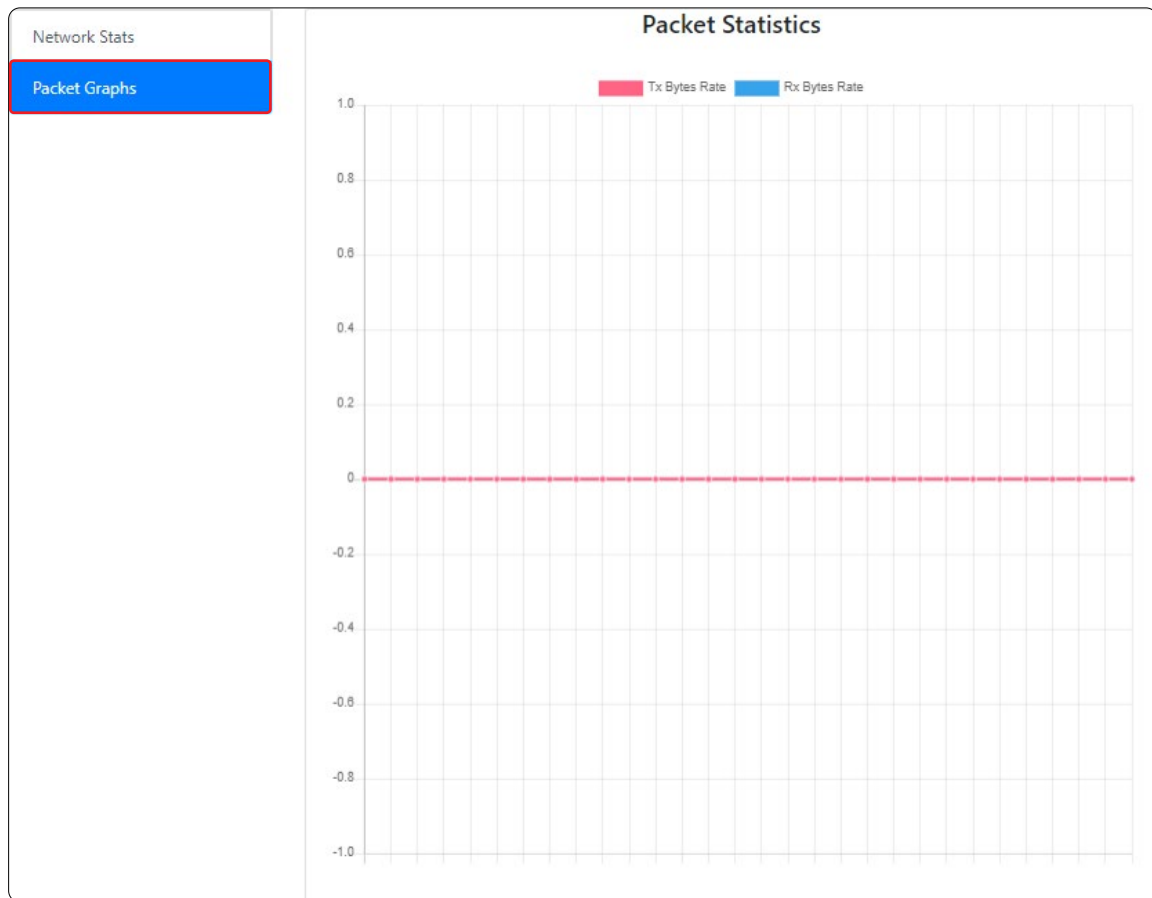
This menu sets and displays the Network info, Packet Graphs .

8.7.1 Network info

CNX Interface	Antenna Interface	Management Interface	WAN0	MoCA Interface
Interface Name	eth1			
Interface IPv4 Address	192.168.100.253			
Interface Address Mask	255.255.255.128			
Interface Duplex	Full			
Interface MAC Address	00:51:82:11:22:01			
Interface Speed	100Mb/s			
Interface Status	Up			
Interface Namespace	NA			
Multicast Received	0			
Received Bytes	16,875,127 (16 MB)			
Received Dropped	0			
Received Errors	0			
Received Packets	21,506 (21K)			
Transmitted Bytes	12,263,579 (12 MB)			
Transmitted Dropped	0			
Transmitted Errors	0			
Transmitted Packets	17,635 (17K)			

Displays the modem information. (CNX Interface, Antenna Interface, Management Interface, WAN0, MoCA Interface)

8.7.2 Packet Graphs



Measures an input Rx/Tx signal frequency within the full frequency range, and displays the information on the Graph. The display of the packet statistics has the amplitude displayed on the vertical axis.

8.8 Diagnostic

This menu sets and displays the UT status, Host Processor Logs, Event Logs, UT Configuration, UT Advanced Configuration, Fault Management, CNX Manager, MoCA Info, System Monitor status, Sensor and Device Info, Statistics, Self Test Results, TWAMP.

8.8.1 UT status

The screenshot shows the OneWeb Diagnostics interface. The 'Diagnostics' menu item is highlighted in the top navigation bar. In the left sidebar, 'UT Status' is selected. The main content area displays the following sections:

- 1. UT Info:** Shows Platform Type (ENT-K), SSM Serial Number (DDAV712688), and UT Serial Number (P7M23020085).
- 2. Restart Panel:** Contains five buttons: Antenna Reset, Modem Reset, GNSS Reset, CNX Reset, and MoCA Reset.
- 3. Feature Status:** Shows Firewall (Enabled) and NAT (NAPT).
- 4. UT Components Software Report:** A table listing various software versions and system information.

UT Components Software Report	
Antenna Software Version (backup)	1.6.38.1
Antenna Software Version (current)	1.6.40.1
Antenna Software Version (factory)	1.6.25.1
CNX Software Version (backup)	N/A
CNX Software Version (current)	N/A
CNX Software Version (factory)	N/A
CPLD Revision	cc05
GNSS Receiver Software Version	1.0.0
Modem Software Version	NOMAD_MPSS.OW.4.0-00019-9655_GEN_PACK-1
MoCA Driver Version	3.11.18
MoCA SoC Version	21.2
SSM Software Image (current)	main
Current Linux BSP Version	SSM_BSP_4.0.18
Current Linux Release Date	Sat Feb 18 19:53:45 UTC 2023
Current Linux Kernel Version	5.4.70
Current U-boot BSP Version	SSM_BSP_4.0.15

Displays the UT status.

①	UT Info	Displays the Platform type, SSM serial number and UT Serial number
②	Restart Panel	Resets the antenna, modem, GNSS, CNX, MoCA. Click each button to reset them.
③	Feature Status	Displays the feature status.
④	UT components software report	Displays the software report.

8.8.2 Host Processor Logs

Download the host processor logs. Choose the desired logs from the drop-down list and then click the submit button.

- Download All : Click the **Download All** button to download the all logs.
- Filter by regex or string: Displays the logs filtering by regex or string.

8.8.3 Event Logs

Event ID	Severity	Timestamp	Description
10713	Moderate	Apr 14, 2023, 7:34:53 PM	Statecode 7.13.3 (sdl_cfg_adv_present) reported
10713	Cleared	Apr 14, 2023, 7:34:53 PM	Statecode 7.13.3 (sdl_cfg_adv_present) cleared
10713	Moderate	Apr 14, 2023, 7:29:50 PM	Statecode 7.13.3 (sdl_cfg_adv_present) reported
10713	Cleared	Apr 14, 2023, 7:29:50 PM	Statecode 7.13.3 (sdl_cfg_adv_present) cleared
10713	Moderate	Apr 14, 2023, 7:24:47 PM	Statecode 7.13.3 (sdl_cfg_adv_present) reported
10713	Cleared	Apr 14, 2023, 7:24:47 PM	Statecode 7.13.3 (sdl_cfg_adv_present) cleared
10713	Moderate	Apr 14, 2023, 7:19:44 PM	Statecode 7.13.3 (sdl_cfg_adv_present) reported
10713	Cleared	Apr 14, 2023, 7:19:44 PM	Statecode 7.13.3 (sdl_cfg_adv_present) cleared
10402	Major	Apr 14, 2023, 7:14:54 PM	Statecode 4.2.2 (modem_gain_ind_not_rcvd) reported
10713	Moderate	Apr 14, 2023, 7:14:41 PM	Statecode 7.13.3 (sdl_cfg_adv_present) reported
10707	Cleared	Apr 14, 2023, 7:14:41 PM	Statecode 7.7.2 (sdl_wait_for_mgt_ip) cleared
10305	Cleared	Apr 14, 2023, 7:14:34 PM	Statecode 3.5.2 (mm_cannot_bring_up_call) cleared
2013	Moderate	Apr 14, 2023, 7:14:19 PM	startNetworkInterface: failed with no_effect
10305	Major	Apr 14, 2023, 7:14:19 PM	Statecode 3.5.2 (mm_cannot_bring_up_call) reported
10304	Cleared	Apr 14, 2023, 7:14:08 PM	Statecode 3.4.2 (mm_no_service_available) cleared
10102	Cleared	Apr 14, 2023, 7:14:01 PM	Statecode 1.2.2 (sysmon_process_restarted) cleared
10303	Cleared	Apr 14, 2023, 7:13:55 PM	Statecode 3.3.2 (mm_cannot_bring_modem_online) cleared
10304	Major	Apr 14, 2023, 7:13:55 PM	Statecode 3.4.2 (mm_no_service_available) reported

Download or reload the event logs.

- Reload: Click the **Reload** button to reload the event logs.
- Reboot Events: Click the **Reboot Events** button to reboot the host controller.
- Download CSV: Click the **Download CSV** button to download the CSV.
- Clear Events: Click the Clear Events button to clear the host controller logs.

8.8.4 UT Configuration

UT Status

Host Processor Logs

Event Logs

Configuration

Advanced Configuration

Fault Management

CNX Manager

MoCA Info

System Monitor Stats

Sensor and Device Info

Statistics

Self Test Results

TWAMP

UT Configuration

Save

Reload

Filter by regex or string

Group	Name	Value	Source
temp	log_level	error	cfg_default.json
temp	log_location	/var/log/temp.log	cfg_default.json
temp	log_num_backups	0	cfg_default.json
temp	log_size_kb	10	cfg_default.json
mm	cache_eid	true	cfg_default.json
mm	cache_iccid	true	cfg_default.json
mm	cache_imei	true	cfg_default.json
mm	cache_imsi	true	cfg_default.json
mm	log_level	debug	cfg_ces.json
mm	log_location	/var/log/mm.log	cfg_default.json
mm	log_num_backups	0	cfg_default.json
mm	log_size_kb	3000	cfg_ces.json
mm	lte_rsrp_delta_tenths_db	10	cfg_default.json
mm	lte_rssi_delta_tenths_db	10	cfg_default.json
mm	lte_snr_delta_tenths_db	10	cfg_default.json
mm	modem_heartbeat_timeout_s	5	cfg_default.json
mm	modem_qmi_timeout_ms	300000	cfg_default.json

Displays the UT Configuration.

- **Save:** Click the **Save** button to save the UT Configurations.
- **Reload:** Click the **Reload** button to reload the UT Configurations.

8.8.5 UT Advanced Configuration

UT Advanced Configuration

1 CNX Interface

Interface Name: eth0

Interface IPv4 Address: 192.168.100.1

Interface Address Mask: 255.255.255.128

Enable DHCP ☒

DHCP Start Address: 192.168.100.11

DHCP End Address: 192.168.100.126

2 Antenna Interface

Interface Name: eth1

Interface IPv4 Address: 192.168.100.253

Interface Address Mask: 255.255.255.128

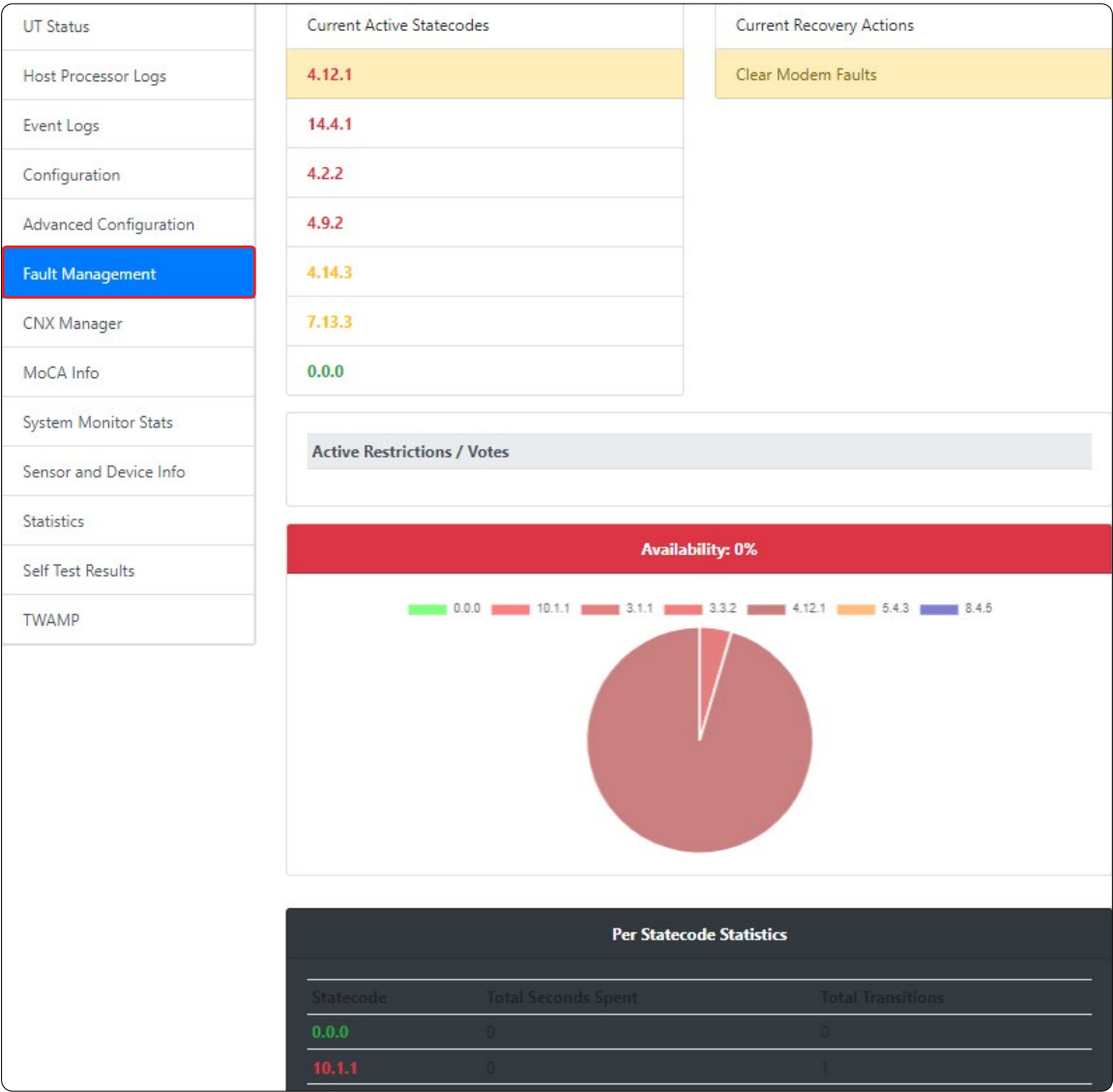
Try Save

Display the UT advanced configuration.

- Reload: Click the Reload button to reload the UT advanced configuration.

①	CNX Interface	Displays the CNX interface. • Interface Name: Displays the interface name. • Interface IPv4 Address : Enter the ip address. • Interface Address Mask: Choose the subnet mask from the drop-down list. • Enable DHCP: Select the checkbox to activate the DHCP. • DHCP Start address: Enter the DHCP start address. • DHCP End address: Enter the DHCP end address.
②	Antenna Interface	Displays the antenna interface. • Interface Name: Displays the interface name. • Interface IPv4 Address : Displays the ip address. • Interface Address Mask: Displays the subnet mask

8.8.6 Fault Management



Displays the fault status.

8.8.7 CNX Manager

UT Status

Host Processor Logs

Event Logs

Configuration

Advanced Configuration

Fault Management

CNX Manager

MoCA Info

System Monitor Stats

Sensor and Device Info

Statistics

Self Test Results

TWAMP

1

CNX Information

API Version Info	0.0
Classification	Unknown
Current Firmware Version	0.0.0
Factory Firmware Version	0.0.0
High Temperature Threshold	0°C
Maximum Temperature Threshold	0°C
MAC Learning Based on GARP	false
Model	Unknown
Serial Number	Unknown
Switch Activation Time (ms)	0
Switch Criteria	0
System Status	good
Uptime	0
Vendor	Unknown

2

Diagnostic Data

Name	Status	Value
CPU Usage	GOOD	
Memory Usage	GOOD	

Displays the CNX information.

①	CNX Information	Displays the CNX information.
②	Diagnostic Data	Displays the diagnostic result.

8.8.8 MoCA Info

UT Status

Host Processor Logs

Event Logs

Configuration

Advanced Configuration

Fault Management

CNX Manager

MoCA Info

System Monitor Stats

Sensor and Device Info

Statistics

Self Test Results

TWAMP

MoCA Information

Link Status	Up
MoCA Version	2.0
Driver Version	3.11.18
SoC Version	21.2
Link Up Time	1742 seconds
Up Time	1750 seconds
Beacon Channel	550 MHz

Displays the MoCA information.

8.8.9 System Monitor status

UT Status

Host Processor Logs

Event Logs

Configuration

Advanced Configuration

Fault Management

CNX Manager

MoCA Info

System Monitor Stats

Sensor and Device Info

Statistics

Self Test Results

TWAMP

Watchdog Status: Enabled

Watchdog Count: 353

Clear Stats

	Heartbeat Count	Heartbeat Fail	Consecutive Restarts	Total Restarts
tfw	57	0	0	0
moca	57	0	0	0
faultman	0	0	0	0
fm_perf	0	0	0	0
stats_collector	0	0	0	0
amu	57	0	0	0
sigstablemon	0	0	0	0
tempmon	0	0	0	0
sdl	57	0	0	0
gnssmon	57	0	0	0
amc	0	0	0	0
cnx	0	0	0	0
component_upgrade	57	0	0	0
npsmon	0	0	0	0

Displays the system monitor status

- **Clear Status:** Click the **Clear status** button to clear the shown page.

8.8.10 System Monitor status

UT Status

Host Processor Logs

Event Logs

Configuration

Advanced Configuration

Fault Management

CNX Manager

MoCA Info

System Monitor Stats

Sensor and Device Info

Statistics

Self Test Results

TWAMP

Available Memory: 333MB

Total Memory: 463MB

Board Level Status

DDM Power

OK

DDM Aux Power

OFF

DC-DC Power for GigE

OK

DC-DC Power for MoCA

OK

CNX Data Path

MoCA

PLL Status

38.4MHz PLL

N/A

25.0MHz PLL

Locked

RF-LMM Status

RF-LMM Power

OK

RF-LMM TX0 ON Signal

N/A

RF-LMM TX1 ON Signal

N/A

RF-LMM 25MHz Clock

Tx0 RF Path

Enabled

Tx1 RF Path

Enabled

AIM Status

AIM Power

OFF

Temperature Sensor Information

DC-DC Converter Module

29.9 °C

RF-LMM

26.0 °C

Host Processor Reference Clock

29.0 °C

Host Processor Core

30.0 °C

eMMC Info

mmcbk2

3.7G

mmcbk2boot0

4M

mmcbk2boot1

4M

Displays the sensor/device information. The color shows the sensor/device status.

- White: The modem is behaving as normal.
- Yellow: The system might cause errors.
- Red: The modem is abnormal or incorrect (Error).

8.8.11 System Monitor status

UT Status	Statistics Upload Metrics
Host Processor Logs	
Event Logs	
Configuration	
Advanced Configuration	
Fault Management	
CNX Manager	
MoCA Info	
System Monitor Stats	
Sensor and Device Info	
Statistics	
Self Test Results	
TWAMP	

Mar 7, 2023, 10:24:06 AM	Mar 7, 2023, 9:23:50 AM
Mar 7, 2023, 8:23:35 AM	Mar 7, 2023, 7:23:20 AM
Mar 7, 2023, 6:23:05 AM	Mar 7, 2023, 5:22:49 AM
Mar 7, 2023, 4:22:34 AM	Mar 7, 2023, 3:22:19 AM
Mar 7, 2023, 2:22:04 AM	Mar 7, 2023, 1:21:49 AM
Mar 7, 2023, 12:21:34 AM	Mar 6, 2023, 11:21:20 PM
Mar 6, 2023, 10:21:06 PM	Mar 6, 2023, 9:20:51 PM
Mar 6, 2023, 8:20:36 PM	Mar 6, 2023, 7:20:22 PM
Mar 6, 2023, 6:20:07 PM	Mar 6, 2023, 5:19:52 PM
Mar 6, 2023, 4:19:37 PM	Mar 6, 2023, 3:19:23 PM
Mar 6, 2023, 2:15:10 PM	Mar 6, 2023, 1:14:57 PM
Mar 6, 2023, 12:14:43 PM	Mar 6, 2023, 11:14:31 AM

Checks the antenna status periodically and displays on the page. To activate the function, set the **Update_Statistics** value to true on configuration.

- Upload Metrics: Upload the status information to OneWeb server.

8.8.12 Self Test Results

UT Status

Host Processor Logs

Event Logs

Configuration

Advanced Configuration

Fault Management

CNX Manager

MoCA Info

System Monitor Stats

Sensor and Device Info

Statistics

Self Test Results

TWAMP

Self Test Overall Result : pass

Self Test Sub-test Results

25MHz PLL Successfully Programmed	true
38MHz PLL Successfully Programmed	true
SSM Software Image (current)	SSM_5.0.15
BSP Version (current)	SSM_BSP_4.0.15
DDR Size (bytes)	536,870,912
eMMC Size (bytes)	3,909,091,328
MMC Test Passed?	true
RAM Test Passed?	true

AIM Result : PASS

Antenna Power on Self Test Results Subsection (Master main board)

FLASH	Pass
GPIO_0	Pass
GPIO_1	Pass
GPIO_2	Pass
SDRAM	Pass

CNX Result : NOT AVAILABLE

Run the self test to check the AIM/CNX status.

8.8.13 TWAMP

UT Status	TWAMP Test			
Host Processor Logs	Server IPv4 Address	Server Port	Inter-Packet Interval (ms)	Number of Packets
Event Logs	Server IPv4 Address	862	100	100
Configuration	Start			
Advanced Configuration				
Fault Management				
CNX Manager				
MoCA Info				
System Monitor Stats				
Sensor and Device Info				
Statistics				
Self Test Results				
TWAMP				

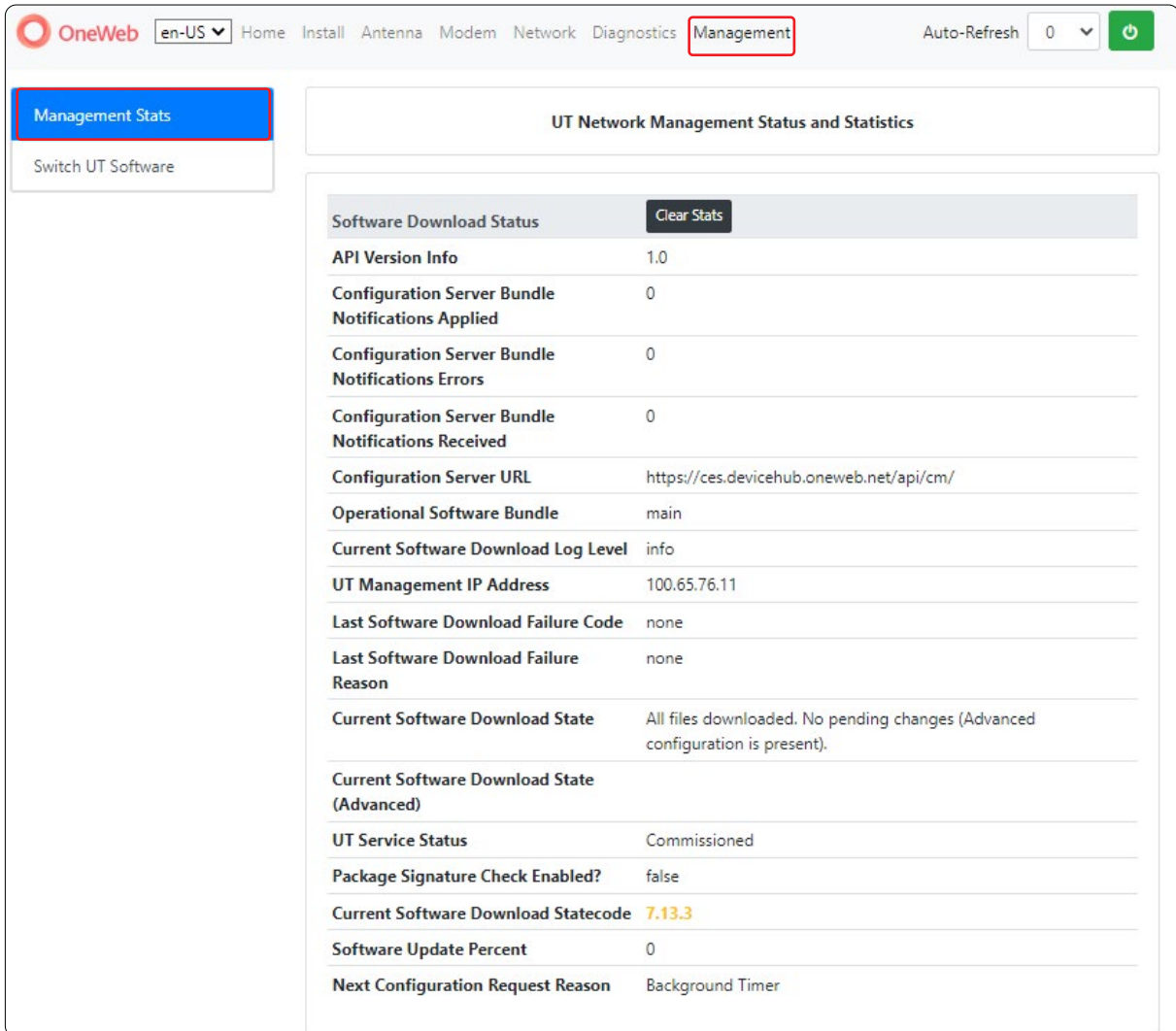
Sets the network test function by entering the required parameters.

- Server IPv4 Address: Enter the server IPv4 address.
- Server Port: Enter the server port.
- Inter-Packet Interval(m):Enter the inter-packet interval(m).
- Number of Packets: Enter the number of packets.
- Start: Click the Start button to start the TWAMP.

8.9 Management

This menu sets and displays the Management Status and Switch UT Software.

8.9.1 Management Status



The screenshot displays the OneWeb Management interface. The top navigation bar includes the OneWeb logo, a language dropdown set to 'en-US', and links for Home, Install, Antenna, Modem, Network, Diagnostics, and Management (which is highlighted with a red box). On the right of the navigation bar, there is an 'Auto-Refresh' section with a value of '0' and a power icon.

The left sidebar contains two buttons: 'Management Stats' (highlighted with a blue box) and 'Switch UT Software'.

The main content area is titled 'UT Network Management Status and Statistics'. It features a table of system information with a 'Clear Stats' button in the top right corner of the table area.

Software Download Status	Clear Stats
API Version Info	1.0
Configuration Server Bundle Notifications Applied	0
Configuration Server Bundle Notifications Errors	0
Configuration Server Bundle Notifications Received	0
Configuration Server URL	https://ces.devicehub.oneweb.net/api/cm/
Operational Software Bundle	main
Current Software Download Log Level	info
UT Management IP Address	100.65.76.11
Last Software Download Failure Code	none
Last Software Download Failure Reason	none
Current Software Download State	All files downloaded. No pending changes (Advanced configuration is present).
Current Software Download State (Advanced)	
UT Service Status	Commissioned
Package Signature Check Enabled?	false
Current Software Download Statecode	7.13.3
Software Update Percent	0
Next Configuration Request Reason	Background Timer

Displays the management status.

- Clear Status: Click the **Clear status** button to clear the shown page.

8.9.2 Switch UT Software

Management Stats	Switch UT Operational Software Settings
Switch UT Software	Please select the new mode. Switch UT Operational Software to factory ▼
	Submit

Software mode can be switched to factory or main. Click the **Submit** button to apply the settings to the system.

Chapter 9. Specification

9.1 Antenna Specification

Item		Specification
Platform		Three Axis: Azimuth, Elevation, Cross-level
Positioning		3-axis Velocity Mode Servo : Azimuth, Elevation, Cross-Level
Pedestal Motion Range	Azimuth	Unlimited
	Elevation	-80° to +80° (FOV -80° to +80°)
	Cross-Level	-30° to +30°
Ship's Motion	Roll	± 25° at 6 second
	Pitch	± 15° at 6 second
	Yaw	± 10° at 6 second
	Turning rate	Up to 12°/sec & 5°/sec ²
Power Module(Inside CNX) (for Each 1 Antenna)		Max ~ 250W(Total : Max ~ 500W)
CNX Input Power		100 – 240 VAC, 50 – 60 Hz
Power to Antenna Subsystem (for Each 1 Antenna)		Current 1.9 A average/ 3 A peak @ 32-60 V, 56 V nominal
EGR	GPS L1 Frequency	1574.397 – 1576.443 MHz
	GLONASS Frequency	1597.5515 – 1605.886 MHz
	Communication Protocol	NMEA 0183
	Reference Clock Frequency	38.4MHz sinusoidal reference clock output to the SSMv2
	Supply Voltage	Nominal 5.5V (Min. 5.2 V, Max. 5.8 V)
	Power Consumption	Max. 8 W
	Antenna Power Interface	Min. 3 V, Max. 5 V
	Surge Protection	IEC 61000-4-5, Class 3
	Connections	SMA
Digital Signals		Tx-ON : LVDS
		Rx-ON : LVDS
		Frequency Reference: LVDS
		Reset: LVDS
Ant. Monitor, Control Interface		Ethernet, 10/100 Base T
RF Cable		RG6(30m) or RG11(100m)
Heater Power Consumption		Max ~ 400W(220 Vac)
Ethernet Cable		CAT5(CNX to User terminal)
Radome Height		850 mm (33.5")
Radome Diameter		Ø856 mm (33.7")
Reflector Size		Ø530 mm (20.8 ")
Antenna Weight		52kg (114.6 lbs) with Radome 54kg (119.0 lbs) with Radome and Heating system

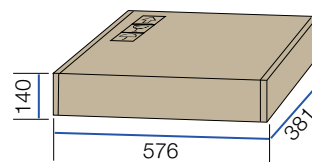
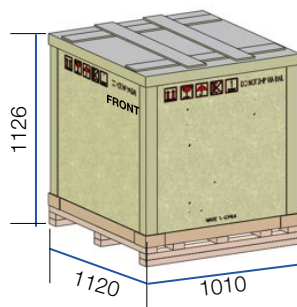
9.2 RF Specification

Item	Ku-band
Rx Frequency	10.7 ~ 12.7 GHz
Rx Gain (Without Radome)	32.0dBi
G/T	9.3 dB/K
Tx Frequency	14.0 ~ 14.5 GHz
Tx Gain (Without Radome)	35.0dBi
EIRP	33.6 dBW / 20 MHz (single carrier)
Cross pol Isolation	Min 15 dB (Antennas Field of view)
Polarization	Rx: RHCP, Tx: LHCP

9.3 Packing Specification

Item	Specification
Antenna Package	Size
	1010 mm x 1120 mm x 1126 mm
	Weight
CNX Package	106 kg (233.7 lbs)
	Material
	Paper+Wooden
CNX Package	Size
	576 mm x 381 mm x 140 mm
	Weight
CNX Package	6.3 kg (2.6 lbs)
	Material
	Paper

Unit: mm



9.4 Customer Network Exchange (CNX) Specification

Item	Specification
Size (W x D x H)	442 mm x 249 mm x 40.4 mm (17.4" x 9.8" x 1.6")
Weight	5.1kg (11.2 lbs)
Antenna Subsystem Interface	Eight GigE RJ-45 Ethernet(1 Management Port)
Encryption	MoCA 2.0 E-band (400-700MHz)
AC Input Voltage	AC 100V ~ 240V/50Hz ~ 60Hz
Operating Power	Max. 30 W
DC output range	DC 56V +/- 5%

Item	Specification
Output Power (For each power module)	Max ~ 250W(Total : Max ~ 500W)
LEDs	Power - Operational: Solid GREEN - Off: No power
	Ethernet - Ready: Solid GREEN - Activity: Blinking GREEN - Off: No device connected or device connected not operational

9.5 Environmental Specification

Item	Specification
Operational Temperature (ADU)	- 25°C to + 55°C (without heating module) - 40°C to + 55°C (with heating module)
Operational Temperature (CNX)	0°C to 40°C
Storage Temperature	-40°C to +85°C
Operational Humidity	Relative humidity range of 20% to 95% non-condensing in accordance with IEC60068-2-30 for a period of 96 hours.
Non-operational Humidity	IEC 60068-2-78, Method Db for a period of 96 hours.
Operational Vibration	EN60945 5~13.2Hz/ 1mm, 13.2~100Hz/0.7g
Non-operational Vibration	IEC 60721-3-6 Class 6M3 5~18Hz/1.5mm 18~200Hz/2G (Sweep Rate: 1.0 Oct/min) 5 sweeps at each Axes
Non-operational Shock	IEC 60721 3 6 Class 6M3 10G, 11ms (half sine), 3 cycles 30G, 6ms (half sine), 3 cycles 50G, 3ms (half sine), 3 cycles
Weather Tightness	IP56 per IEC 60529
Lightning Protection	IEC 61000-4-5 Class 4
Hail Impact	ASTM E822
Operating Wind Resistance	148 km/hr (80 Kt)
Salt Erosion	IEC 60068-2-52 Severity Lv 3

Chapter 10. 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.

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

Chapter 11. Appendix

11.1 Tightening Torque Specification

This table shows the recommended values of tightening torques.

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

11.2 Using Theodolite Application

11.2.1 Installing Mobile Application

To be able to confirm the blockage zone value, you should install the Theodolite application. The application can be installed only for iOS devices.

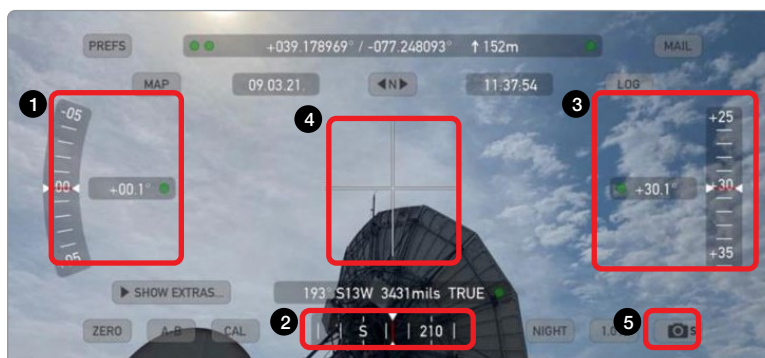
Theodolite App

- **App Store:** <https://apps.apple.com/us/app/theodolite/id339393884>

11.2.2 Using the Theodolite Application

Using Theodolite App only for iOS devices

To confirm the blockage zone value, Intellian recommends using the Theodolite app. After installing the application, position the mobile device above approx 1 m (3.3 ft) from the mast where the antenna will be installed. The following table describes the function of the application.



No	Item	Description
①	Roll Indicator	Level the mobile device by adjusting 0 degrees in the roll indicator.
②	Azimuth indicator	Measure the four cardinal directions in the azimuth indicator. The four letters indicate the four cardinal directions: N(North), S(South), E(East), and W(West).
③	Elevation indicator.	Adjust up to 31 degrees in the elevation indicator.
④	Crosshair	Direct the center of crosshairs to highest point of the obstruction after setting the indicators. The cross hairs color will change to yellow.
⑤	Camera Button	Take a picture by pressing the camera button.

Visit the web site <http://hunter.pairsite.com> for more information.