



GENERAL INFORMATION

1. The HEU chassis is supplied empty and only includes the factory-assembled fan module (FAM). All other modules are ordered separately and must be installed.
2. Each HEU includes 14 slots — two for RF expander modules (RIXs) and 12 for extended radio interface modules (RIMes).

This document describes the installation procedure for the Corning® optical network evolution (ONE™) headend unit (HEU) and relevant modules.

1. REQUIRED KITS

The following items are required for installing the ONE™ HEU. If any of the listed items are missing, contact your Corning representative.





HEU Kit	Qty	Item
Headend Unit Chassis (with blank panels on RIM and one PSM slots) – includes factory-installed FAM in chassis rear	1	
FAM – single unit hosting four fans (factory installed in chassis rear)	1	
RJ45/RJ45 Communication Cable L = 2 m-2.15 m (P/N 705900003) – HCM management cable	1	
RIMe Kit (1-12 according to order)	Qty	Item
Extended Radio Interface Module (service specific)	1	

Table 1. Kits Required for HEU Installation

1. REQUIRED KITS (CONTINUED)









RIX Module Kit (1 or 2 according to order)	Qty	Item
Radio Expander Module – expands the RF sources to the OIU	1	
Pilot Transport Cable (P/N: PCKC47*) – Single QMA to QMA cable; L = 47 in; used for passing reference clock signal connections between RIX modules. *Additional lengths can be ordered: <ul style="list-style-type: none"> • PCKC20: L = 20 in • PCKC63: L = 63 in • PCKC79: L = 79 in 	1	
ERFC Cable Kit (according to order)	Qty	Item
ERFC (Expander Cable) - RF interface cable to HEU; 9-pin SMP to SMP connector Available in five different lengths: <ul style="list-style-type: none"> • ERFC16: L = 16 in • ERFC24: L = 24 in • ERFC34: L = 34 in • ERFC40: L = 40 in • ERFC59: L = 59 in 	1	
ETM Kit (according to order)	Qty	Item
ETM Expander Termination Module (for unused Expander slot) unit	1	
PSM Kit (AC or DC modules — 1 or 2 kits according to order)	Qty	Item
PSM-AC: 100-240 VAC Power Supply Module including standard IEC 60320-1 C13 cable	1 (per item)	
PSM-DC: 48 V DC Power Supply Module; 9 A maximum; Includes 6-pin terminal block connector	1	
Controller Module Kit (HCM or ACM — according to order)	Qty	Item
HCM Kit (Headend Control Module) – installed in HEU; enables local/remote management of the system units; one HCM per system	1	
ACM Kit (Auxiliary Control Module) – installed in additional HEU/OIU/IHU chassis; provides management connections between the unit and the HCM	1	

Table 1. Kits Required for HEU Installation (continued)

2. MOUNT CHASSIS IN 19-IN RACK

- Notes:
- One HEU supports connections to up to four OIUs
 - HEU chassis requires 4U rack height availability
 - Rack nuts and screws not provided

Step 1: Determine the location of the HEU in the rack while considering additional HEU and OIU units and the lengths of the available ERFC cable.

Figure 1 and Figure 2 describe the optimal rack installations for a maximum 4x4 HEU-OIU configuration in shared and dedicated equipment scenarios.

Step 2: Referring to Figure 3, secure the units' rack ears to the rack frame as follows:

- Insert two screws halfway into the rack frame.
- Position the chassis on to the screws using the handles and the top and bottom half slots of the rack ears.
- Secure the unit in the rack via all applicable bracket holes using the appropriate rack nuts and screws.

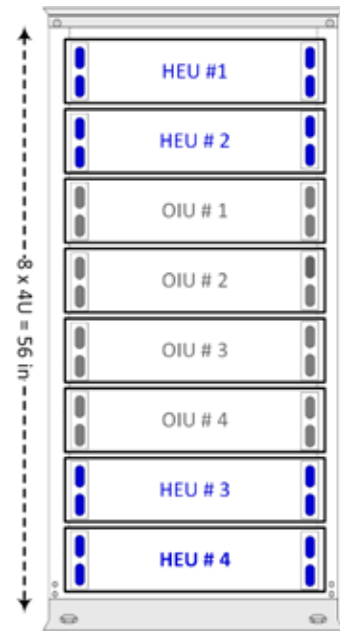


Figure 1. 4x4 Installation Diagram – Dedicated

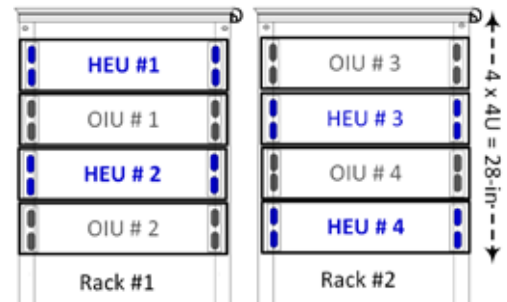


Figure 2. 4x4 Installation Diagram – Shared

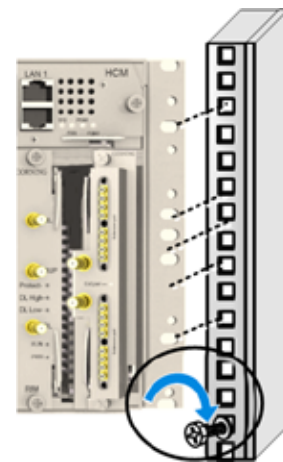


Figure 3. Installing Chassis in Rack

3. INSTALL ALL MODULES

Note: For modules with ejectors (i.e., RIM, RIX, and HCM/ACM) – verify that the ejectors are completely open when inserting in dedicated slot and then push in until the module clicks in to the backplane. Figure 5 shows example of module type captive screws and ejectors.

Step 1: Refer to Figure 4 for module locations. Remove blank panel and slide in the relevant module (chassis slots are 100 percent mistake proof):

- (One) HCM/ACM
- (One to two) PSM
- (Two) RIXs
- (One to 12) RIMs – no need to terminate unoccupied RIM slot.

Step 2: Referring to Figure 5, secure the modules to the backplane by:

- Closing the ejectors (for relevant modules)
- Tightening the captive screws

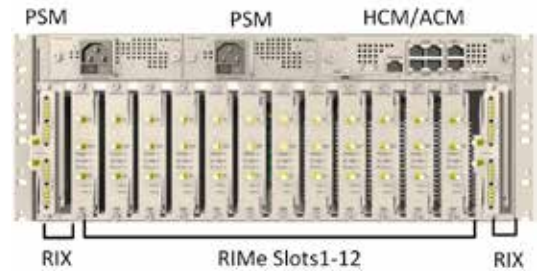


Figure 4. Example of Occupied HEU



Figure 5. Module Captive Screws and Ejectors

4. GROUND HEU CHASSIS

The grounding connection is performed via a two-hole, standard barrel grounding lug located on the HEU rear panel (see Figure 6).

Prise de terre du châssis HEU

La mise à la terre est réalisée en utilisant une cosse deux trous a œillet standard, située à l'arrière du châssis HEU (voir Figure 6).

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 — for crimping the grounding wire to the lug.
- Wire-stripping tool — for removing insulation from grounding wire



Figure 6. Grounding Lug (Chassis Rear)

5. CONNECT RIMS TO RF SOURCE(S)

For each RIMe — connect the external RF source to the corresponding RIMe (service specific) simplex or duplex QMA connectors. See Figure 7.

6. RIX TO OIX CONNECTIONS

Note: Each RIX module can be connected to two OIUs.

Using the appropriate length ERFC cable (according to distance of available OIX port), connect the HEU RIX module 9-Pin connector to the corresponding connector on the OIU OIX module. See Figure 8.

Refer to Section 11 for schematic diagram of coax connections in a maximum HEU-OIU configuration of 4x4 where all HEU units are connected to all OIU units.

7. RIX PILOT CLOCK CONNECTIONS

The pilot clock connections are required in both single- and multiple-chassis configurations. Referring to Figures 9, 10, and 11, use the QMA/QMA jumper cable (PCKC47 provided with each RIX) to connect the REF OUT and REF IN ports of each of the RIXs in the HEU chassis.

- Notes:*
- The REF IN and REF OUT pilot clock ports must be connected in a closed loop as shown in Figure 10.
 - Both RIX modules of each chassis must be connected.

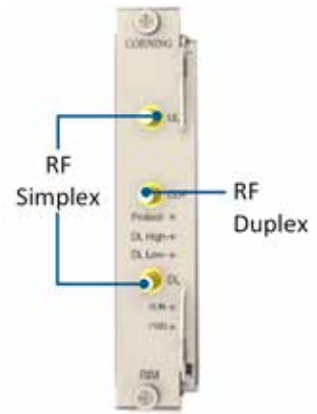


Figure 7. RIM RF Source Interfaces

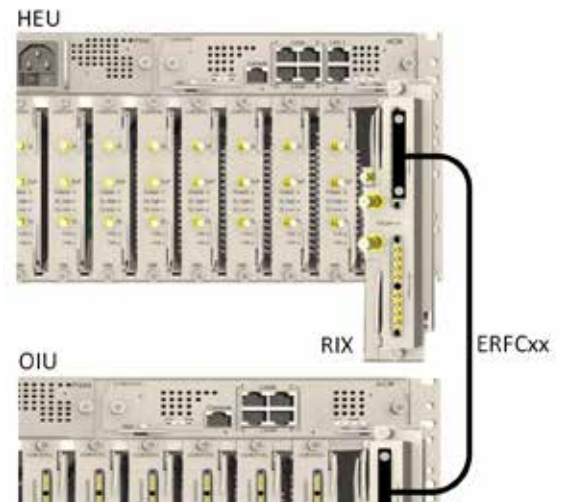


Figure 8. HEU to OIU Coax Connections

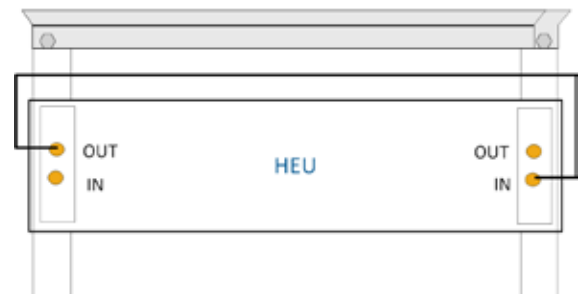


Figure 9. Pilot Clock Connections Example – Single HEU with Two RIXs

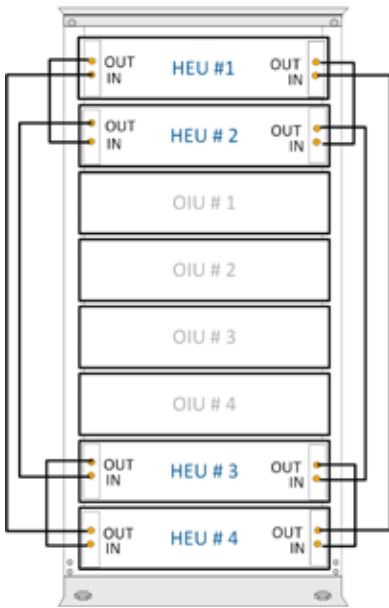


Figure 10. Pilot Clock Connections Diagram – (4x4) Shared Rack

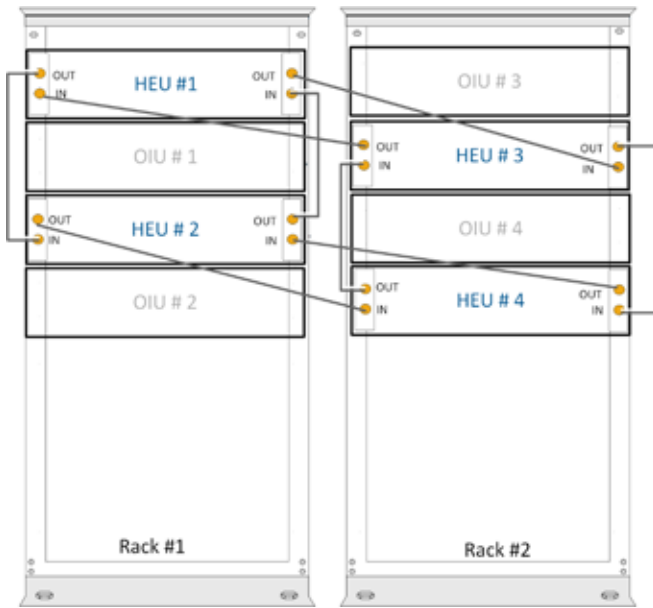


Figure 11. Pilot Clock Connections Diagram – (4x4) Dedicated Rack

8. MANAGEMENT CONNECTIONS

- Notes:
- One RJ45/RJ45 management cable is provided with each headend unit (i.e., HEU/OIU).
 - Management connections are also described in HCM quick installation sheet.

For HCM only — using the provided RJ45/RJ45 communication cable, connect the HCM LAN port to the corporate LAN (Figure 12).

HCM to ACM Management Connections — using RJ45/RJ45 communication cables perform the headend management connections as follows:

- Referring to Figure 12 — for configurations with one HCM and up to four ACM modules (e.g., one HEU and four OIUs), directly connect as follows:

From (any) HCM	To (any) ACM...
INTERNAL (TO ACM) Port 1/2/3/4	INTERNAL (TO HCM) Port 1/2/3/4

- Referring to Figure 13 — for configurations with one HCM and more than four ACMs (e.g., 4x4 HEU-OIU configurations) where there are only four available HCM INTERNAL ports:

From (any) ACM	To any
INTERNAL (TO ACM) Port 1/2/3/4	Other available ACM “INTERNAL (TO ACM)” port

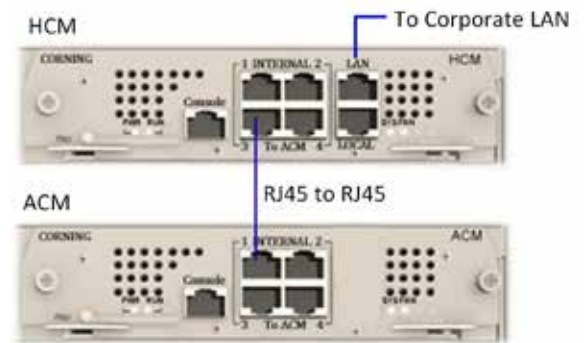


Figure 12. HCM-to-ACM Connection

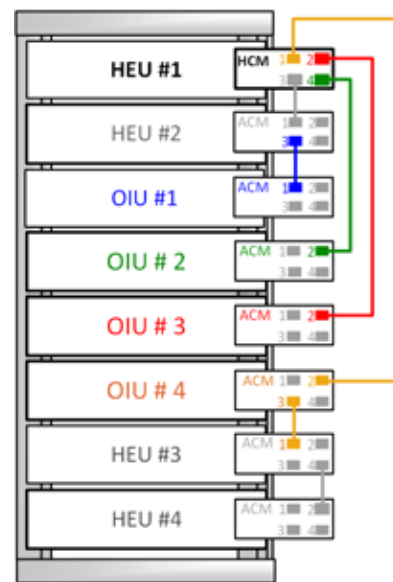
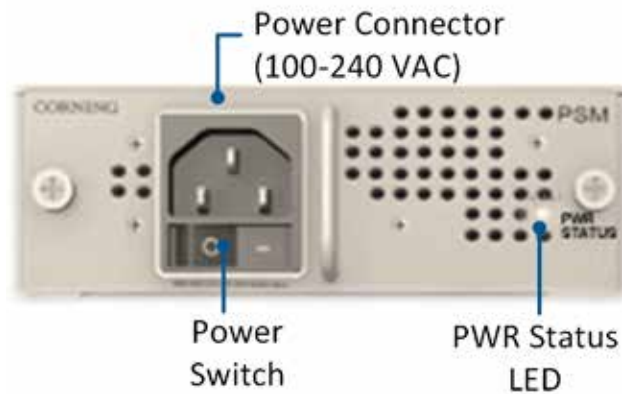


Figure 13. 4x4 Management Connections (Example)

9. POWER UP

Note: Only AC power connections are described in this document. Refer to PSM-DC quick installation sheet (CMA-365-AEN) provided with PSM-DC for wiring pinout.

Figure 14. AC Power Supply Module LEDs



ATTENTION!

- 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 nonstandard power plug can cause electrocution! Also, plugging a nonstandard plug into a standard socket that does not correspond to the plugs' shape can damage the socket making it a safety hazard.
- Always disconnect all AC power sources from the unit before servicing (i.e., maintenance).

ATTENTION!

- Câble d'alimentation qui est approuvé — la totalité de la longueur du câble d'alimentation (ou cordon souple) et de l'isolation doit être intact. Le câble doit être bien connecté à la fois à la prise électrique et l'appareil.
- Prise électrique standard — l'utilisation d'une fiche standard est obligatoire. L'utilisation d'un cordon d'alimentation non standard peut entraîner l'électrocution! De même, brancher une fiche non-standard sur une prise standard ne correspondant pas à la forme de la fiche, peut endommager la prise, ce qui en fait un danger de sécurité.
- Débrancher toujours toutes les sources d'alimentation CA de l'unité avant l'entretien.

To power up the unit:

Connect PSM-AC power connector to the AC power source using the provided AC power cable and turn power switch on. See Figure 14 for AC connector location.

- Power input: 100-240 VAC
- Power consumption (fully loaded chassis): 200 W (maximum); 12 W per RIMe

Pour mettre l'unité sous tension:

Branchez la prise d'alimentation du PSM-AC à la source d'alimentation secteur à l'aide du câble d'alimentation secteur fourni et allumez l'interrupteur. Voir Figure 14 pour l'emplacement du connecteur AC.

- Alimentation: 100-240 VAC
- Consommation maximale électrique (pour les châssis entièrement chargés): 200 W ; 12 W pour RIMe

10. VERIFY NORMAL OPERATION

If RF source is operational, verify that the RIM (see Figure 7) and HCM/ACM (see Figure 15) LEDs indicate normal operation:

Module	LED	Description
RIMe	Protect	N/A
	DL High	Off – DL RF input level in threshold range Steady Red – DL RF input level is 3 dB above maximum expected power
	DL Low	Off – DL RF input level in threshold range Steady Red – DL RF input level is 15 dB below maximum expected power
	RUN	Blinking green – RIMe software has initialized and is up and running Off – Power off
	PWR	Steady green – input power is within required range
HCM/ACM	PWR	Steady green – power input detected by HCM/ACM
	RUN	Blinking green – HCM software up and running
	SYS	Steady green – overall status of the managed system is ok
	FAN	Steady green – normal operation status for all fans
PSM	PWR STATUS	On – power input detected Off – no power

Table 2. RIMe, HCM/ACM, and PSM LED Descriptions

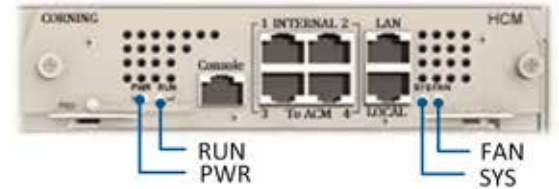


Figure 15. HCM/ACM LEDs

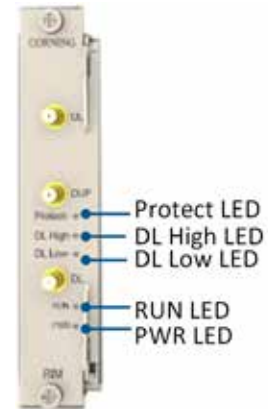


Figure 16. RIMe LEDs

11. COAX CONNECTIONS FOR HEU-OIU 4X4 INSTALLATION CONFIGURATIONS

Figure 17 and Figure 18 illustrate the optimal installation configurations when installing four HEU and four OIU chassis in a rack so that all HEUs can be connected to all OIUs. The optimal configuration takes into consideration the minimum and maximum ERFC cable lengths (provided with OIXs) in either a single 19-inch rack (shared rack equipment scenario) or two separate racks (dedicated rack per operator).

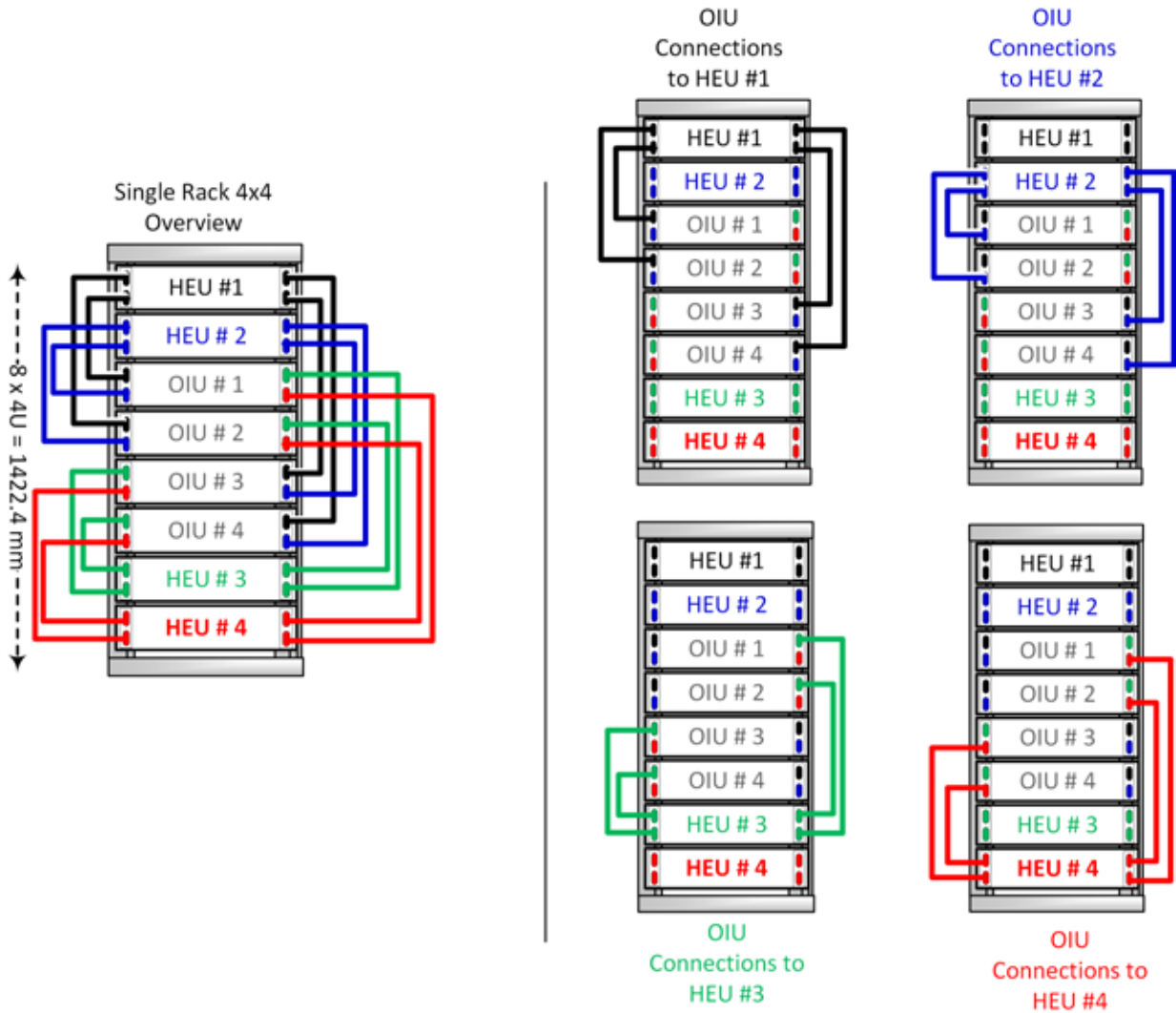
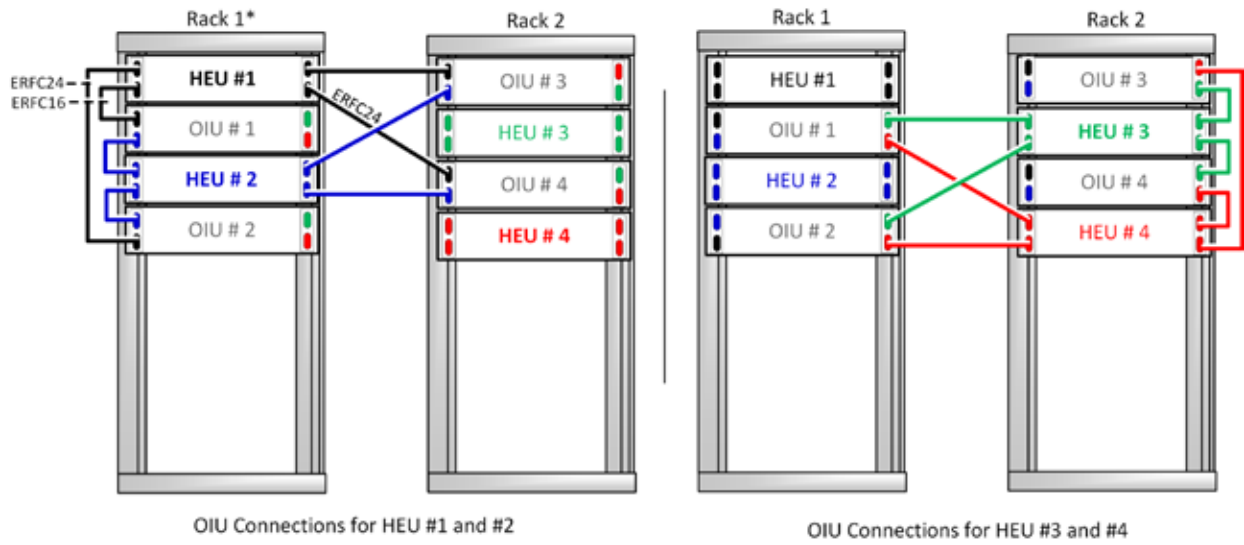
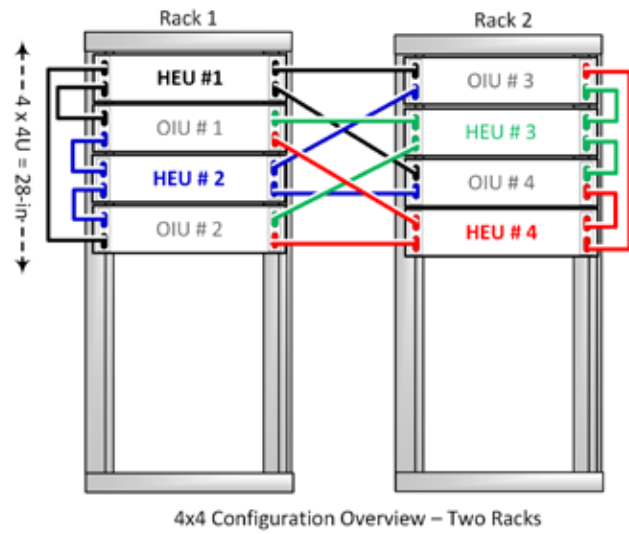


Figure 17. HEU-OIU 4x4 Installation Configuration for Shared Provider Equipment

Figure 17 illustrates how each HEU is connected to each OIU in a dedicated equipment (single rack) scenario. In Figure 17, the port numbers (1-4) indicated on each HEU correspond to the OIUs in the rack and vice versa for the OIU port numbers. For example, Port 3 in HEU #1 indicates the connection to OIU #3, whereas Port 1 in OIU #3 indicates the connection to HEU #1.



*The ERFC cables indicated in Rack 1 are provided as an example of the lengths required for this rack configuration.

Figure 18. HEU-OIU 4x4 Installation Configuration for Dedicated Provider Equipment

Figure 18 illustrates how each HEU is connected to each OIU in a shared equipment (dual rack) scenario. In Figure 18, the port numbers (1-4), indicated on each HEU, correspond to the OIUs in the racks and vice versa for the OIU port numbers. For example, Port 3 in HEU #1 indicates the connection to OIU #3, whereas Port 1 in OIU #3 indicates the connection to HEU #1.

NOTES:

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