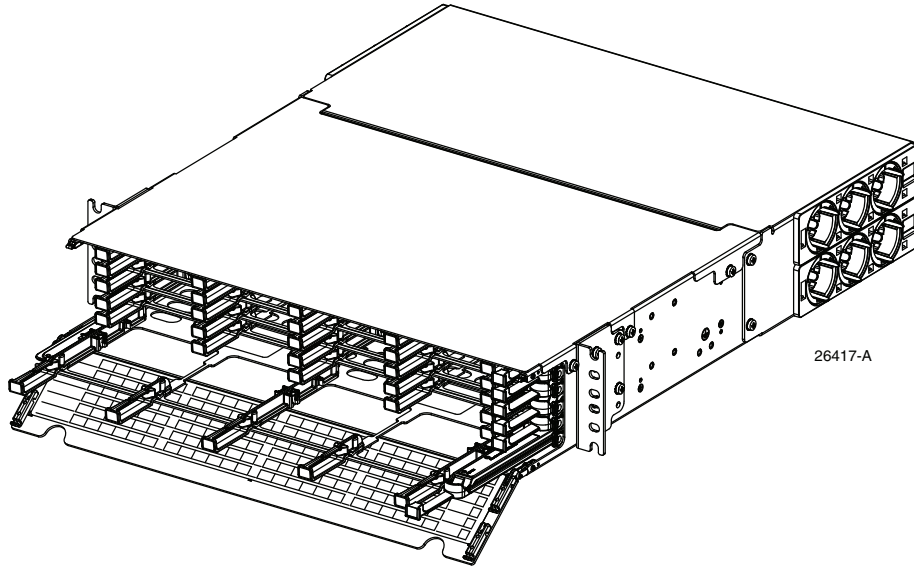


Enhanced High Density (EHD) Panel



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INTRODUCTION

This user manual describes the Enhanced High density (EHD) Panel. Included in this user manual are all procedures required in installing the EHD Panel as well as operation procedures.

Revision History

REV	DATE	REASON FOR CHANGE
Rev C	January 2019	Added new information on shipment (product stacking).

Trademark Information

CommScope (logo), CommScope, and Enhanced High Density Panel are trademarks.


Applicable Standards


UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements)


CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)

Admonishments


Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment. An admonishment identifies a possible hazard and then explains what may happen if the hazard is not avoided. The admonishments — in the form of Dangers, Warnings, and Cautions — must be followed at all times.


 **Danger:** *Danger is used to indicate the presence of a hazard that will cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*

 **Warning:** *Warning is used to indicate the presence of a hazard that can cause severe personal injury, death, or substantial property damage if the hazard is not avoided.*

 **Caution:** *Caution is used to indicate the presence of a hazard that will or can cause minor personal injury or property damage if the hazard is not avoided.*

General Safety Precautions

 **Caution:** *When mounting equipment in the rack make sure mechanical loading is even to avoid a hazardous condition, such as loading heavy equipment in the rack unevenly. The rack should safely support the combined weight of all equipment it supports.*

 **Caution:** *This equipment is to be installed only in Restricted Access Areas (dedicated equipment rooms, equipment closets, etc.).*

1 PRODUCT DESCRIPTION

1.1 General Description

The Enhanced High density (EHD) Panel is a fiber optic connector panel intended for use in large data centers in a direct connect or interconnect environment. The EHD Panel mounts in a 19-inch (48.26 cm) or 23-inch (58.42 cm) equipment rack with a 3-inch or 6-inch channel. The EHD Panel will also mount in 19-inch or 23-inch cabinet. The EHD Panel is available in 1RU, 2RU, or 4RU size. In each 1RU of rack space, a fully loaded panel provides 144 LC (72 Duplex) terminations and/or 72 MPO ports. The panel features slide out blades (three per 1.75 inches (4.44 cm) of rack space) accessible from front or rear and providing full hand access to adapters and connectors. Each blade can accommodate two adapter packs or modules.

1.2 Major Components

Figure 2 shows the main components of the EHD Panel. They are as follows:

- ▶ **Note:** In this figure, the 2RU panel is shown. Main components are analogous for other RU sizes. For comparative views of the three panel sizes, refer to [Section 1.3 on Page 4](#).
- **Blade**—holds two LC-MPO modules or two MPO adapter packs; slides out toward front or rear of the panel. There are three blades per 1RU of rack space. The blade has a first and second position. The first position is used to plug in connectors to the front of an adapter pack or module. The second position (further removed from the front of the panel) is used install adapter packs and modules, and for access to clean the rear connectors when using adapter packs.

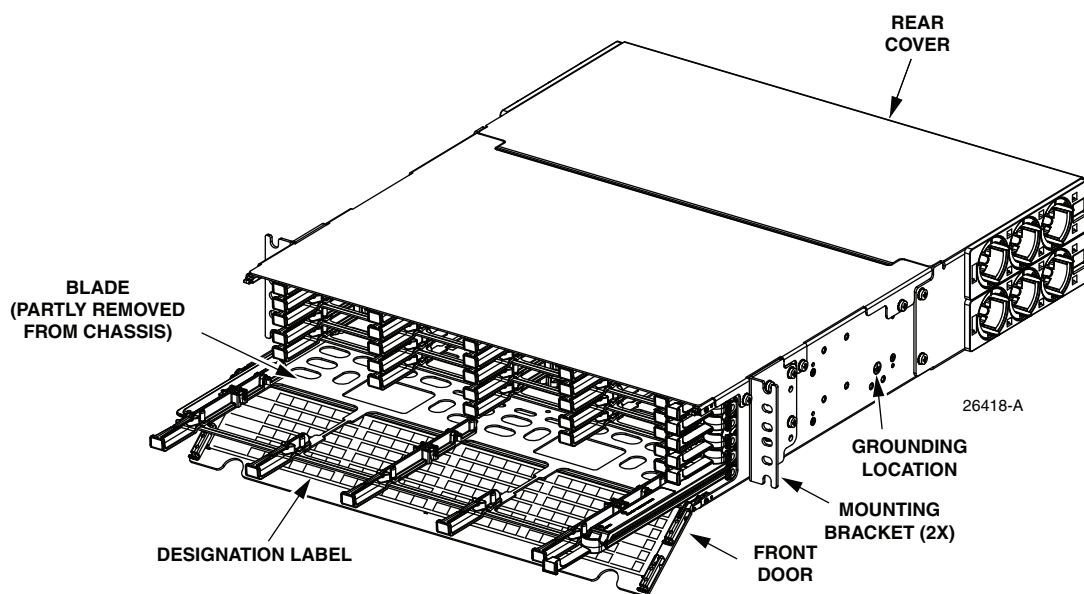


Figure 1. EHD Panel Main Components (2U Model Shown)

- **Rear Cover**—can be removed to allow a blade to be removed from the rear of the panel. It is also removed to route in and secure fiber cables on the rear of the panel.
- **Grounding Location**—is where a two-hole lug (not provided) and ground wire are attached to connect the panel ground PEM nuts to office ground. The two-hole lug to be used requires a spacing between holes of 0.625 inch (1.59 cm).
- **Mounting Brackets**—can be flipped around to provide either front- or rear-facing mounting on a channel rack. The mounting brackets can be mounted with a recess of either 3 inches (7.62 cm) or 6 inches (15.24 cm).
- **Front Door**—swings down to provide access to the interior of the panel. The door features a double-hinged design that allows users to open the door without interfering with equipment below the panel on the same rack, or to move the door into its lower position allowing the lowest blade to open freely.
- **Designation Label**—provides physical space for recording fiber designations.

1.3 Comparative View of 1RU, 2RU, and 4RU Panel

The figures below provide comparative views of the different sizes of the EHD Panel, as follows: 1RU panel (Figure 2); 2RU panel (Figure 3); 4RU panel, front view (Figure 4); 4RU panel, rear view (Figure 5). Figure 6 shows the rear of the 4RU panel with rear cover removed. The 4RU panel has a removable mid-shelf, also shown in Figure 6.



Figure 2. EHD 1RU Panel



Figure 3. EHD 2RU Panel



Figure 4. EHD 4RU Panel



Figure 5. EHD 4RU Panel, Rear View



Figure 6. EHD 4RU Panel, Rear View, Rear Cover Removed

- **Note:** The 4RU panel comes with a rear midshelf, shown in [Figure 6](#). This midshelf can be removed for easier access to the bottom blades when cabling or for high count cables that will be terminated on both lower and upper blades. The midshelf should be used when many trunks are terminated in the panel. The midshelf prevents the weight of the trunks terminated on the top blades from weighing down on the trunks terminated at the bottom of the panel thus impeding their movement.

1.4 Specifications

[Table 1](#) lists specifications for the EHD Panel.

Table 1. EHD Panel Specifications

PARAMETER	SPECIFICATION	REMARKS
Operating conditions	−14°F to +140°F (−10°C to +60C)	
Humidity	10% to 95% RH	No condensation
Storage conditions	−40°F to +158°F (−40°C to +70°C)	
Panel Dimensions and Weight		
1RU panel	Dimensions: 21.17 in. (53.76 cm) D x 17.24 in. (43.78 cm) W x 1.72 in. (4.37 cm) H	Weight without packaging: 14.0 lb. (6.4 Kg); Weight with packaging: 19.5 lb. (8.9 Kg)
2 RU panel	Dimensions: 21.17 in. (53.76 cm) D x 17.24 in. (43.78 cm) W x 3.44 in. (8.74 cm) H	Weight without packaging: 19.4 lb. (8.8 Kg); Weight with packaging: 25.6 lb. (11.6 Kg)
4 RU panel	Dimensions: 21.17 in. (53.76 cm) D x 17.24 in. (43.78 cm) W x 6.94 in. (17.63 cm) H	Weight without packaging: 32.4 lb. (14.7 Kg); Weight with packaging: 42.0 lb. (19.1 Kg)
All panel	Width with 19-inch brackets*	18.31 in. (46.51 cm);

*between mounting holes

1.5 Transportation and Storage

Products packaged in cartons may be stacked two high in transportation and storage. Some products packaged in spools may be stacked two high in transportation and storage. See product packaging labels for designation.

2 UNPACKING AND INSPECTION

1. Inspect the exterior of the shipping container(s) for evidence of rough handling that may have damaged the components in the container.
2. Unpack each container while carefully checking the contents for damage and verify with the packing slip.
 - ▶ **Note:** There will be cardboard and/or plastic inserts inside of the panel to prevent damage during shipping. Panel front door and rear cover will need to be opened to remove them.
3. If damage is found or parts are missing, file a claim with the commercial carrier and notify CommScope Customer Service. Save the damaged cartons for inspection by the carrier.
4. Refer to [Section 7 on Page 26](#) if you need to contact CommScope.

5. Save all shipping containers for use if the equipment requires shipment at a future date.

3 PANEL INSTALLATION



Caution: This equipment is to be installed only in Restricted Access Areas (dedicated equipment rooms, equipment closets, etc.).

3.1 Overview

The EHD Panel, shown in [Figure 7](#), is mounted in a 19 inch (48.26 cm) channel rack or cabinet. When mounting into a cabinet, it is recommended that the rear mounting rails be 24 inches back (60.96 cm) from the front mounting rails. Trunk breakouts are intended to come into the rear right or left side of the panel. CommScope trunks with standard breakouts and gland adapters are the preferred method.

If required per local standards, the panel can be grounded as described in [Section 3.3 on Page 10](#). Ground lugs and ground cables are not provided with the panel.

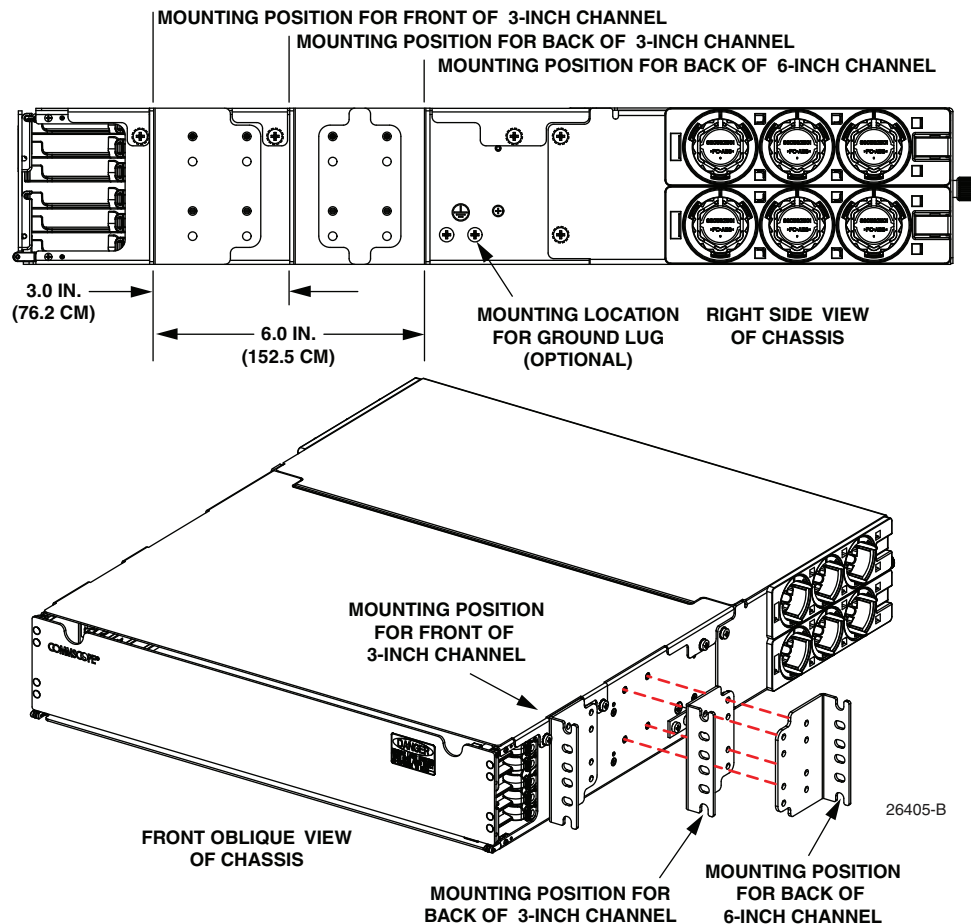


Figure 7. Mounting Options

3.2 Mounting the Panel

The panel can be installed in a 19-inch (48.26 cm) or 23-inch (58.42 cm) equipment rack with a 3-inch or 5-inch channel, as shown in [Figure 7](#). Use the following procedure to mount the panel:

1. Obtain the following tools and equipment:
 - Phillips #2 screwdriver;
 - Mounting hardware provided.

► **Note:** The panel is shipped with the 19-inch mounting brackets at the 3-inch recess position, as shown in [Figure 8](#). The two 23-inch mounting/shipping brackets mounted further back can be removed and discarded. To ease installation, the back cover and side plate/gland adapters assemblies should also be removed. See [Section 4.5 on Page 16](#).

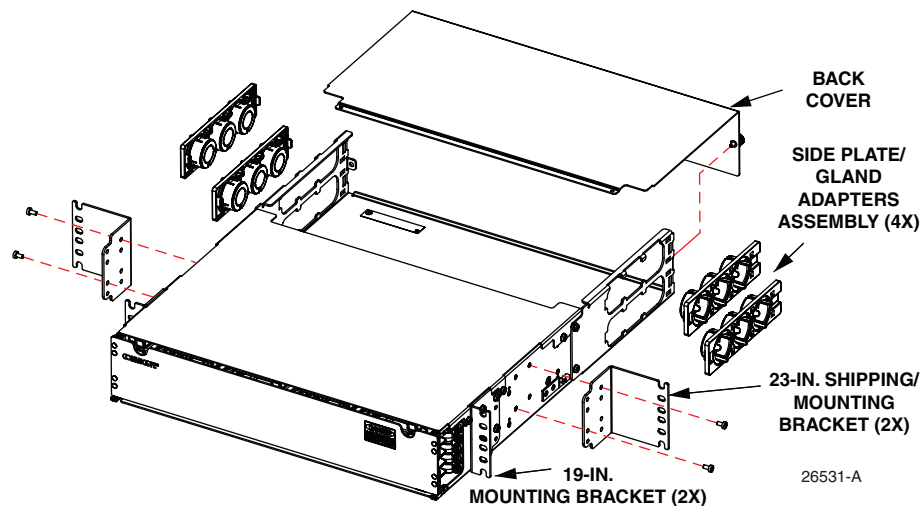


Figure 8. EHD Panel as Shipped

2. Select the mounting position to be used referring to [Figure 7](#), and if required remove and re-install the mounting brackets on the panel using the screws holding the brackets when shipped.
3. Once the mounting brackets are located in the correct position ([Figure 10](#)):
 - a. Select two mounting screws from the accessory pack, and screw the two screws into the rack bottom mounting position on each rail approximately 1.5 turns (so most of the screw shank is still out).
 - b. Place the open slots on the bottom of the mounting brackets onto these screws.
 - c. Secure the brackets with mounting screws at higher points on the bracket. Use the first full mounting hole for the top screw.
 - d. Tighten the bottom screws.

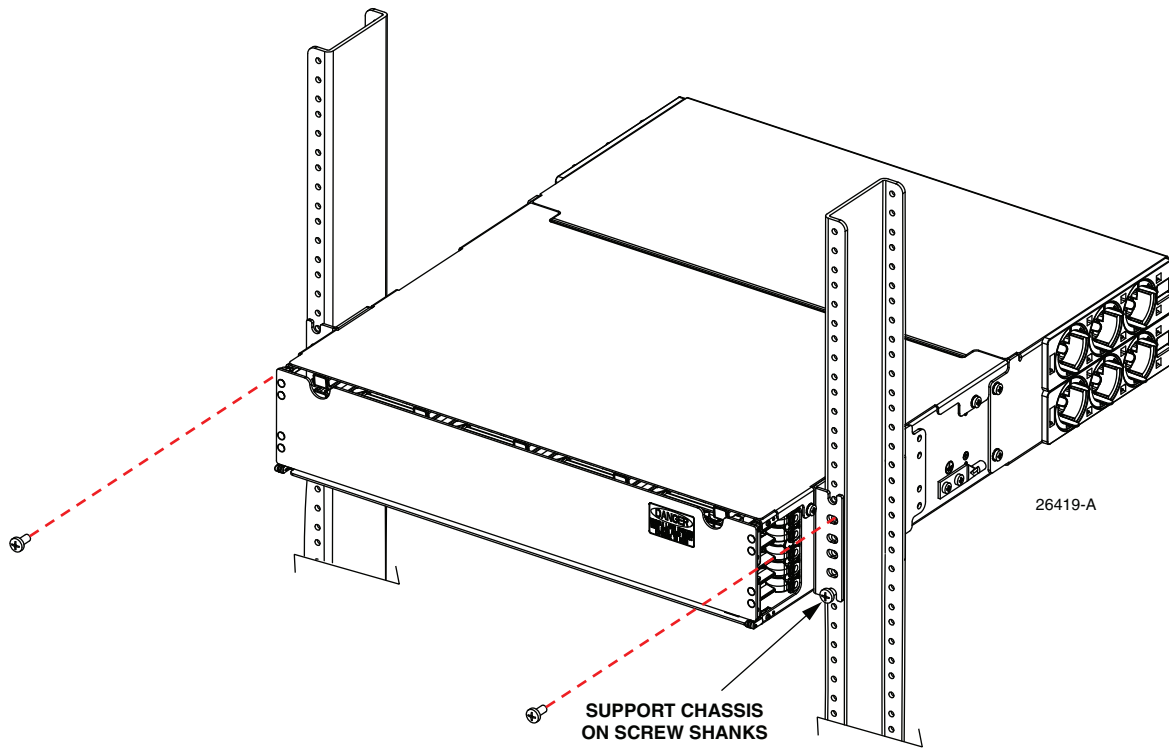


Figure 9. EHD Panel as Shipped

3.3 Grounding the Panel

A termination (for an M4 screw) is provided on the panel for a frame ground connection, if required. The connection must be made in accordance with local and national electrical codes.

Use the following procedure, referring to [Figure 10](#).

1. Locate the ground location on the panel.

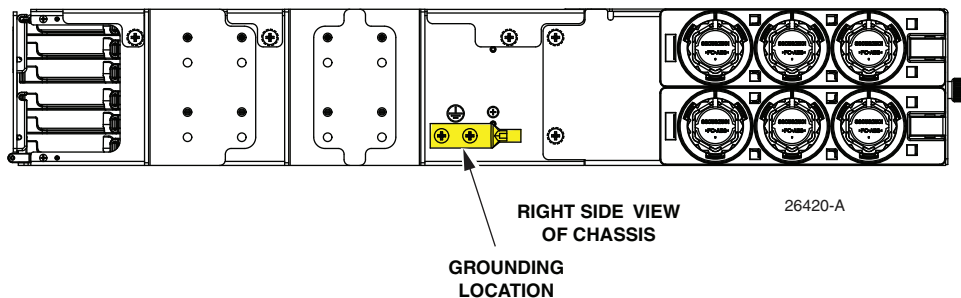


Figure 10. Grounding Location

2. Using AWG 14 (1.6 mm) solid copper wire, secure a crimp lug to one end of the ground wire (installer provided). Secure the crimp lug to panel with two M4 screws. Torque the screws to approximately 15 pound-inches (1.7 Newton meters).
3. Connect the other end of the ground wire to the earth ground conductor. Ensure this connection is made using methods and hardware that meets all applicable local and national electrical codes.

4 OPERATION

4.1 Loading Adapter Packs or Modules

For an adapter pack or module to be loaded, the designated blade must be slid out to the “first position” and then the “second position,” providing access to press the module or adapter pack onto the blade. Use the following procedure.

1. To slide out a blade to the first (access) position, pull out the pull arm on the right side of the panel until the blade contacts the first detent, as shown in [Figure 11](#).

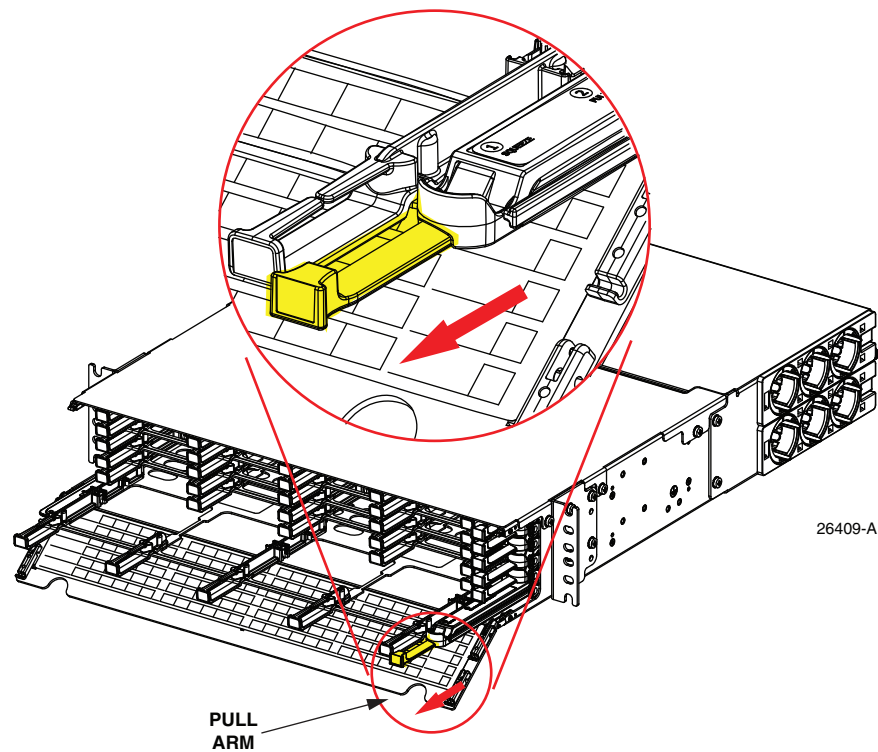


Figure 11. Sliding Out Blade to First Position

2. To slide out the blade further to the second position ([Figure 12](#)):
 - a. Place index finger into the concave loop on the slide mechanism, place thumb on the pull arm, and squeeze index finger and thumb together.
 - b. Slide out the blade until it stops in the second position.
- **Note:** The second position also provides cleaning access to the rear of the modules.

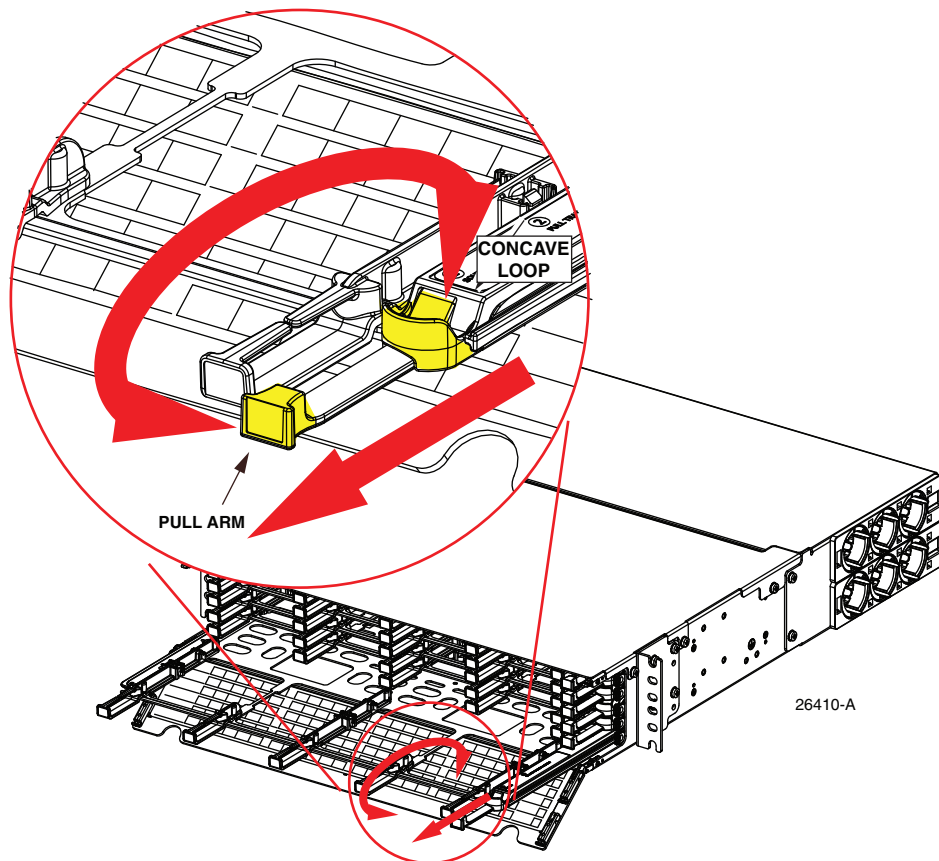


Figure 12. Sliding Out Blade to Second Position

3. Hold the adapter pack or module above the blade, align it with the blade position, and press it into place as shown in [Figure 13](#) (MPO adapter pack) or [Figure 14](#) (LC-MPO module).

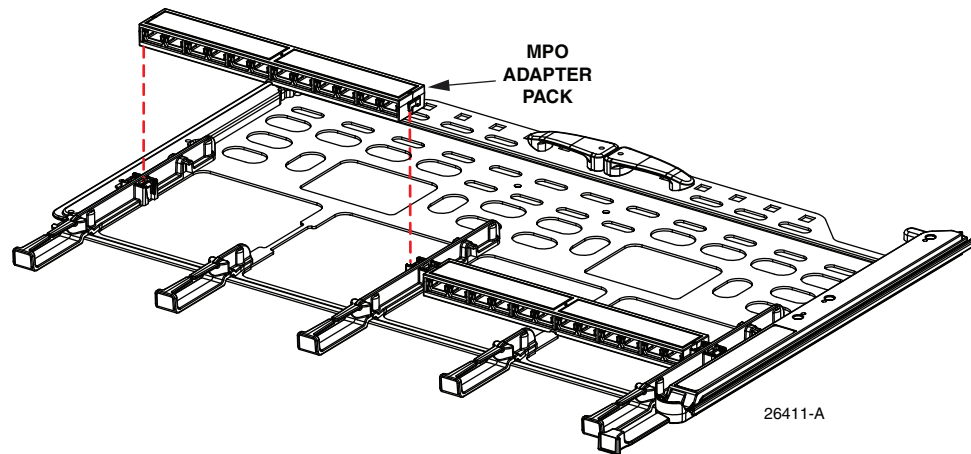


Figure 13. Installing MPO Adapter Pack

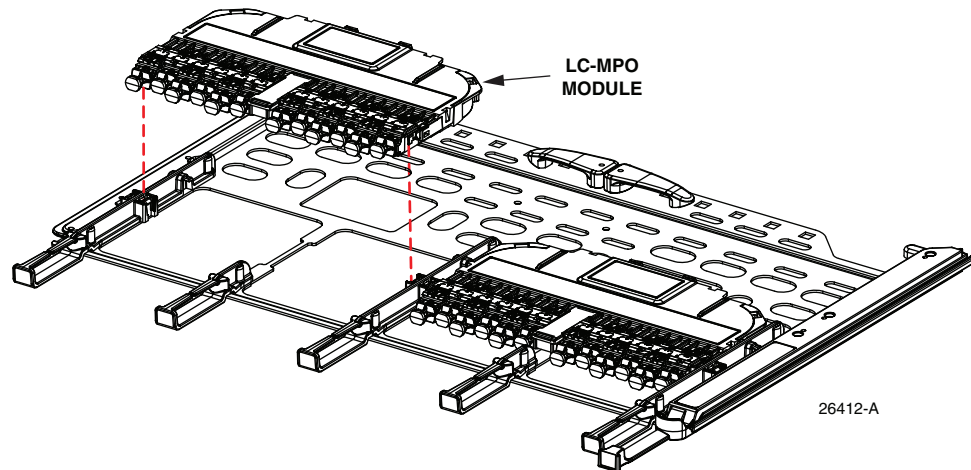


Figure 14. Installing LC-MPO Module

4. To close the blade, push in the push handle on the right side of the panel until the blade is fully within the panel.

4.2 Accessing Connectors on Back of Modules

The rear connectors on LC-MPO modules are able to be unplugged and cleaned from the second blade position. Use the following procedure to access the connectors on the back of an adapter pack.

► **Note:** The connectors on the rear side of the MPO adapter packs can simply be unplugged and cleaned from the second blade position.

1. Slide out the blade to the second position as described in the first two steps in [Section 4.1 on Page 11](#).
2. Pull straight up on the module to remove it from the blade.
3. Clean the connectors following local practice.
4. When done, replace the module and close the blade.

4.3 Closing Blade

To close a blade, push in the push handle on the right side of the panel until the blade is fully within the panel.

4.4 Removing Blade from Front (if Required)

To remove a blade from the panel ([Figure 15](#)):

1. Deflect the tab outward on the right side of the panel.
2. Pull on a gray fiber management finger (not the white pull handle). The gray management finger is highlighted in yellow in the figure.

► **Note:** Pull on the middle fiber management finger as shown.

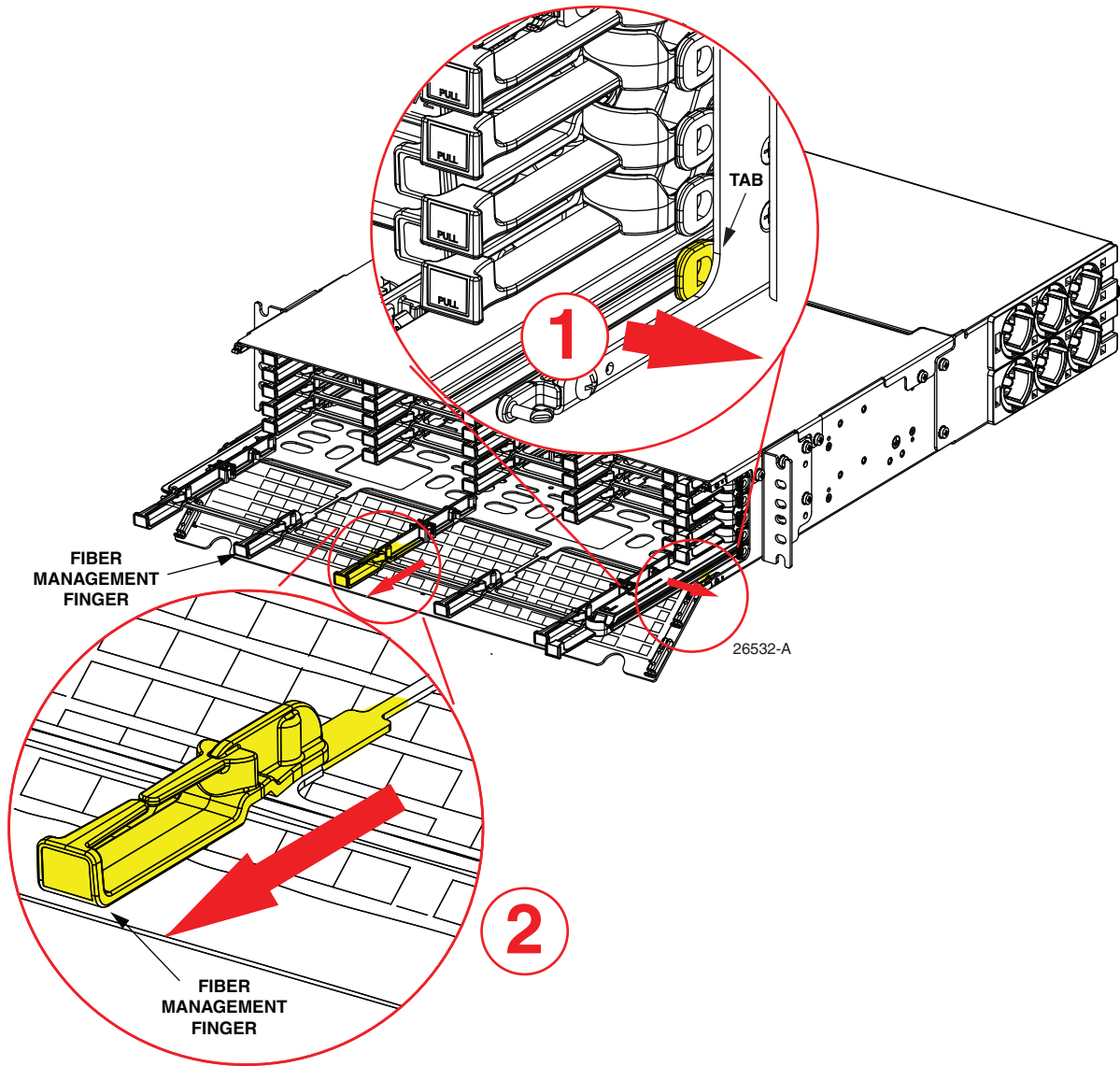


Figure 15. Removing Blade From Front

4.5 Installing Trunk Cables

Trunk cables (“trunks”) are installed from the rear of the panel. The rear cover must first be removed. Trunks should be installed from bottom up. Cables may be routed to the panel from either side or from both sides.

- ▶ **Note:** The preferred trunks for the EHD panel are CommScope trunks with gland adapters and standard breakout lengths.
- ▶ **Note:** Trunks entering through lower level entry points should be routed to the lower level trays within the chassis and trunks entering through higher level entry points should be routed to upper level trays within the chassis.
- ▶ **Note:** Hook-and-loops should be installed around bundles for each tray. Install where bundle begins to spread out naturally due to routing lengths. See [Figure 16](#)



Figure 16. Cable Bundled With Hook-and-Loops

Use the following procedure.

1. Remove the rear cover by loosening the captive fasteners, as shown in [Figure 17](#).

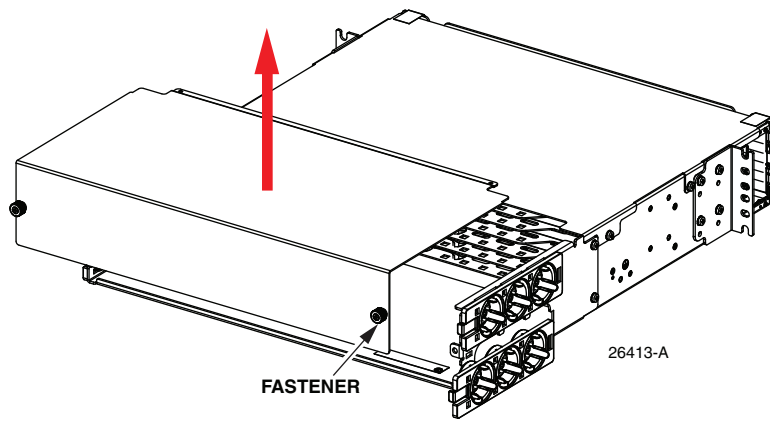


Figure 17. Removing the Rear Cover

2. Remove the cable attachment molding from the hole positions where trunks will be installed, as shown in [Figure 18](#).
- **Note:** Leave the molding plates in place. The plates can be temporarily removed, however, if space is required (not part of this procedure).

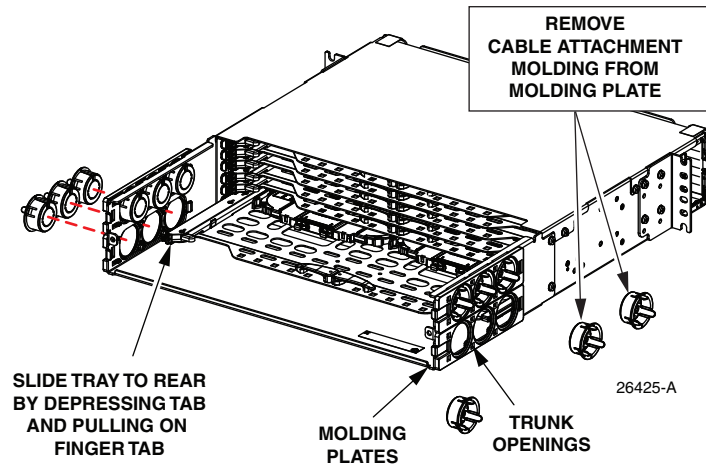


Figure 18. Removing the Cable Attachment Molding

3. Depress the tab on the lowest blade, as shown in [Figure 18](#), and pull the blade backward using the finger pull so that the blade will be accessible for connecting the trunk connectors to the adapter pack or module already installed on the blade.

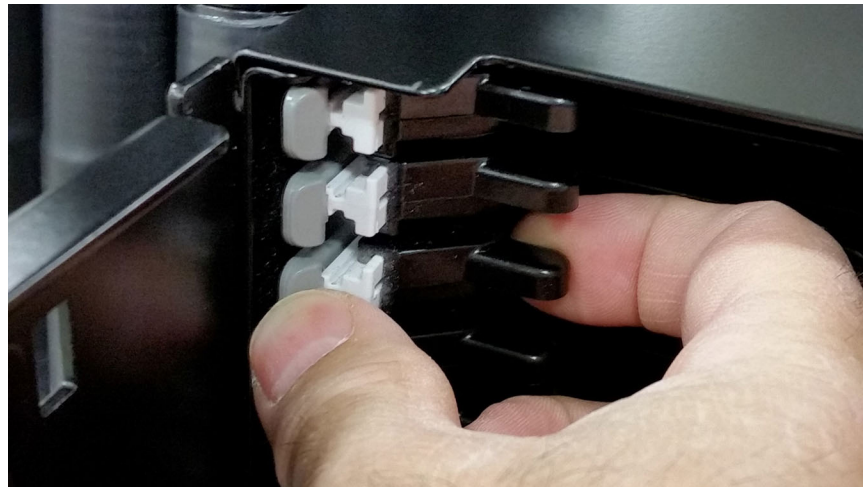


Figure 19. Depressing the Tab

4. Based on cable location and number of sub-units, determine the configuration to be used for routing cables to the EHD panel. Cables may enter the panel from either side only or from both sides. For an example of single side entry, see [Figure 20](#). For an example of left and right cable entry, see [Figure 21](#).



Figure 20. Single Entry Cable Routing (Top View)



**Figure 21. Left and Right Cable Routing (Rear View)
(Cables With Hook-and-Loops Shown)**

- **Note:** Some cables are shipped with protective mesh tubing already installed as shown in [Figure 22](#) at the cable clamp and in [Figure 23](#) at the entry point to the EHD panel.

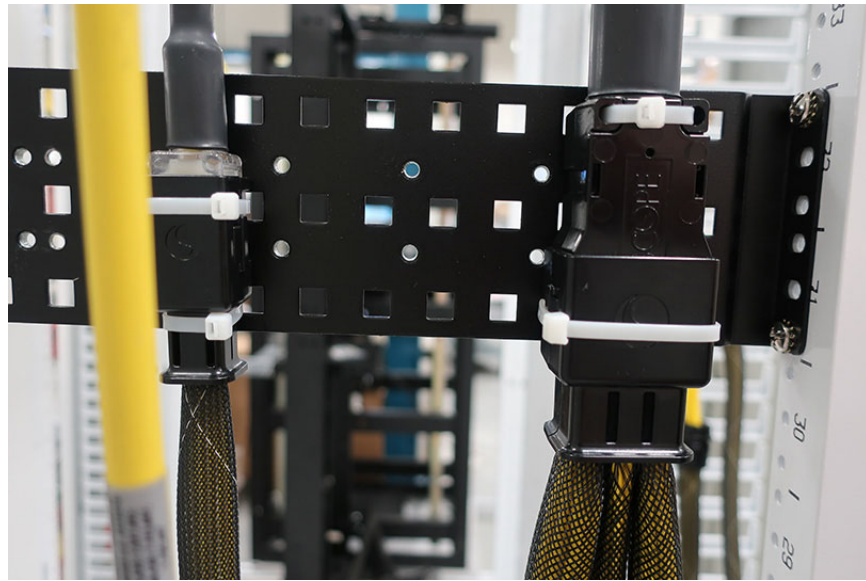


Figure 22. Trunks With Protective Mesh Fitting Secured in Cable Clamps

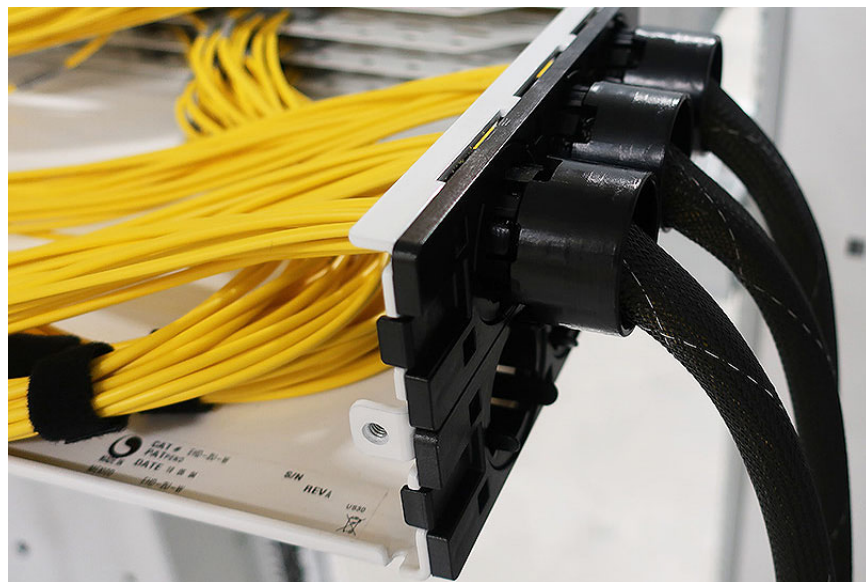
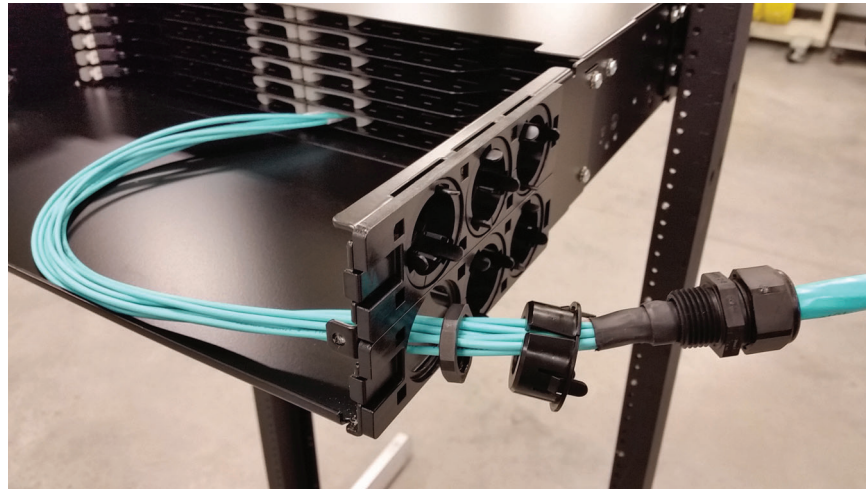


Figure 23. Trunks With Protective Mesh Tubing at Entry Point to EHD Panel

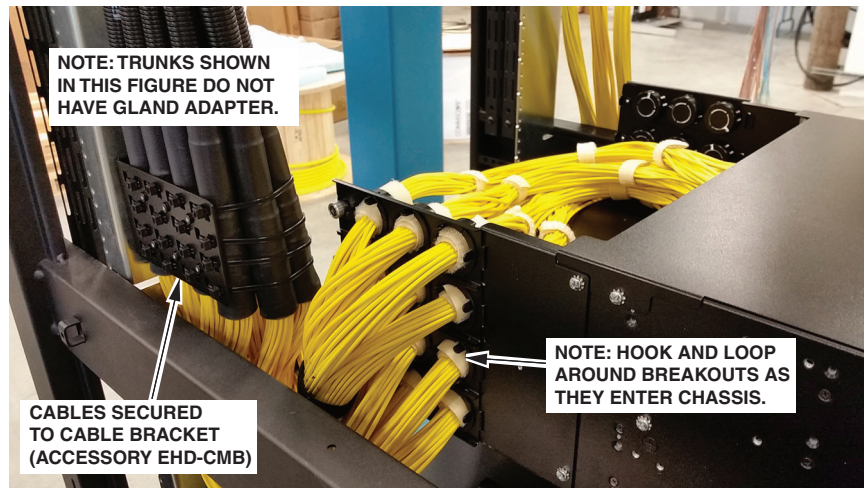
5. Starting with the lowest, rear-most hole, remove the center “knockout” from the molding. Slide the cable breakout through the slit on the side of the molding. Before securing the cable to the rack or bracket outside of the panel, make sure there is enough slack in the cable to allow the blade to be slide forward to the “second position” (described in [Section 4.2 on Page 14](#)).

- ▶ **Note:** Hook-and-loops should be installed around bundles for each tray. Install where bundle begins to spread out naturally due to routing lengths. Refer to [Figure 21 on Page 18](#).
- ▶ **Note:** Breakout lengths for trunks entering panel from side plates should be 30+/- 3 in. (76.2+/-7.62 cm). CommScope trunk cables with gland adapters meet this requirement.



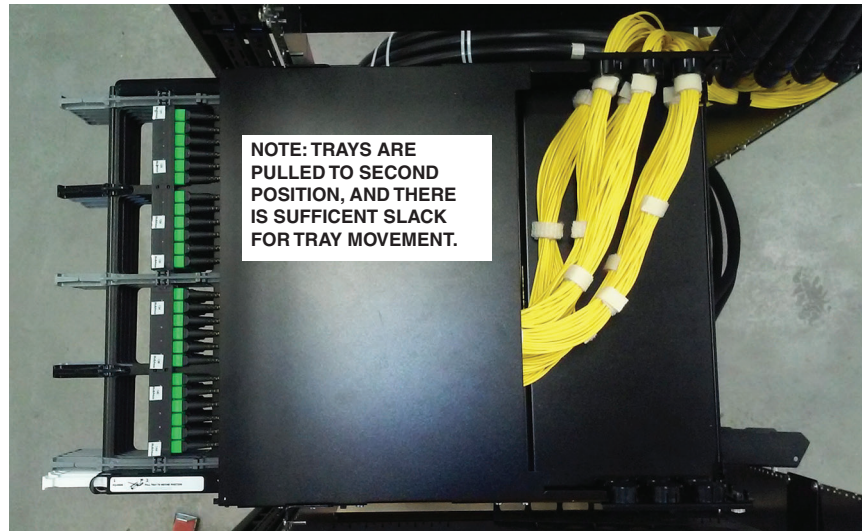
**Figure 24. Routing in the First Trunk
(Trunk With Gland Adapter Shown)**

6. Continue routing in trunks and plugging in connectors, referring to [Figure 25](#), [Figure 26](#), and [Figure 27](#).



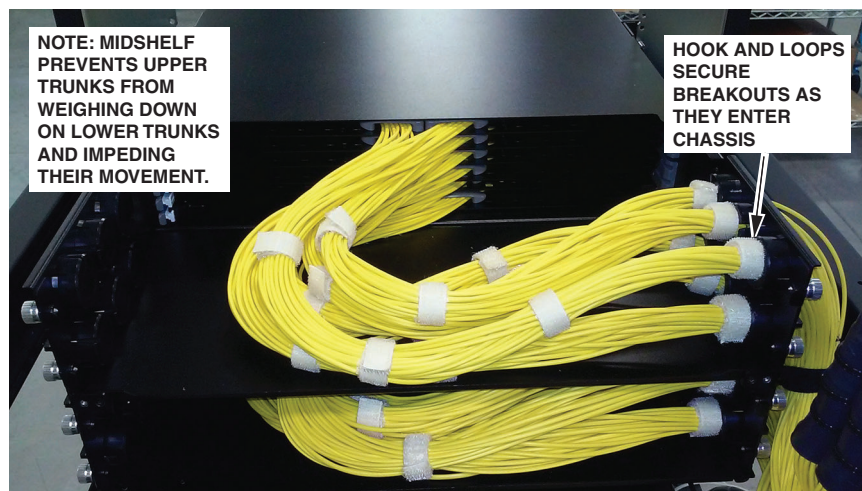
26428-A

**Figure 25. Trunk Routing Into Side of Panel
(Trunk With No Gland Adapter Shown)**



26429-A

Figure 26. Top View of Cable Routing



26430-A

Figure 27. Rear View of Cable Routing

7. Secure the trunks outside of the panel to rack or cabinet with cable mounting brackets or similar method.
8. Pull all blades fully forward into second position and dress cables with hook-and loops.
9. Push in blades and ensure unimpeded cable movement.

5 ACCESSORIES

Accessories are available for channel rack mounting and cabinet mounting. Use M6 or #12-24 screw (provided) as appropriate.

5.1 Channel Rack Mounting

Figure 28 shows accessories available for channel rack mounting. They are as follows:

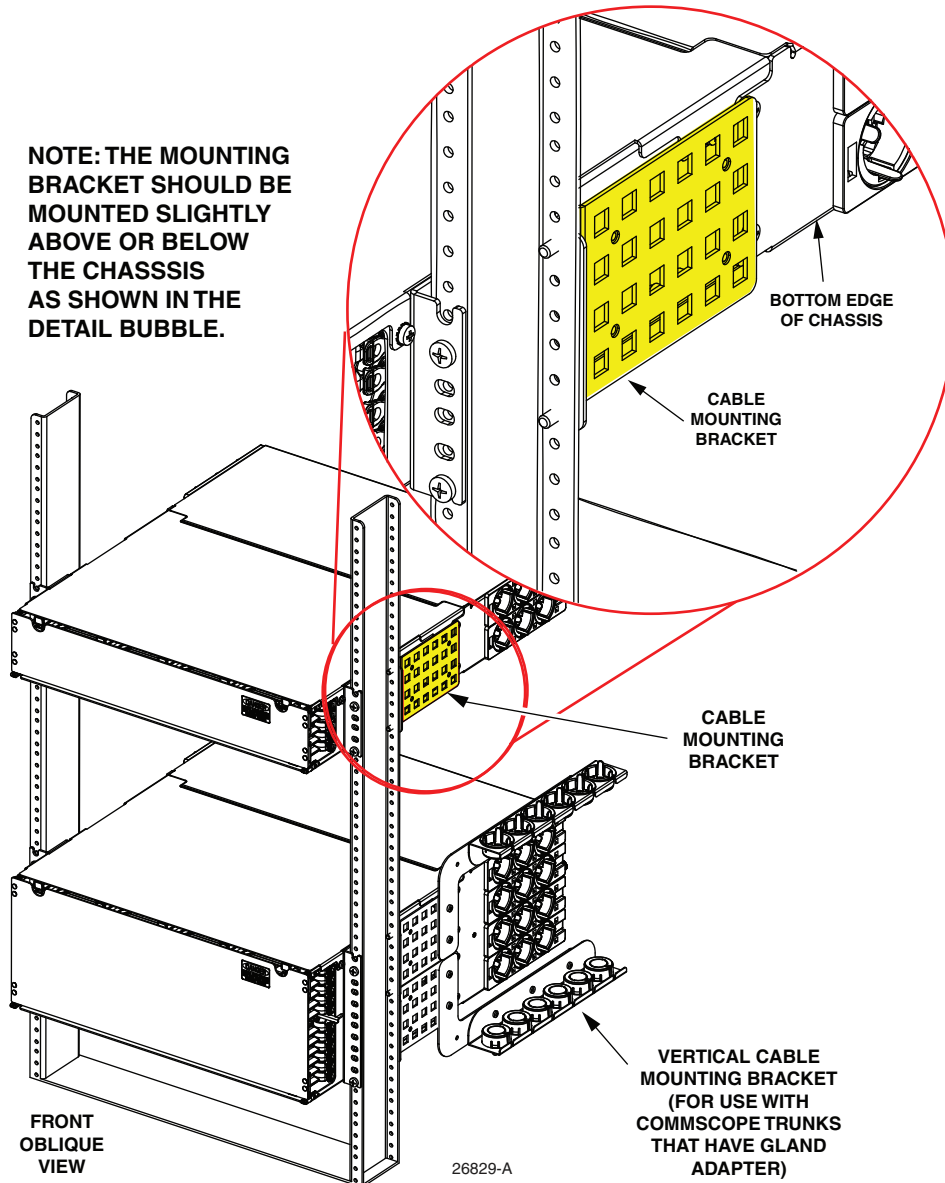


Figure 28. Channel Rack Mounting Accessories

- ▶ **Note:** When using the Vertical Cable Mounting Bracket with CommScope trunks, it may be required to lengthen the breakouts on cables with 144 or less fibers and with a gland nut. To do this, loosen the gland adapter, slide up the trunk approximately 2-3 inches (5.08-7.62 cm), and remove the outer jacket up to the gland adapter. This will lengthen the breakouts.
- **Cable Mounting Bracket (EHD-RMB)** mounts to rear side of rail and provides a point to secure trunks.
- **Vertical Cable Mounting Bracket (EHD-RMB-GAB)** mounts to rear side of the rail and allows the cable attachment molding to snap into the bracket for top down or bottom up securing of CommScope trunks with gland adapters.

5.2 Cabinet Mounting

Figure 29 shows accessories available for cabinet mounting, They are as follows:

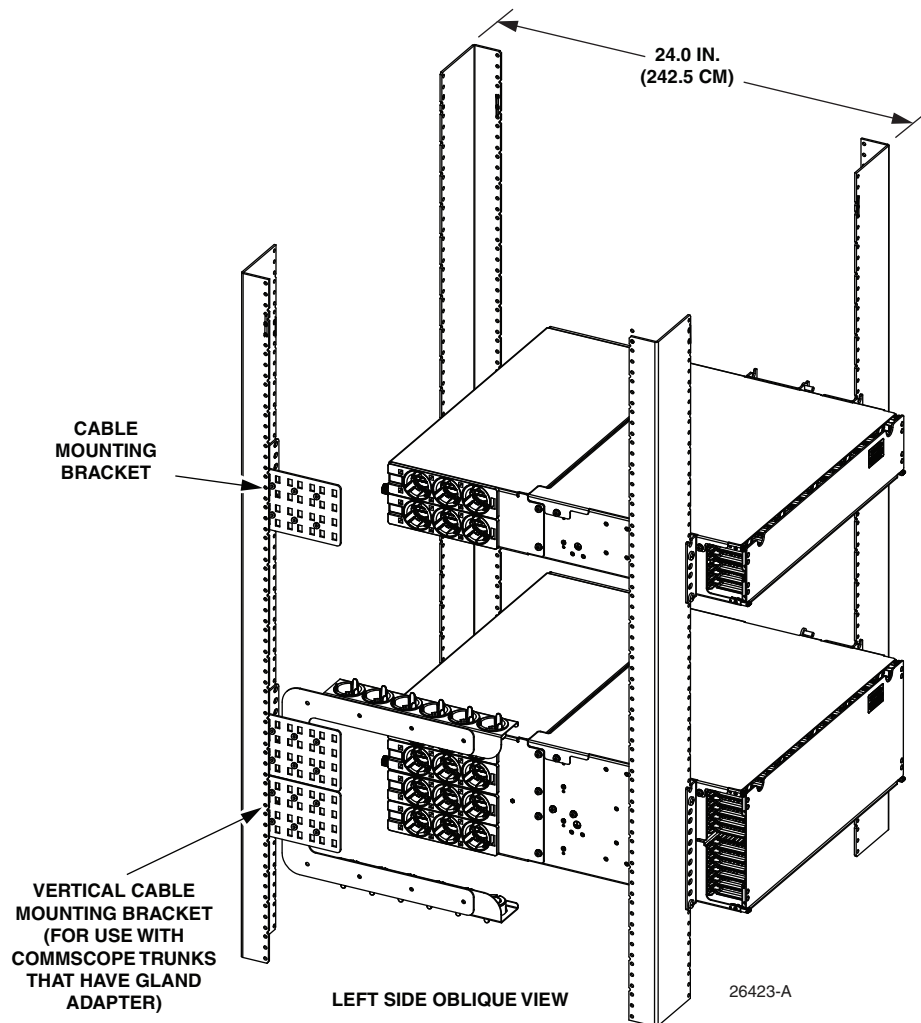


Figure 29. Cabinet Mounting Accessories

- ▶ **Note:** When using the Vertical Cable Mounting Bracket with CommScope trunks, it may be required to lengthen the breakouts on some trunks. To do this, loosen the gland adapter, slide up the trunk approximately 2-3 inches (5.08-7.62 cm) and remove the outer jacket up to the gland adapter. This will lengthen the breakouts.
- **Cable Mounting Bracket (EHD-CMB)** mounts to rear side of rail and provides a point to secure trunks.
- **Vertical Cable Mounting Bracket (EHD-CMB-GAB)** mounts to rear side of rail and allows the cable attachment molding to snap into the bracket for top down or bottom up securing of CommScope trunks with gland adapters.

5.3 UMB Brackets

UMB brackets are available for securing cables to a rack or cabinet. The brackets can be installed either above or below the panel (see **Note** below). Select the version needed based on space considerations. Refer to [Figure 30](#).

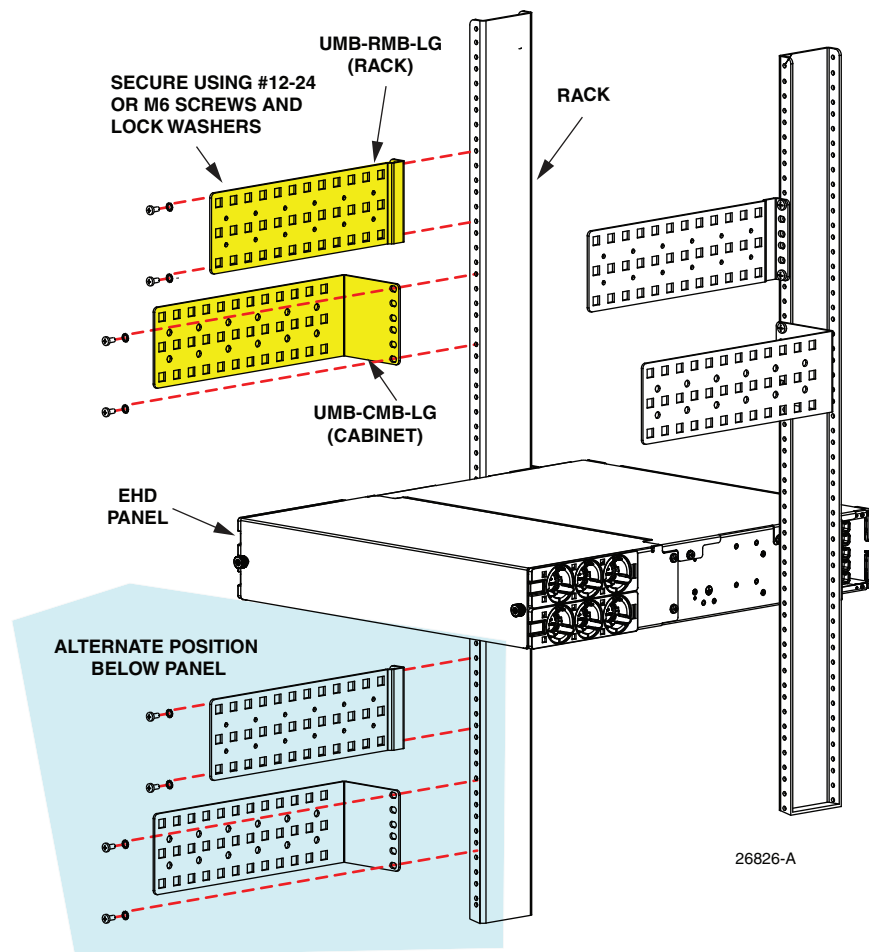


Figure 30. Cabinet Mounting Accessories

- ▶ **Note:** The most common application is to mount the UMB bracket on the rack or cabinet such that the fanout is oriented with subunits facing down and a natural drip loop is formed when routing subunits in the panel. Take caution not to exceed bend radius limitations of the fiber. Refer to [Figure 31](#).



Figure 31. Drip Loop

6 CONNECTING AND ROUTING PATCH CORDS

When connecting patch cords, route patch cords from the center of the EHD either outward to each side or outward to one side, using the cable guides to secure the patch cords as shown in [Figure 32](#).

Observe the following maximum radius diameters:

- 3.8 mm: When routing 12 patch cords, either simplex or duplex, from center to both sides.
- 3.0 mm: When routing 24 patch cords, either simplex or duplex, from center to one side.



Figure 32. Patch Cord Routing on Front of Panel

7 CONTACT INFORMATION

To find out more about CommScope® products, visit us on the web at www.commscope.com

For technical assistance, customer service, or to report any missing/damaged parts, visit us at <http://www.commscope.com/SupportCenter>

For information on CommScope product patents, refer to <http://www.cs-pat.com>

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