

2.6.8 Connect the rest of the Cables

For each of the units, connect the cables as follows:

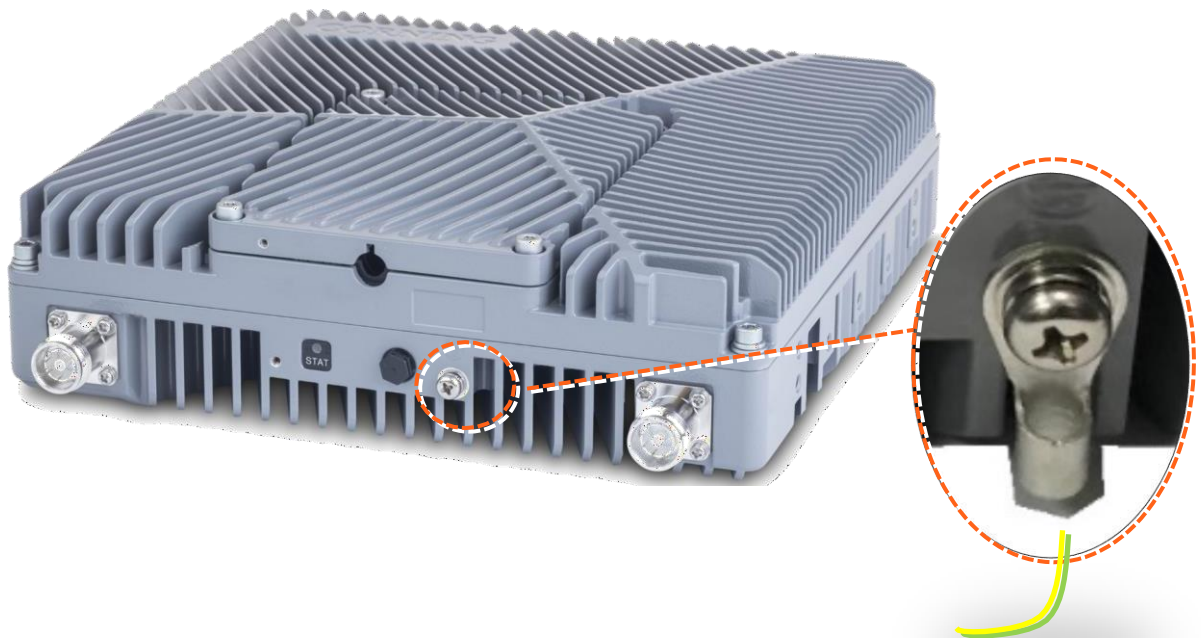
- Ground, see 2.6.8.1
- Antenna, see 2.6.8.2

2.6.8.1 Ground

Note: Ground according to local regulations

The following additional (not supplied) tools and components are required for connecting the system ground:

- Grounding wire - grounding wire should be sized according to local and national installation requirements. The provided grounding lug supports 14 AWG to 10 AWG stranded copper (or 12 AWG to 10 AWG solid) wire conductors.
1. Use a wire-stripping tool to remove approximately 0.4 inch (10.9 mm) of the covering from the end of the grounding wire
 2. Insert the stripped end of the grounding wire into the open end of the grounding lug
 3. Crimp the grounding wire in the barrel of the grounding lug. Verify that the ground wire is securely attached to the ground lug by holding the ground lug and gently pulling on the ground wire
 4. Prepare the other end of the grounding wire and connect it to an appropriate grounding point at the site to ensure adequate earth ground



2.6.8.2 Antenna

Connect the MRU male 4.3-10 Type duplexed RF “ANTENNA” port to the broadband antenna(s) using appropriate coax cables.



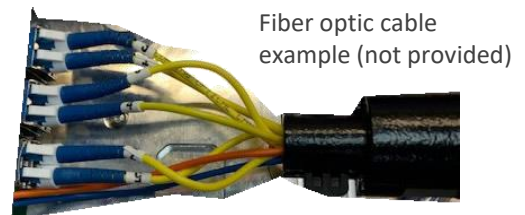
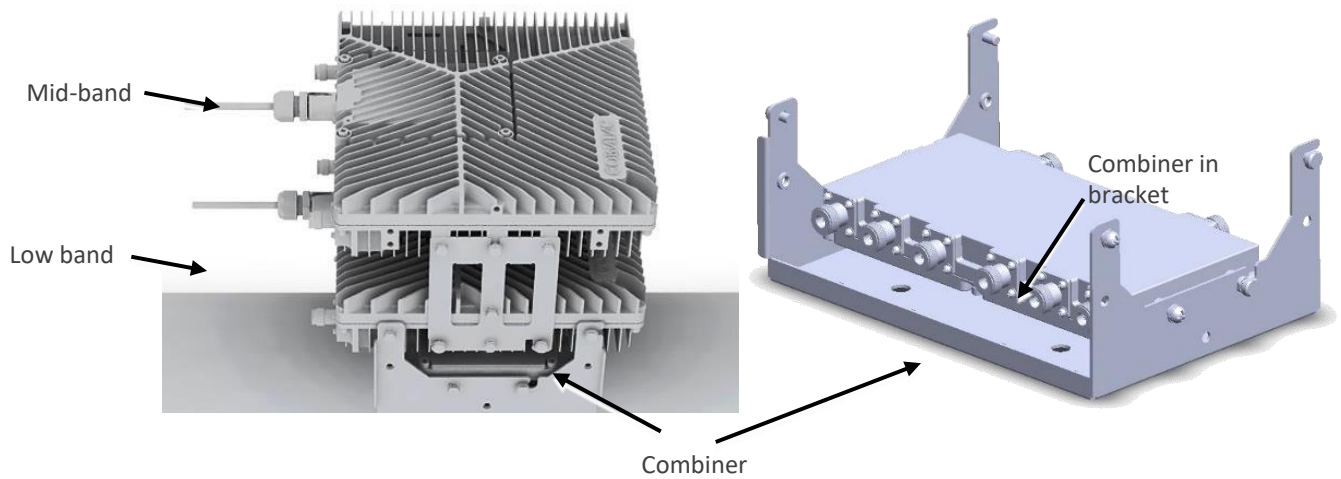
Notes:

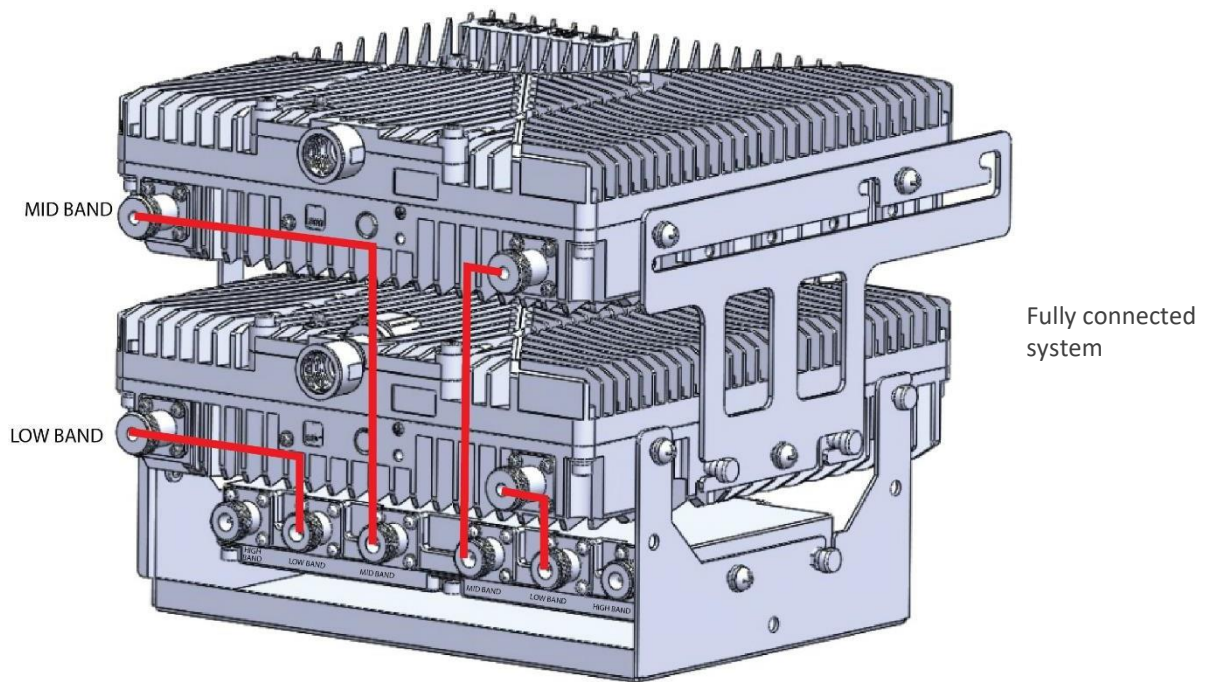
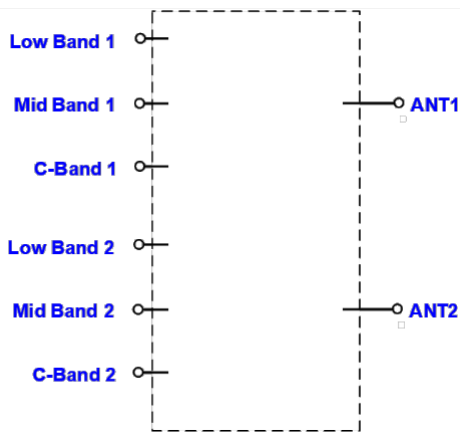
1. To avoid MIMO disruption, ensure the antennas are connected correctly according to the combiner labels.
 2. There may be some configurations/use-cases where a combiner is not required, as there is only one type of unit (either low or mid band)
-

2.6.9 Combiner cables

Connect the Antenna cables according to the figure below.

NOTE: C-Band is for future use.





Notes:

1. To avoid MIMO disruption, ensure the antennas are connected correctly according to the combiner labels.
2. There may be some configurations/use-cases where a combiner is not required, as there is only one type of unit (either low or mid band)

2.6.10 Verify normal operation

The following table describes the LRU LED behaviour.

MODULE LED	Outside the module		
Status	Description	Color	State
Power Up	The LPR was powered up	Green	Solid
RUN	The system is up and running	Green	Blinking (1Hz)
Identify	Identify RU was activated	Green	Blinking (2Hz)
Over temperature	The LPR temperature exceeded the max. range	Red	Blinking (1Hz)
HW Failure	HW failure occurred	Red	Solid
SFP LED (Same as DRU)			
SFP LEDs	Inside the module		
Status	Description	LED State	
		Green	Amber
SFP Plugout	SFP Plugout	OFF	OFF
Optic Link Fail	1. Optic cable disconnected	OFF	ON
	2. SFP fail		
	2.1 SFP fault		
	2.2 SFP warning		
	2.3 SFP alarm		
	3. CPRI link down		
Optic Link Ok	1. Optic cable connected	ON	ON
	2. SFP ok		
	3. CPRI link down		
CPRI Link Ok	1. Optic cable connected	ON	OFF
	2. SFP ok		
	3. CPRI link up		

2.7 MRU (Digital Medium-power Remote Unit) Installation

dMRU Notes:

- * Equipment with permanently connected to PE, conductor for installation of this conductor is carried by a skilled person.
- * The shield of the coax cable shall be connected to PE .
- * Equipment for use in locations where children not likely to be present.
- * dMRU DC shall be provided with double pole circuit breaker rated maximum 20A and having contact separation at least 3mm.

2.7.1 Verify Box Contents

1. Open the package and verify all elements are available according to the following table.





Notes:

- * for details see APPENDIX B: Ordering information
- * See unpacking example underneath the table.

Table 6: MRU Package Items List

Item Description	Flavor	PN	Image
Mid-power Remote Unit Chassis (includes two rack ears for 19-in rack – factory assembled onto sides of MRU) Quantity: 1	AC Chassis		
	dMRU Chassis Assembly with: DOPTM, FAM, Mid-Plane, Cavity Filter, MUX and AC power supply	dMRU-ASM-AC	
	dMRU-AC supported assembly with three dPAM modules - 600/700, PCS and WCS	dMRU-671923-AC	
	dMRU-AC supported assembly with four dPAM modules - 600/700, 800/850, AWS and PCS	dMRU-6781719-AC	
	dMRU-AC supported assembly with five dPAM modules - 600/700, 800/850, AWS, PCS, WCS and 2.5	dMRU-67817192325-AC	
dMRU-AC supported assembly with five dPAM modules - 600/700, 800/850, AWS, PCS and WCS	dMRU-678171923-AC		

Item Description	Flavor	PN	Image
	dMRU-AC supported assembly with three dPAM modules - 600/700, 800/850 and PCS	dMRU-67819-AC	
	dMRU-AC supported assembly with four dPAM modules - 600/700, 800/850, PCS and WCS	dMRU-6781923-AC	
DC Chassis			
	<i>dMRU Chassis Assembly with: DOPTM, FAM, Mid-Plane, Cavity Filter, MUX and DC power supply</i>	dMRU-ASM-DC	
	dMRU-DC supported assembly with three dPAM modules - 600/700, AWS and PCS	dMRU-671719-DC	
	dMRU-DC supported assembly with three dPAM modules - 600/700, PCS and WCS	dMRU-671923-DC	
	dMRU-DC supported assembly with four dPAM modules - 600/700, 800/850, AWS and PCS	dMRU-6781719-DC	
	dMRU-DC supported assembly with five dPAM modules - 600/700, 800/850, AWS, PCS and WCS	dMRU-678171923-DC	
	dMRU-DC supported assembly with five dPAM modules - 600/700, 800/850, AWS, PCS, WCS and 2.5	dMRU-67817192325-DC	
	dMRU-DC supported assembly with three dPAM modules - 600/700, 800/850 and PCS	dMRU-67819-DC	

Item Description		Flavor	PN	Image
		dMRU-DC supported assembly with four dPAM modules - 600/700, 800/850, PCS and WCS	dMRU-6781923-DC	
		dMRU CHASSIS ASSEMBLY WITH: DOPTM, FAM, MID-PLANE, CAVITY FILTER, MUX	dMRU-CHS-ASM	
Brackets	Wall mount bracket for dMRU Screws, flathead,8-32X3/8 (Quantity: 11)	1	BR-dMRU-W	
DC connector class 1 mating		1		
Not provided				
AC Power Cable (AC models only)	Cable, power, straight, U.S 10 A ,UL, L = 1.8-2.5m ,black,110 V	1		
	SFP+ Pluggable Transceivers (hot-pluggable optical transceiver module); Support for option 8 line-rate 10.1 Gbps, single mode	?		
	Termination plug (for test port and 3.5 GHz port)			
	Optical cables Up to 900 meters LC/UPC SM DX			
	Grounding cable: The provided grounding lug supports 14 to 10 AWG stranded copper (or 12 to 10 AWG solid) wire conduction			
	Service-specific power amplifier modules (PAMs), that are NOT provided		HRU-dHPOM	

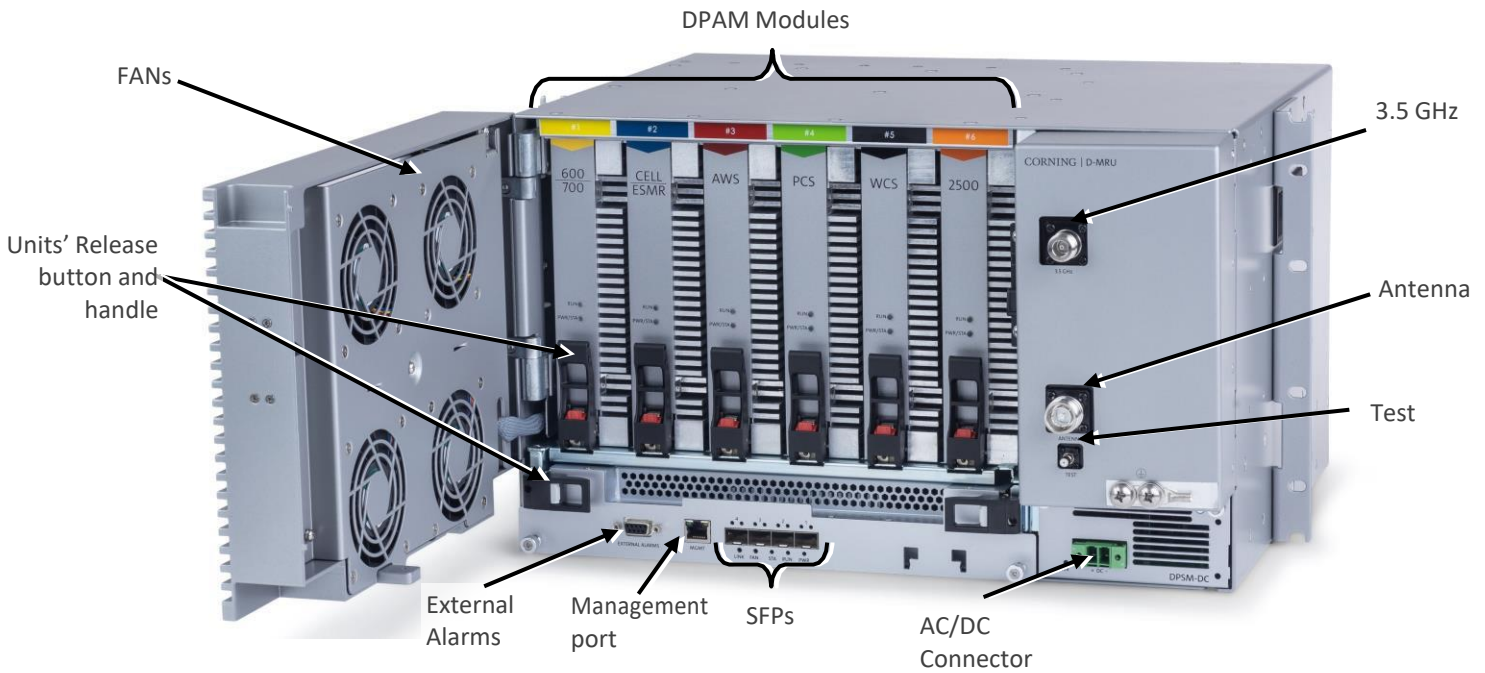
➤ **Example Package Unpacking**

For an ordered package of PN *dmru-asm-ac*: Open the box and verify the following units are available:

DOPTM, FAM, Mid-Plane, Cavity Filter, MUX and AC power supply.

The units are to be entered into the chassis according to the installation instructions below.

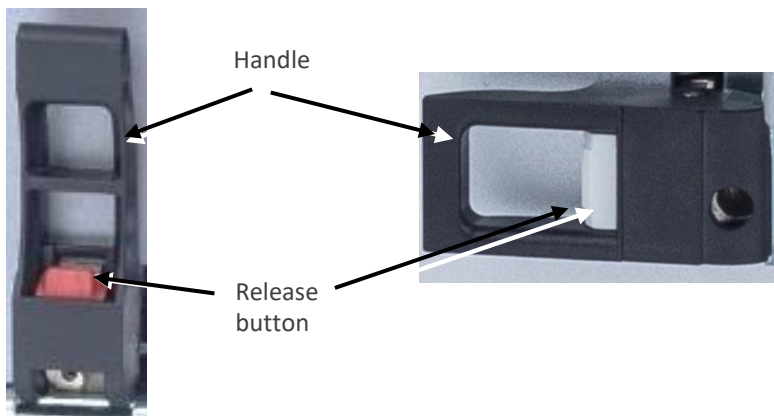
2.7.2 MRU Interfaces



Warning! In the event that a PAM or the OPTM needs to be removed from the chassis, make sure to first press the release button on the module and then pull out using the handle. Any attempt to pull out the module without first releasing may cause damage.

Corning will not be liable for damage of products resulting from improper handling during installation or repair.

PAMs are entered to their relevant slots by matching the color of the PAM and the color on top of the slot.



Notes:



- * MRU chassis requires 6U rack height availability
- * Rack nuts and screws not provided
- * Digital optical module & FAN are pre-installed in the chassis

2.7.3 Mount chassis in 19-in Rack

Note: for dimensions and specifications refer to chapter 11

1. Before mounting the chassis: unwrap each of the PAMs, and enter each PAM to its dedicated slot inside the chassis, according to the color-codes:



2. Determine the location of the MRU in the rack while considering additional units (e.g. power supply)
3. Referring to Figure 11 secure the units' rack ears to the rack frame as follows:
 - a. Insert two screws halfway into the rack frame (one on each side)
 - b. Position the bottom half slots of the chassis rack ears onto the screws
 - c. Secure the unit in the rack via remaining applicable bracket holes using the appropriate rack nuts and screws

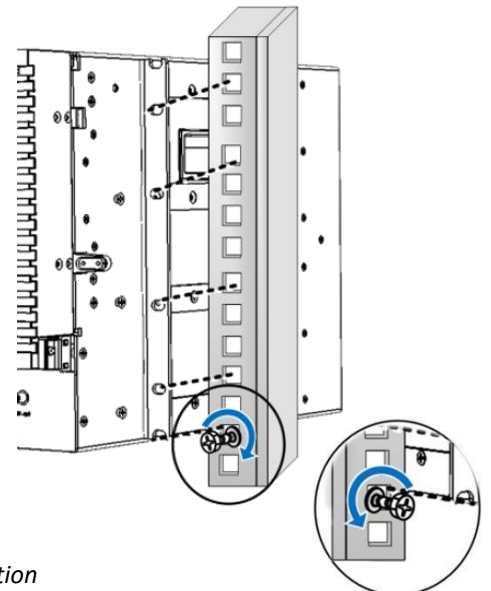


Figure 11. Example of MRU Chassis Rack Installation

2.7.4 Wall Mount

This section provides instructions on how to assemble the wall-mount bracket onto the MRU and mount the assembly on the wall (belly-to-wall installation).



Note: The installer is responsible for accommodating the installation to the surface type. The mounting surface shall be capable of supporting the weight of the equipment. The weight of a fully populated MRU chassis is 92.59 lbs (42 kg).



ATTENTION! In the event that a PAM or the OPTM needs to be removed from the chassis, make sure to first press the release button on the module and then pull out using the handle (see Error! Reference source not found.). Any attempt to pull out the module without first releasing may cause damage.

Corning will not be liable for damage of products resulting from improper handling during installation or repair.



Caution: Due to the chassis + 6 DPAMS weight, it is recommended the unit is carried by two persons, to avoid damage to the system.

➤ To mount the MRU onto the wall

1. Select location and mark and drill appropriate holes in the wall

IMPORTANT! MRU is installed belly-to-the-wall with door opening rightward.



Note: Make sure that there is at least 16 inches of clearance to open the MRU door to the right and to successfully remove and replace all modules.

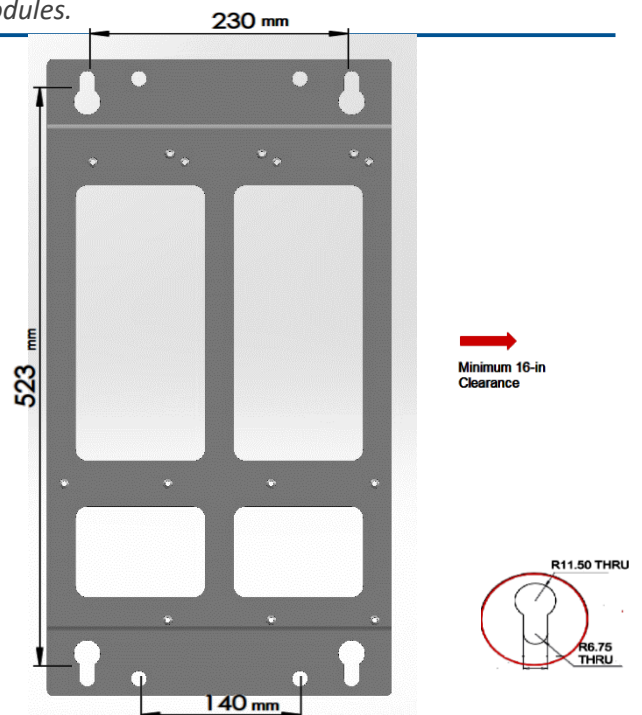
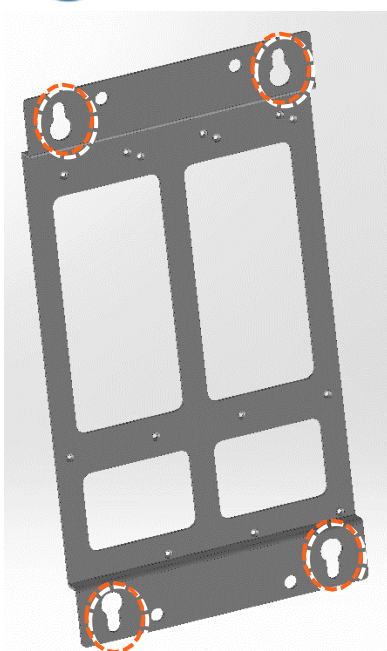
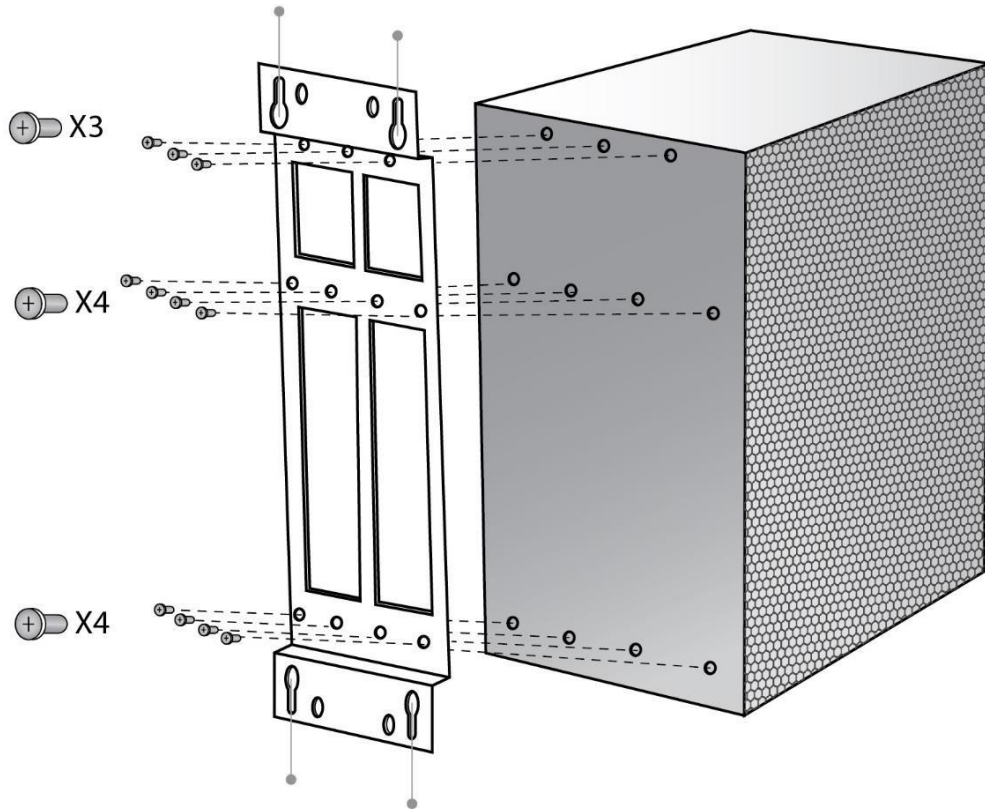


Figure 12: Wall Mount Bracket

- 2. Assemble the wall-mount bracket to MRU underside



- 3. Insert anchors in wall, hang unit and tighten to secure

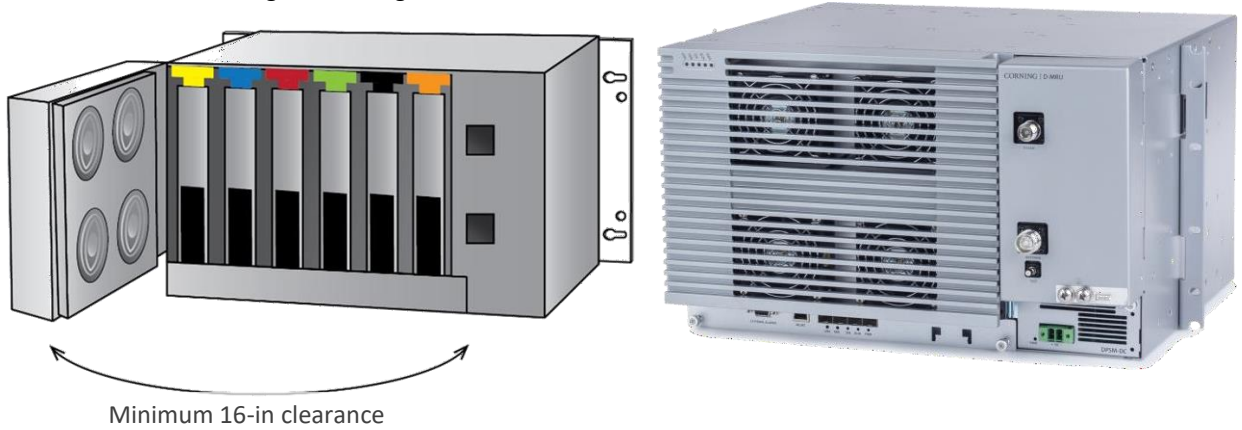


Figure 13. Example of MRU Chassis wall Installation

2.7.5 Ground MRU Chassis

The grounding connection is performed via a two-hole, standard barrel grounding lug located on the front of the MRU chassis.

➤ Required tools and components

The following additional (not supplied) tools and components are required for connecting the system ground:

- Grounding wire - grounding wire should be sized according to local and national installation requirements. The provided grounding lug supports 14 AWG to 10 AWG stranded copper (or 12 AWG to 10 AWG solid) wire conductors.

Note: The length of the grounding wire depends on the proximity of the switch to proper grounding facilities.

- Phillips-head screwdriver
 - Crimping tool to crimp the grounding wire to the grounding lug.
 - Wire-stripping tool to remove the insulation from the grounding wire
4. Use a wire-stripping tool to remove approximately 0.4 inch (10.9 mm) of the covering from the end of the grounding wire
 5. Insert the stripped end of the grounding wire into the open end of the grounding lug
 6. Crimp the grounding wire in the barrel of the grounding lug. Verify that the ground wire is securely attached to the ground lug by holding the ground lug and gently pulling on the ground wire
 7. Prepare the other end of the grounding wire and connect it to an appropriate grounding point at the site to ensure adequate earth ground



Figure 14: MRU Grounding Lug

2.7.6 Connect Fiber SFP+

Note: use SFP+ from the approved list provided by Corning.

1. Remove the rubber stopper from the source port.
2. Push the SFP+ connector into the port, until it clicks (note that there is only one correct direction for plugging-in).
3. Remove the white plug-protectors from the end of the SFP+ cable.
4. Plug the SFP+ cable into the D-MRU port until it clicks.
5. connect the other edge of the cable to the source unit

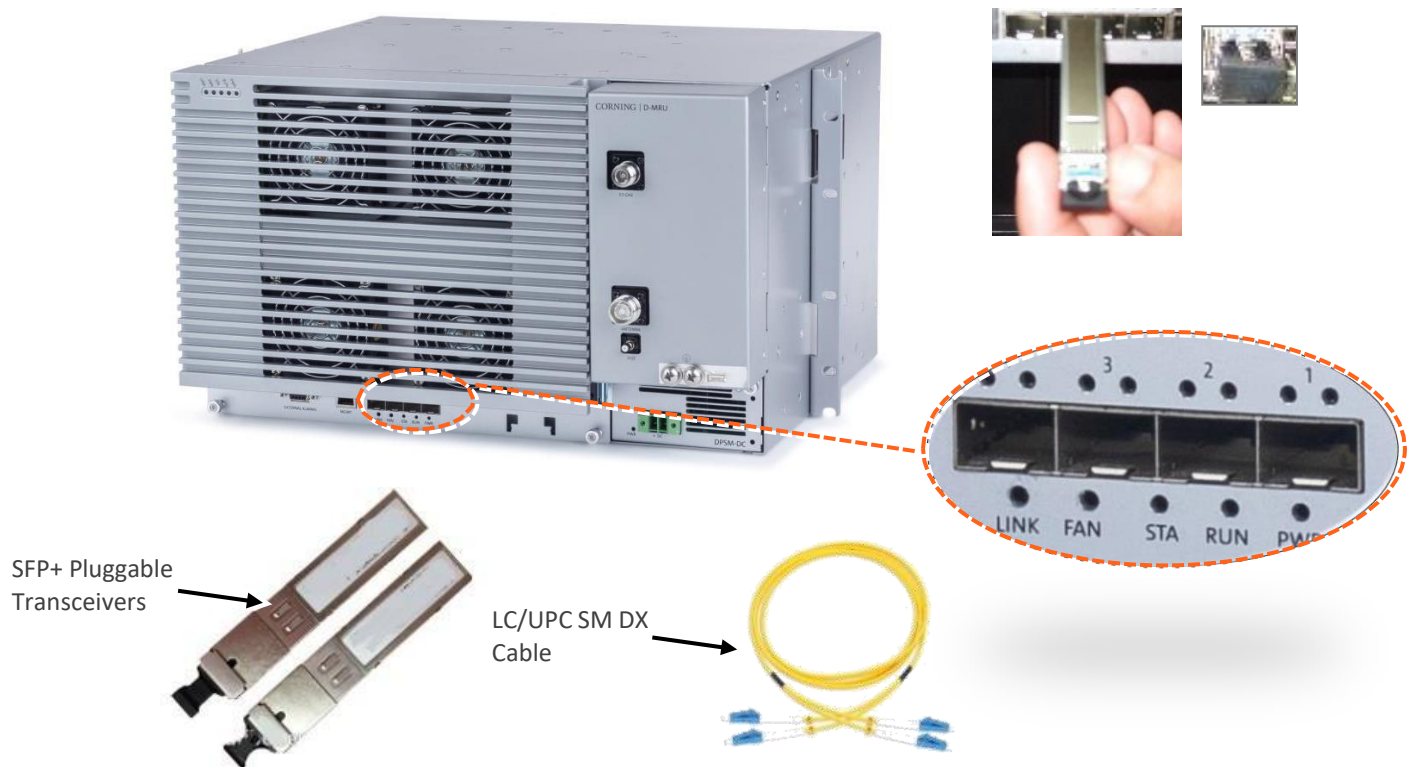
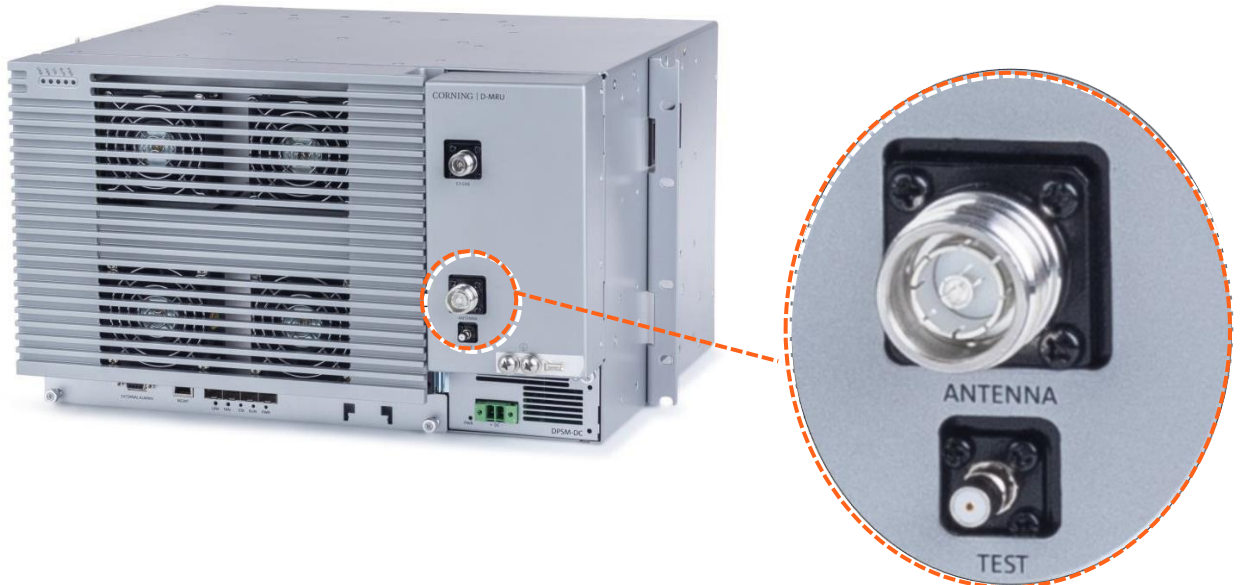


Figure 15 Remove rubber stopper from port and from SFP+ Pluggable Transceiver and insert the SFP+ Pluggable Transceivers (hot-pluggable optical transceiver module) into the port.

2.7.7 Connect Antenna

NOTE: The MRU has one output, that can be split via passive splitters.

1. Connect the MRU male 4.3-10 Type duplexed RF "ANTENNA" port to the broadband antenna(s) using appropriate coax cables.

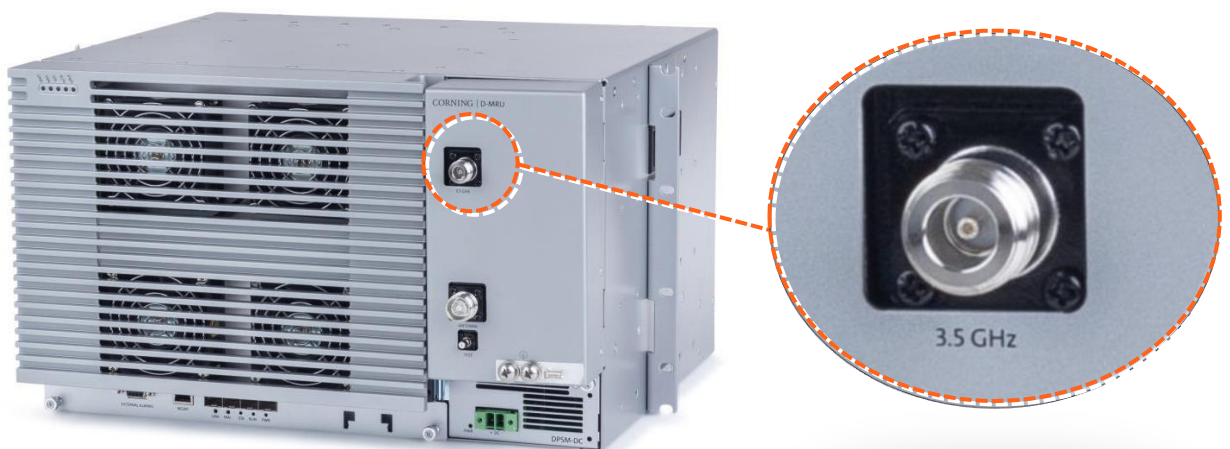


Note: The test port is used for coupling; used for measuring the power without disconnecting the antenna.

2.7.8 External RF Source (3.5 GHz)

The MRU includes one N-Type Female RF port used for connecting to an external RF source, such as, a small cell or Pico cell.

*Note: This external RF cavity port is market specific and may not be applicable to certain markets
For future CBRS/C-Band services at 3.5 GHz.*



2.7.9 Connect Power & POWER UP

The MRU PSM is located on the bottom right of the chassis front. The PSM type (AC/DC) is model dependent.

- Refer to section 2.4.7.1 for AC models.
- Refer to section 2.4.7.2 for DC models

2.7.9.1 AC models

WARNING! Approved power cable – the entire length of the power cable (or flexible cord) and the insulation must be intact. The cable must be firmly connected to both the electrical plug and the unit itself.



Standard plug – the use of a standard plug is mandatory. The use of a non-standard power plug can cause electrocution! Also, plugging a non-standard plug into a standard socket that does not correspond to the plugs' shape, can damage the socket making it a safety hazard



AC Power Connection

Connect the MRU power connector to the AC power source using the provided AC power cable:

- Power input: 100-240 VAC/50-60 Hz
- Power consumption: 620 W (maximum)
- Maximum AC current consumption: 7 A

2.7.9.2 DC Models

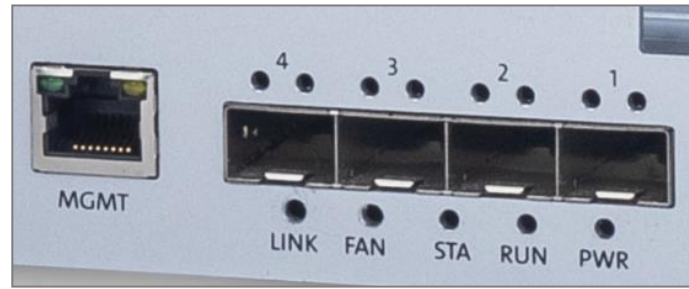
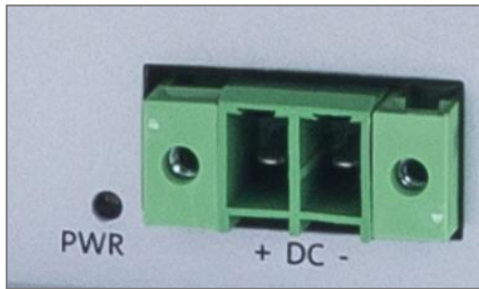
DC model includes Class 1 terminal block connector:

- Power input: 36-60VDC
- Power consumption: 580W (maximum)
- Maximum DC current consumption: 16A



1. Open PSM captive screws and pull-out module from chassis.
2. Set DC input source type to "CLASS1" connector and secure PSM module back in place. See Figure 8.
3. Route DC pair from CLASS1 connector to local power source; Power input: 48 VDC (40-60 VDC) 15 A max

2.7.10 Verify Normal Operation



LEDs

1. Verify that fans are operational.
2. Refer to status LEDs on the top-left of the chassis door and on each PAM to confirm normal system operation according to the following table:

Table 7: MRU Chassis and DOPTM LEDs

LED Name	Status	Description	Color	State
Power	Power on	The dMRU was powered up	Green	Solid
Run	Run mode	The system is up and running	Green	Blinking (1Hz)
	Identify	Identify RU was activated	Green	Blinking (2Hz)
Status	System O.K.	System up and running	Green	Solid
	HW Failure/TDD Sync Loss	HW failure or sync loss in the TDD PAM occurred	Red	Solid
FAN	Fan working properly	Fan working properly	Green	Solid
	Minor problem in fan module	One or more fans exceed the expected fan velocity	Amber	Solid
	Major problem in fan module	One or more of the fans stopped working	Red	Solid
Link	Link O.K.	There is a connection to the head end equipment	Green	Solid
	Link is down	There is no connection to the head end equipment	-	Off

Table 8: PAM LEDs

LED Name	Status	Description	Color	State
Power/Status	PAM O.K.	Power exist and no alarms	Green	Solid
	HW Failure	There is any alarm in the PAM	Red	Solid
	TDD Sync acquiring	The TDD PAM is in process of final syncing on TDD pattern	Green	Blinking (1Hz)*
Run	Run mode	The system is up and running	Green	Blinking (1Hz)*

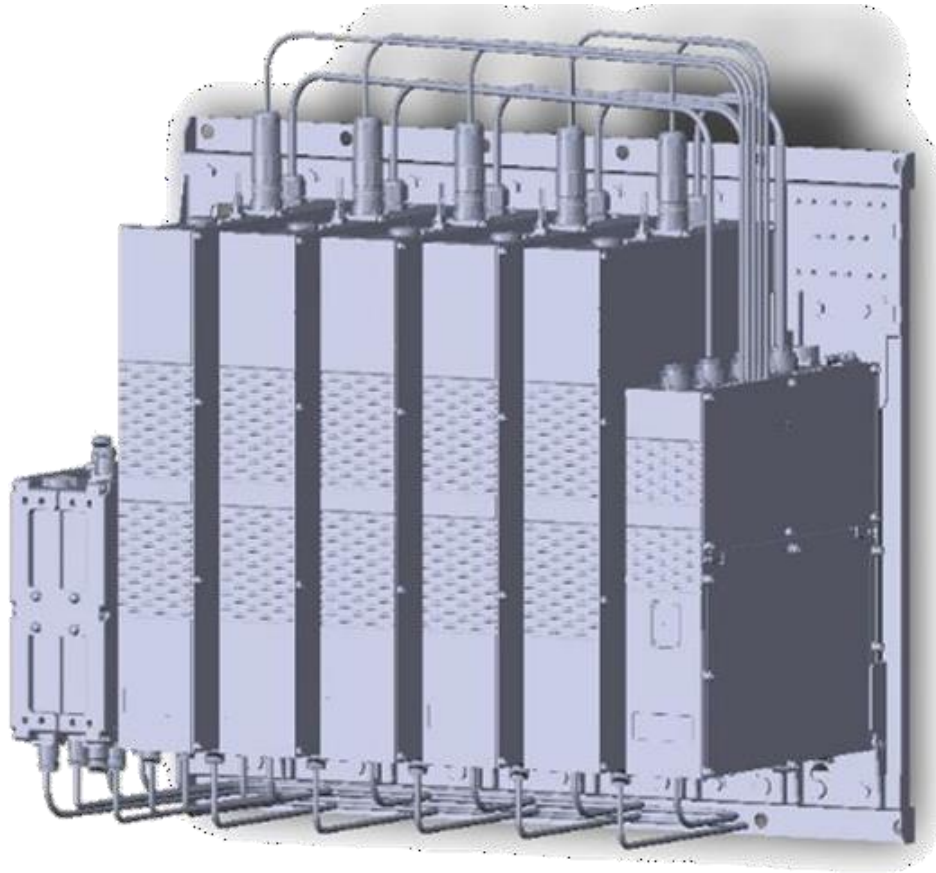


Table 9: SFP LEDs

Status	Description	LED State	
		Green	Amber
SFP Plug out	SFP Plug out	OFF	OFF
Optic Link Fail	1. Optic cable disconnected	OFF	ON
	2. SFP fail		
	2.1 SFP fault		
	2.2 SFP warning		
	2.3 SFP alarm		
3. CPRI link down			
Optic Link Ok	1. Optic cable connected	ON	ON
	2. SFP ok		
	3. CPRI link down		
CPRI Link Ok	1. Optic cable connected	ON	OFF
	2. SFP ok		
	3. CPRI link up		

2.8 HRU Installation

dHRU comes in various formats, according to customer needs. An example is brought bellow:



To install the dHRU, follow these steps:

1. Verify your box contents, according to the specific model ordered, see 2.8.1
2. Review the system elements and interfaces, see 2.8.2
3. Install the system, see 0

2.8.1 Verify Box Contents





1. Open the package and verify all elements are available according to the following table.




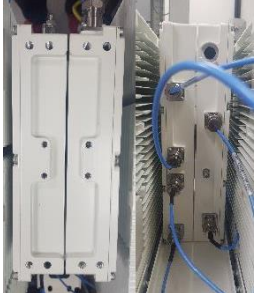
Notes:

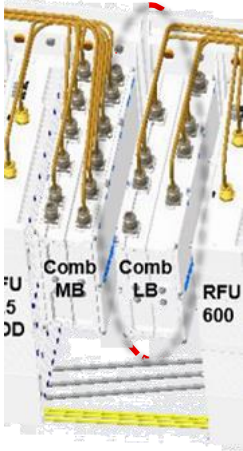

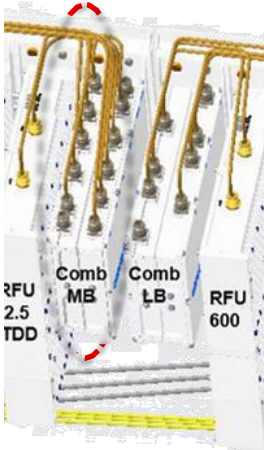

** for details see APPENDIX B: Ordering information*



** See unpacking example underneath the table.*

Table 10: dHRU Package Items List

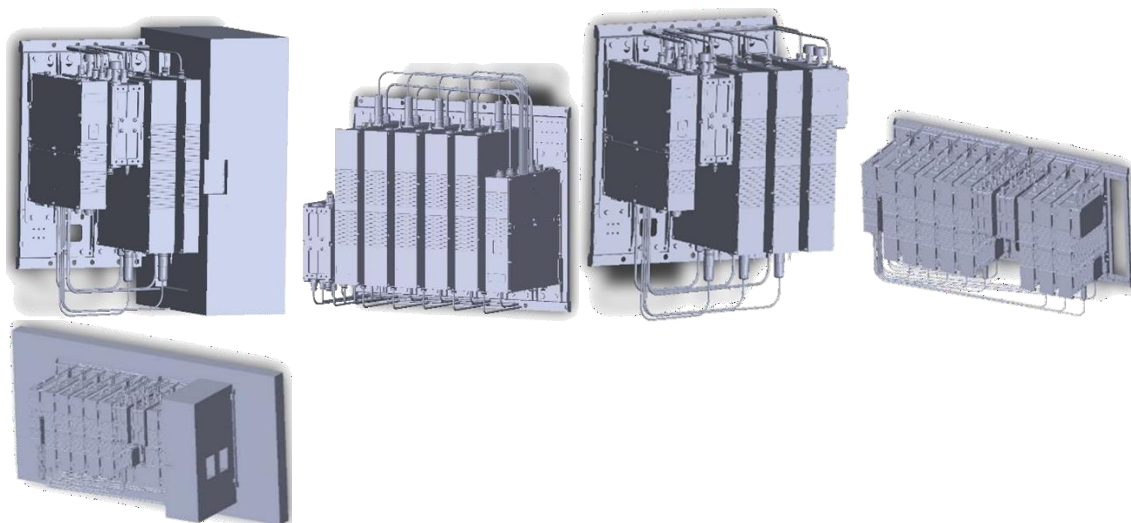
Item Description	Flavor	PN	Image
dHRU-dHPOM		HRU Digital High Power Optical Module	
dHRU-dHPAM-6		HRU Digital High Power Amplifier Module supporting 600	
dHRU-dHPAM-7		HRU Digital High Power Amplifier Module supporting 700	
dHRU-dHPAM-85		HRU Digital High Power Amplifier Module supporting 800/850	

Item Description	Flavor	PN	Image
dHRU-dHPAM-19		HRU Digital High Power Amplifier Module supporting PCS	
dHRU-dHPAM-17		HRU Digital High Power Amplifier Module supporting AWS	
dHRU-dHPAM-23		HRU Digital High Power Amplifier Module supporting WCS	
dHRU-dHPAM-25		HRU Digital High Power Amplifier Module supporting TDD 2500, 100MHz contiguous BW	
dHRU-COMB-L		HRU combiner module supporting low bands 600,700,800/850 including cables	

Item Description	Flavor	PN	Image
			
dHRU-COMB-M		HRU combiner module supporting low bands AWS, PCS, WCS and TDD 2500 including cables	 
dHRU-TL		HRU termination load	
BR-dHRU-L		HRU bracket to support low band modules	

Item Description	Flavor	PN	Image
BR-dHRU-M		HRU bracket to support mid band modules	
dHRU-CABLE		HRU 4.3-10 RF Jumper Cable	
dHRU-INT-SFP		HRU Internal SFPs (from dHRU-dHPOM to modules) and Fiber	

➤ **Example Layouts**

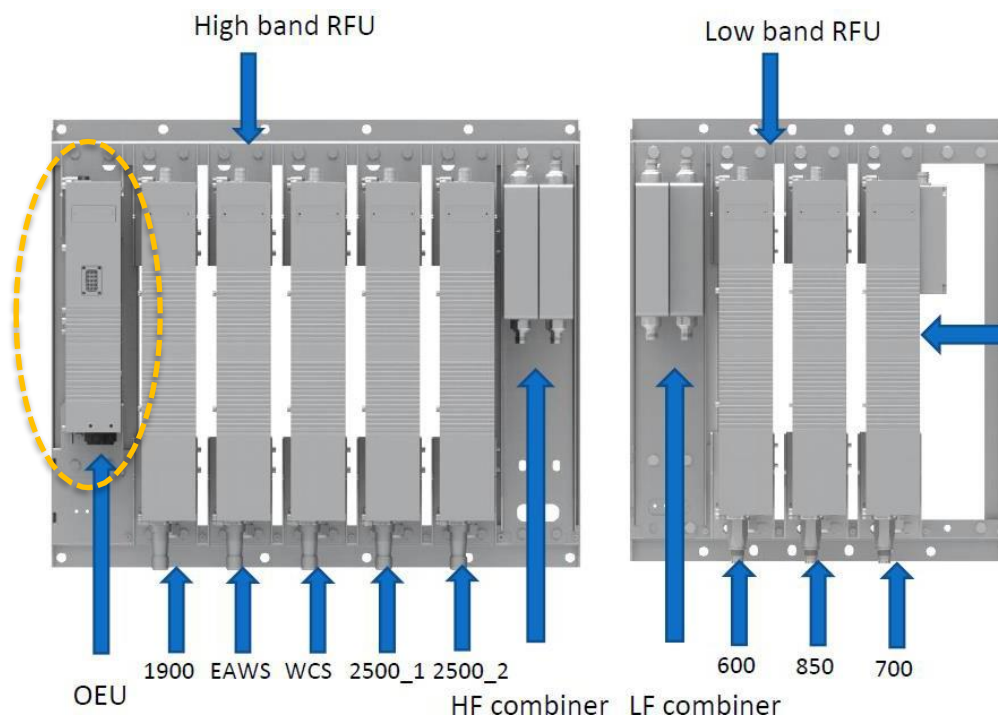


2.8.2 dHRU Interfaces, Connections, Dimensions

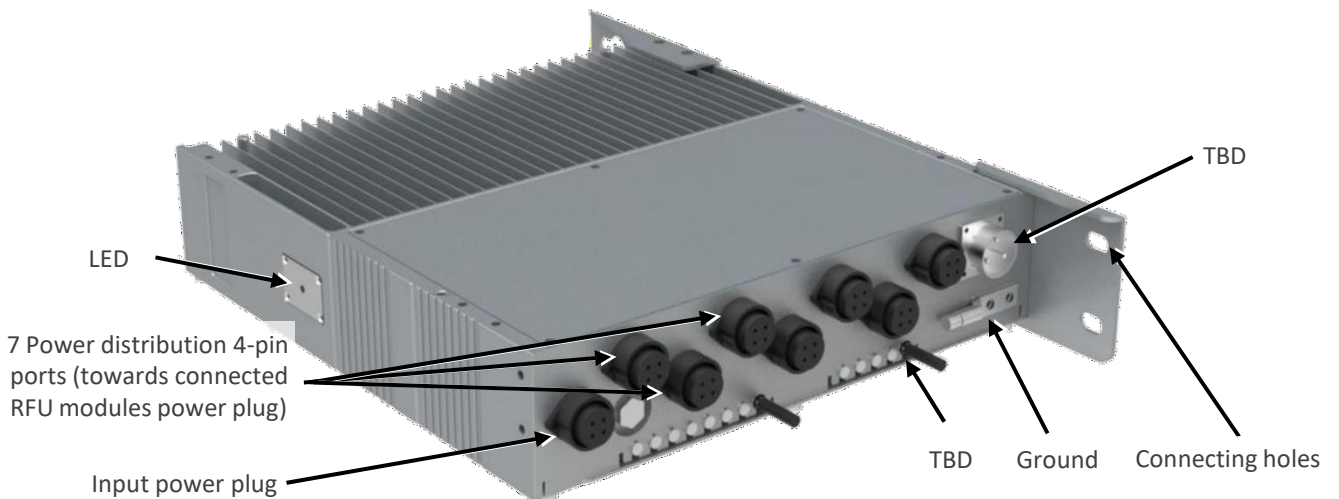
This section details the interfaces of the system sub-elements, as well as the fully connected system internal and external interfaces:

- OEU interfaces, see 2.8.2.1
- RFU interfaces, see 2.8.2.2
- Combiner interfaces, see 2.8.2.3
- Fully connected system interfaces, see 2.8.2.4
- System connection architecture, see 2.8.2.5

2.8.2.1 OEU interfaces



➤ **Top panel**





Power Plug to dHPAM

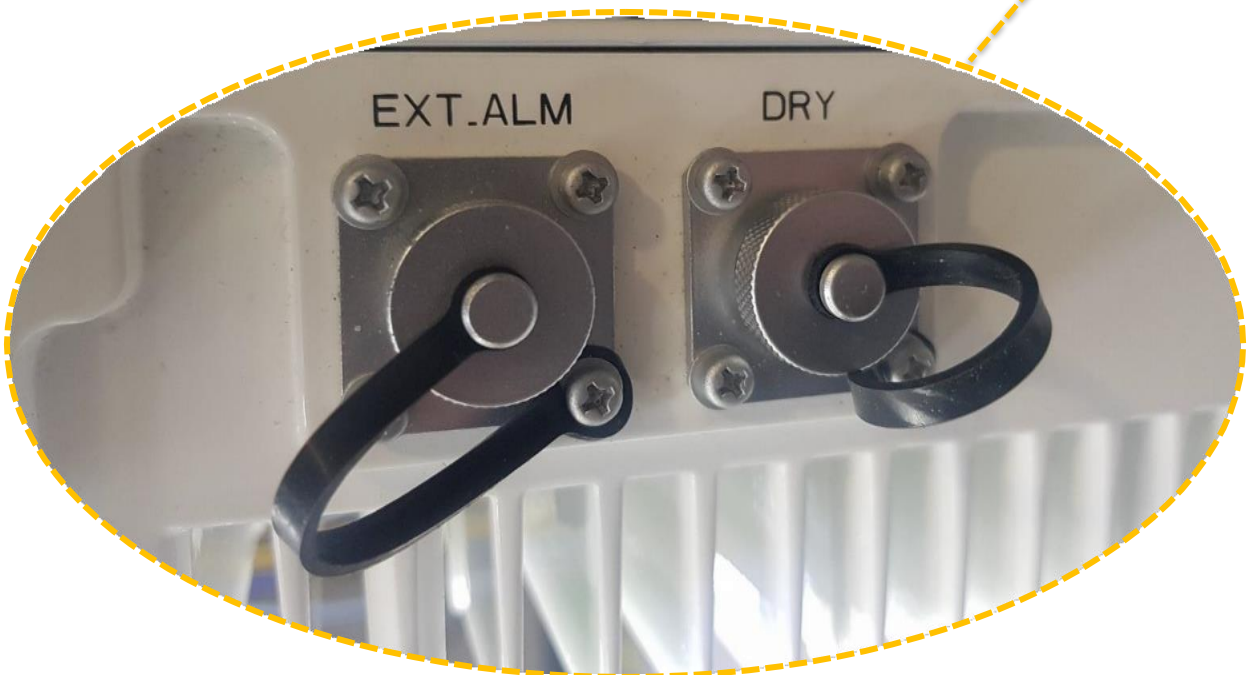
Power Supply



➤ **Bottom panel**

Local debug port, RJ45

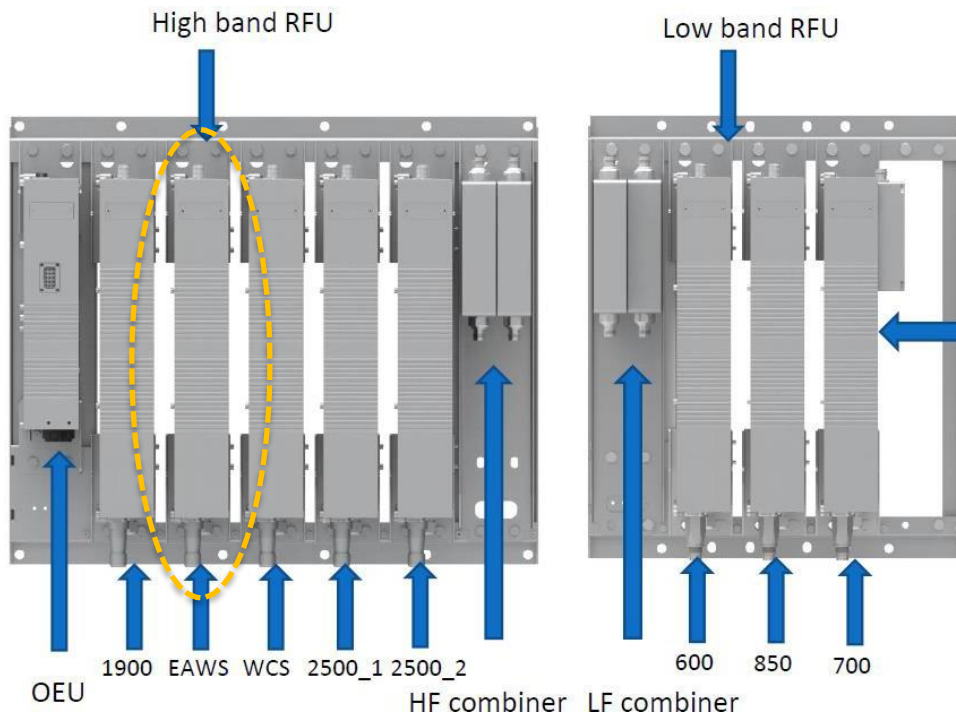
DRY CONTACT (8 pin) and external alarm interface (6pin)



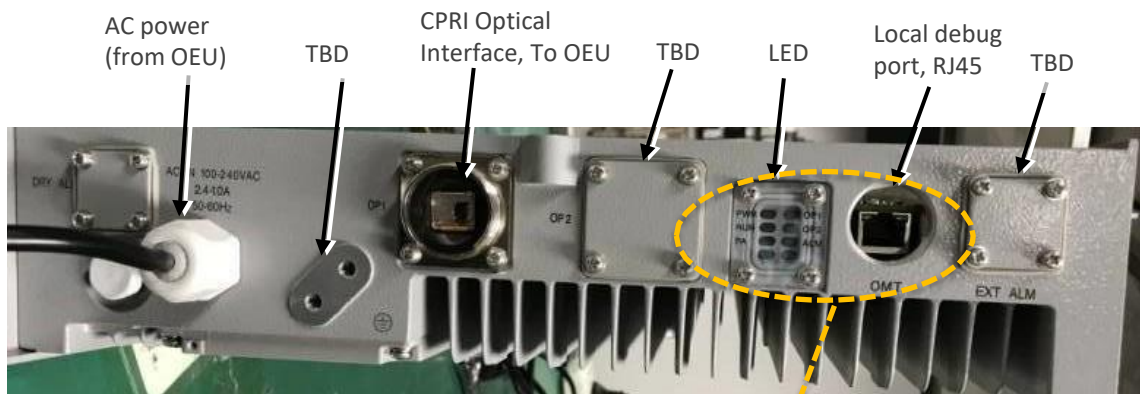
➤ **OEU Dimensions**

Dimensions, H x W x D		mm	370 x 80 x 355
Weight (approx.)		kg	12
Power Supply		VAC	AC100-240/50-60Hz
Power Consumption (approx.)		W	50
Fiber Connectors			LC/PC
Interfaces	SFP 1-4		Optical port to DRU
	SFP 4-8		Optical port for OEU daisy chain
	SFP8~SFP16		Optical port to RFU
	Power		To RFU1~8 power supply

2.8.2.2 RFU Interfaces



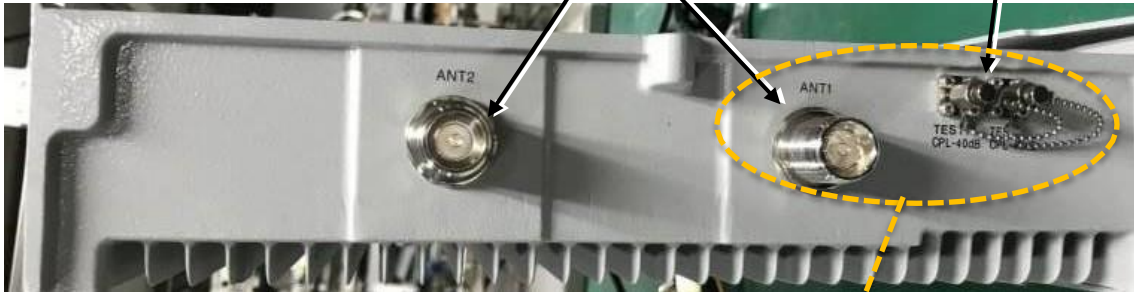
➤ Bottom Panel



➤ **Top Panel**

External Interface:
4.3-10 Mini Din

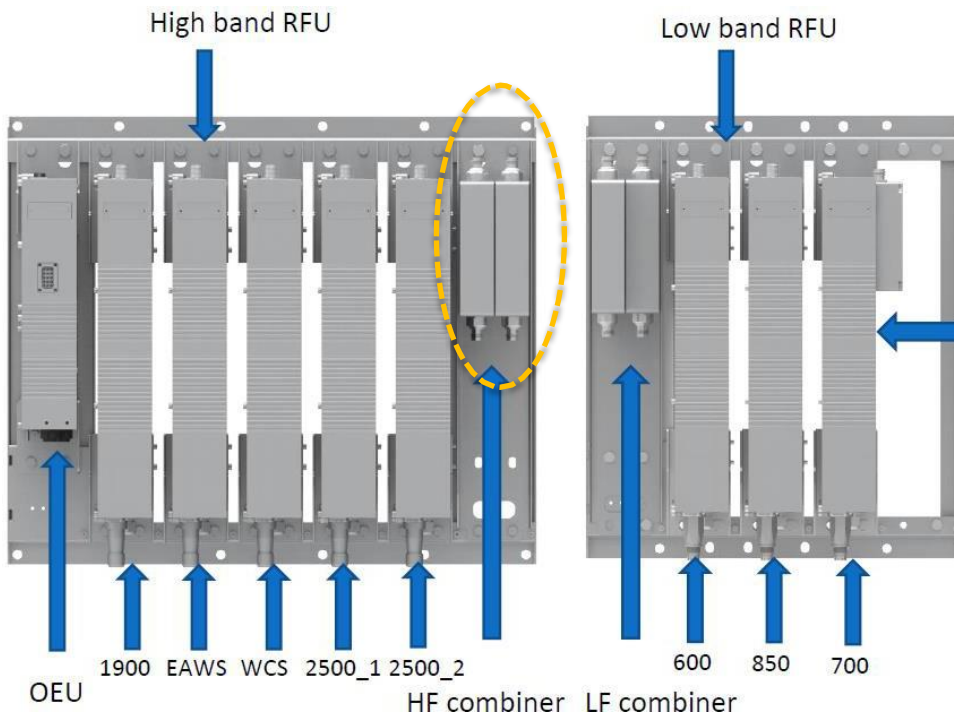
Coupling (power check
without disconnecting
from internet)



➤ **Mechanical dimensions**

Dimensions, H x W x D	mm	500 x 80 x 355 (per RFU); 500 x 121 x 355 (700L+700U)
Weight (approx.)	kg	18 (per RFU); 20 (700L+700U RFU)
Power Supply	VAC	AC100-240/50-60Hz
Power Consumption (approx.)	W	220 (per band)
RF Connectors		4.3-10, duplex per band
Fiber Connectors		LC/PC
Operating Temperature	°C	-40 to +55

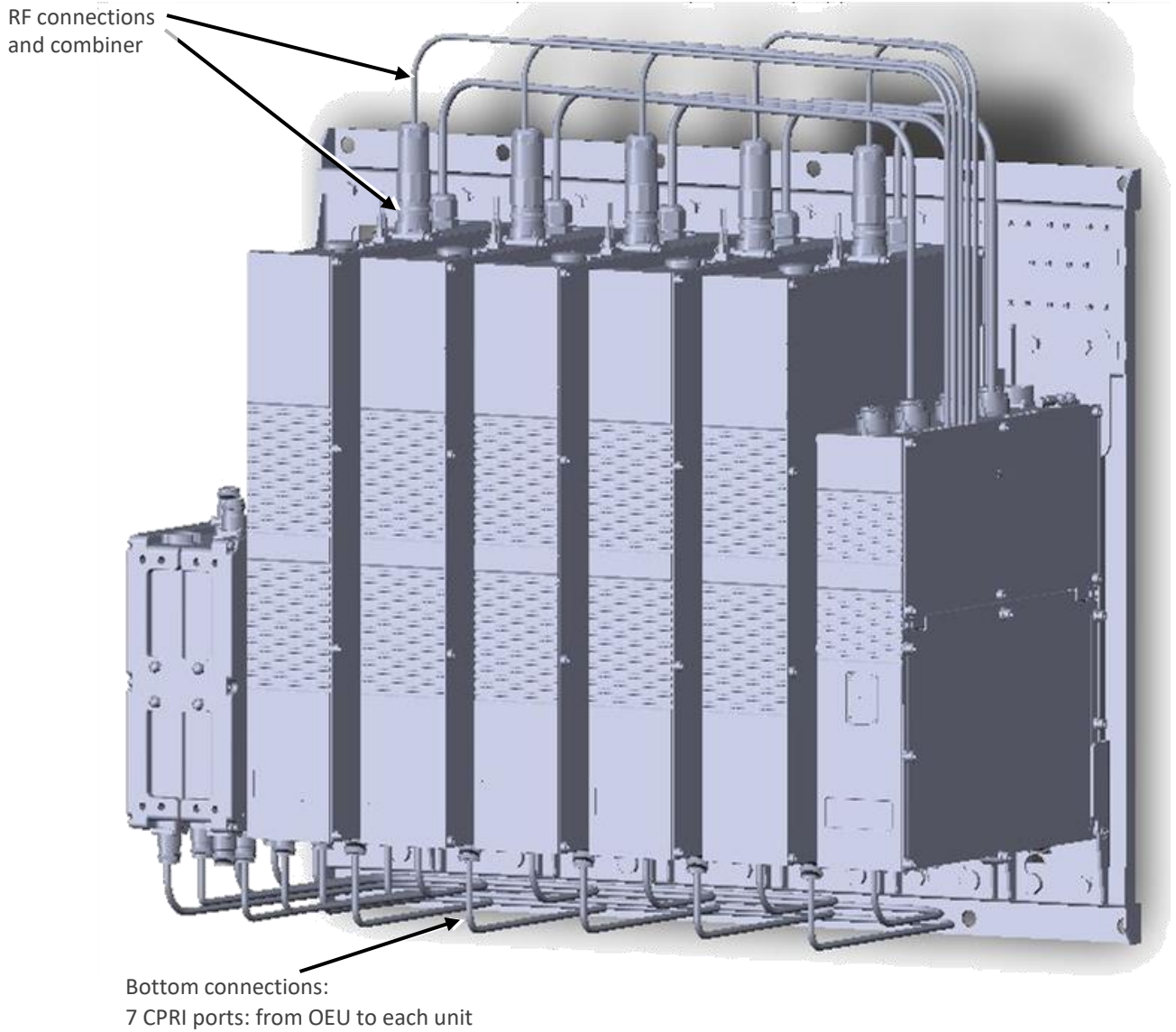
2.8.2.3 Combiner interfaces

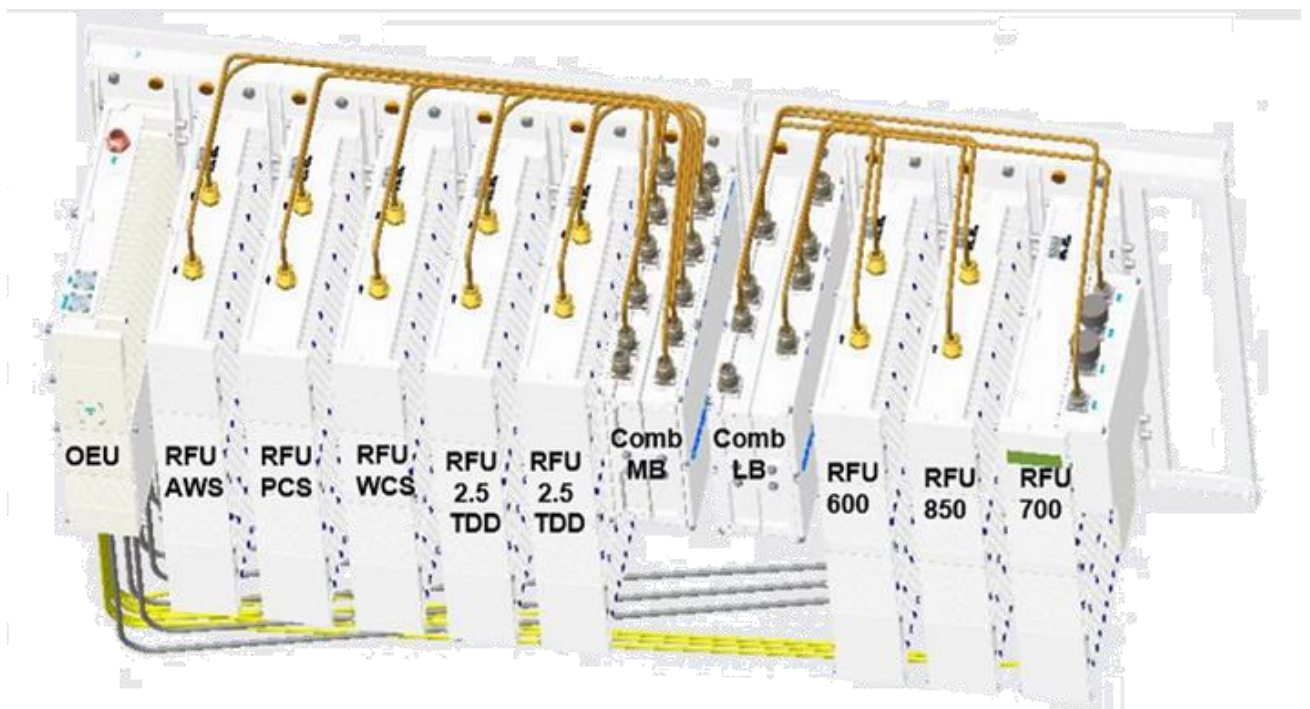
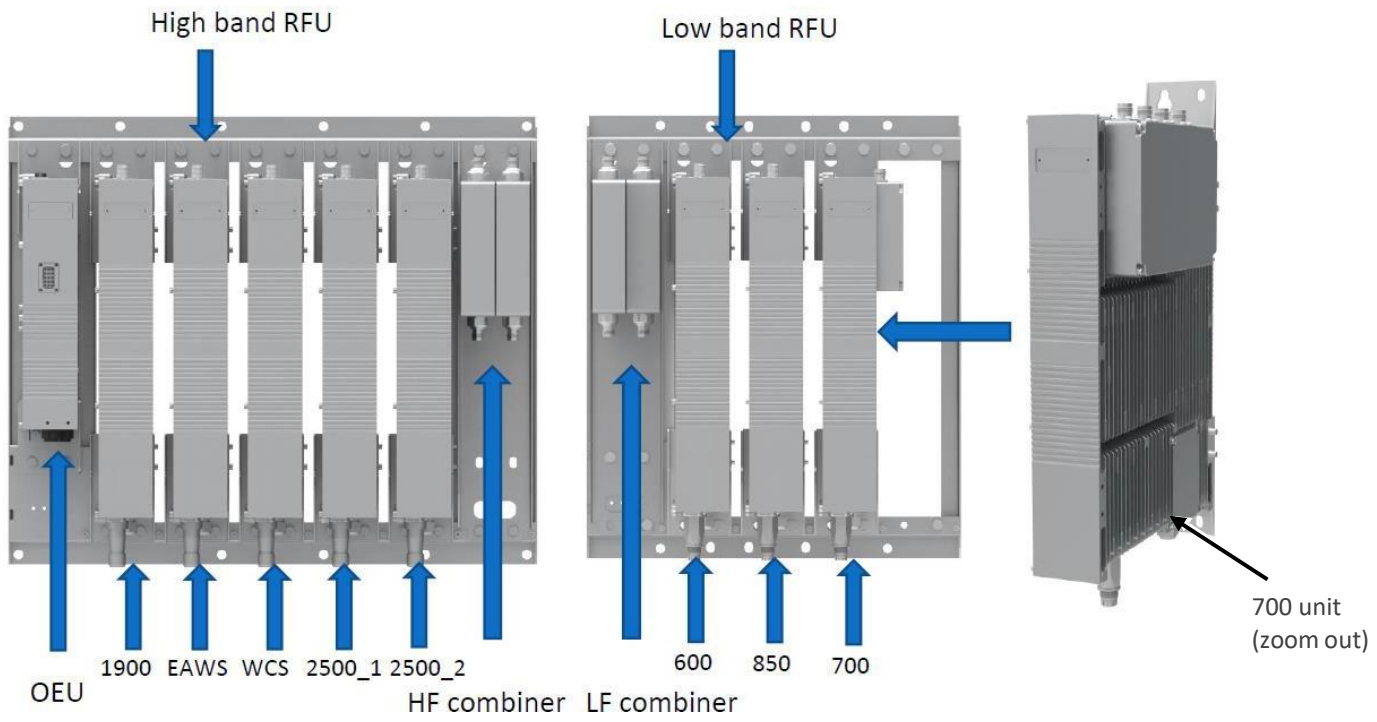


2.8.2.4 Full System Interfaces

The system includes two combiners and several band modules.

Note: There are labels on the combiners, indicating the RFU band names, to which they connect (two of each, as this is MIMO)





2.8.2.5 System Connection Architecture

Note: all internal connectors from OEUs to RFUs are provided. All external SFPs (OEUs to DRU) are purchased separately.

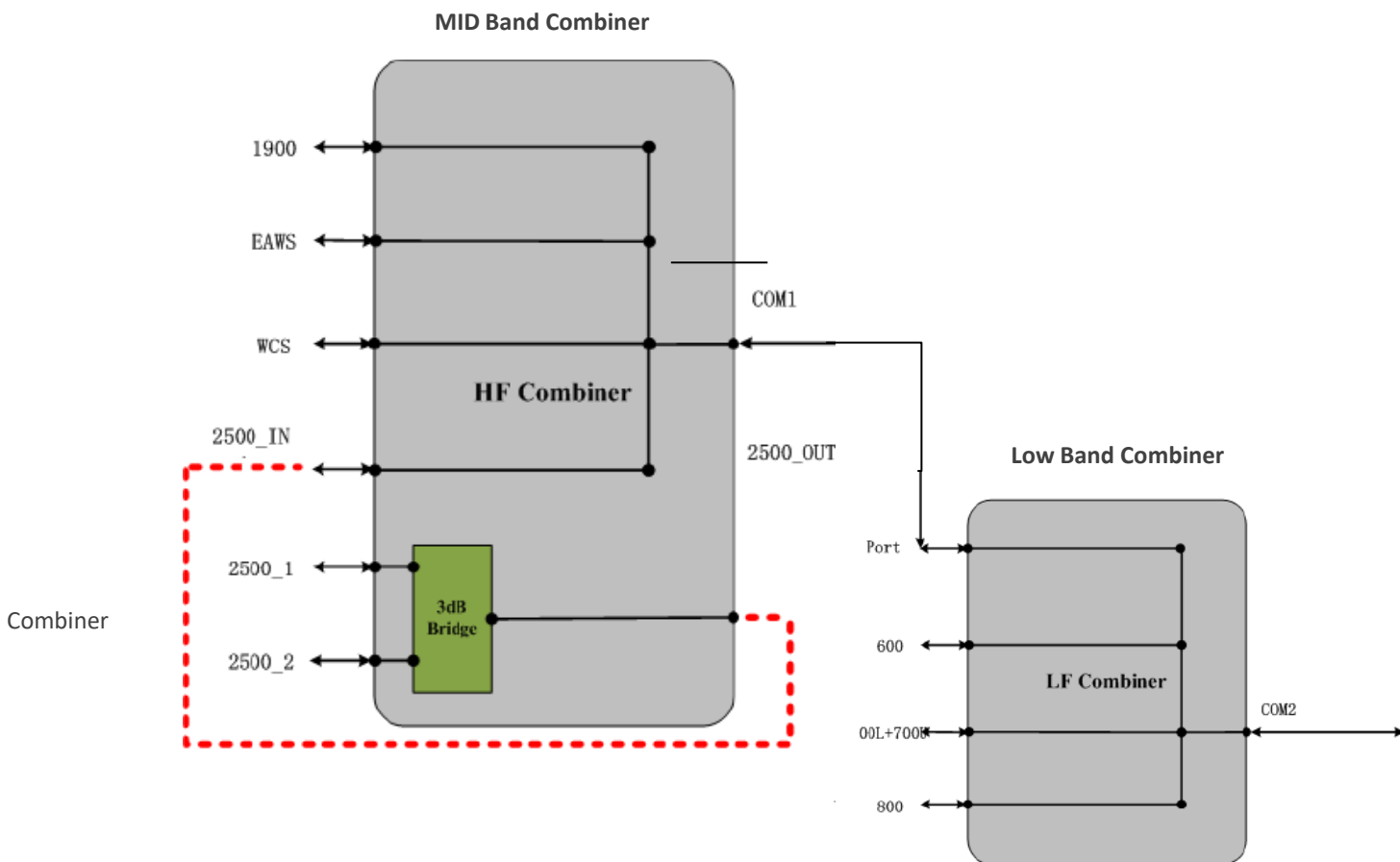
The following figure indicates the system internal and external interfaces.

The system includes two combiners:

1) **Low band**: Ports for: 600, 700, 850 + a port that receives the combined RF signal from the mid-band combiner (entry coming from the Mid-band)

2) **Mid band**: Ports: sums all bands – 1 port per band (except TDD).

For TDD: 2 entry ports (2500_1, 2500_2) – to sum 2 modules. The output is bridged towards the 2500_IN entry through an external jumper (marked in RED in the above figure; provided).



2.8.3 Installation steps Overview

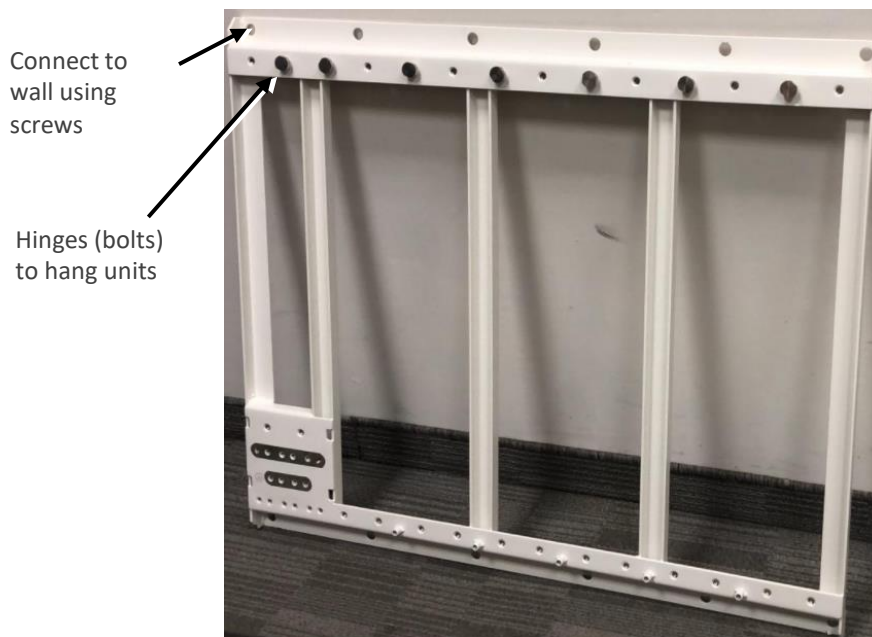
- 1) Mount the system, see 2.8.3.1
- 2) Connect the internal cables (CPRIs, RFs), see 2.8.3.2
- 3) Connect external cables (OEU to DRUs) see 2.8.3.3
- 4) Connect the other cables (ground, power), see 2.8.3.4
- 5) Power up and verify normal operation, see 0
- 6) Perform fine tuning (via login to the GUI), see 2.8.3.6

2.8.3.1 Mount chassis on the wall

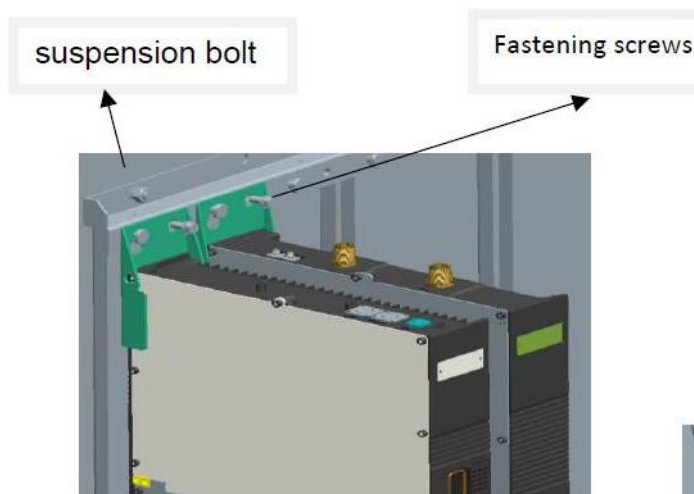
Note: for dimensions and specifications refer to chapter 11

Mount each of the two brackets (Low and Mid) on the wall, and connect the modules to the bracket using screws as follows:

1. Before mounting the dHRU: unwrap each of the elements.
2. Determine the location on the wall for the two dHRU brackets (one for mid power and one for high power), ensuring the high and low units are in close proximity, to allow cable lengths to connect easily. Consider accessibility.
3. Connect the mounting bracket to the wall, using M10x110 screws:

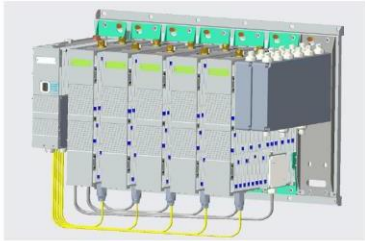


4. Connect each of the modules to its dedicated position, according to the labels on the bracket:
 - Hang the unit on the hinge
 - using two screws M8X16

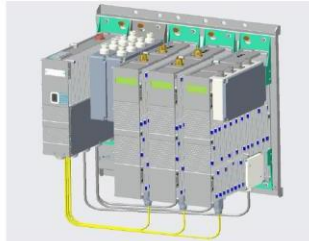


Note: The following figures demonstrate the wall installation for low and high bands

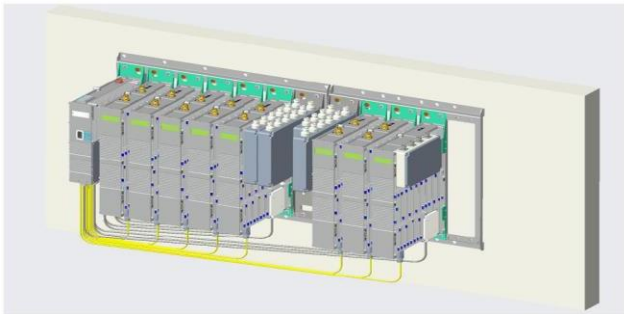
● Wall Installation (High bands and low bands RFU separated installed)



High Band Combinations



Low Band Combinations

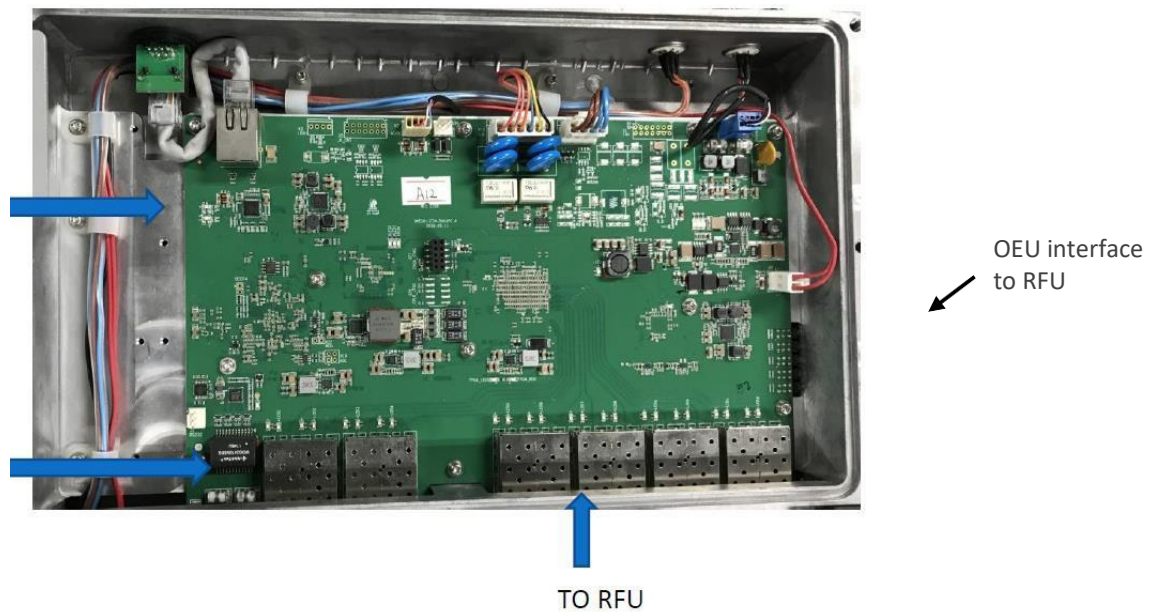


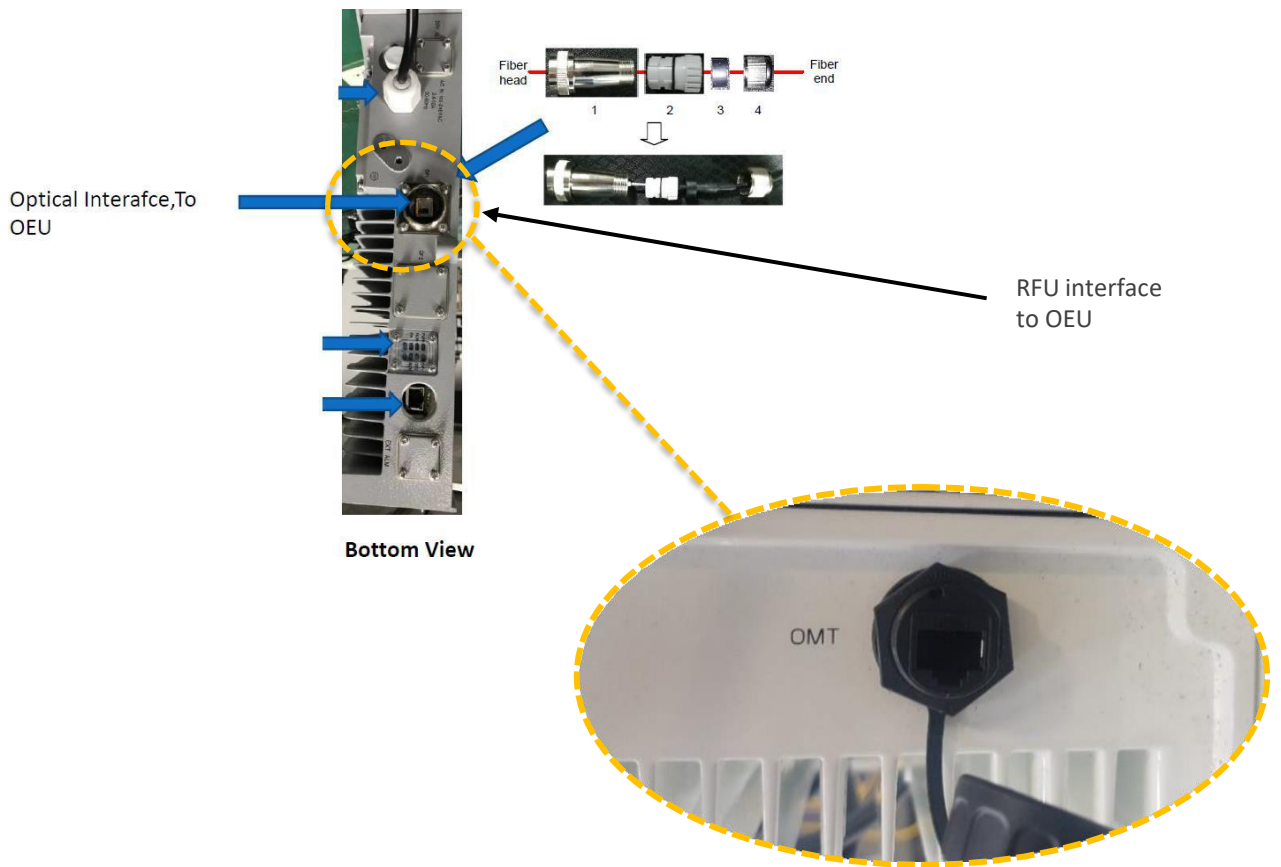
2.8.3.2 Connect the Internal cables (OEU to RFUs)

The internal cable connections include:

1. Connect the modules bottom panel CPRI connections (lower RFU and OEU panels)

Note: the internal fibers are provided; the external fibers are not provided.



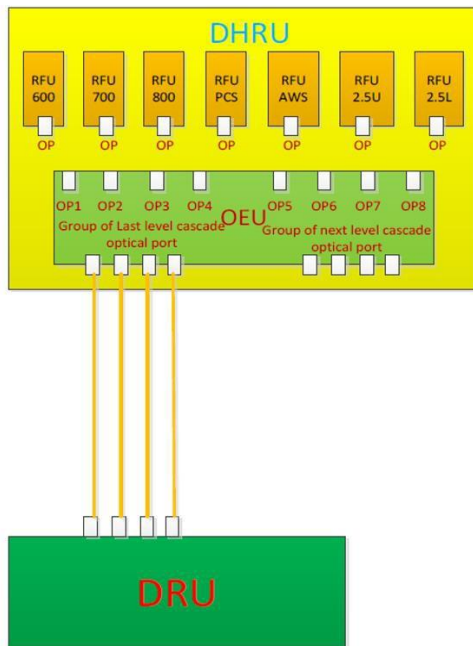


- 2. Connect the RF between the modules and the combiners in the upper panel (all jumpers – these are provided with the kit)

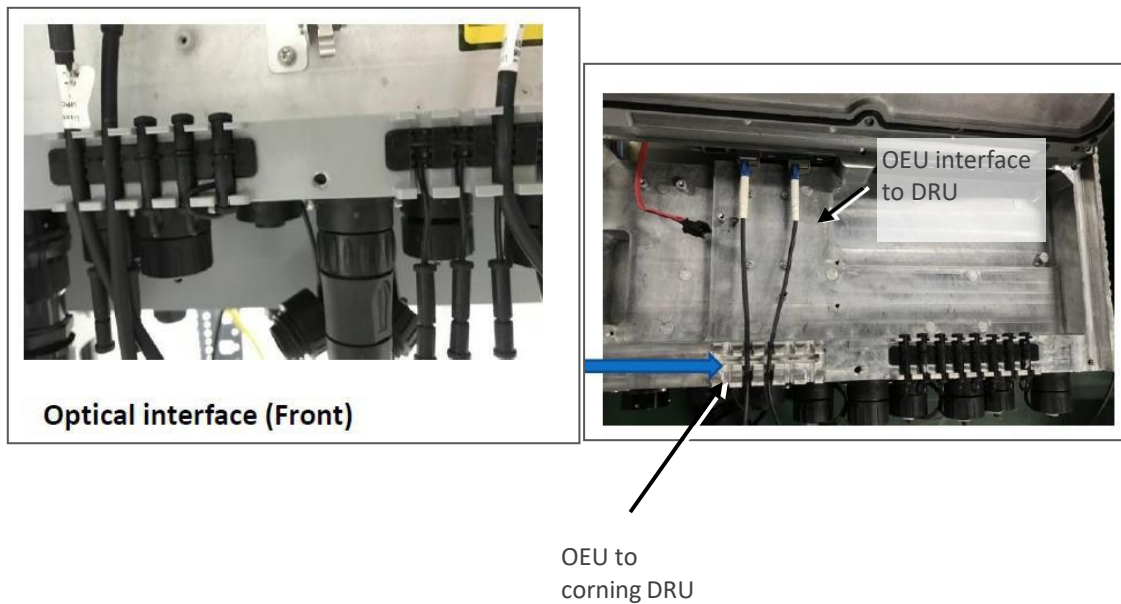


2.8.3.3 Connect the External cables (OEU to DRUs)

The following figure indicates the connections between the system and the DRU



1. Connect the cables between the OEU and the DRU



2.8.3.4 Connect the rest of the Cables

For each of the units, connect the cables as follows:

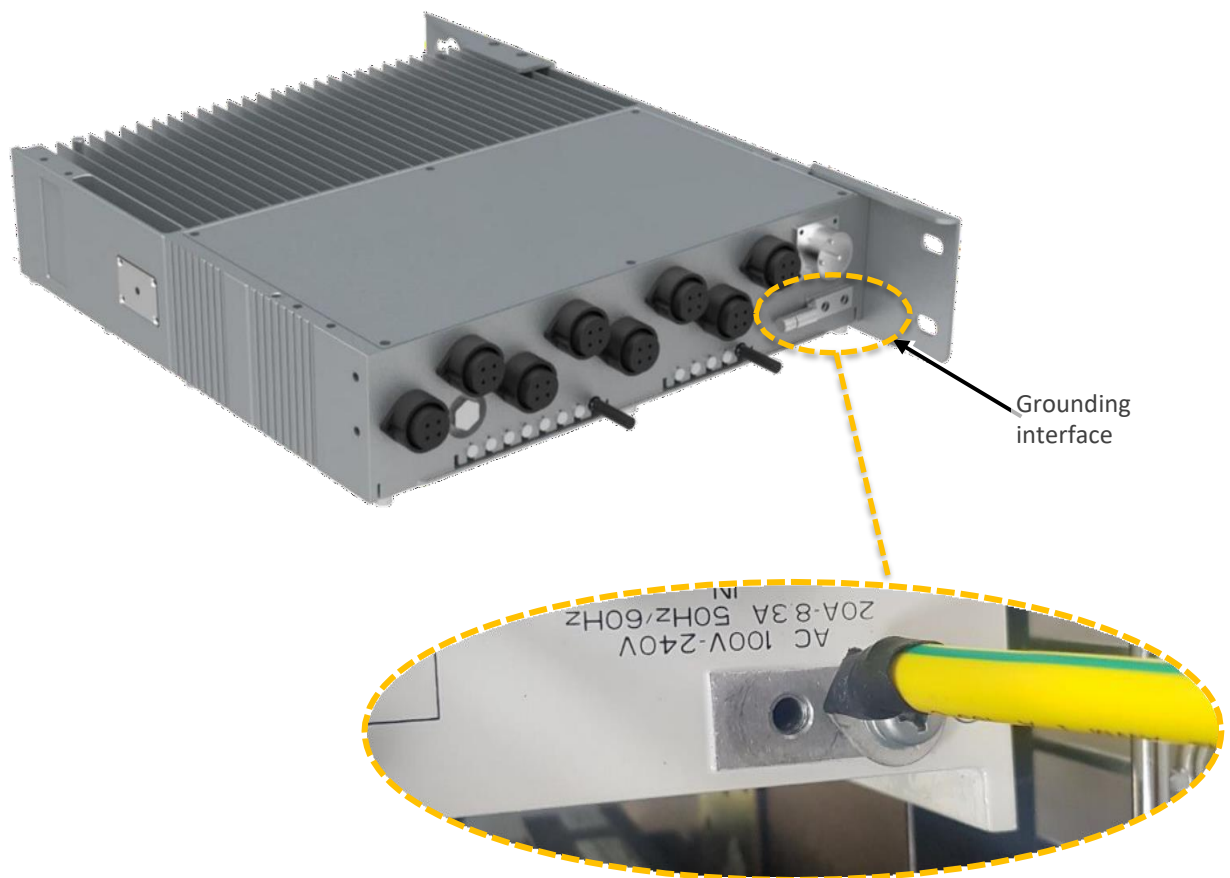
- Ground, see 2.8.3.4.1
- Power, see 2.8.3.4.2

2.8.3.4.1 Connect Ground

Note: Ground according to local regulations

The following additional (not supplied) tools and components are required for connecting the system ground:

- Grounding wire - grounding wire should be sized according to local and national installation requirements. The provided grounding lug supports 14 AWG to 10 AWG stranded copper (or 12 AWG to 10 AWG solid) wire conductors.



1. Use a wire-stripping tool to remove approximately 0.4 inch (10.9 mm) of the covering from the end of the grounding wire
2. Insert the stripped end of the grounding wire into the open end of the grounding lug
3. Crimp the grounding wire in the barrel of the grounding lug. Verify that the ground wire is securely attached to the ground lug by holding the ground lug and gently pulling on the ground wire
4. Prepare the other end of the grounding wire and connect it to an appropriate grounding point at the site to ensure adequate earth ground

2.8.3.4.2 Connect AC Power

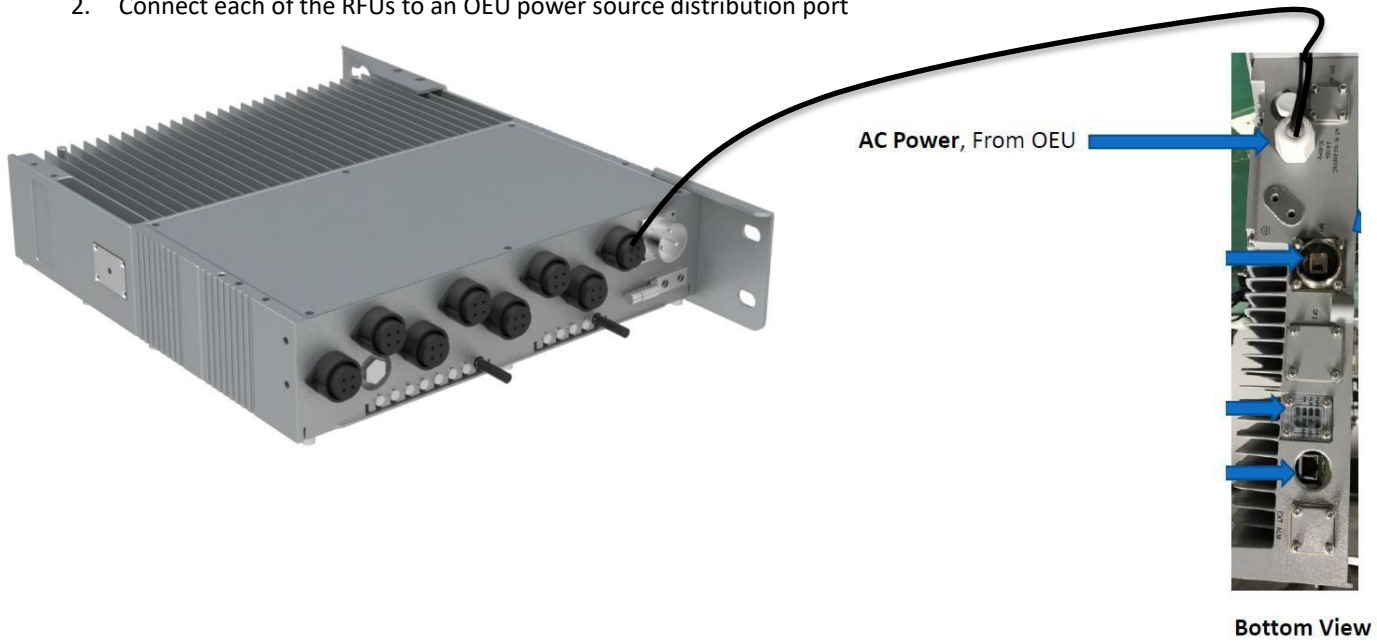
The AC power is connected to the OEU, and is distributed from the OEU to the modules

➤ **To connect the power**

1. Connect the AC power source to the OEU input power port



- 2. Connect each of the RFUs to an OEU power source distribution port



2.8.3.5 Power up and Verify Normal Operation

Power up the system, and verify normal operation according to the following LED guidelines

Status	Description	Color	State
Power	The RFU was powered up	Green	Solid
RUN	The RFU is up and running	Green	Blinking (1s)
OP1	The RFU is sync to the OEU	Green	Solid
PA	The PA of RFU is on	Green	Solid
ALARM	The RFU is alarm	Red	Solid

Note: the alarm LED is lit in RED only when there is an alarm.



The above figure is an illustration.

2.8.3.6 Perform fine tuning (via login to the GUI)

See setup from user interface for details on how to setup the system.

3. GUI – General Description

This section provides general guidelines and tools for navigating the system GUI:

- Screen layout, see 3.1
- Main menu options, see 3.2
- Default network settings, see 3.3
- Supported access options, see 3.4

3.1 Screen Layout

The main menu (located to the left of the window) lists all the available management options.

Next to the main menu either the system tree or the corresponding sub-options are displayed. The display changes according to the option selected from the main menu.

The screenshot displays the CORNING EVERON™ 6000 SOLUTIONS GUI. The interface is divided into several sections:

- Main Menu (Left):** A vertical sidebar containing navigation options such as Device View, Events, Admin, Multi-stack, Channels Map, and Designer Old.
- System Tree (Middle-Left):** A hierarchical tree view showing the system structure, including 1.4 Dima stack-ATT St..., IHU, and various RIM and DCM components.
- Device View (Right):** A table displaying the status of multiple RIM devices. The table has columns for Name, Inconsistent Version, DL input Power Low, DL Power Overload, Service OFF, Temperature, Adjustment Fault, and HW Failure. A callout box labeled "Parameters Display area" points to a detailed view of a RIM device's parameters, including Name, Slot index, IP Address, Chassis Serial Number, Band Type, Temperature, Serial Number, SW Version, and Operators.





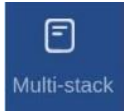

Callouts in the image identify the "Main Menu options" and "System tree: sub-options".

Name	Inconsistent Version	DL input Power Low	DL Power Overload	Service OFF	Temperature	Adjustment Fault	HW Failure
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●
RIM	●	●	●	●	●	●	●

3.2 Main Menu Options

The table below lists the management options provided by the main menu:

Table 11: Main Menu Options

Icon	Enables user to...
 Devices	View the system topology and information about the different system elements.
 Events	View all system events and generate reports.
 Config	Perform initial system configurations. This option is only visible to the system administrator.
 Admin	Administrative options to perform system configurations, implement updates, define and monitor user's activity.
 Multi-stack	View the information of the different stacks of the system.
	Manage the system RF channels.

3.3 Default Network Settings

The system devices are managed via a web session to the headend control module (HCM) that is installed as either a headend unit (HEU) or integrated headend unit (IHU)



The HCM has three types of RJ45 Ethernet ports: LOCAL port, LAN port and four INTERNAL ports.

- LOCAL Port: 1 Gb Ethernet connection for a local setup session.

By default, the port is configured to have a static IP address: 172.16.1.1; Subnet Mask: 255.255.0.0.

Alternatively, the port can be configured as a DHCP server (connected to a DHCP client computer).

Note: The LOCAL port is designated for a local connection. However, the port may be used for a remote session as well, for troubleshooting and service purposes. In any case, don't connect a network device to the port if it's configured as a DHCP server, as the server will disrupt the LAN IP addressing.

- LAN Port: 1 Gb Ethernet connection to the customer's network for remote management.

By default, the port is configured to have a static IP address: 192.168.1.1; Subnet Mask: 255.255.0.0.

Alternatively, the port can be configured as a DHCP client.

IPv4 and IPv6 network protocols can be simultaneously supported.

- INTERNAL Ports: Four RJ45, 100 Mb Ethernet ports used for management of connected ACMs.

Note: Any one of these ports can also be used for a local connection if required.

Default settings: IP: 10.0.0.1; Subnet Mask: 255.0.0.0

3.4 Supported Access Options

This section describes the HW and SW required to connect to the HCM.

First connection to the HCM should be done with a laptop or a tablet.

The following browsers are supported:

- Microsoft Internet Explorer 11.0 and above
- Mozilla Firefox 42.0, 43.0, and above
- Google Chrome 45.0, 46.0, and above

After the initial configurations are done, it is recommended to establish remote access to the HCM by using the following:

LAN Ethernet connection to the HCM with a minimum connectivity and throughput capability of 256 Kbps.

4. Session Access and first-time settings

Once all the system elements are installed, the system administrator can log into the system GUI and perform initial configurations.

It is recommended to begin working with the Corning® Everon™ 6000 by following these steps:

1. **Open a local session to the HCM**, see section 4.1.
2. **Configure the LAN IP settings** (remote management) to allow remote access, see section 4.2
3. **Perform the initial configurations (commissioning)** using the system GUI, see, chapter 5

4.1 Open a Local Session

Below are the instructions for opening a local management session, to perform basic system configurations via the system GUI.

➤ To Open the system GUI

1. Connect a computer (i.e., laptop) to the HCM LOCAL port via an RJ45 Cat 5 Ethernet cable, as shown below:



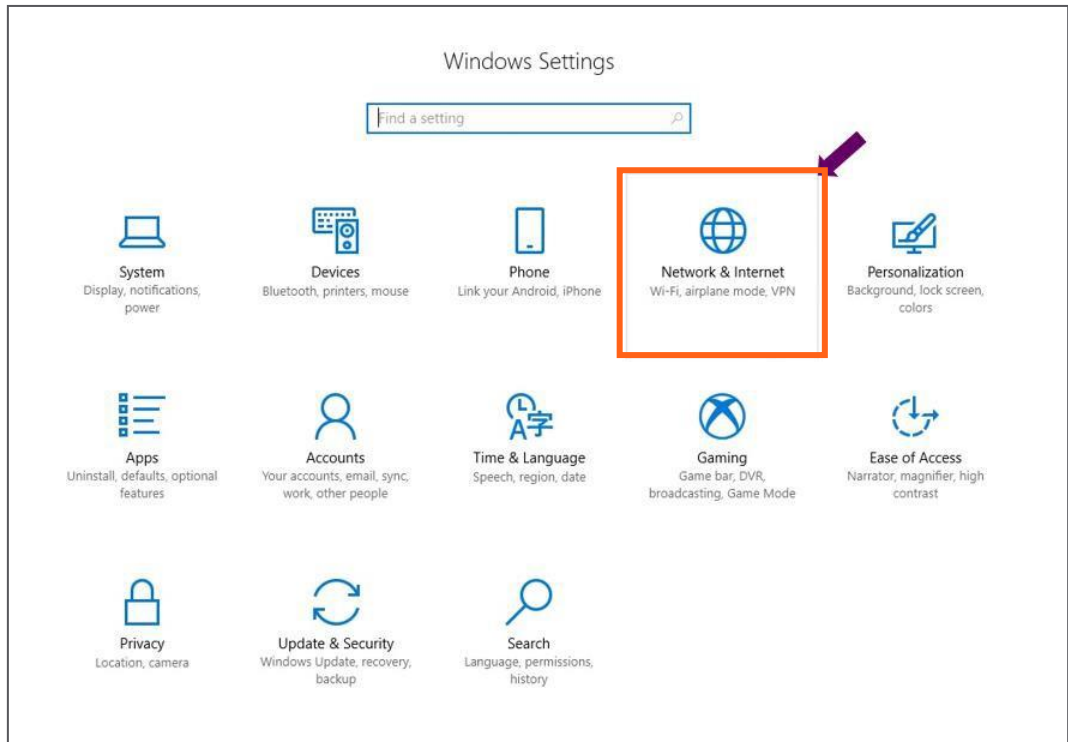
Notes:

* The LOCAL port is set to a static IP Address by default: 172.16.1.1; Subnet Mask: 255.255.0.0. Your laptop/tablet network parameters must be set to match the subnet of the default IP address.

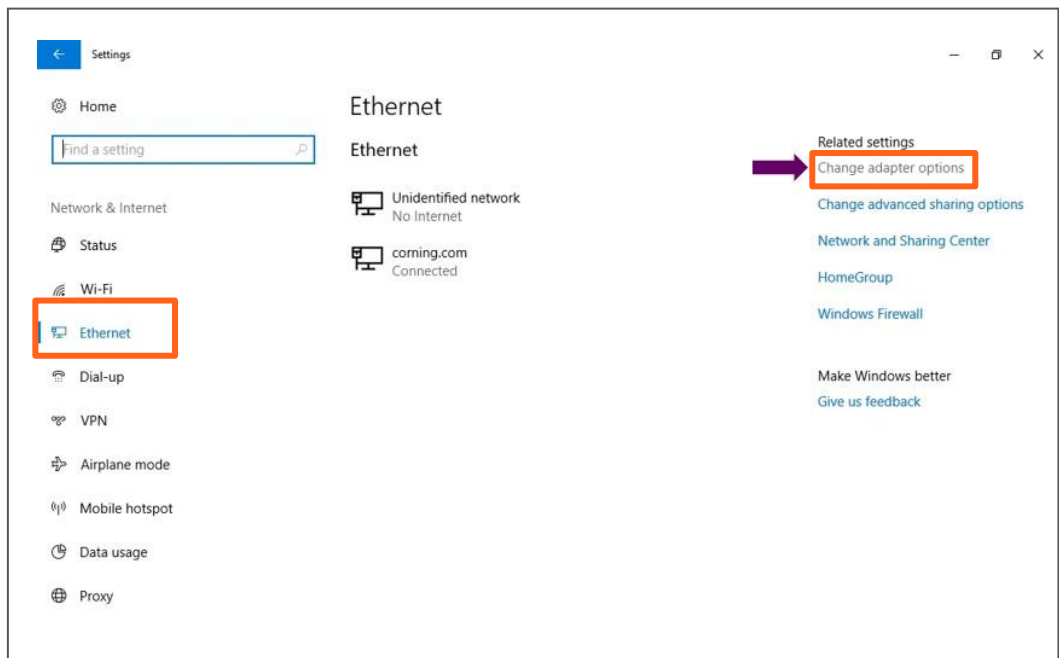
* The laptop/tablet IP address must be different than the LOCAL port IP address.

2. Set up your laptop/tablet network parameters by following the steps below (the steps may vary slightly depending on the OS version used):

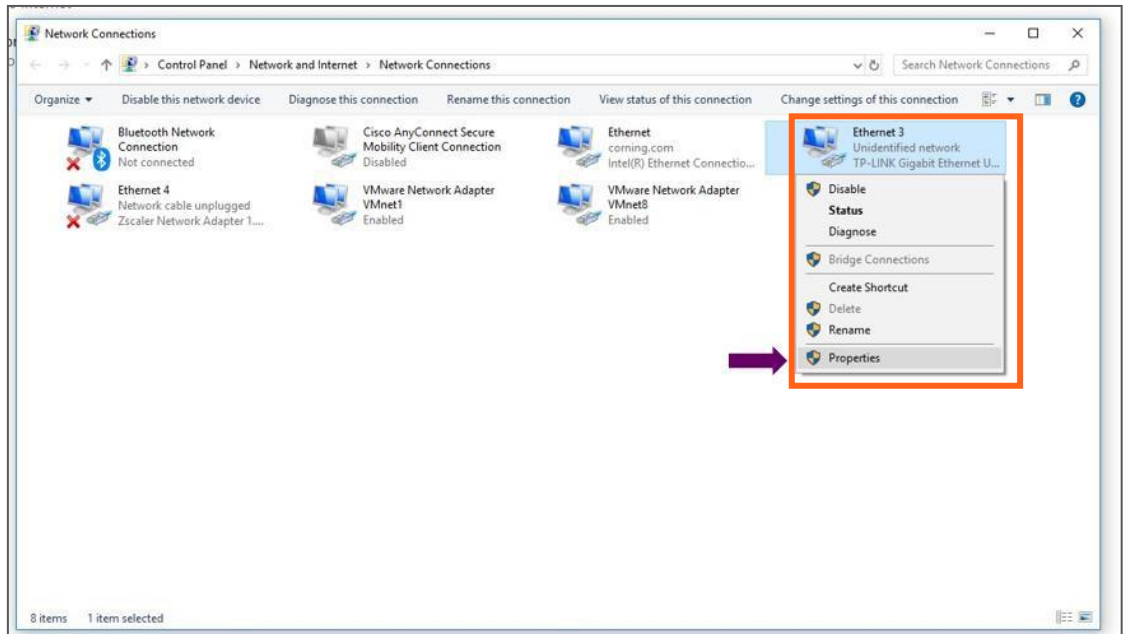
a. Go to **Start** → **Settings** → **Network & Internet**



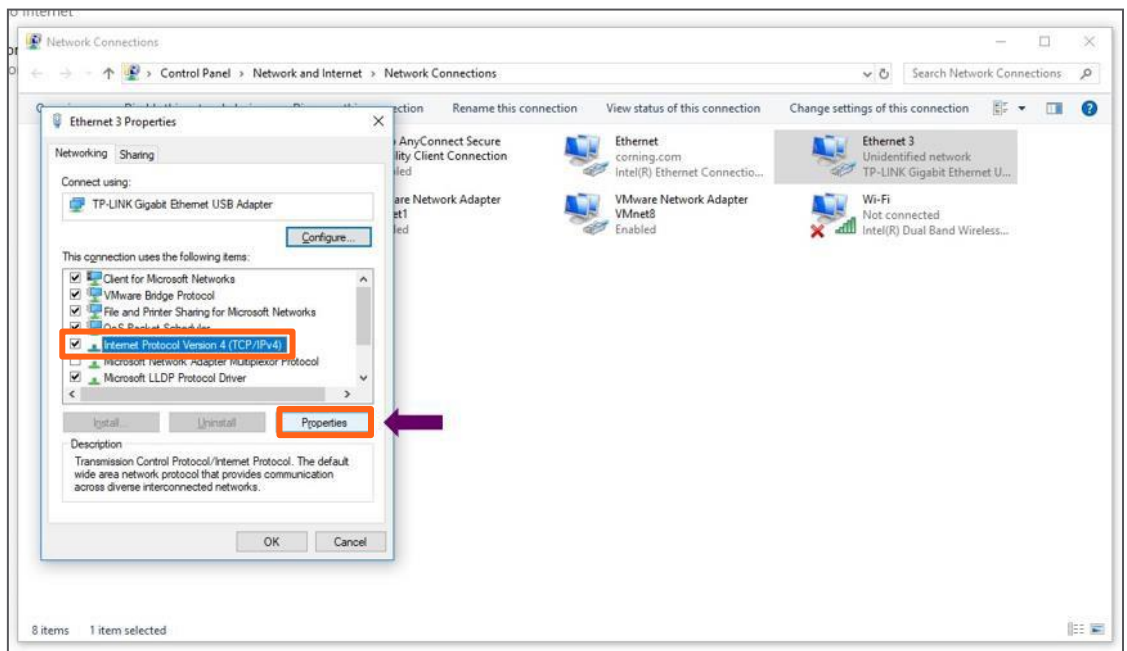
b. Select **Ethernet** → **Change adapter options**



c. Right-click on the **Ethernet USB adapter** or ethernet cable and select **Properties**



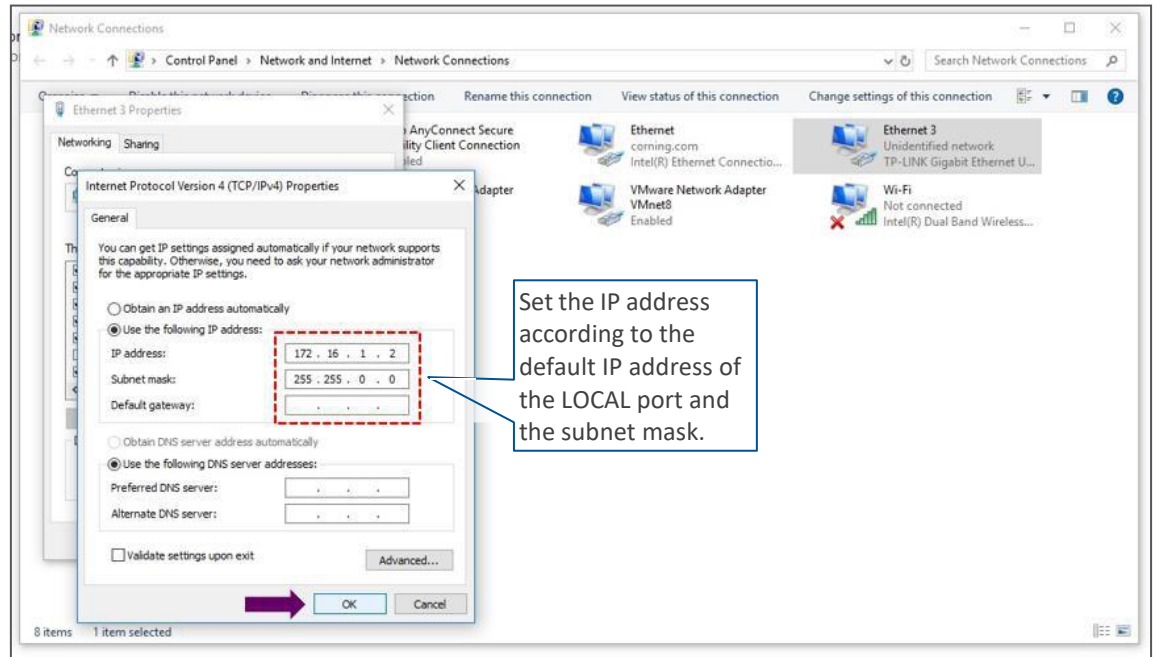
d. Select **TCP/IPv4** and click **Properties**



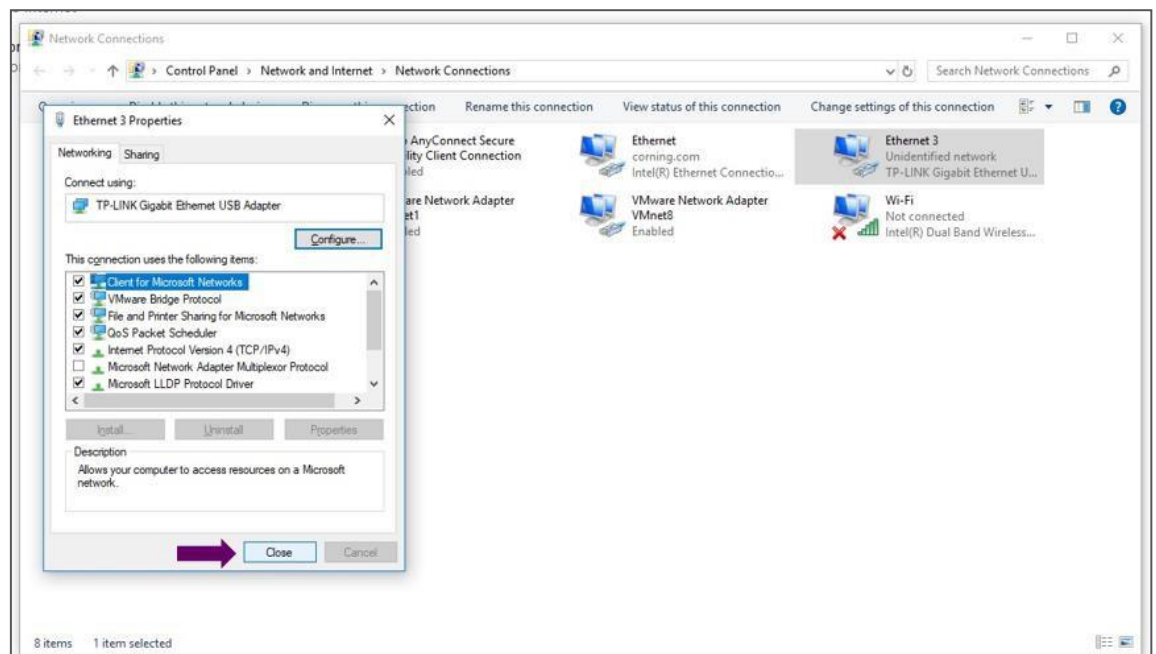
- a. Type in the properties: 172.16.1.2 : 255.255.0.0 → click **OK**

Examples of IP addresses:

- **Allowed: 172.16.1.5.**
- **Not allowed: 172.16.1.1 (this IP is used by the LOCAL port).**



- b. Click on **Close** and close the control panel



3. Once the connection is established (can be verified by accessing through command prompt: cmd → ipconfig), open a browser and type-in the LOCAL port default IP address in the address bar: 172.16.1.1. You can also ping the 172.16.1.1 IP address. See section 4.2 for instructions on how to continue.

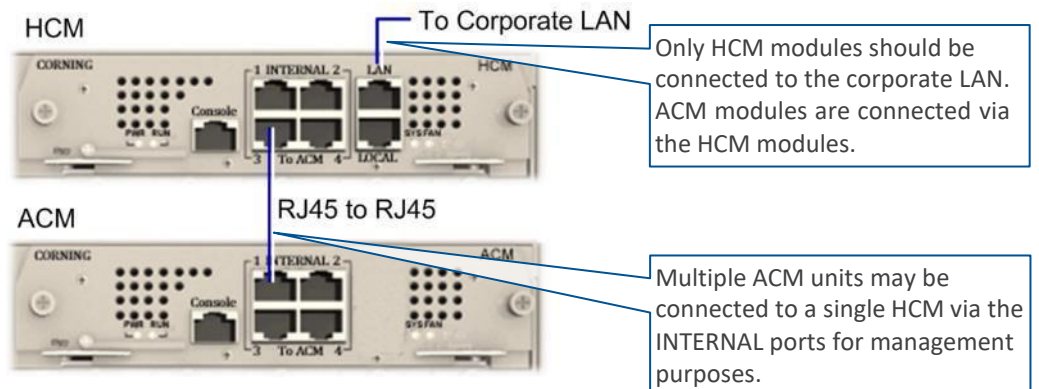
4.2 Remote Management (Configure the LAN IP settings)

After doing the preliminary configuration (see section 4.1), the system can be used for remote management, and needs to be configured as follows.

This section describes the configurations required for remote session access using Ethernet connection via the LAN port.

At this point the system is ready to be connected to the LAN according to the instructions below.

For HCM modules only – using the provided RJ45/RJ45 communication cable, connect the HCM LAN port to the corporate LAN:



The LAN port is set to a static IP address by default: 192.168.1.1; Subnet Mask: 255.255.0.0.

➤ To configure the HCM LAN port

1. **IMPORTANT:** Make sure the HCM LAN port is connected to the corporate LAN.

2. In the main menu bar, click



3. Select the **IPv4 LAN Port** or **IPv6 LAN Port** tabs and click the  button.

The screenshot displays the 'IP Settings' configuration page in the CORNING EVERON 6000 SOLUTIONS web interface. The 'Multicast Address' is set to 224.21.21.21. Below this, there are tabs for 'IPv4 LAN Port123' and 'IPv6 LAN Port123', both highlighted with red boxes. An 'EDIT' button is also highlighted with a red box. A table below shows the configuration for the selected IPv4 LAN Port.

IPv4 LAN Port						
Name	IP Address(IPv4)	Status	DHCP	IP Address	Subnet Mask	Default Gateway
FORD	10.208.255.175	Connected	Client	10.208.255.175	255.255.254.0	10.208.254.1

4. The LAN port is set to a static IP address, by default: 192.168.1.1; Subnet Mask: 255.255.0.0.

You may change the **static IP address**, **subnet mask** and **default gateway** manually to legal IP values.

Note: make sure the values you enter in the above fields aren't used by other system elements, and are different than the default values.

Make sure the address format matches IPv4 or IPv6, according to the tab being updated.

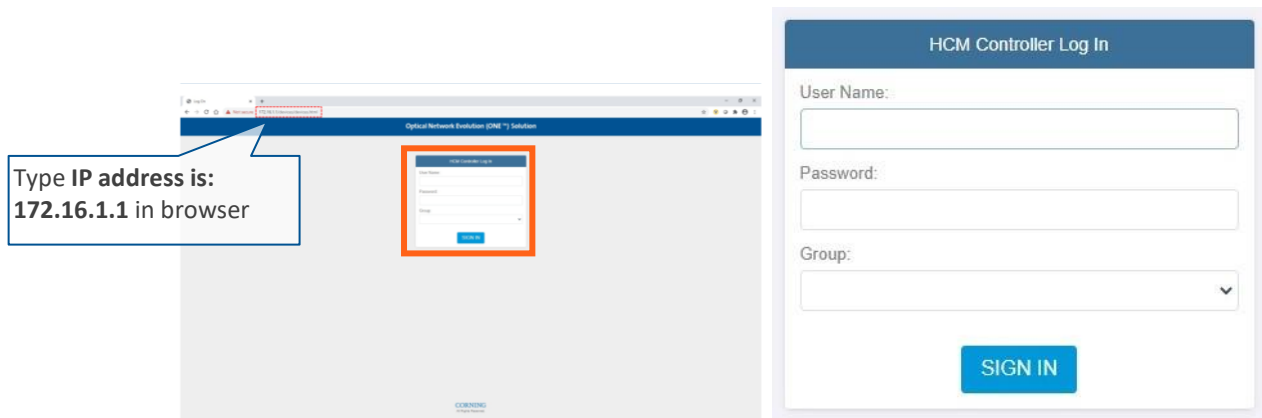
For Dynamic IP Address — set **DHCP** as **Client**, then click **OK**.

5. The HCM restarts after the LAN IP address is updated.
6. To open a remote management session: Open a browser and enter the **LAN port IP Address** in the **address bar**.

Note: A Ping Tool option is provided to verify access to IP hosts (rather than opening another application). For more information about the ping tool and the IP Settings tab refer to section 9.3.6.

7. Once the connection is established (can be verified by accessing through command prompt: cmd → ipconfig), open a browser and type-in the LOCAL port default IP address in the address bar: 172.16.1.1.

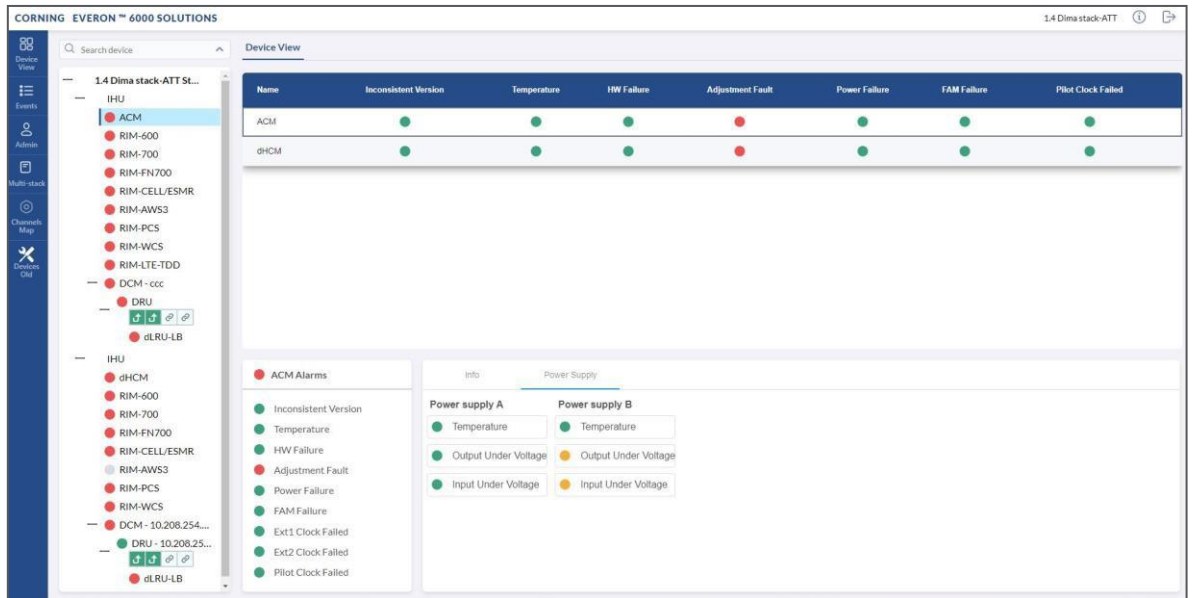
The HCM Controller Log In dialog appears:



8. For first-time authentication use the following default values:
 - Username: *admin*
 - Password: *default provided with your system*
 - Group: *leave blank*

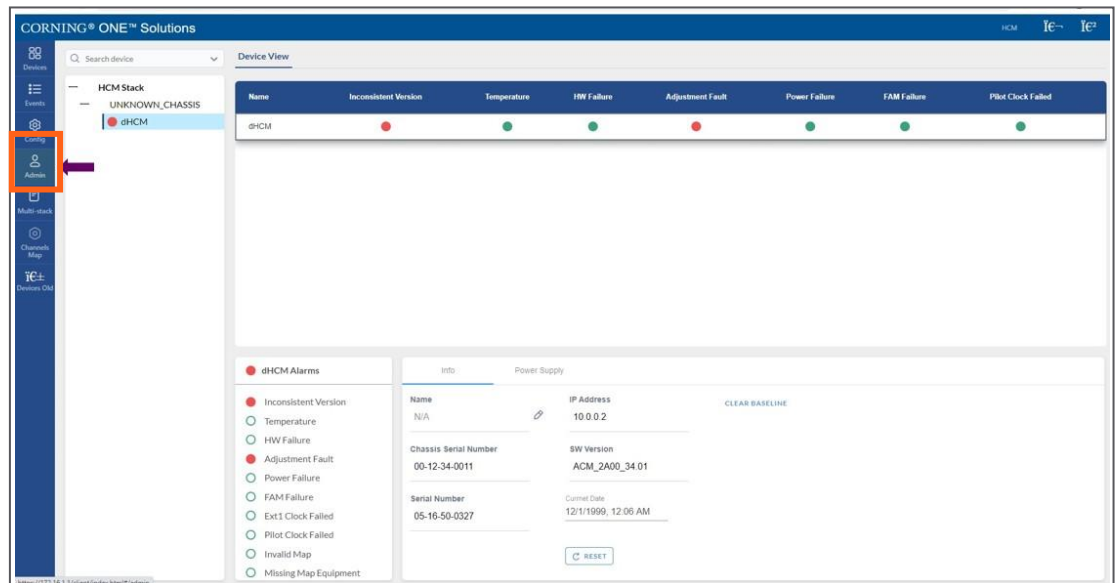
Note: IMPORTANT! For security reasons it is highly recommended to immediately change the password (via the "Admin" -> "Security" tab) and log in again using the new password.

9. Click the "SIGN IN" button. System GUI main screen appears.

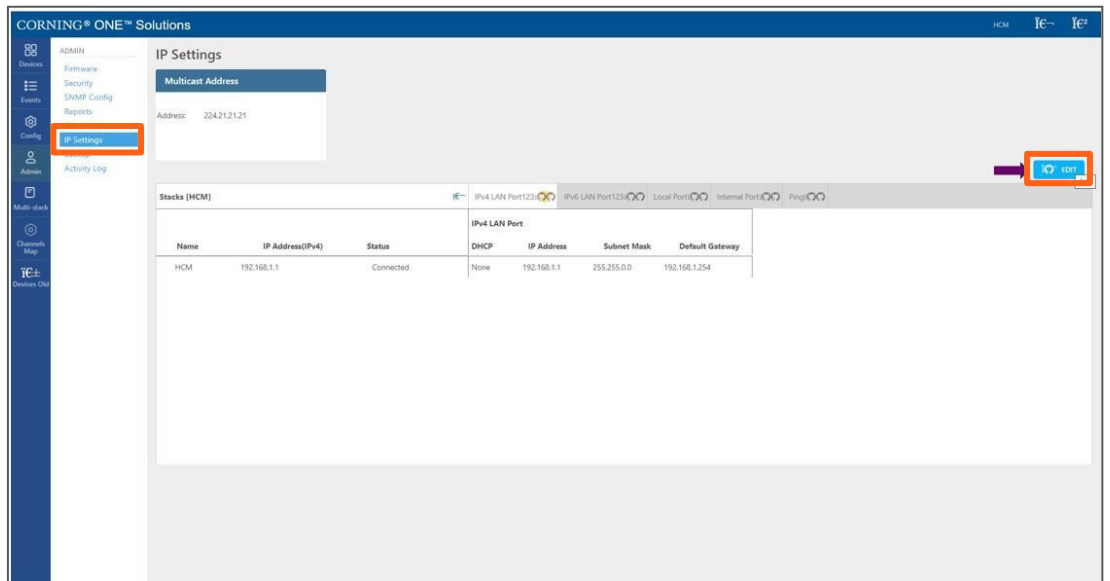


10. Configure the IP settings (to allow working through LAN IP address and not only via the local port connection) as follows:

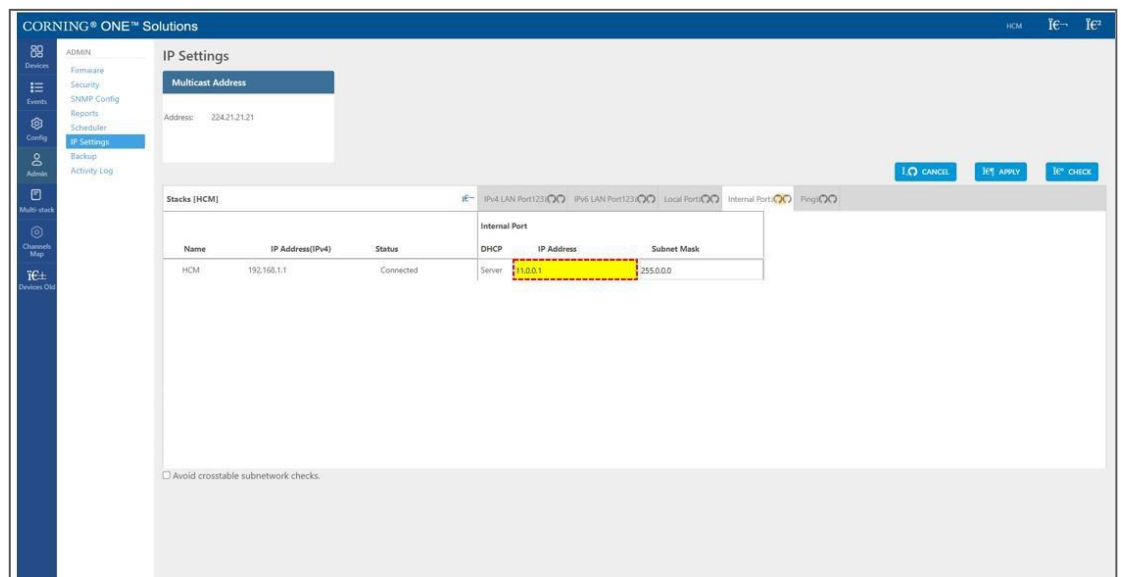
a. In the Device view Select **Admin**



b. Select **IP Settings** and click on **Edit**

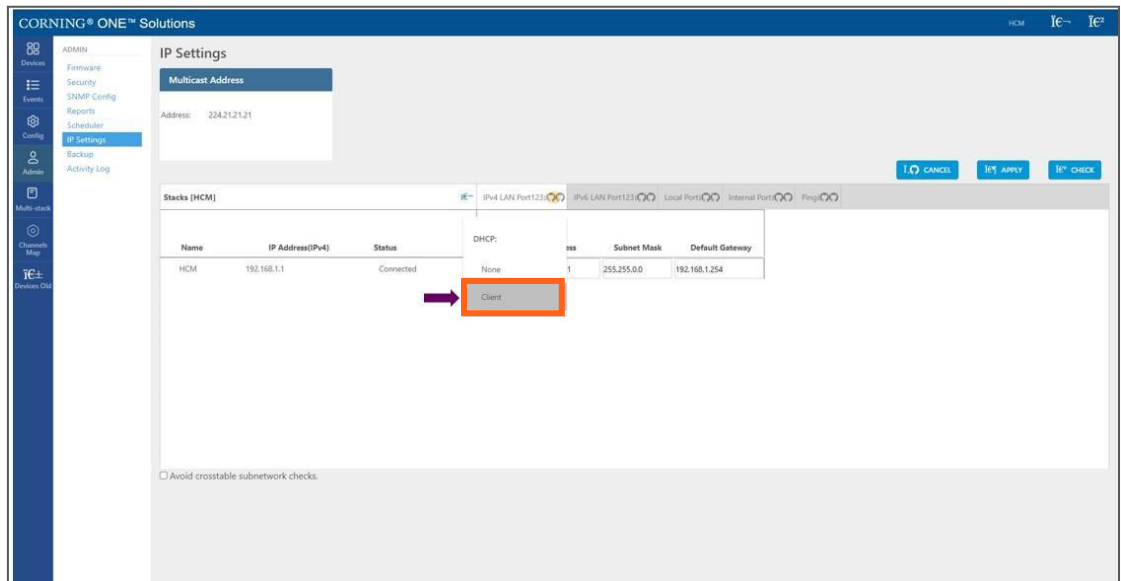


c. Set internal ports to the required IP address (in this example 11.0.0.1)

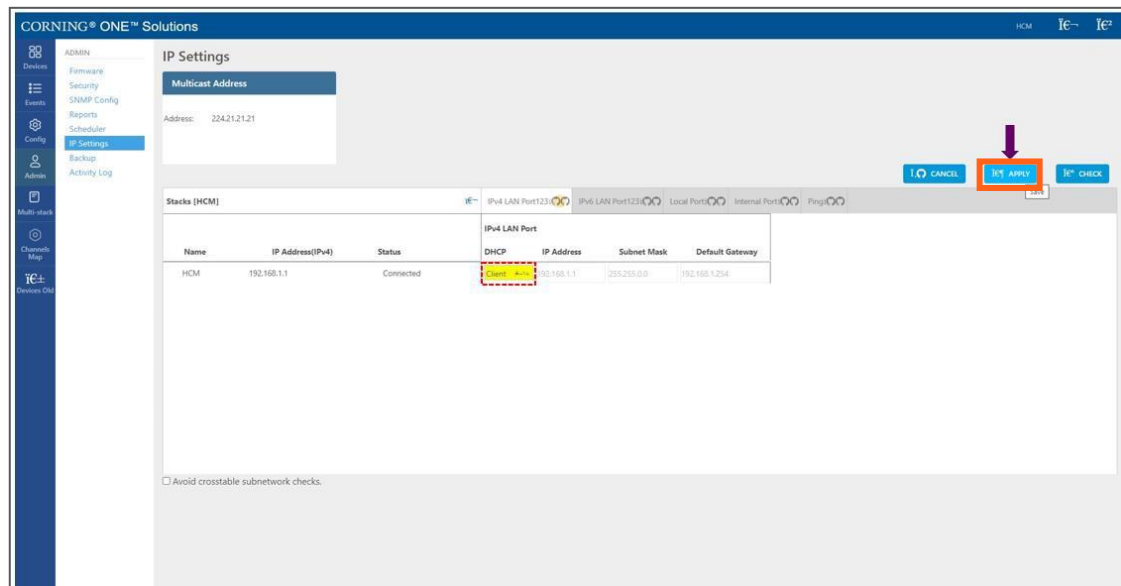




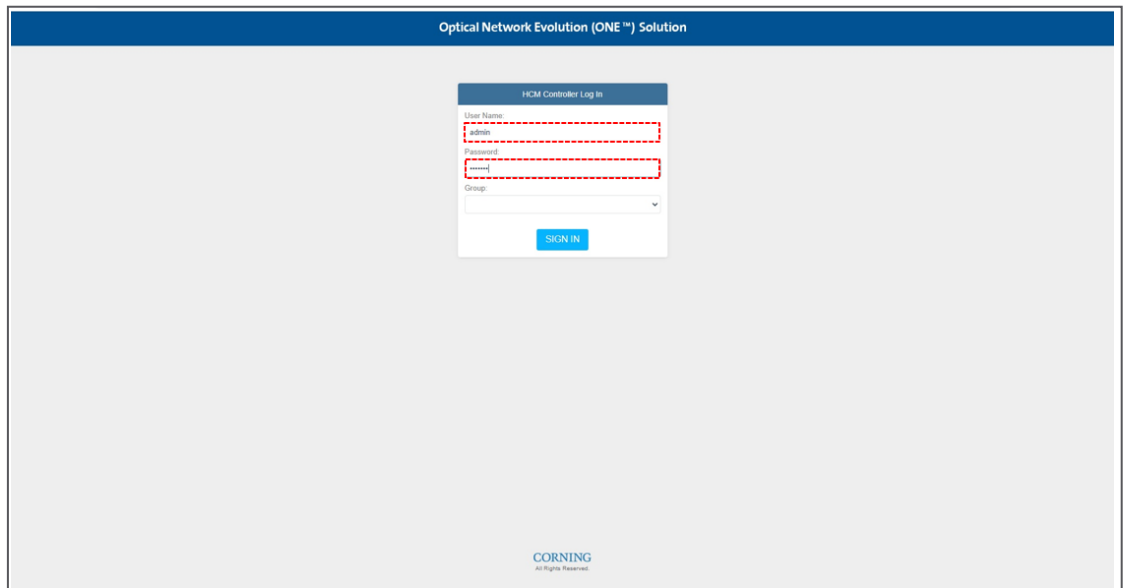
d. Click on LAN port to display roll-down menu and select **Client**



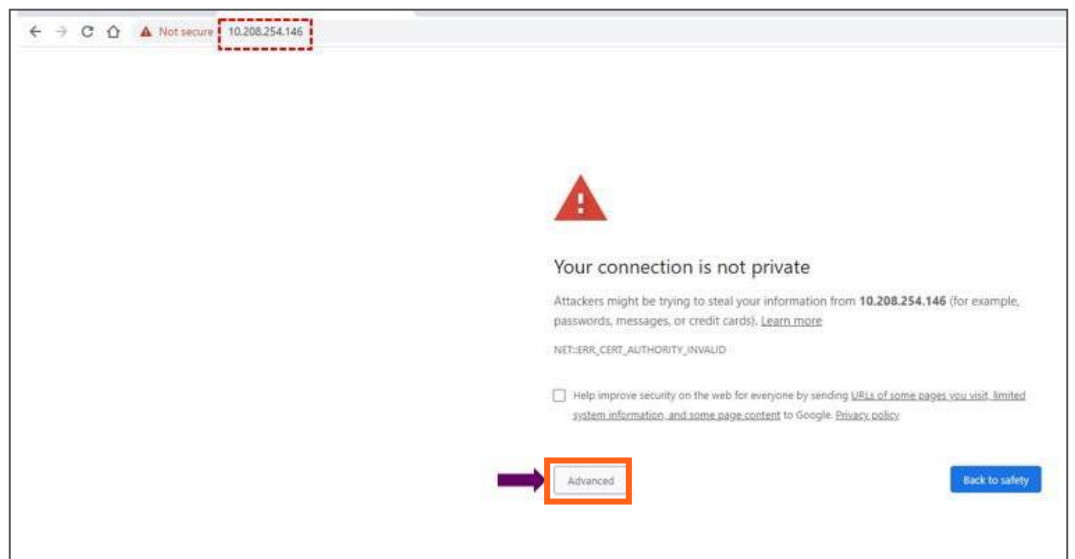
e. Click on **Apply**



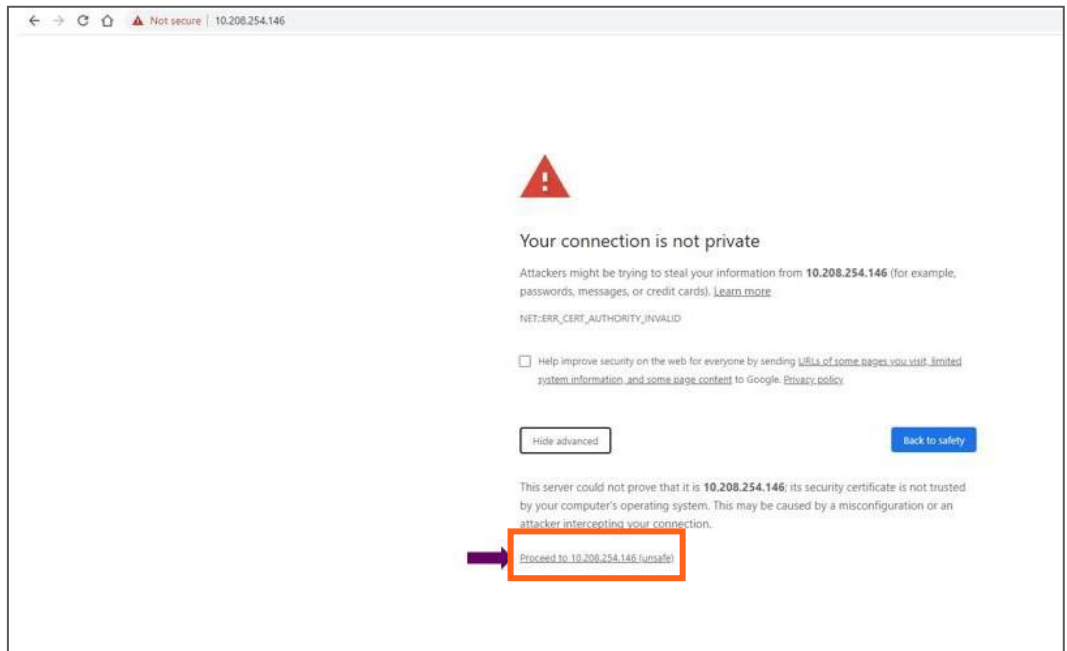
f. Enter the credentials



g. Sign out of the application. Then re-access the application:
In your browser address bar type the IP address again:



h. Select advanced → proceed to (the IP address)

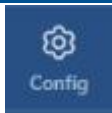


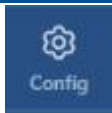
i. The application appears.

5. Commissioning (Initial configurations)

This section describes all the initial configurations (commissioning) that **must** be done by the system administrator, in order to add operators and perform commissioning. Also – to configure maps:

1. Verify all the hardware and modules have been connected, see 5.1
2. Create new user operators, see 5.2
3. Set the system parameters:
 - Set power sharing for the operators, see 5.3
 - Set channels, see 5.4
 - Set TDD config, see 5.5
 - Perform adjustment, see 5.6
4. Review the auto-set site configurations, see 5.7



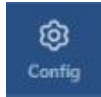
Note: The  option in the main menu is only visible to the system administrator. This section describes the configurations that only the system administrator can perform.

5.1 Verify Hardware-modules connection (auto discovery)

Verify that all the hardware and modules have been connected. This is indicated by the message: “system is in discovery mode”. When the message disappears, you may view the system hardware configuration through the site-config auto set screen.

➤ **To verify Hardware and modules are connected**

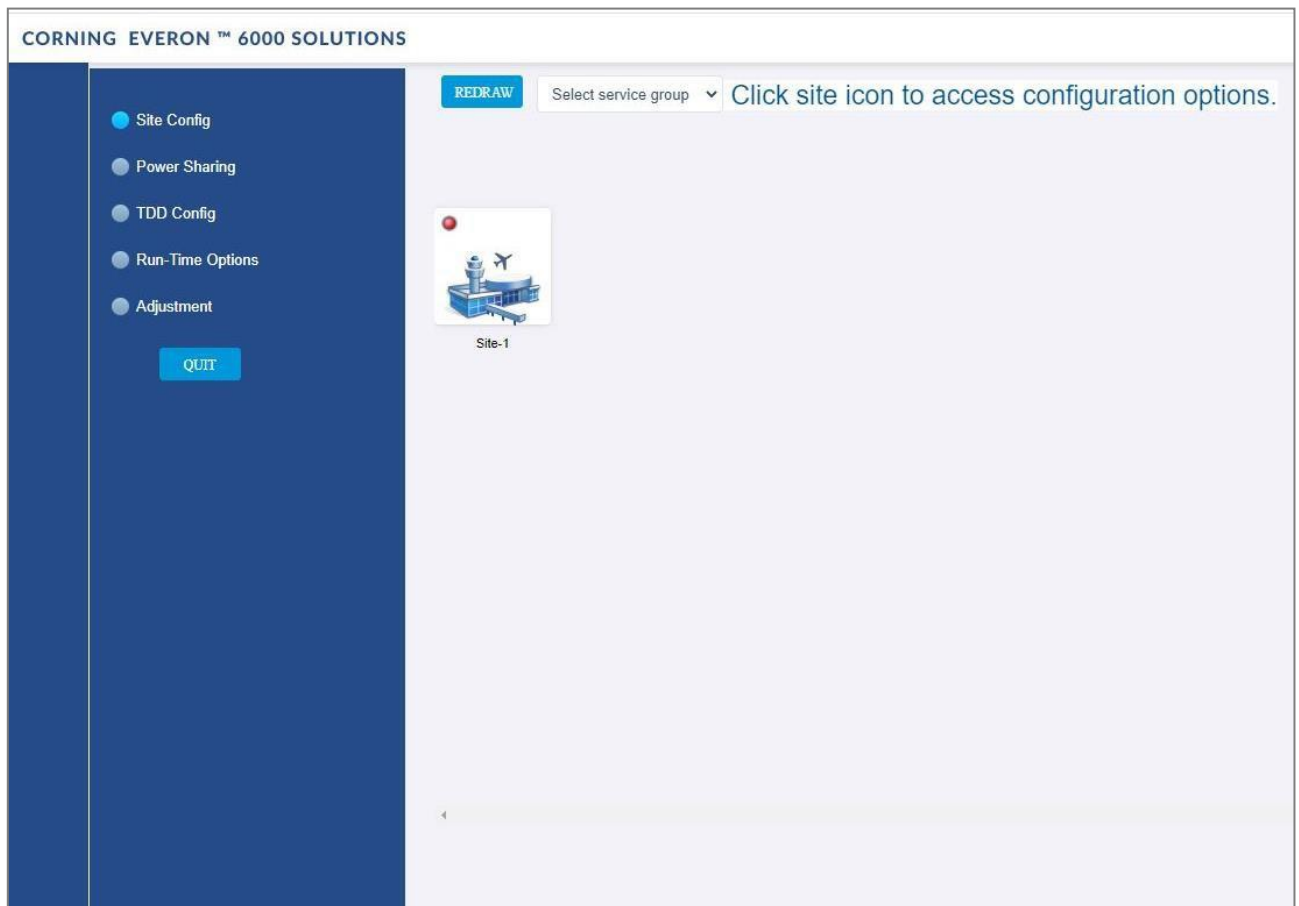
1. Verify you have accessed the system as an admin user.



2. In the main menu options, click on . The configuration screen appears
3. Select the Site Config radio button. The site configuration screen appears.

Notes:

1. The config option is only available for admin users.
 2. While the system discovery mode is in progress, new user operators can be created.
 3. This screen indicates if the auto discovery procedure has been completed. While the system identifies the elements, a message appears: “system is in discovery mode”.
-



5.2 Create new user operators

Initially the system administrator is the only system user. To enable other users to log in to the system, the system administrator must create user operators for the different providers/carriers.

When a new operator is created the administrator of the new operator must log in to add users to the operator.

Only the system administrator can create new operators.

For more information about system security refer to section 9.3.2.

➤ To create a new operator

1. Log in as the **system** administrator.



2. In the main menu bar, click
3. Click the **Add operator** button → enter the new operator name (alphanumeric characters only, no spaces) and click OK. Up to 31 operators can be created.
4. The new operator name is added to the list of defined operators and the operator administrator is automatically created with the following default authentication:
 - Username: admin
 - Password: admin
 - Operator: operator name

Note: Default Passwords should be changed when the relevant users first log in to the system. System admin can't change the operator admin password.
