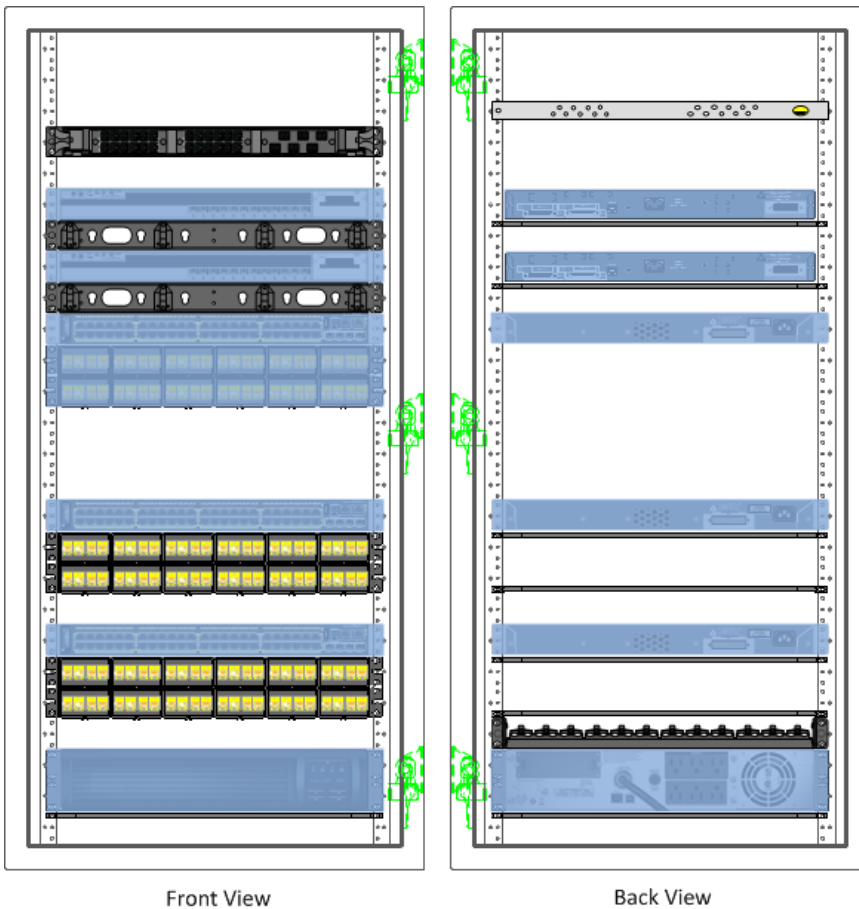




Panduit PreConfigured Industrial Distribution Frame (IDF) Installation Instructions

Part Numbers ZDF48-RA and ZDF48-EA ZDF48-6RA and ZDF48-6EA



- RU 24 PANDUIT RGRG19CN GROUND BAR
- RU 23 PANDUIT FRME1U FIBER ENCLOSURE
- RU 22 OPEN (ADDITIONAL FRME1U IF REQUIRED)
- RU 21 CUSTOMER SWITCH w/ 12 FIBER LS NICs – “B”
- RU 20 PANDUIT CMPHF1 HORIZONTAL CABLE MANGER
- RU 19 CUSTOMER FIBER w/ 12 FIBER LS NICs– “A”
- RU 18 PANDUIT CMPHF1 HORIZONTAL CABLE MANGER
- RU 17 OPTIONAL CUSTOMER SWITCH – “C”
- RU 15-16 OPTIONAL PANDUIT CPP48WBLY 48 PORT COPPER PATCH PANEL
- RU 12-14 OPEN
- RU 11 CUSTOMER SWITCH – “B”
- RU 9-10 PANDUIT CPP48WBLY 48 PORT COPPER PATCH PANEL
- RU 8 OPEN
- RU 7 CUSTOMER SWITCH – “A”
- RU 5-6 PANDUIT CPP48WBLY 48 PORT COPPER PATCH PANEL
- RU 4 PANDUIT SRBBRWC STRAIN RELIEF BAR
- RU 2-3 CUSTOMER UPS
- RU 1 OPEN

Figure 1: Industrial Distribution Frame (IDF) Equipment Elevation



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IDF Unpacking

1. Unpack the IDF enclosure and remove the miscellaneous carton on top of the IDF enclosure.

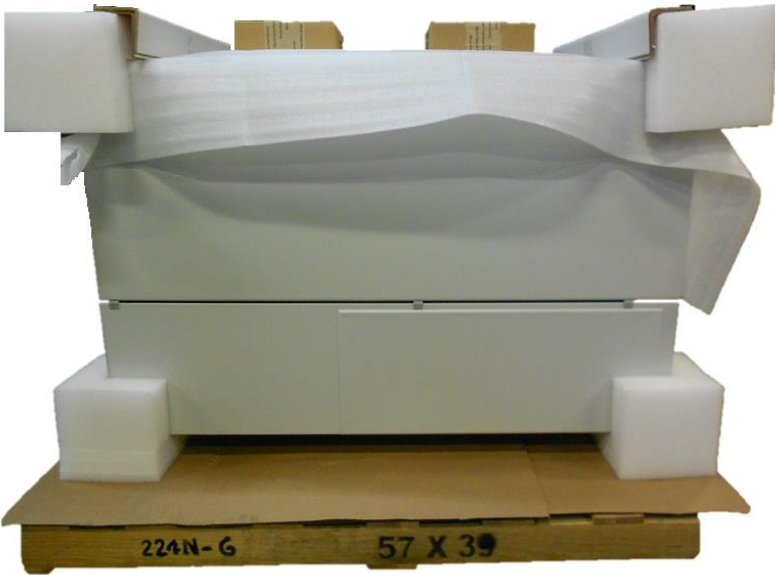


Figure 2: Unwrapped enclosure and carton.

2. Remove the enclosure mounting hardware and Hoffman Protek installation guide from the miscellaneous carton.

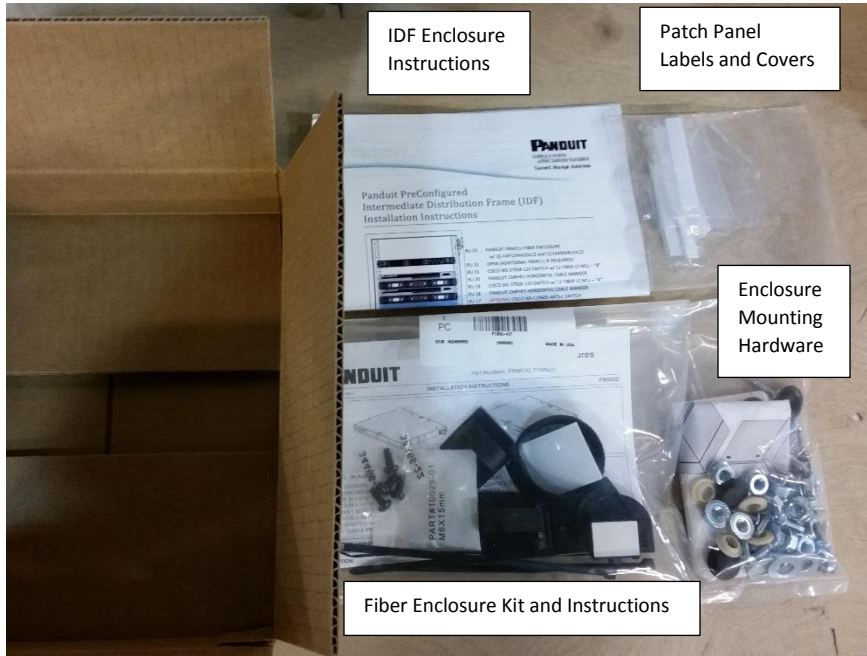


Figure 3: Contents of the miscellaneous cartons.



IDF Switch Deployment Guide

Prior to routing power cable and horizontal communication cables, the switch placement inside the enclosure must be considered for a successful deployment. This document is intended to provide system integrators and field installers with Panduit's recommendations regarding switch deployment within Panduit's Industrial Distribution Frame (IDF). The IDF is currently PreConfigured to support the system layout as shown in [Figure 1](#), page 1. The allowable size of a switch in an IDF is dependent on the following factors:

1. RU location in the IDF. [Table 1](#) on page 5, provides the physical useable depth of the enclosure per RU space.
2. Switch chassis depth: Does the switch chassis fit in the physical space behind the mounting rails? [Figure 4](#) on page 6, illustrates the dimensions:
 - a. Dimension A: 25.96" [659mm] is the dimension to the back panels.
 - b. Dimension B: 22.69" [576mm] is the dimension from the front rail to the horizontal copper cable D-Rings.
 - c. Dimension D: 24.90" [632mm] is the dimension front the front rail to the horizontal fiber cable duct.
 - d. Dimensions B and D are used for a maximum switch chassis depth.
 - e. Dimensions C and E are shown for reference.
3. Horizontal trunk cables routed inside the enclosure. The horizontal cabling D-Rings in the rear of the enclosure protrudes from the rear wall. This is illustrated in [Figure 4](#), Dimension B.
4. Switch power supplies used. Some power supplies extend further past the switch chassis. An example of this is the Cisco WS-C3850, 1100 watt power supply extends 3" past the chassis.
5. Switch power plug locations:
 - a. Are they in front of the copper cable entry?
 - b. Are they in front of the fiber duct?
 - c. Power cables should usually be right or left of the duct, so the useable limit may be 25.96" [659mm].
6. Switch stack cable locations:
 - a. Is there clearance to the back panels? The dimension to the back panel as 25.96" [659mm]. Note that there is extra relief on the right side of the Top Back Panel to allow more clearance.
7. The Center Section release handles swing into the areas where devices mount. This can result where patch cords may be interfered with by the handles if the devices are mounted here.

The user can use some recommendations to determine if there switch will sufficiently fit inside the enclosure. The recommended allowances for different switch characteristics are as follows:

- 4" - 5" [101.6 – 127mm] – add to chassis depth for stack cable
- 3½" [88.9mm] – add to depth for power cable support and cable loop past 3750 and 3850 power supplies
- 2 ½" – 3" [63.5 – 76.2mm] – add to chassis depth for power cables without strain relief brackets

Examples of planning switch deployment:

- A) A standard Cisco WS-C3850 and WS-C3850 are 17.7" to 19.2" deep. 3½" need to be added for power cable support and cable loop resulting in 21.2" to 22.5" on the left side of the switch. If stack cables are used, add 4" – 5" to the chassis depth resulting in 22.7" to 24.2" on the right side of the switch. These switches are useable in all RUs of the enclosure.
- B) Some switches such as the Cisco WS-C3850-48X** have a power supply option (1100W) which extends 3" from the switch chassis. The switch chassis may be 19.2" to 20.1" deep. The physical switch depth is not a problem until power and stack cables are taken into consideration. Adding 3" for the extended supply + 3½" for the power cable support and loop puts the switch at 25.5" to 26.5" deep on the left side of the switch.
 - a. 25.5" will fit in RUs 18 - 23, and 25 of the IDF. There is clearance behind the power supplies to the Top Back Plate. RUs 12 – 17 are dependent on the number of horizontal trunk cables.



- b. 26.5" will not fit unless the Top Back Plate is removed in RUs 18 - 23, and 25 of the IDF. RUs 12 – 17 are dependent on the number of horizontal trunk cables.
- c) A switch is 20.5" deep. The main power plug is on the left side facing the front, does not have a strain relief, and there are no stack cables. 20.5" + 3" is a maximum of 23.5" on the left side. This will fit in RUs 18 – 23, and 25 of the IDF. RUs 12 – 17 are dependent on the number of horizontal trunk cables.

RU	Useable Depth (in)	Useable Depth (mm)	Comments
1	13.31	338	Limited by Center Section and Wall Section flange
2	22.69	576	Handle may interfere with patch field
3	22.69	576	Handle may interfere with patch field
4	22.69	576	
5	22.69	576	
6	22.69	576	
7	22.69	576	
8	22.69	576	
9	22.69	576	
10	22.69	576	
11	22.69	576	
12	22.69	576	24.9" if there is no 3rd trunk cable. Figure 12 , page 11, shows 2 trunk cables. The 3rd trunk loop would rise above the 2 shown.
13	22.69	576	24.9" if there is no 3rd trunk cable. Handle may interfere with patch field.
14	22.69	576	24.9" if there is no 3rd trunk cable. Handle may interfere with patch field.
15	22.69	576	24.9" if there is no 3rd trunk cable.
16	22.69	576	24.9" if there is no 3rd trunk cable.
17	22.69	576	24.9" if there is no 3rd trunk cable.
18	24.9	632	
19	24.9	632	
20	24.9	632	
21	24.9	632	
22	25.5	648	
23	25.5	648	
24	13.31	338	
25	24.9	632	Handle may interfere with patch field
26	13.31	338	Handle may interfere with patch field. Limited by Center Section and Wall Section flange

Table 1: Useable depth of the enclosure per RU

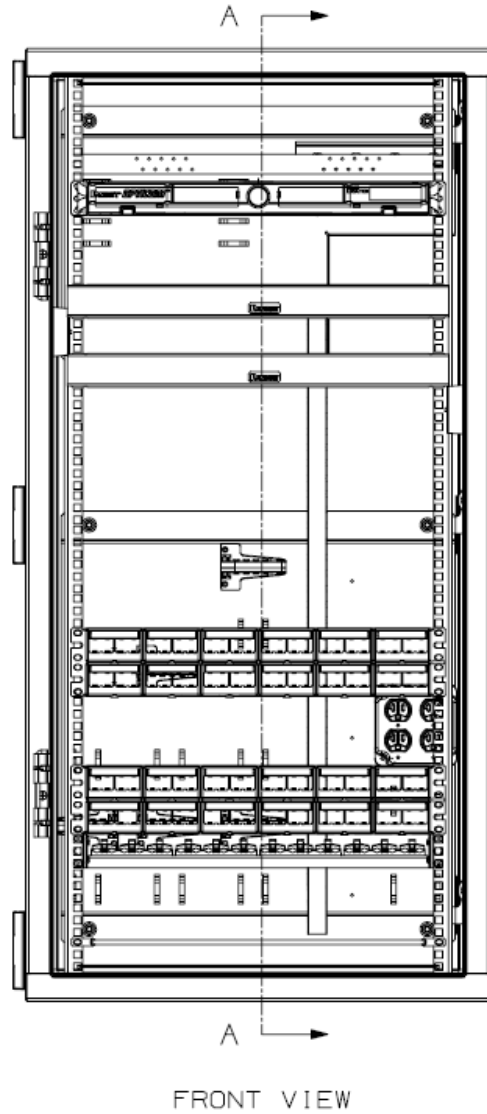
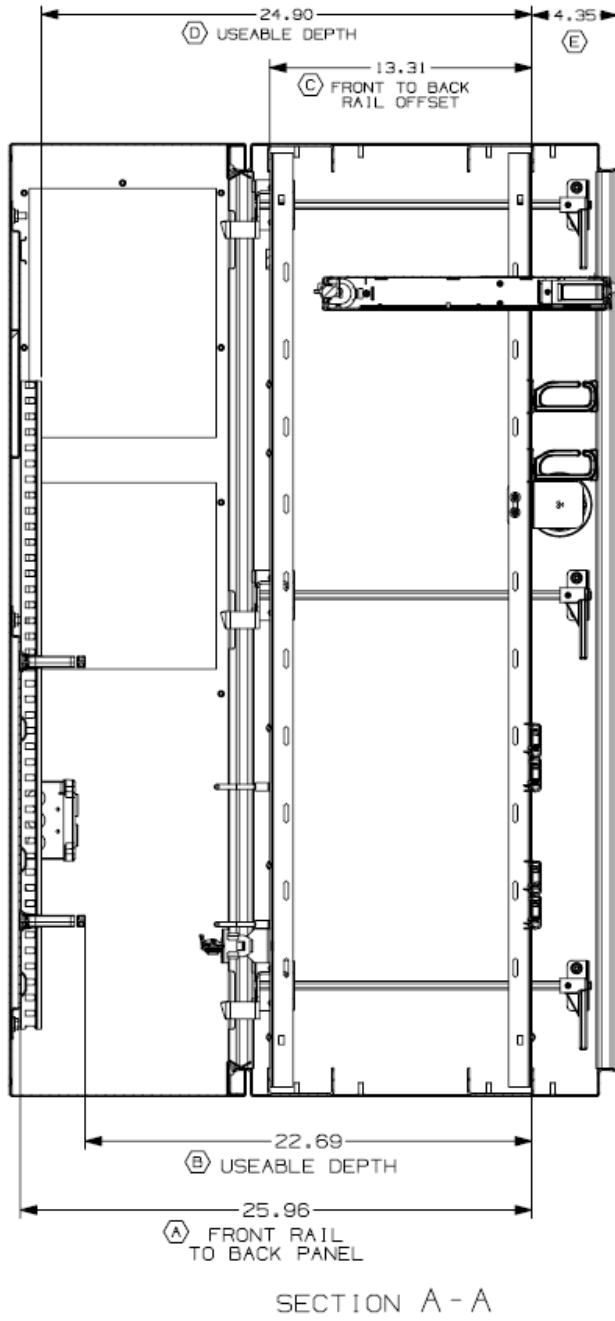


Figure 4: IDF Section showing the useable depth of the enclosure.



IDF Preparation and Mounting

3. Stand up the IDF enclosure so that there is access to open the front door and center section. Open so that there is access to the rear panel of the enclosure.
4. Remove the Recommended Conduit Locations Template from the Lower Backplane (rolled up in the Tak-Ty).



Figure 5: Location of template in step 4:

5. Tape the template to the bottom of the IDF enclosure. The bottom outside rear edge of the bend is indicated on the template in Figure 6.

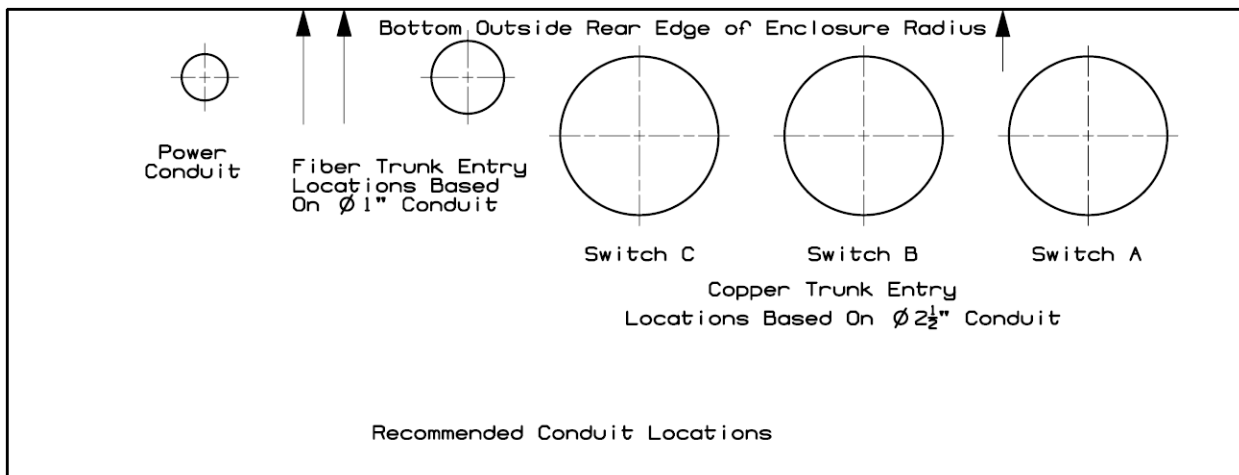


Figure 6: Recommended Conduit Location Template

6. Using the template from step 4, mark the desired locations for the external conduit entry on the bottom of the enclosure.
7. Drill and punch all conduit entry positions that will be used in this installation.
8. Following the Hoffman installation guide, mount the enclosure in the desired location using the 6 holes on the wall section of the enclosure.
9. Install all conduit connections in the appropriate locations.



ZDF48-RA - Power Installation

10. Remove the outlet box cover with the (2) 20 amp power outlets.



Figure 7: Outlet Box and Cover

11. Punch out the center knockout of the outlet box.
12. Pull the plant power through the conduit into the outlet box and terminate the power and ground according to local IEC code.
13. Re-install the outlet box cover onto the box.
14. OPTIONAL: Remove the side gland plate and install the air conditioner per instructions supplied with the AC unit.

ZDF48-EA - Power Installation

15. Install an outlet box and power outlets with that are compliant with local IEC standards. Four #10-32 holes are provided on the right side of the lower base plate.
16. Punch out the center knockout of the outlet box.
17. Pull the plant power through the conduit into the outlet box and terminate the power and ground according to local IEC code.
18. Install an outlet box cover onto the box.
19. OPTIONAL: Remove the side gland plate and install the air conditioner per instructions supplied with the AC unit.
20. Tak-Ty Power Cords for the switches to the Rear Rail as shown in [Figure 8](#) and [Figure 9](#). The aqua arrows show the Tak-Ty locations. Tak-Ty the grounding jumpers from with the power cords to the rail.

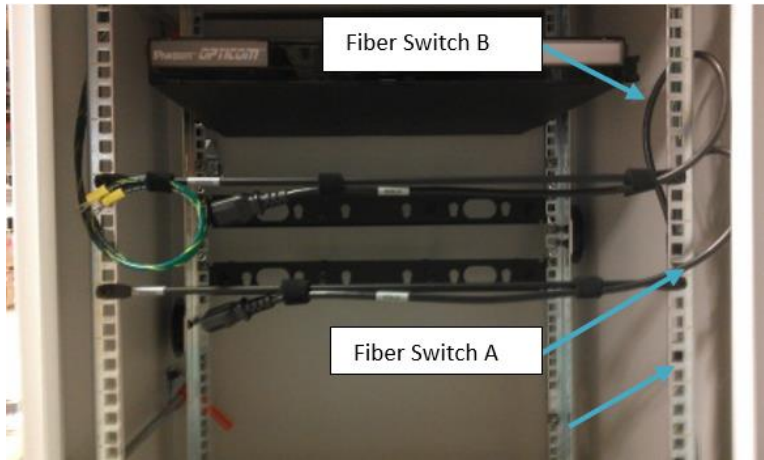


Figure 8: Fiber Switch A and B Tak-Ty to Rear Rail



Figure 9: Fiber Power Cables A and B. View looking from the rear of the enclosure. Arrows indicate Tak-Ty locations.



21. Tak-Ty the Power Cords to the rear rail using the rail slots as shown in [Figure 9](#). **Error! Reference source not found.** The aqua arrows show the Tak-Ty locations.

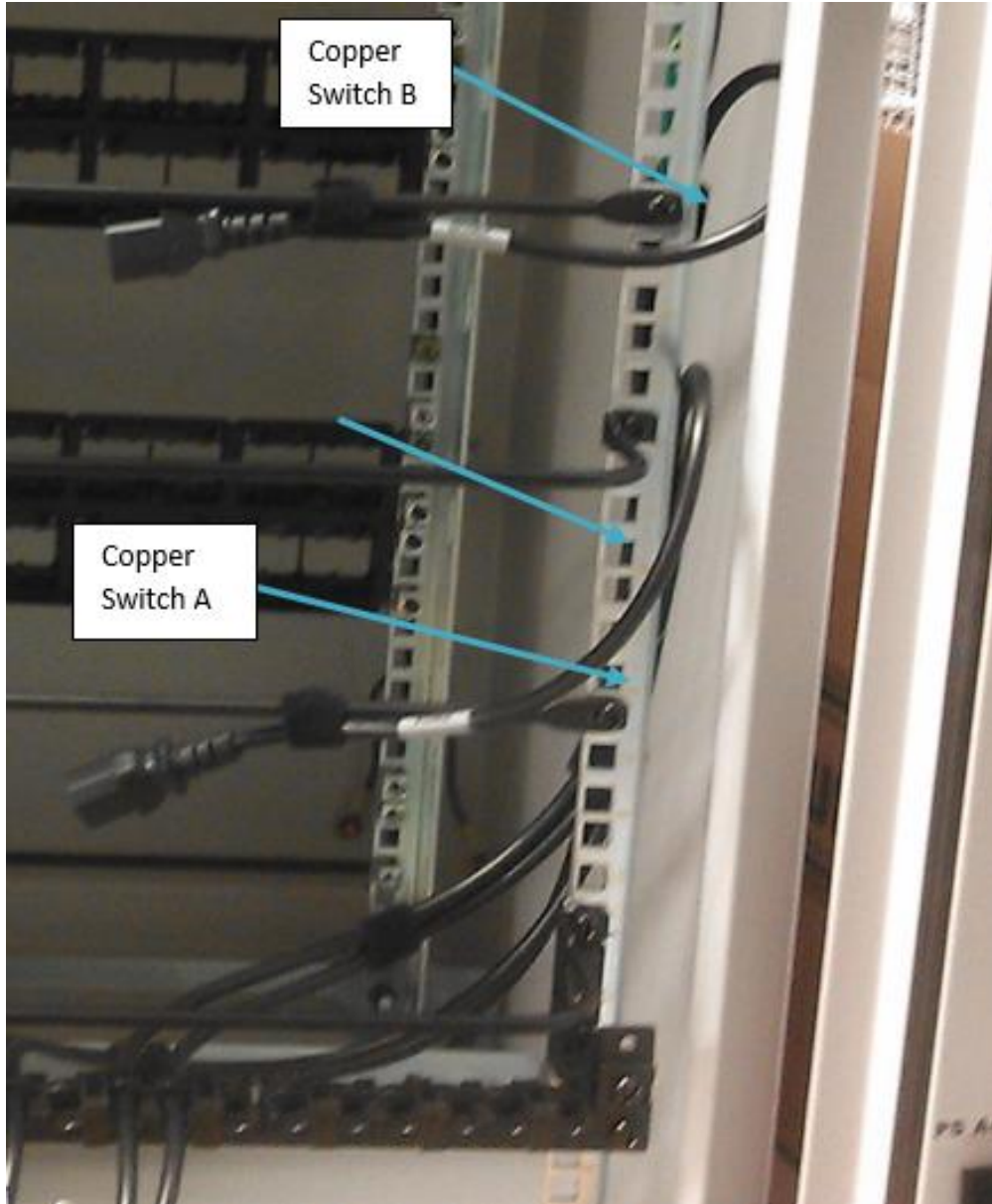


Figure 10: Copper Power Cables A and B. View looking from the rear of the enclosure. Arrows indicate Tak-Ty locations.



22. Finish the Power Cord Routing to the lower Strain Relief Bar.

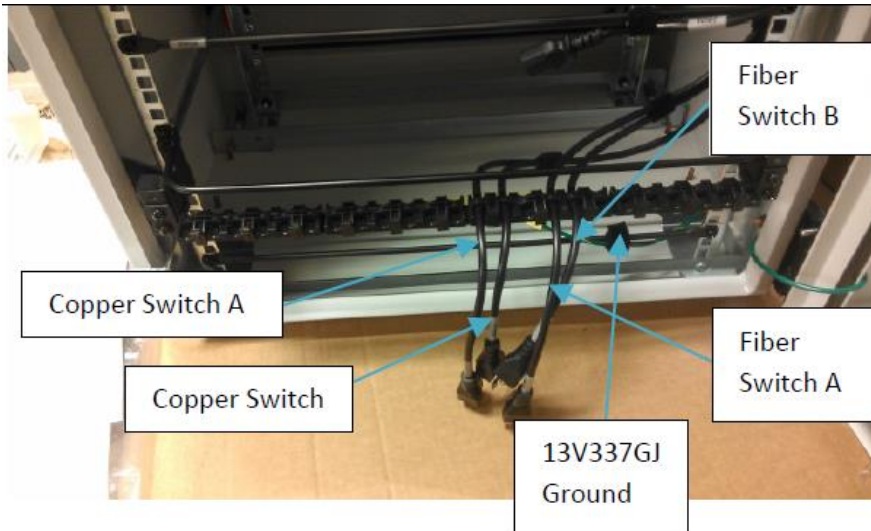


Figure 11: Route the Power Cords into the lower Strain Relief Bracket.

Copper Trunk Cable Installation

23. Pull the Switch-A trunk cable through the conduit into the enclosure.

24. Route the Switch-A trunk cable up the left side of the rear Backplane, refer to [Figure 12](#). Use the Tak-Ty and D-ring provided to secure the cable to the Backplane. 78" of slack (measured from enclosure bottom) is required in the enclosure. This leaves enough cable to terminate onto the copper jacks.



Figure 12: Copper Cable Routing showing Switch-A on the left and Switch-B cables on the right.



25. Attach the cables to the installed Strain Relief Bar using Tak-Ty in the miscellaneous carton. This is shown in [Figure 13](#).



Figure 13: Switch-A (lower) and Switch-B (upper) copper cable bundles attached to strain relief bars.

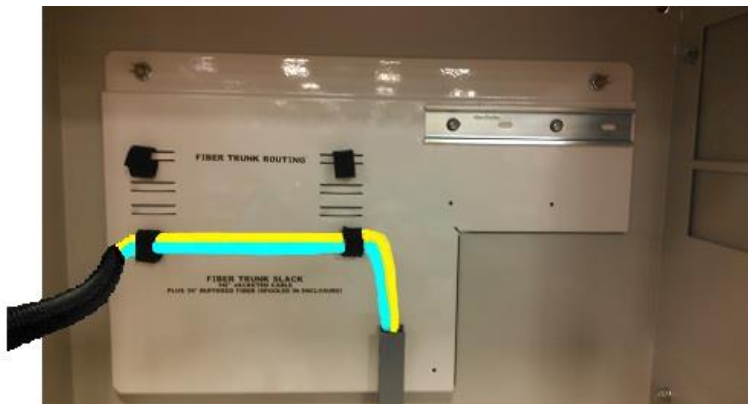
26. Bundle the cable in sets of (4) to be installed into the patch panel.
27. Remove the (12) snap-in faceplates from the installed lower patch panel.
28. Feed the bundles of cables through the openings in the panel.
29. Terminate the cables onto CJ688TGYL copper jacks (ordered separately) per PN403L, *TX6 PLUS and TX5e UTP Jack Module Installation Instructions*.
30. Snap the jacks into the removable snap-in faceplates from step 27 per PN207C, *Mini-Com Modular Faceplate Patch Panel Installation Instructions*.
31. Reinstall the faceplates onto the patch panel in the desired locations.
32. Optional: Print and apply the supplied labels and covers ([Figure 3](#)) to the front of the patch panel. Use a Panduit LS9 printer to create TIA-606 compliant labeling.
33. *Repeat steps 23 through 32 for the Switch-B copper trunk cable and upper patch panel.*

Fiber Trunk Cable Installation

34. Pull the Fiber Switch-A and Fiber Switch-B (if applicable) fiber trunk cables through the conduit(s) into the enclosure.
35. If using armored cable:
 - a. Cut the armored cable for 155 inches inside the enclosure. Leaving a stub of bare armor above the conduit.
 - b. Optional: Utilize Panduit's Armored Cable Grounding Jumper Kit (ACG24K, ACG24K-500, ACG24KX-500) to ground the armor of the cable.



36. Route the jacketed fiber cable up through the Panduit Duct and through the supplied Tak-Ty indicated on the Upper Backplane as shown in [Figure 14](#).



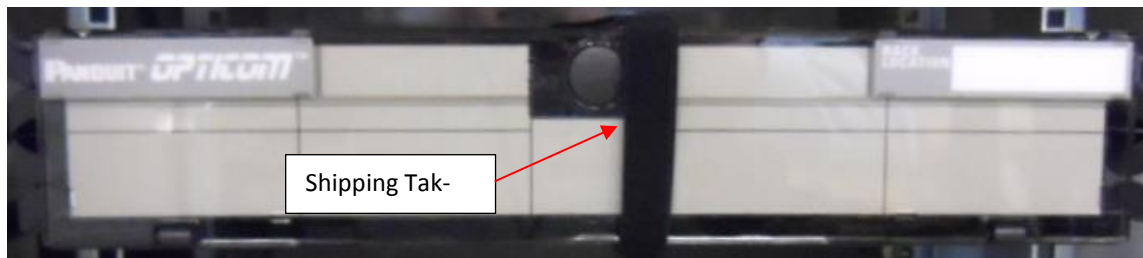
[Figure 14: Fiber Trunk routing on Upper Backplane](#)

37. Route the jacketed cable through the loom tubing supplied in the miscellaneous kit. The tubing protects the fiber from getting pinched in the hinge.



[Figure 15: Loom tubing routed around hinge point and rail.](#)

38. Remove the shipping Tak-Ty from the front of the FRME1U Fiber Enclosure shown in [Figure 16](#).



[Figure 16: Shipping tape to be removed from FRME1U.](#)

39. Install the cable into the FRME1U Fiber Enclosure (RU 23) per FS002C, Opticom Rack Mount Fiber Enclosure Installation Instructions.
- c. Install fiber adapter panels in the FRME1U. Panduit recommends (3) FAP12WAQDLCZ multi-mode FAPs for switch connections (ordered separately). (1) FAP is recommended for management ports in the right FAP position in the enclosure



- d. Remove the pre-installed Fiber Bend Radius Control Clips from the front of the enclosure. This allows the inner drawer to be pulled back towards the rear of the enclosure.
- e. Remove the cable entry grommet from the rear of the fiber enclosure.
- f. Route the jacketed fiber through cable entry grommet.
- g. Remove approximately 39" of the fiber jacket exposing the buffered fiber inside.
- h. Field-terminate the required fiber adapters onto the fiber.
- i. Re-insert the grommet back into the Fiber Enclosure.
- j. Route the Fiber Cable as shown in **Figure 17**. The fiber entry for this application is on the right side of the enclosure. Use Tak-Ty to secure fiber cords at the cable entry location and other points as shown.
- k. Route the buffered fiber around the spools as shown.
- l. Insert the fiber connectors into the desired pre-installed fiber adapter panel (FAP) locations in the enclosure. Note that the FAPs can be easily removed via push pull latches on the faceplates.

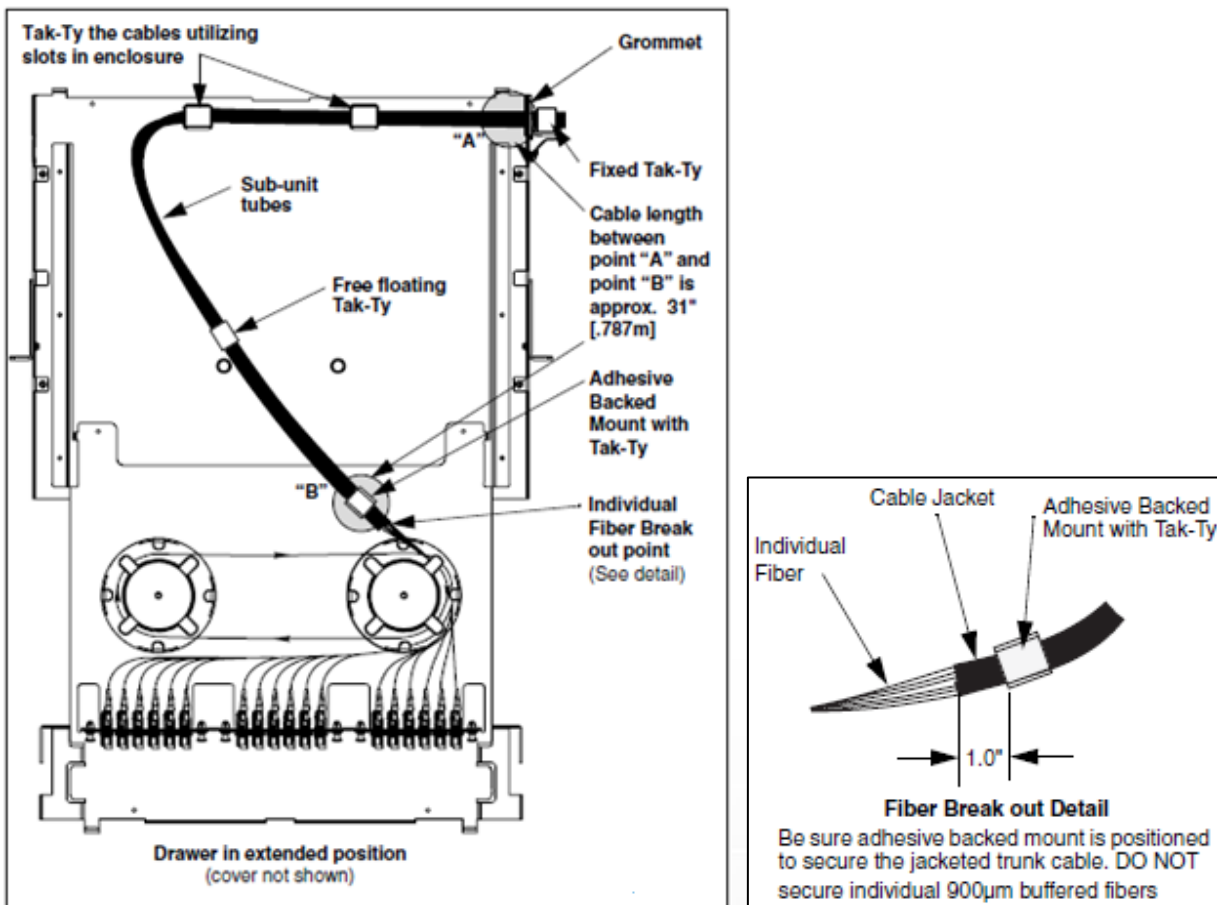


Figure 17: FRME1U Fiber Enclosure Cable Routing

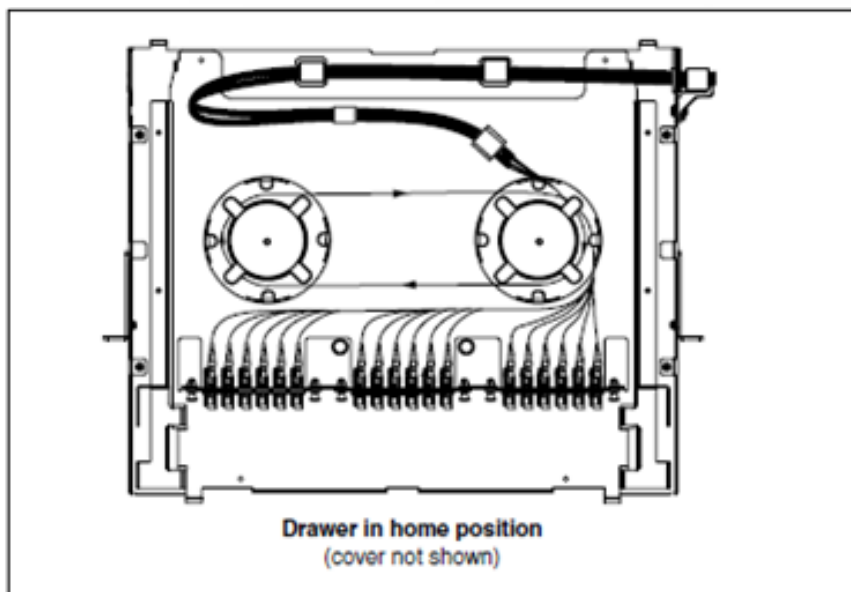


Figure 18: Fiber Enclosure Drawer showing the fiber cable when the drawer is closed.

40. If a second Fiber Enclosure is required:
 - a. Install the enclosure in RU21 indicated in [Figure 1](#) per FS002C, Opticom Rack Mount Fiber Enclosure Installation Instructions.
 - b. Repeat steps 35 through 39.

UPS Installation

41. Install the UPS in RUs 2 and 3 indicated in the equipment elevation ([Figure 1](#)). Note that the horizontal bar on the rear rail will support the UPS, eliminating excessive sag.
42. Connect the ground cable to the UPS. It is Tak-Ty to the rear bottom support.
43. Route the UPS power cord. Use the template on the bottom of the enclosure.
 - a. Along the hinge
 - b. Through the cord grip on the side of the enclosure
 - c. Along the bottom front of the enclosure through the cord grips.
 - d. Plug into the outlet box on the Lower Backplane.
 - e. Use the Tak-Ty provided on the Backplane to retain the AC power Cord.

Copper Switch A&B Installation.

44. Reference the Cisco Installation Instructions provided with the switches.



45. Install a Switch-A switch in RU7 indicated in the equipment elevation (**Figure 1**). Use the mounting angles provided with the switch. The horizontal bar on the rear rail (shown in **Figure 19**) will support the switch eliminating excessive sag.

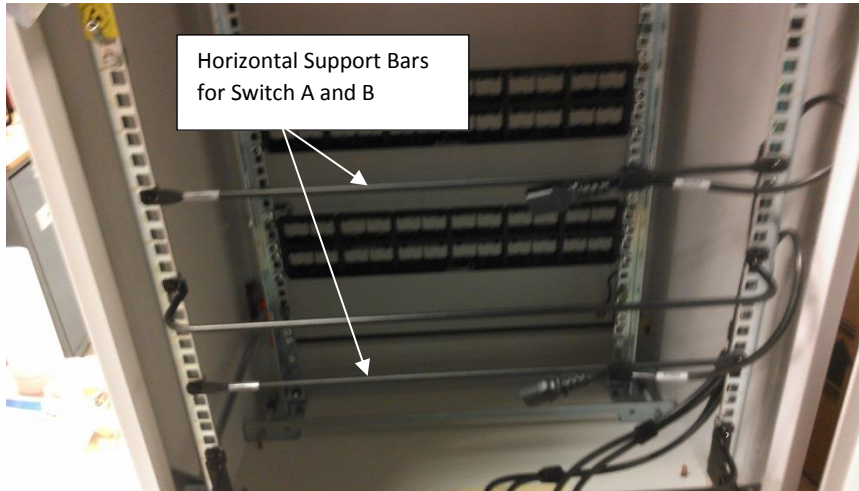


Figure 19: Location of horizontal support bars on rear of IDF.

46. Connect the switch to the patch panel in RUs 5 and 6. Panduit recommends using part number UTP28SP8INBU-48, Cat6 UTP 28AWG CM/LSZH Cable Assembly, Blue, 8 Inch, Bulk Package of 48 (ordered separately). The 8-inch length allows for connection from switch port to patch panel without extra length that would require cable management.



Figure 20: Switch-A (lower) and Switch-B (upper) switches showing fully populated patch cords.

47. Connect fiber patch cables to the management ports on the right side of the enclosure as shown by the yellow cable in **Figure 20**. For switches from RU 1 to RU11, Panduit recommends using part number FX2ERLNLNSNM002, 2-fiber OM3 1.6mm Jacket Patch Cord LSZH LC Duplex to LC Duplex Std IL – 2M. Connect the other end of the patch cord to the front side of the FAPs mounted in the FRME1U (step 31a).
48. Attach the power cord in the rear of the enclosure. It is labeled and Tak-Ty to the horizontal bar on the rear rails.
49. Attach the Switch A and B power cable to the UPS. **Figure 11** shows the location of the AC cords.



50. Complete the installation and setup per the switch installation instructions.

51. Repeat steps 45 through 50 for Copper Switch-B in RU 11.

Fiber Switch A&B Installation.

52. Reference the Cisco Installation Instructions provided with the switches.

53. Install Fiber Switch-A switch in RU19 indicated in the equipment elevation (**Figure 1**). Use the mounting angles provided with the switch. The horizontal bar on the rear rail will support the switch, eliminating excessive sag.

54. Connect the switch to the desired FAPs and ports installed in the FRME1U (step 31a). For switches from RU 15 to RU21, Panduit recommends using part number FX2ERLNLNSNM001, *2-fiber OM3 1.6mm Jacket Patch Cord LSZH LC Duplex to LC Duplex Std IL – 1M*. The cable should be routed through the Panduit CMPHF1 Horizontal Cable Manger in RU 18. Refer to **Figure 21** and **Figure 22**.



Figure 21: Fiber Switch A and B mounted to front rail showing fiber cable routing.



Figure 22: Fiber connections to FAPs inside of FRME1U. Yellow is for management ports. Aqua is for the Fiber Switches.

55. Connect fiber patch cables to the management ports of the Fiber Switch (if applicable) and connect to ports right side of the FRME1U enclosure as shown by the yellow cable in **Figure 22**. For switches from RU 15 to RU21, Panduit recommends using part number FX2ERLNLNSNM001, *2-fiber OM3 1.6mm Jacket Patch Cord LSZH LC Duplex to LC Duplex Std IL – 1M*.

56. Connect a pre-installed ground cable to the rear of the switch. Refer to **Figure 23**. It is Tak-Ty on the right side of the horizontal bar shown in **Figure 24**.



Figure 23: Ground cable connection to the Fiber switch.



Figure 24: Horizontal support bar with ground cables and AC power cords.

57. Attach the power cord in the rear of the enclosure shown in [Figure 24](#). It is Tak-Ty to the horizontal bar on the rear rails.
58. Attach the Fiber Switch-A AC cable to the UPS. The plug is Tak-Ty just above the UPS. The cords are shown in [Figure 11](#).
59. Complete the installation and setup per the switch installation instructions.
60. Repeat steps 53 through 59 for Fiber Switch-B in RU 21.