Product Technical Specifications

Compact Flat Panel Series

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Document Revision History

Version	Date	Author	Reason for Change
0.1	10 Jan 2024	T. Ryan	Initial Draft
1.0	30 April 2024	T. Ryan	Final
1.1	14 June 2024	R. Maroney	Configuration updates
1.2	24 July 2024	T. Ryan	Added CNX-WIFI Shock and Vibe
1.3	30 July 2024	T. Ryan	Added fan information

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1. Introduction Compact Flat Panel Series

1.1. User Terminal Overview

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

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

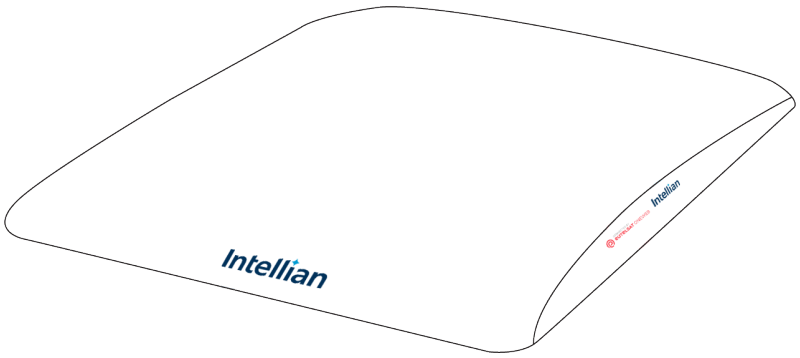


Figure 1: Intellian Compact Flat Panel Series

1.2. User Terminal Key Features

1. Proven Performance

Intellian's Compact Flat Panel series user terminals are based on Half-duplex architecture utilizing active electronically scanned array. It features a Field-of-view of ±55°, a G/T of 9dB/K at boresight, an EIRP of +36.6dBW (dual carrier) and +33.6dBW (single carrier), as well as supports data rates up to the maximum allowed on the network.

2. Optimized Design

The user terminal's design enables a single person installation. A single IFL coax cable to the outdoor unit from the CNX-WIFI provides power and encrypted data. The UT's sleek and lightweight form factor makes the 56 cm. x 45 cm. x 12 cm. and 12.2 kg UT easy it maneuver.

The UT's ruggedized radome withstands harsh environments and is curved for functional rain and snow shedding. No heater is required for the extended temperature support of -40°C to +55°C. Intellian's user-friendly Mobile Application offers a step-by-step guide that significantly simplifies site surveys, installation, maintenance, and troubleshooting processes.

The embedded dual GNSS receivers provide differential GPS location to support automated true north calibration. The KIM (kinetic inertial module) provides tilt measurement to aid in the installation and highly accurate timing reference for precise beam forming, even in mobile environment.

3. Portfolio of CNX

The CNX portfolio provides users with several options for use case specific requirements. The CNX-WIFI is a desktop form factor (wall mount coming soon) that has three GigE data ports in addition to an embedded Wi-Fi- 6 access point. There is also a CNX-BB option available which is also a desktop form factor and a single GigE data port. Another form factor that will be coming soon is the CNX-Rack design with fully integrated PDMs (power distribution modules), AC and -48VDC (telco) variants available , supports dual antenna configurations delivering a blockage mitigation solution. Also coming soon is CNX-Mobility, an ideal solution for Land Mobile applications requiring higher IP rating and extended temperature range.

1.3. System Configuration

1.3.1. AC System Configuration

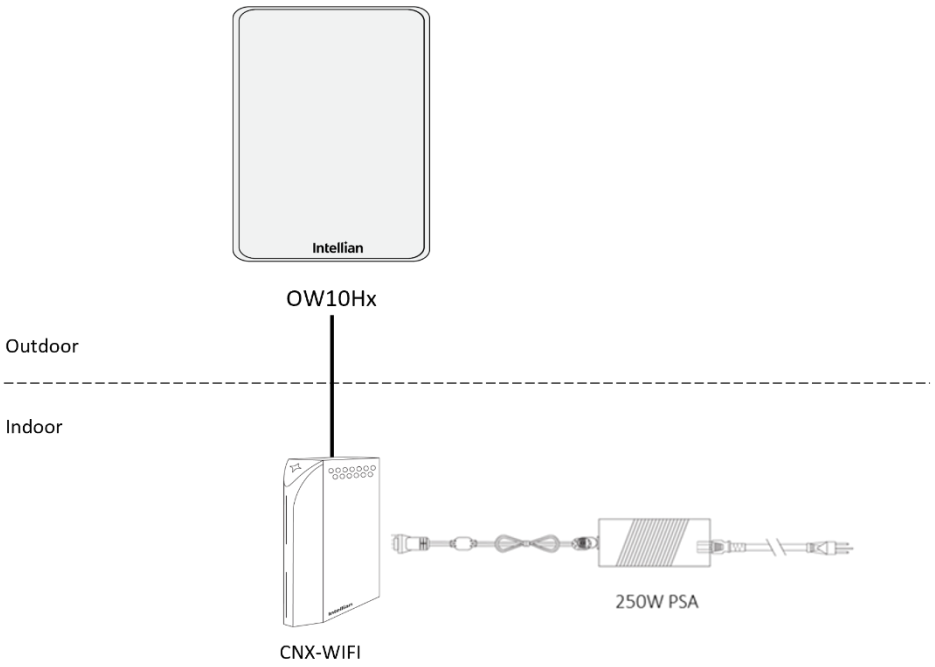


Figure 2: AC System Configuration

1.3.3. DC-DC System Configuration

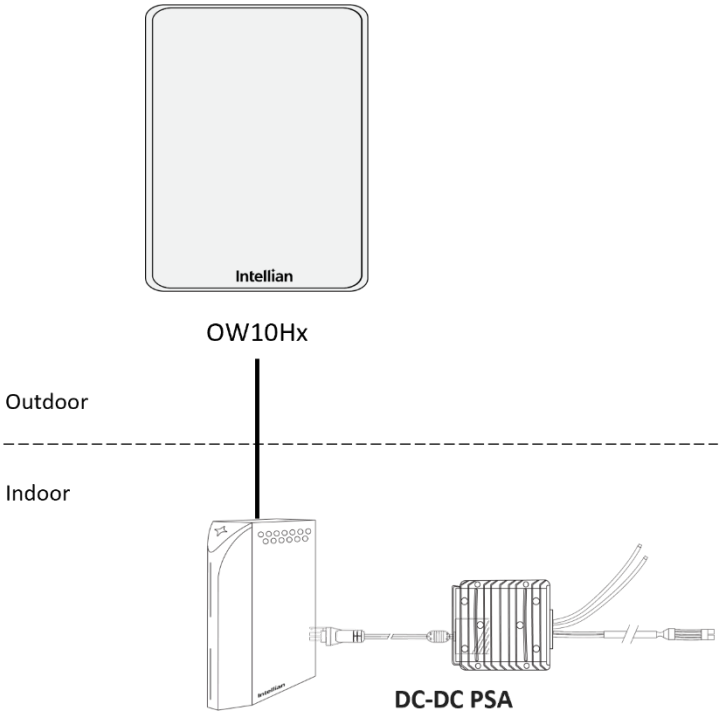


Figure 3: DC-DC System Configuration

Note: CNXs are interchangeable between CNX-BB and CNX-WIFI.

2. Packaging

2.1. What's in the box - OW10Hx

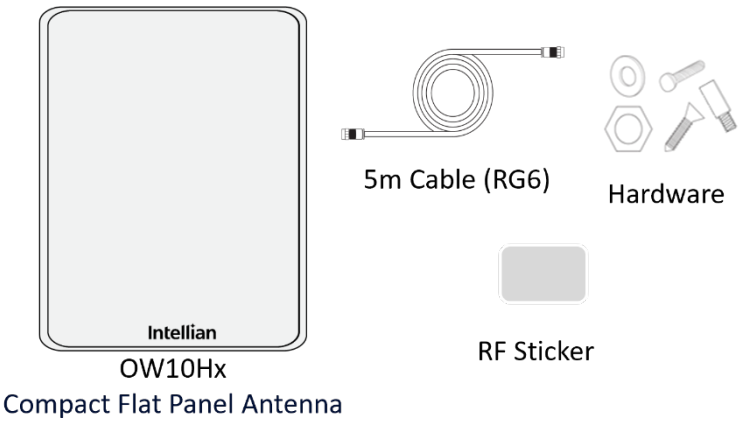


Figure 4: OW10Hx package items

Note: The OW10HL also includes an adjustable mount adapter (OW-6017) and grounding strap (BL1035).

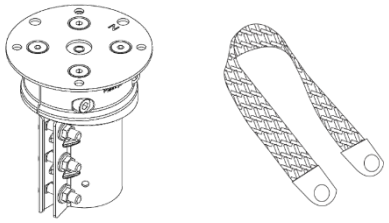


Figure 5: Adjustable Mount Adapter and Grounding Strap

2.2. What's in the box – CNX-WIFI

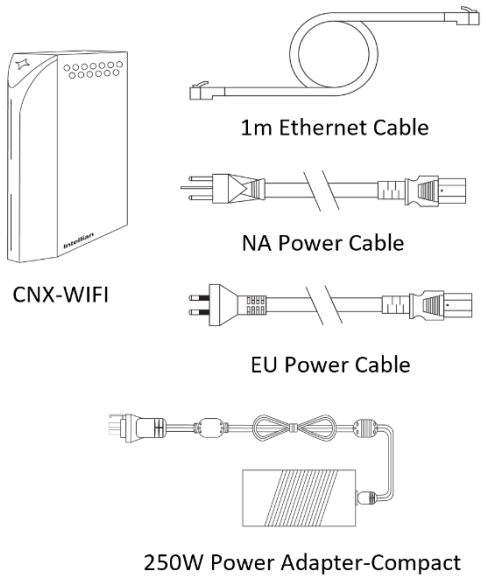


Figure 6: CNX-WIFI package items

2.3. What's in the box – CNX-BB

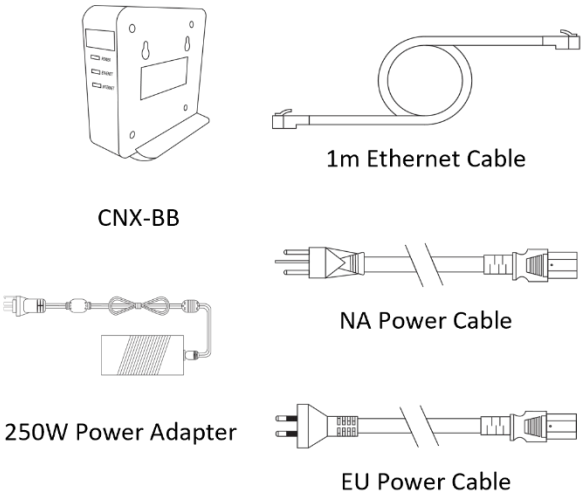


Figure 7: CNX-BB package items

2.4. What's in the box – DC-DC Converter Kit

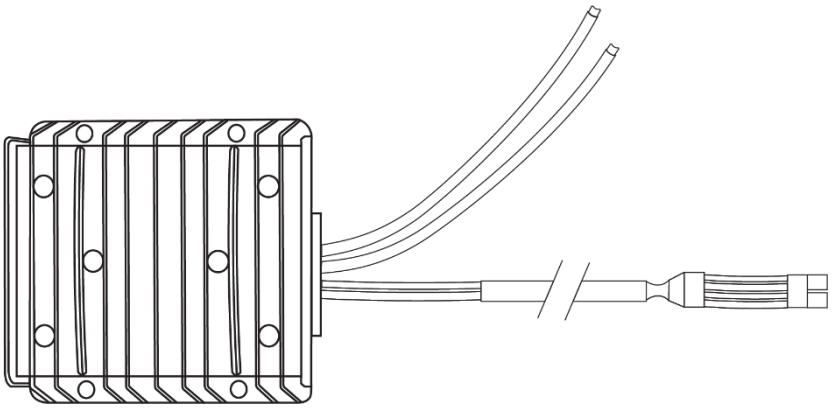


Figure 8: DC-DC Converter Kit

2.5. OW10Hx Packaging Details

Description (UT Box)	Qty	Specification
OW10Hx Outdoor Unit	1	
Adjustable Mount Adapter (OW-6017)	1	Land only
RG6 cable (5m)	1	
Flexible grounding braid	1	Land only
Hex bolt_M6_12	4	
Spring washer_M6	4	
Flat washer_M6	4	
Hex-S bolt_SF_M6	4	
OW10Hx QIG	1	
RF sticker	1	

Table 1: OW10Hx Packaging Details

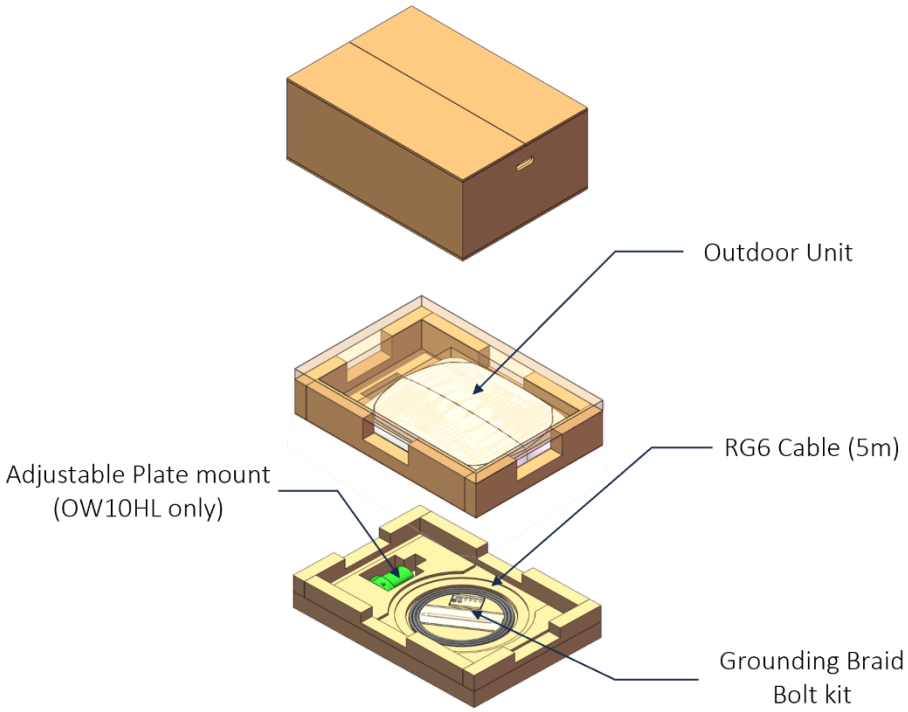
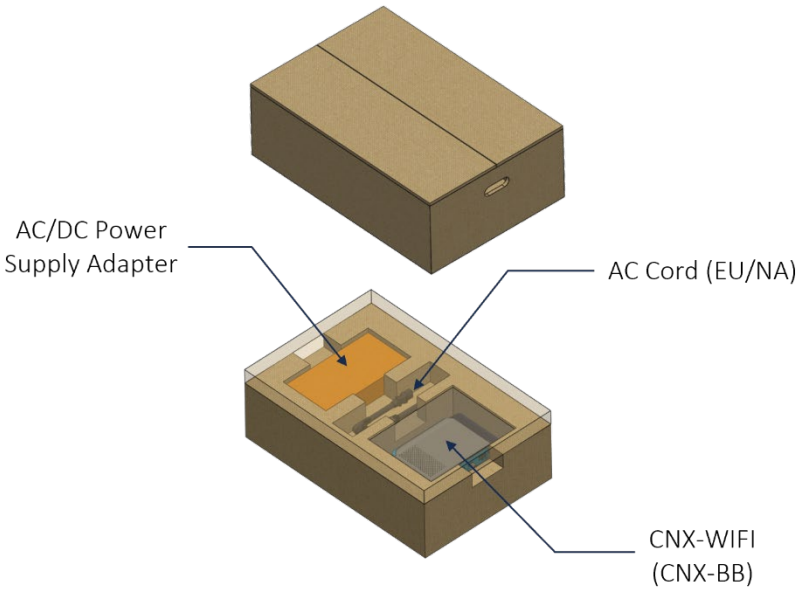


Figure 9: Outdoor Unit Packaging

2.6. CNX-WIFI Packaging Details

Description (CNX Box)	Qty	Specification
CNX-WIFI or CNX-BB	1	
Ethernet cable (RJ45)	1	
250W PSA	1	
AC power (220V)	1	
AC power (110V)	1	
CNX QIG	1	

Table 2: CNX Packaging Details



CNX Indoor Unit Package

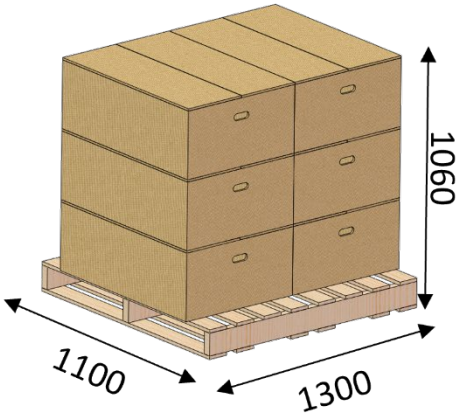
569 x 429 x 310 (W x D x H, mm)

Figure 10: CNX-WIFI Packaging

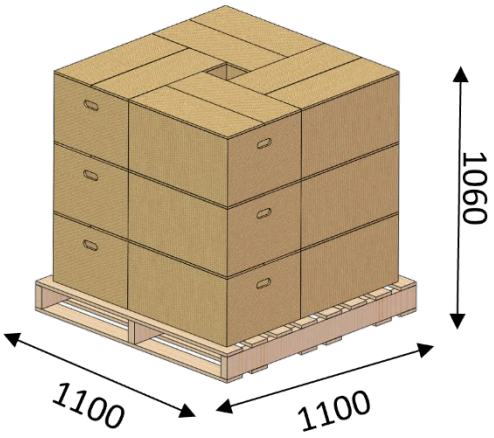
2.7. Pallets Dimensions and Weight

OW10Hx Size	1100 * 1100 * 1060
CNX-WIFI Size	1100 * 1100 * 1060
Weight (PST)	12.2kg/UT, TBC
Weight (CNX)	5kg/UT, TBC
Total weight	17kg/UT, TBC
ISTA 3E	~ Apr

Table 3: Pallet Dimensions and Weight



OW10Hx Packages on Pallet



CNX Packages on Pallet

Figure 11: Pallet Dimensions

3. Technical Specifications

3.1. Physical Specifications

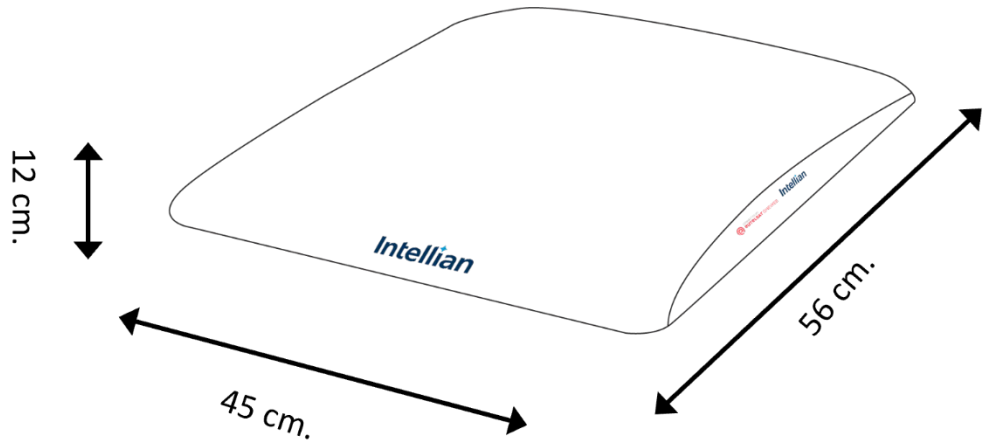


Figure 12: ODU Dimensions

3.1.1. Outdoor Unit (ODU)

Item	Target Specifications
Dimensions	56 cm. x 45 cm. x 12 cm. (22 in. 17.7 in. x 4.7 in.)
Weight	12.2 kg (27 lb.)

Table 4: ODU Dimensions

3.2. RF Specifications

Item		Specification
TX	Frequency	14.0 ~ 14.5 GHz
EIRP		+36.6 dBW (dual carrier) +33.6 dBW (single carrier)
Rx	Frequency	10.7 ~ 12.7 GHz
G/T		9 dB/K @ boresight
Antenna Polarization		RX – RHCP TX - LHCP

Table 5: Antenna RF specifications table

3.3. Outdoor Unit (ODU) Power

Item	Specification
Antenna Power Input	56VDC supplied from CNX-WIFI over Coax Cable
Antenna Power Consumption	180 W. (max)

Table 6: Power Specifications

3.4. Physical Connectors

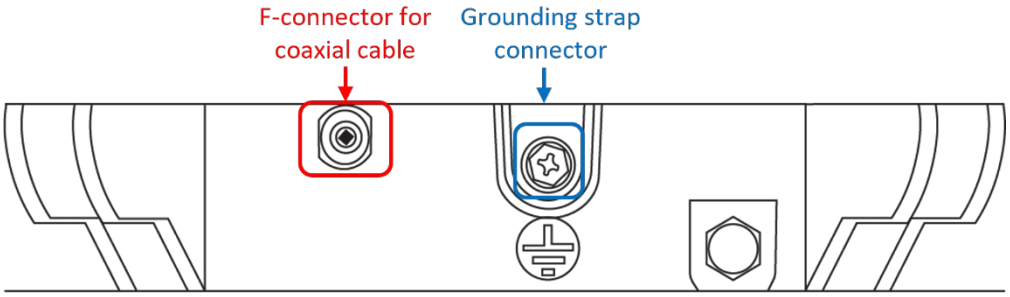


Figure 13: Physical Connectors

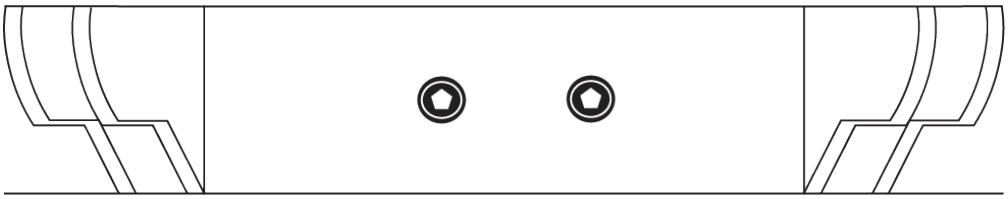


Figure 14: R-GNSS Connectors

3.5. Environmental Specifications

The environmental specifications applies to all ODU variants unless otherwise specified.

Item		Specification
Temperature (ODU)	Operational	-40°C to +55°C / Power on IEC-60945
	Storage	-40 °C to +85 °C / Power off IEC-60945
Wind		240 kph (149 mph)
Humidity		IEC-60068-2-30 Upper test Temp: +40°C (-3), Humidity 98% Lower test Temp: +15°C (+3), Humidity 71% ~ 78%
Vibration	Operational	IEC-60945 MIL-STD-810H (For Land Mobile and Maritime) MIL-STD-167-1 (For Land Mobile)
	Survival	IEC-60721-3-6 Class 6M3
Shock	Operational	IEC-60068-2-27 Method Ea 20g, 7 ms MIL-STD-810H (Land Mobile & Maritime)
	Survival (Transient)	IEC-60721-3-6 Class 6M3 type II 30g, 6 ms
	Survival (Bump)	IEC-60068-2-29 Method Eb 25g, 6 ms
Salt mist		Saline solution 5+/-1% NaCL Storage period of 7 days (IEC-60945)
Water proofing		IP66 (IEC-60529)
Solar		IEC 60945-Annex B Operational air temperature between -40°C and +45°C with the addition of 1120 Watt / m2 solar radiation

Table 7: Environmental Specifications

Note: The sound level of the antenna fans is </= 63 dB. This measurement was recorded using a sound-level meter meeting ANSI Standards and was set to the A-weighting scale and the slow response setting. This sound level meets the acoustic noise requirements for electronic equipment as described in Telcordia GR-63-CORE, and Telcordia GR-487-CORE.

3.6. Mobility Profiles

3.6.1. Maritime

Requirement	Specification
Maritime Profile	The Compact UT (OW10HM) shall support the following dynamic profile for marine vessels operating in moderate to rough sea conditions, while maintaining no more than 0.7deg motion induced beam pointing error: Maritime Class A Dynamics Angular Rate (deg/s): 14.0 +/- 3.0 (1-sigma) Angular Acceleration (deg/s^2): 75.0 Translational Acceleration (m/sec^2): 4.0 +/- 1.0 (1-sigma). The UT mobility system shall compensate for rotational motion on each axis (roll, pitch, yaw) that does not exceed a maximum rate of 17 deg/s.
Angular Velocity	The Compact UT (OW10HM) shall compensate for rotational motion on each axis (roll, pitch, yaw) that does not exceed a maximum rate of 17 deg/s. Commentary: The max. angular rates account for 95% of Class A maritime measurements, as described in GVF-105 "Performance and Test Guidelines for Type Approval of 'Comms On The Move' Mobile Satellite Communication Terminals.
Angular Acceleration	The Compact UT (OW10HM) shall compensate for angular acceleration on all axes that does not exceed a maximum rate of 75 deg/s/s. Commentary: The max. angular accelerations account for 95% of Class A maritime measurements, as described in GVF-105 "Performance and Test Guidelines for Type Approval of 'Comms On The Move' Mobile Satellite Communication Terminals.
Translational Acceleration	The Compact UT (OW10HM) shall compensate for translational acceleration on all axes that does not exceed a maximum rate of 5 m/s/s. Commentary: The max. translational accelerations account for 95% of Class A maritime measurements, as described in GVF-105 "Performance and Test Guidelines for Type Approval of 'Comms On The Move' Mobile Satellite Communication Terminals.
Shock & Vibe	The Compact UT (OW10HM) shall support COTM (Comms on the Move) operation while complying with MIL-STD-810H 514.8 vibration Procedure I, and MIL-STD-810H 516.8 shock Procedure I, as well as MIL-STD-167-1 vibration and shock profiles and shall maintain connection in a manner that ensures the end user doesn't perceive a pause or drop in connectivity when subjected to motion the motion profile defines in the "Mobility Performance - Maritime" Requirements.

Table 8: Maritime Mobility Profile

3.6.2. Land Mobile

Requirement	Specification
Land Mobile Profile	The Land Mobile UTs shall support the Class B Land Mobile motion profile as defined in GVF-105
Angular Velocity	The Compact UT (OW10HV) shall compensate for rotational motion on each axis (roll, pitch, yaw) that does not exceed a maximum rate of 16 deg/s.
Angular Acceleration – 1	The Compact UT (OW10HV) shall compensate for angular acceleration on the roll and pitch axes that does not exceed a maximum rate of 300 deg/s/s. Refer to GVF-105 Class B land mobile motion profile for additional details.
Angular Acceleration – 2	The Compact UT (OW10HV) shall compensate for angular acceleration on the yaw axis that does not exceed a maximum rate of 100 deg/s/s. Refer to GVF-105 Class B land mobile motion profile for additional details.
Translational Acceleration	The Compact UT (OW10HV) shall compensate for translational acceleration on all axes that does not exceed a maximum rate of 10 m/s/s. Refer to GVF-105 Class B land mobile motion profile for additional details.
Shock & Vibe	The Compact UT (OW10HV) shall support COTM (Comms on the Move) operation while complying with MIL-STD-810H 514.8 vibration Procedure I, and MIL-STD-810H 516.8 shock Procedure I, and shall maintain connection in a manner that ensures the end user doesn't perceive a pause or drop in connectivity when subjected to motion the motion profile as defined in the "Mobility Performance - Land Mobile" requirement.

Table 9: Land Mobile Mobility Profile

4. CNX-WIFI

4.1. CNX-WIFI Specifications

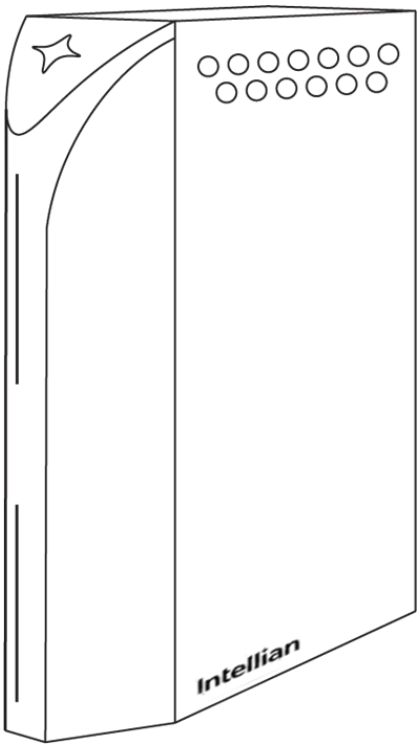


Figure 15: CNX-WIFI

Item	Specifications
Size (W x D x H)	21 cm. x 17 cm. 8 cm (8.3 in. x 7 in. x 3 in.)
Weight	0.6 kg. (1.3 lb.)
Form Factor	Desktop
Operating Temperature	0° to 40° C
Ingress	IP44
Power Consumption	18W (max)

Table 10: CNX-WIFI Specifications

4.2. Interfaces and LEDs

Item	Light Output	Description of status/function
Front Panel		
Status LED	Off	No Power
	Solid Blue	Connected to power supply
	Solid Red	Fault Condition
WIFI6 LED	Off	5G and 2.4G Disabled
	Blinking Blue	Data Activity
	Solid Blue	5G or 2.4G Enabled
WAN LED	Off	Coaxial Port Disconnected
	Blinking Blue	Data Activity
	Solid Blue	Coaxial Port Connected, but no data activity
Back Panel		
RJ45 LED MGMT (1) LAN (3)	Off	RJ45 Port Disconnected
	Blinking Blue	Data Activity
	Solid Blue	RJ45 Port Connected, but no data activity
WPS Button	Press WPS button	Ongoing/active WPS process
Reset Button	Press more than 5s	Reset the default configuration
Coaxial Port	Port	Coaxial cable F(M) - F(M) for CNX-WIFI power and data connection
Power Input	Port	To convert AC 100-240V power to DC +56V power for CNX-WIFI (250W)

Table 11: Interface LEDs

4.3. CNX-WIFI Shock and Vibration Specifications

Test	Test Item	Description
CNX-WIFI-ENV-003	Operational Shock	The CNX-WIFI shall meet the following shock profile with performance degradation or data transmission error as defined in as defined in the CNX-WIFI Requirement specification. All shock tests are half sine three times per each of the axes. The test method is in accordance with IEC60068-2-27. Test performance criteria will be defined in a separate test plan document. Test levels are defined as: • 2g, 20ms (half sine) Required • 4g, 20ms (half sine) Required • 10g, 11ms (half sine) Required • 20g, 11ms (half sine) Optional
CNX-WIFI-ENV-004	Non-Operational Shock	The CNX-WIFI shall operate correctly after being tested in accordance with the IEC 60068-2-27, at the following level: 40 G at 10 msec (half sine) on x, y, z axes.

CNX-WIFI-ENV-005	Operational Vibration	The CNX-WIFI shall remain operational when tested in accordance with the specified operational random vibration test defined in IEC

Table 12: CNX-WIFI Shock and Vibration

4.4. CNX-BB Specifications

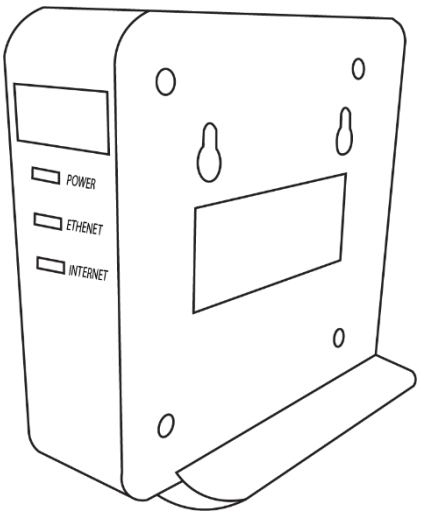


Figure 16: CNX-BB Dimensions

Item	Specification
Size (W x D x H)	13 cm. x 12 cm. 4 cm (8.2 in. x 6.7 in. x 3.1 in.)
Weight	0.25 kg. (.56 lb.)
Form Factor	Desktop
Operating Temperature	0° to 40° C

Table 13: CNX-BB Specifications

4.5. Interfaces and LEDs

Label	Light Output	Description of status/function
Front Panel		
POWER	Steady Green	The CNX is powered on.
	Off	The CNX is powered off.
ETHERNET	Steady Green	The user network is ready. There is a good physical connection and also, running through traffic stably connected.
	Blinking Green	The user network is connected. There is a physical connection.
	Off	The user network is not connected.
INTERNET	Blinking Green	The CNX Coaxial cable is connected. Its blinking frequency changes by the signal traffic. MoCA communication is established.
	Off	The CNX Coaxial cable is not connected properly. MoCA communication is not properly established.
Back Panel		
LAN 1	Blinking Green	Data Activity
	Solid Green	RJ45 port connected, but no data activity.
	Off	RJ45 port disconnected.
RESET	Press more than 5s	Reset the default configuration.
SAT	Port	Coaxial cable F(M) - F(M) for CNX-BB power and data connection
POWER	Port	To convert AC 100-240V power to DC +56V power for CNX-BB (250W)

Table 14: Interface LEDs

5. Mounting Options

5.1.1. Mounting Hole Pattern

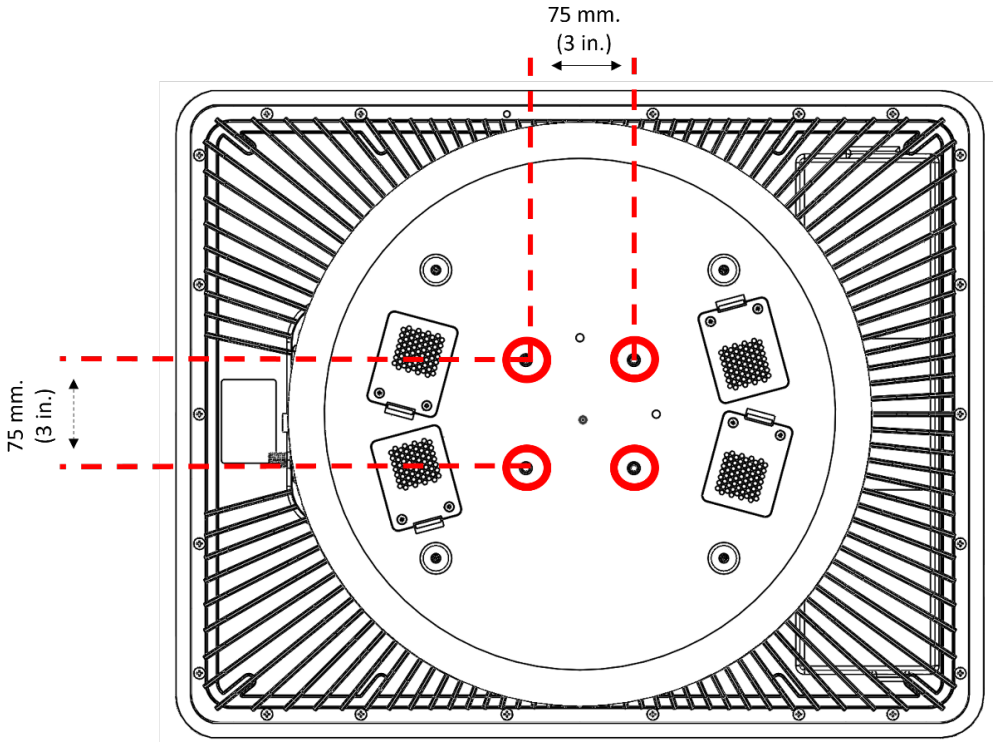


Figure 17: Mounting Hole Pattern 1

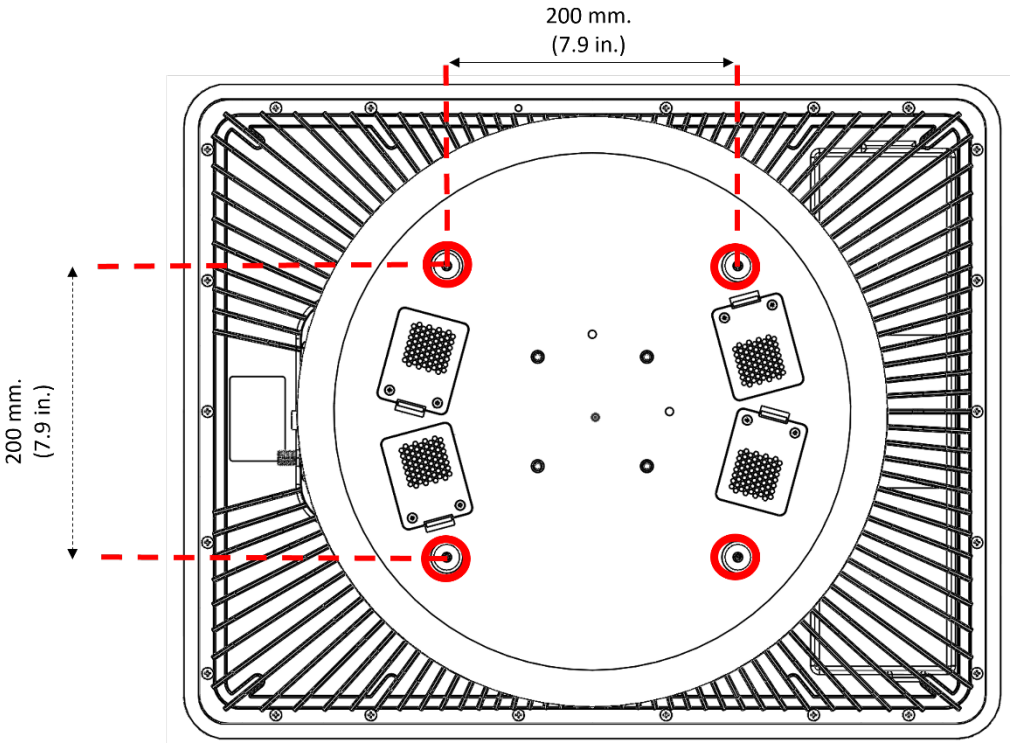


Figure 18: Mounting Hole Pattern 2

5.1.2. Adjustable Mount Adapter

5.1.2.1. Pole Mount Adapter

The adjustable mount adapter (OW-6017) is used with pole mounts of 60mm diameter. It has a built-in leveling tool for easy adjustments. Once the appropriate mount is assembled, attach the adjustable mount adapter, and ensure that it is level. Once it is level, attach the antenna to the adjustable mount adapter. The mount adapter has a built-in leveling tool for easy alignment with automated True North (TN) and Tilt Error (TE).

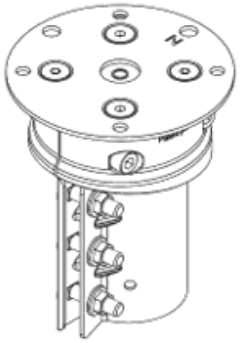


Figure 19: Mount adapter design

5.1.3. Maritime Mount Adapters

The Maritime Mount adapter kit consists of an adjustable mount adapter (OW-6017) and maritime mount adapter plate (OW-6019).

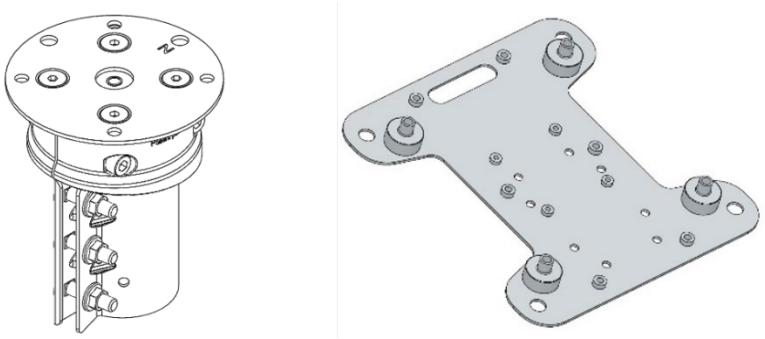


Figure 20: Adjustable Mount Adapter and Maritime Mount Adapter Plate

Examples of how the maritime mount adapter kit can be used are seen below.

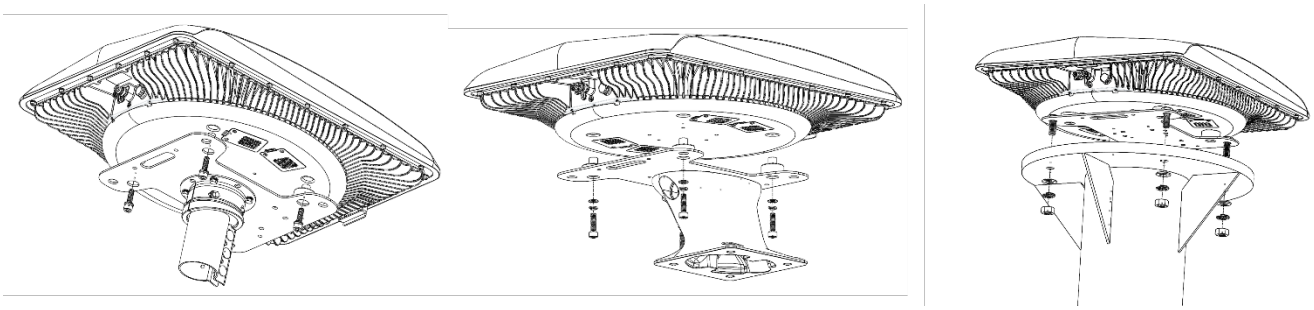


Figure 21: Maritime mounting options

5.1.4. Custom Mount Adapters Maritime

In the case a pedestal mount is used for the installation, custom mount adapter plates may be developed utilizing the Bolt Pattern included in the package.

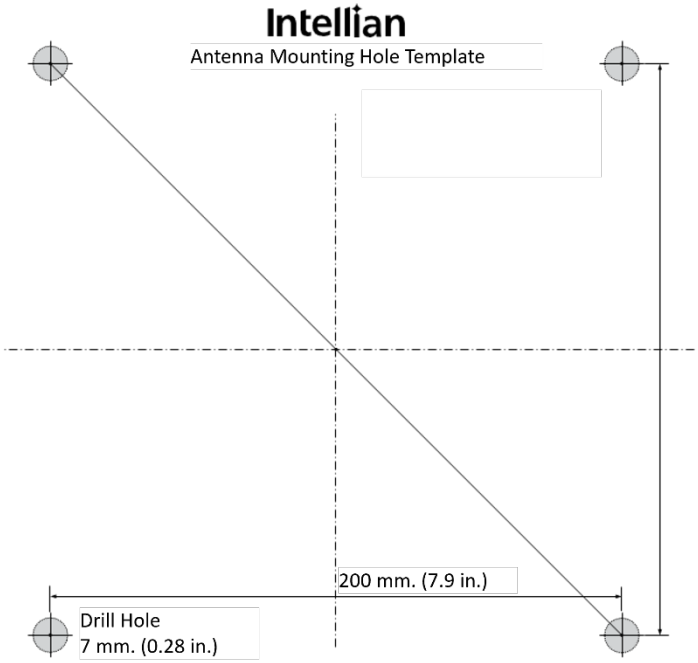


Figure 22: Bolt Pattern

5.1.5. Land Mobile Mount Adapters

The Land Mobile mount adapter kit (OW-6018) consist of two mount adapter rails and all associated hardware. This mount adapter kit can be used in conjunction with vehicle roof crossbars.

Attach Antenna to Mount Adapter

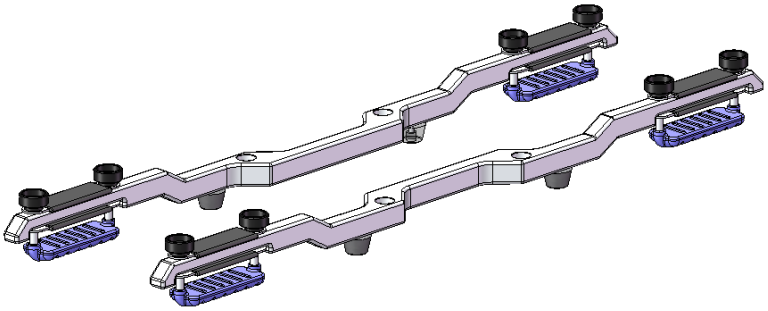


Figure 23: Land Mobile Mount Adapter

Attach the mount adapter to the base on the antenna using the provided hardware.

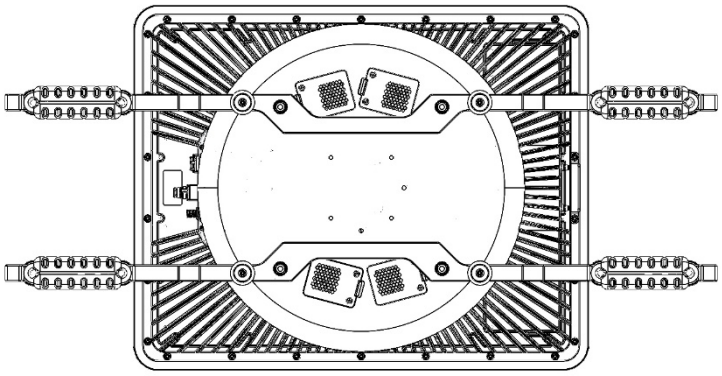


Figure 24: Attach Antenna to Mount Adapter

5.2. Supported Cable Types

Coaxial Cable Type	Part Number	Connector Type	Recommended Max. Cable Length
RG6	Belden 1694A	UNC N-006AT-CP-0	60 m. (197 ft.)
RG6	D06AQBT600O21UBK2A	UNC N-006AT-CP-0	60 m. (197 ft.)
RG11	011177T04BK401HN10R1	Holland SLCU-11Q	150 m. (492 ft.)
RG11	011WTBA950EO1UBKXA	Holland SLCU-11Q	140 m. (460 ft.)
LMR400, 50 Ohm	LMR-400-FR-BULK	(TMS) Amphenol EZ-400-NMH-X	230 m. (755 ft.)
LMR600, 50 Ohm	LMR600	(TMS) Amphenol EZ-600-NMH-X	400 m. (1312 ft.)

Table 15: Recommended Cable Length Table

6. Regulatory & Compliance

6.1. Safety Compliance

It is expected that the terminal as a minimum will comply with the following:

Item	Specification
FCC	47 CFR FCC Part 2 (General) and Part 25 Satellite Communication 47 CFR Part 15 Subpart B and Class B EMC regulations
RED	Radio Equipment Directive 2014/53/EU
EIRP	EIRP spectrum density mask 1503-3v2 provided by OneWeb in the document OW-UT TN00184
ETSI	ETSI EN 301 489-1 and EN 301 489-12
EMC	EN 55032 Class B/CISPR 22 Class B IEC 60945 EN 61000-3-2 EN 61000-3-3 EN 55035/CISPR 35 IEC/EN 61000-4-2 IEC/EN 61000-4-3 IEC/EN 61000-4-4 IEC/EN 61000-4-5, Class 4 IEC/EN 61000-4-6 IEC/EN 61000-4-11 IEC/EN 61643-21 ANSI C63.4/.10 Federal Communications Commission (FCC) Rules, Part 15, Subpart B, Class A and Class B digital devices
RF	47 CFR FCC Part 1.1310 and Part 2.1091 ECC 1999/519/EC and EN 50385 ETSI EN 303 980 FCC CFR 47, Part 25, Subpart C
Safety	IEC/EN/UL/CSA 62368-1 IEC 62311 IEC/EN/UL/CSA 60950-22 IEC 62368-1
CE	UT-RAD-002
RoHS	RoHS (2011/65/EU)
WEEE	WEEE (2012/19/EU)
REACH	REACH (EC 1907/2006)

Table 16: Regulatory Compliance Table

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