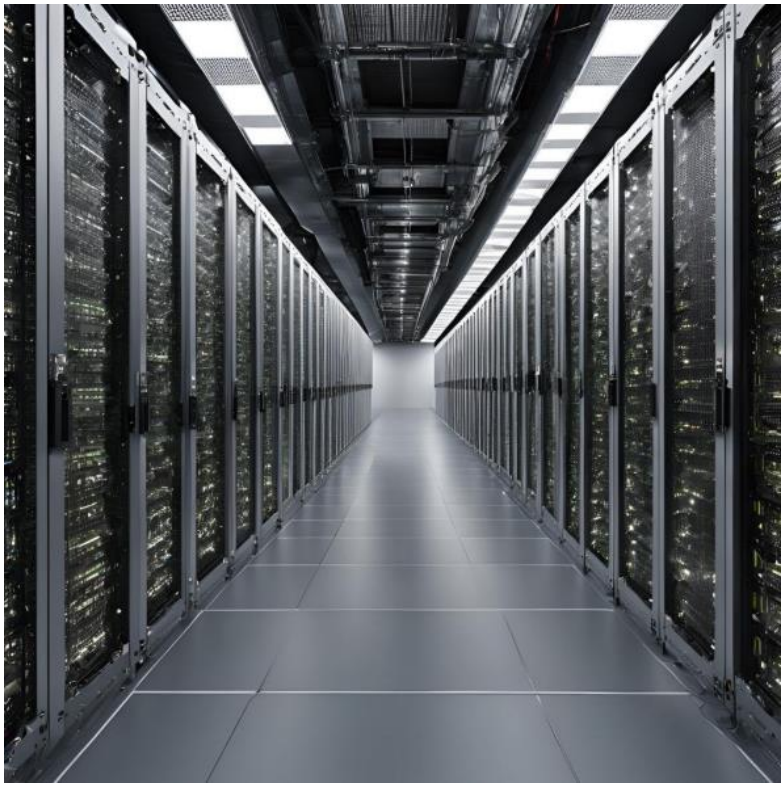
HCS BRILLIANT 8 & 12 SYSTEM SOLUTIONS

Installation Guide, draft v1



14-JAN-2026

HCS CABLING SYSTEMS
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Content

1. General

This document describes installation of the BRILLIANT 1U, 2U, and 4U Panel Solutions (Figure 1).

Figure 1. Brilliant Panels

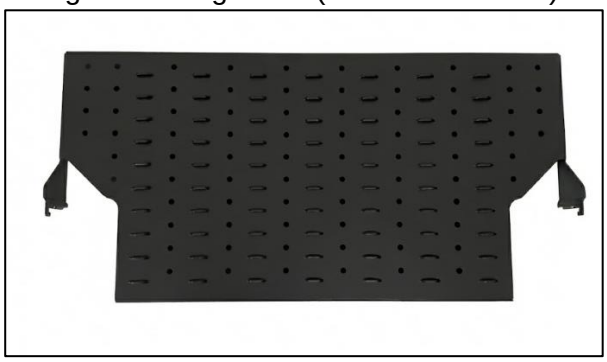
2. Carton Box Content

Panel, Either 1U, 2U, or 4U rack-height (Figure 2)

• Panel Housing

• Small Back Organizer (1U Panel and 4U Panel)

• Large Back Organizer (2U and 4U Panel)



• Front Door Label

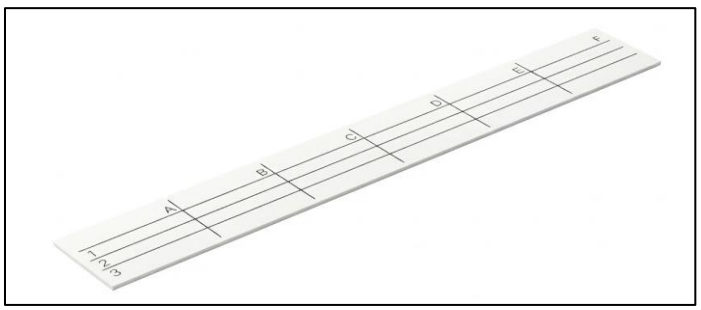


Figure 2. Carton Box Content

3. Tools and Materials Required

3.1 Tools

• Phillips screwdriver
• Reel stand

3.2 Materials

• Velcro straps
• LC connector/adapter cleaning tool
• MPO connector cleaning cassette
• MPO connector and adapter cleaning tool

4. Installation

4.1 Rack Mounting

Step 1: Identify the position on the rack where the panel will be installed and partially install screws to rest the mounting brackets on Figure 3.
Step 2: Move brackets forward or backward for desired frontal projection and rest the mounting brackets behind the screw heads just installed in the rack.
Step 3: Install screws into the rack through the mounting brackets.
Step 4: If installing a 2U or 4U panel, slide the fiber management fingers onto the panel.

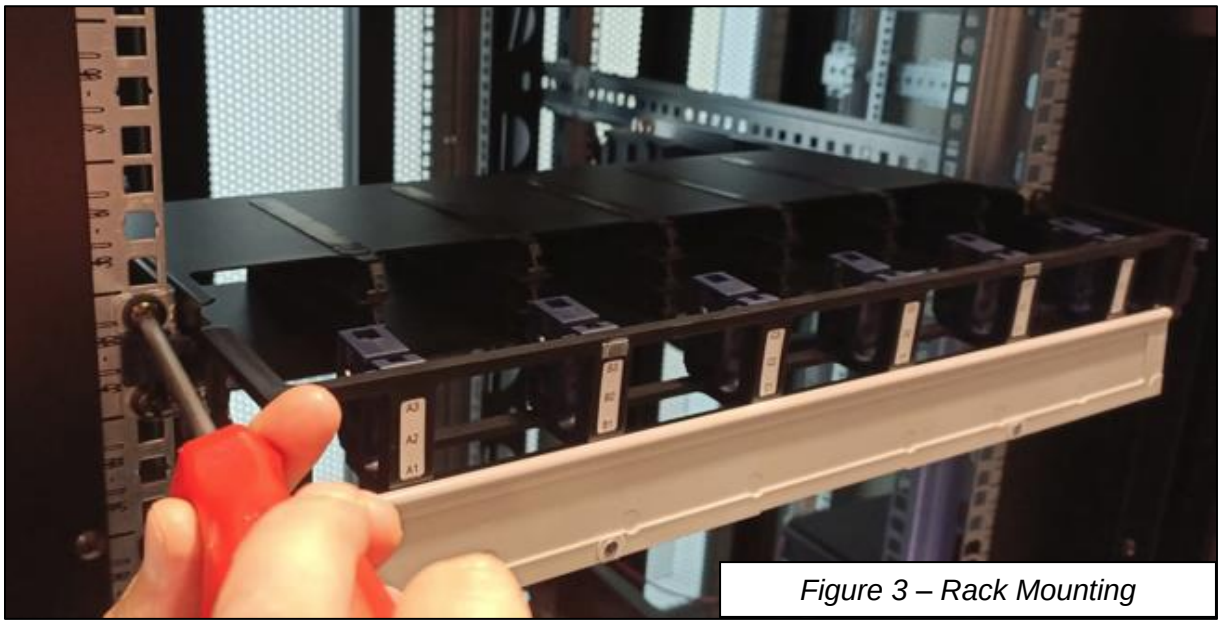


Figure 3 – Rack Mounting

4.2 Install Trunk Cables

The Brilliant trunk cable is supplied with factory-installed protection Pulling-eye (Figure 4) to protect the connectors and their fibers by coupling the pulling load back to the cable.

Figure 4 – Trunk Cable with Pulling-eye

Weather Precautions

• Always follow the recommended storage temperature guidelines for the cable when storing a trunk/pigtail. Each cable type will have a storage temperature rating that can be found on the product specification sheets. Storage outside of these ranges can cause damage to the cables.

• Cable type, Pulling-eye and reel material dictate indoor or outdoor storage. Plywood reels should never be stored outdoors. Doing so may cause damage to the reel. Cables designed specifically for indoor use should never be stored outdoors. Indoor cables are also not UV rated, and jacket damage can occur from storing indoor cables in sunlight. Not all Pulling-eyes are watertight and suitable for exposure to weather. Trunks/pigtails with non-watertight grips will need to be stored inside, even though the cable may be suitable for outdoor storage.

Trunks greater than 144 fibers do not have watertight Pulling-eyes. These trunks should be stored in a dry location to ensure proper performance of the connectors.

Reel Handling

• Always lift a plywood or wooden reel by both flanges. Do not pick up a reel by one flange. Picking up a reel by one flange can cause the reel bolts to loosen leading to cable damage.
• Never drop a reel. When a reel is dropped, damage to the cable can occur and flange bolts can loosen. Any dropped reel should be thoroughly evaluated for cable/reel damage.
• Do not allow reels to bump into one another. Allowing the flanges to rub or bump the cable can cause cable or fiber damage.
• Pay attention to reel labels. Reels should always be stored in the orientation outlined on the reel. Observe “This End Up” arrows on reels or boxes.
• Ensure that all flange bolts are tight prior to loading a reel for pulling. Changes in temperature and humidity can cause the wooden/cardboard components of the reel to expand and contract allowing the flange bolts to loosen over time. Loose flange bolts may cause the
cable to become entangled and possibly damage the cable during installation.

IMPORTANT: *The Pulling-eyes installed on pre-connectorized cables contain the connectors and their subunits. Do not cut off the grip and cable inside it upon the completion of cable installation. Remove the Pulling-eye from over the connectors and subunits only as described in this procedure. Failure to do so may result in damage or loss of the connector assemblies.*
Do not attempt to disassemble the Pulling-eye before the cable is pulled into place. Doing so may cause the Pulling-eye to fail.

For detailed information on cable placement, and a comprehensive list of applicable safety precautions, refer to SRP-005-014, Fiber Optic Cable Placing - Intrabuilding. It is necessary to have radio or other two-way communications between pull points. Should a kink or other pulling problem occur, instant communication is vital to stop the pulling operation to prevent cable and/or connector damage.

CAUTION: Do not use any type of lubricant when installing this series of Pulling-eye.

CAUTION: These grips are intended to be placed and pulled by hand. Do not use any mechanical pulling devices on this series of grip.

CAUTION: This preconnectorized Pulling-eye has a maximum tensile rating of 100 pounds (44.5kg). NEVER EXCEED THIS TENSION DURING INSTALLATION. The Pulling-eye has a minimum bend
radius of 18 inches (45.72 cm). Refer to the BRILLIANT specification sheet for cable/grip dimensions and appropriate duct sizes.

CAUTION: Fiber optic cable is sensitive to excessive pulling, bending, and crushing forces. Consult the cable specification sheet for the cable you are installing. Do not bend the cable more sharply than the
minimum recommended bend radius. Do not apply more pulling force to the cable than specified. Do not crush the cable or allow it to kink. Doing so may cause damage that can alter the transmission characteristics of the cable; the cable may have to be replaced.

4.2.1 Trunk Cable Placement with the Pulling-eye

NOTE: *This procedure assumes that a pull line has been placed in the duct route and that the equipment necessary to maintain the bend radius of the Pulling-eye is in position.*

Step 1: If necessary, remove the corrugated reel from its protective shipping box or pallet.
Step 2: Place the cable reel on a reel stand so that the Pulling-eye/cable will pay-off the top of the reel (Figure 5).

Figure 5 — Reel Stand and Trunk Cable Route

Step 3: Attach a pull line to the pulling-eye at the end of the sleeve (Figure 6).

Figure 6 — Pull Line

Step 4: Place the cable using your company's standard practice, taking care not to exceed either the minimum bend radius or tensile rating of the grip.

4.2.2 Pulling-eye Removal

Step 1: Remove the pull line and clean any dirt or debris from the outer surfaces of the sleeve.

IMPORTANT: *Disassemble the pulling sleeve on a work surface free from dirt, excessive heat, or any solvents.*

Step 2: While holding the sleeve's pulling-eye with one hand, pull the ripcord (Figure 7).

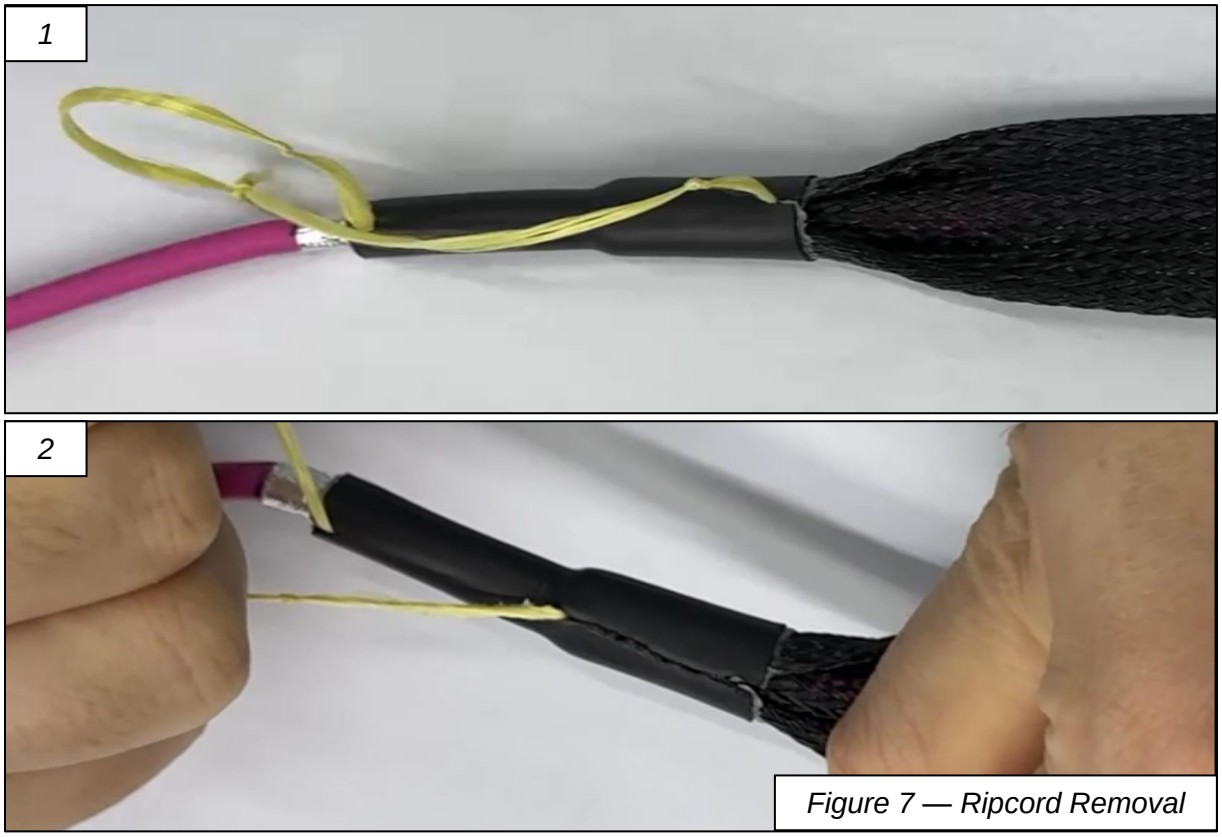


Figure 7 — Ripcord Removal

Step 3: Remove the sleeve grip tube from around the trunk cable (Figure 8).

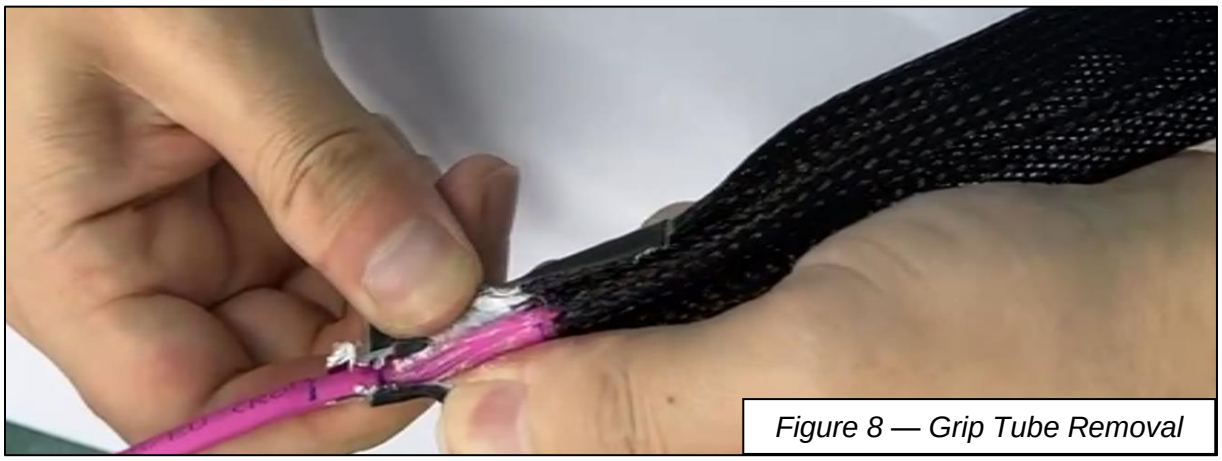


Figure 8 — Grip Tube Removal

Step 4: Remove the mesh bag to expose the set of legs (Figure 9).

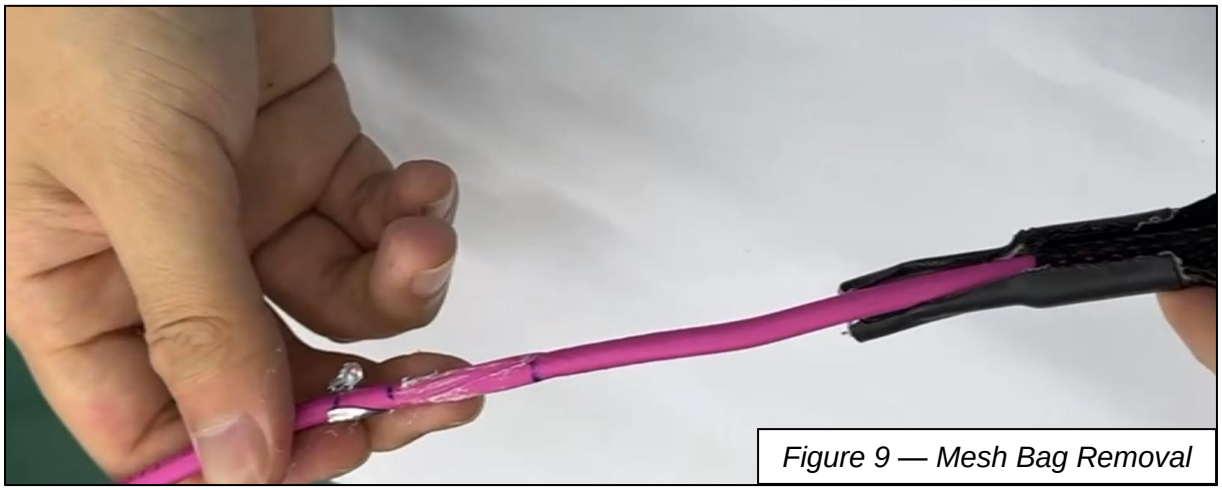


Figure 9 — Mesh Bag Removal

4.4 Install Trunk Cables from Either Side of the Panel

4.4.1 Installing Trunk Cable Using Pinned Cable Clamp

Step 1: Open cable clamp provided inside the reel or plastic bag, wrap the adhesive tape around the trunk cable (breakout area) and place each trunk cable into the clamp (Figure 10).

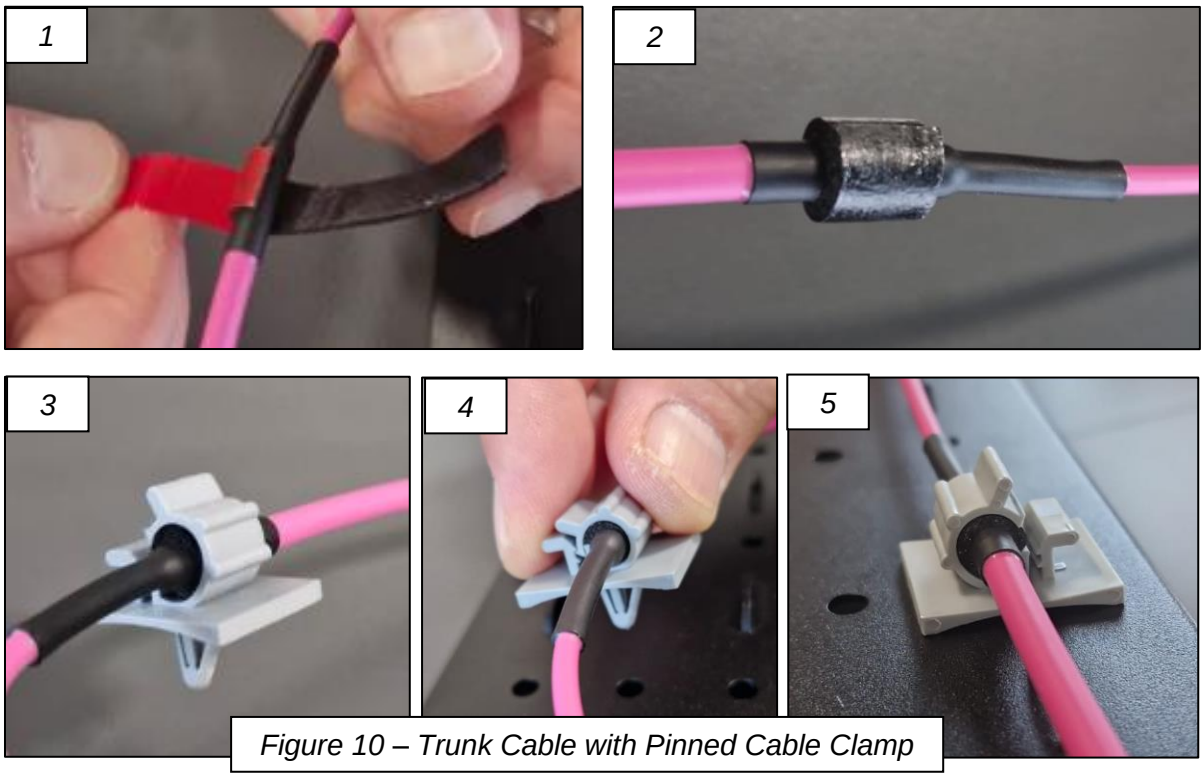
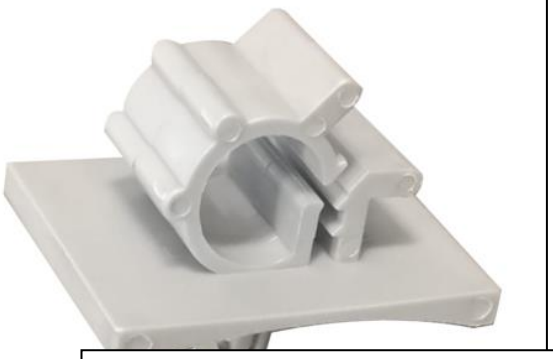


Figure 10 – Trunk Cable with Pinned Cable Clamp

NOTE: *NOTE: One pinned cable clamp and one adhesive tape (shown in Figure 11) are provided with the trunk cable.*



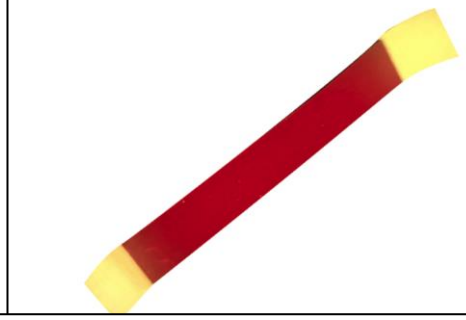


Figure 11 - Pinned Cable Clamp and Adhesive Tape

Step 2: Route cables into panel through side cable manager (Figure 12).

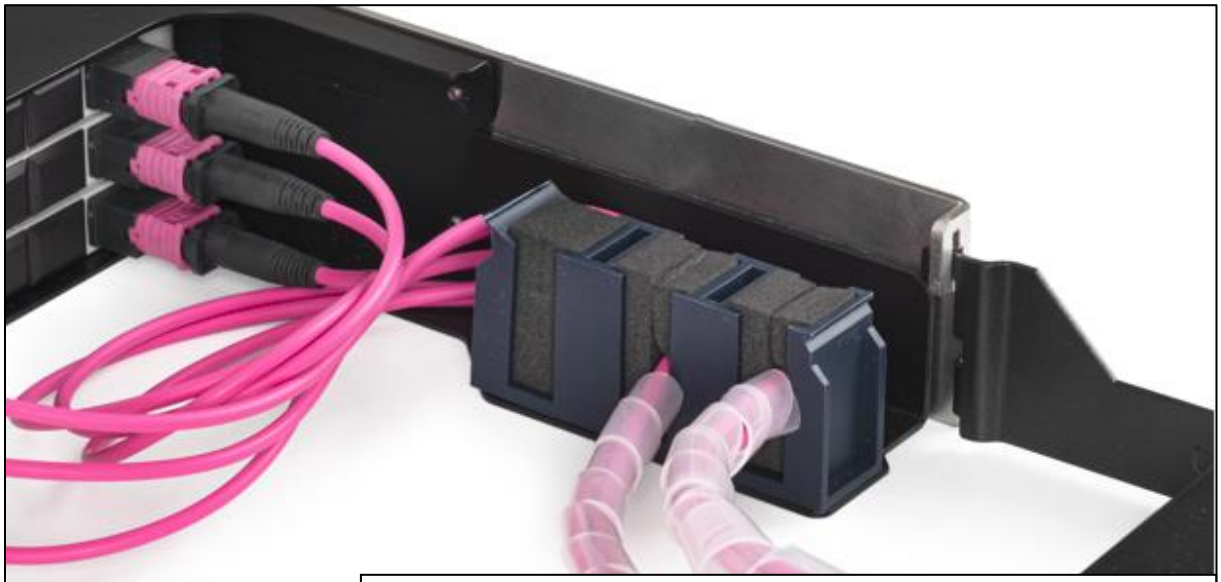


Figure 12 – Install Trunk Cable into Side Cable Manager

Step 3: Insert (push down) the pinned cable clamp feet into Rear Bridge to lock in place (Figure 13).

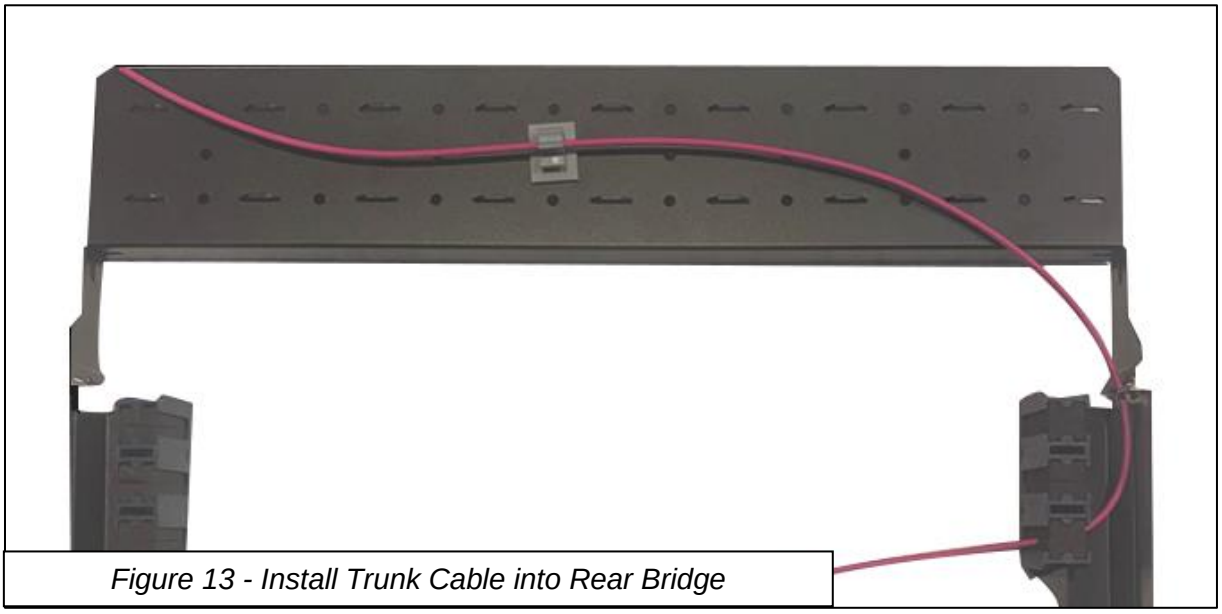


Figure 13 - Install Trunk Cable into Rear Bridge

Step 4: Repeat for all trunk cables and allow connectorized MPO legs to flow out the rear of the panel until ready to clean and mate in the appropriate cassette or panel.

4.6 Remove Panel Rear Bridge (OPTIONAL)

If trunk cable locking is accomplished in a location external to the panel, the trunk rear bridge may be removed to allow more room behind the panel (Figure 14).

Step 1: Release the Rear Bridge locking from the panel side ears.
Step 2: Remove the Rear Bridge from the panel.
Step 3: Repeat for all Rear Bridges per panel U.

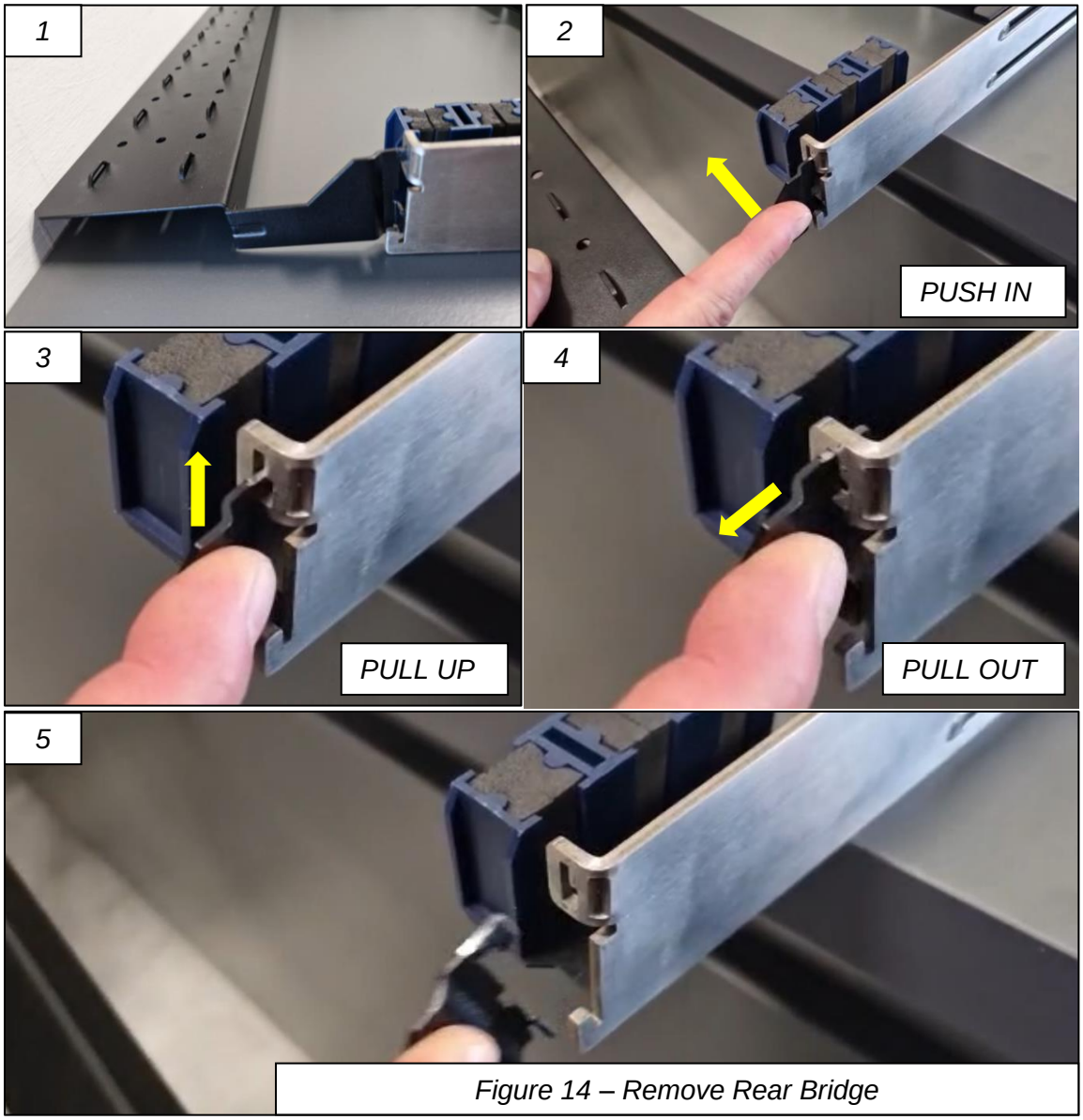


Figure 14 – Remove Rear Bridge

4.7 Install BRILLIANT Conversion Cassettes

4.7.1 Into BRILLIANT-1U, BRILLIANT-2U, and BRILLIANT-4U Panels

Step 1: Remove MPO connector and adapter dust caps. Clean connectors and adapters using the MPO cleaning tool.
Step 2: Mate the MPO connector(s) into the adapter(s) at the back of the cassette (Figure 15) with the MPO key down/opposite the cassette label.
Step 3: Starting with lower left corner (bottom panel slot A1), insert cassette from the front until it locks into place. Load all panels from left to right, bottom to top in the panel.
Step 4: Loop slack as shown in Figure 15, leaving enough slack to pull out the 1U panel without violating the minimum bend radius.
Step 5: Repeat for all cassettes.
Step 6: Loosely capture fiber slack with hook-and-loop straps, if desired (Figure 15).

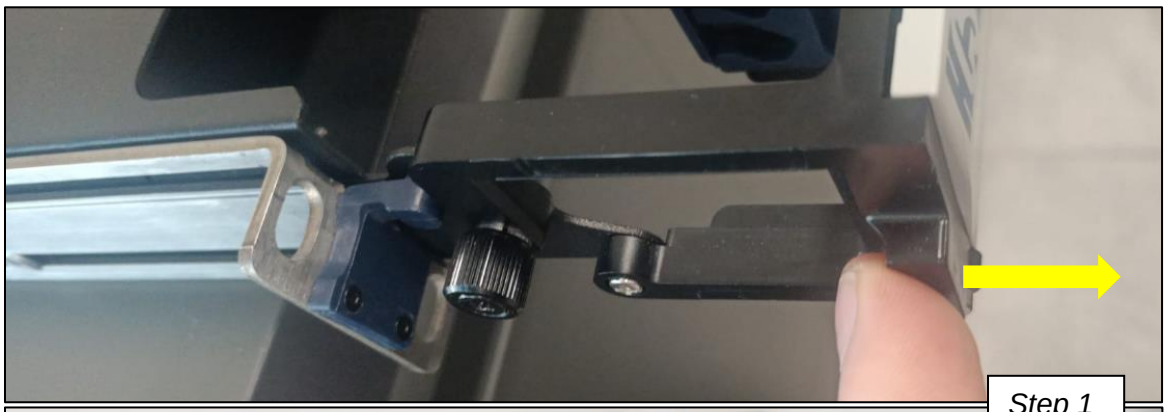
CAUTION: *When moving the 1U panel in or out, position yourself in the center of the rack and use both hands to pull out or to push in the 1U panel. Failure to do so may damage the panel slides.*

Step 7: Return to front of panel and pull out each 1U panel to test that panel freely pulls out without stress on the cables. If restriction in movement is felt, return to rear of the panel and adjust slack to relieve tension on cables.

4.7.2 Into BRILLIANT-1U Panel

CAUTION: *When moving the 1U panel in or out, position yourself in the center of the rack and use both hands to pull out or to push in the 1U panel. Failure to do so may damage the panel slides.*

Step 1: Open and lower the front door. Using the tabs on the side of the front cable management pull out the 1U panel horizontally until reaching hard stop (Figure 16).
Step 2: Release the front cable management captive screws and tilt it down to an angled position.
(Figure 16).


Step 1


Step 2

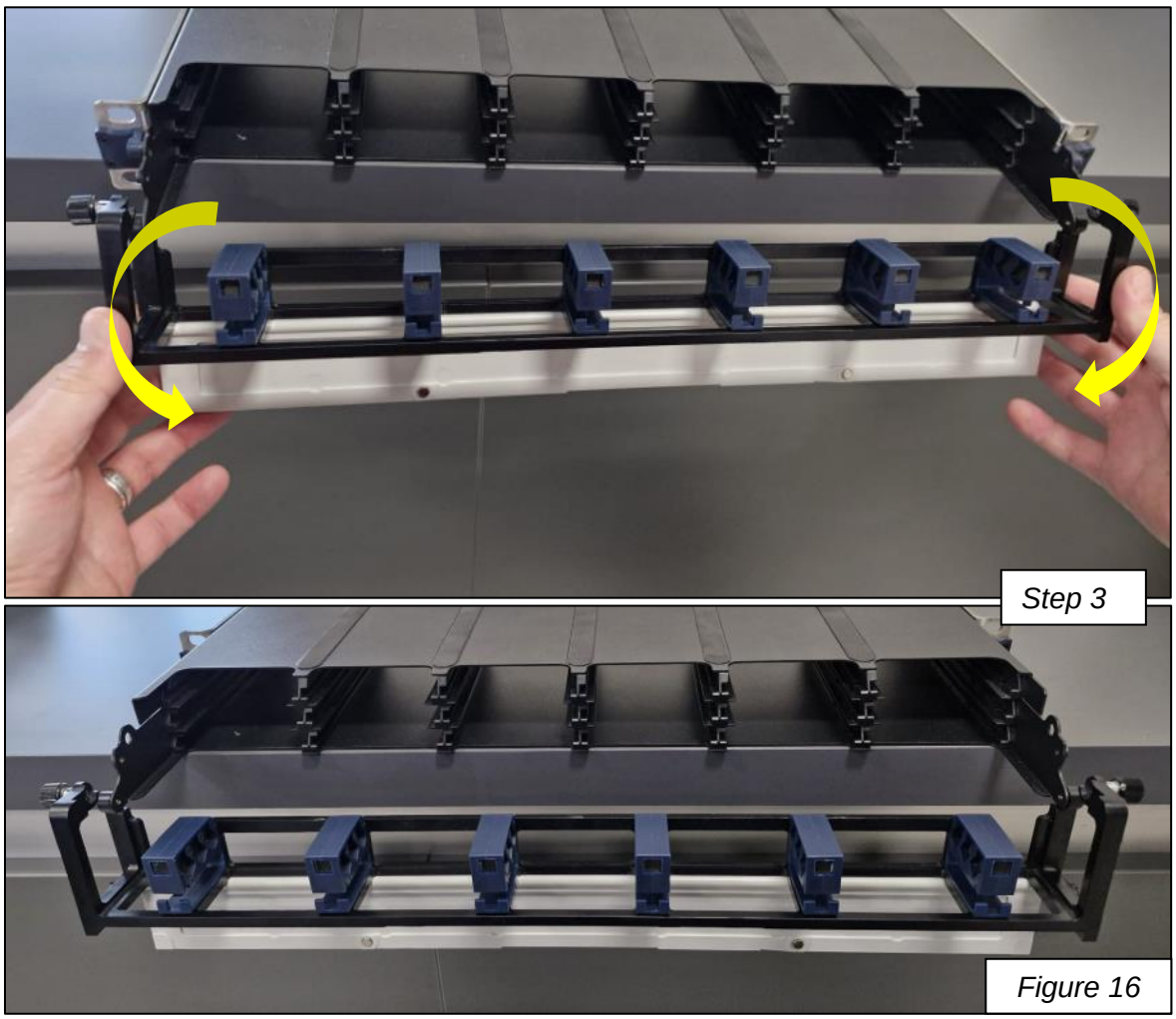


Figure 16

Step 4: From rear of panel, feed connectorized MPO trunk connector legs through to the front of the panel.
Step 5: From the front of the panel, remove MPO trunk connector legs and cassette adapter dust caps. Clean connectors and adapters using the appropriate cleaning tool. Follow the instructions provided with each tool.
Step 6: Mate the MPO connector(s) into the adapter(s) at the back of the cassette (Figure 17).
Step 7: Starting with the lower left corner (bottom panel, slot A1), as seen from the front, insert the cassette from the front until it locks into place (Figure 17).
Step 8: Repeat for all cassettes.
Step 9: Tilt back the front cable management, close the captive screws and slide back the 1U panel until reaching hard stop, ensuring connector legs are not pinched in the process.

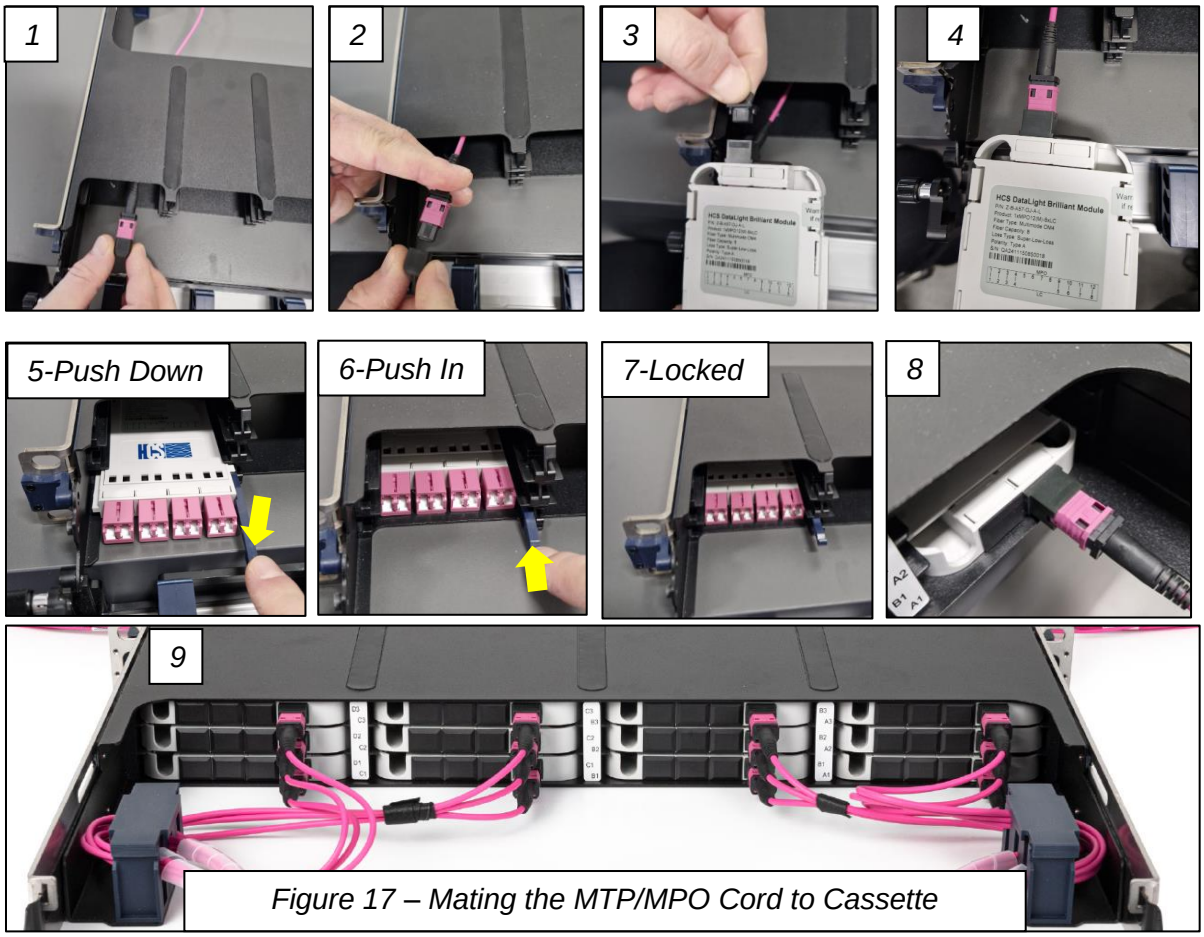


Figure 17 – Mating the MTP/MPO Cord to Cassette

4.8 Install BRILLIANT Transition Cassettes

4.8.1 Into BRILLIANT-1U, BRILLIANT-2U, and BRILLIANT-4U Panels

Step 1: Starting with lower left corner (bottom panel, slot A1), insert cassette from the front until it locks into place. Load all panels from left to right, bottom to top in the panel, as seen from the front.
Step 2: Loop slack as shown in Figure 18, leaving enough slack to pull out a 1U panel without violating the minimum bend radius.
Step 3: Repeat for all cassettes.
Step 4: Loosely capture fiber slack with hook-and-loop straps, if desired (Figure 18).

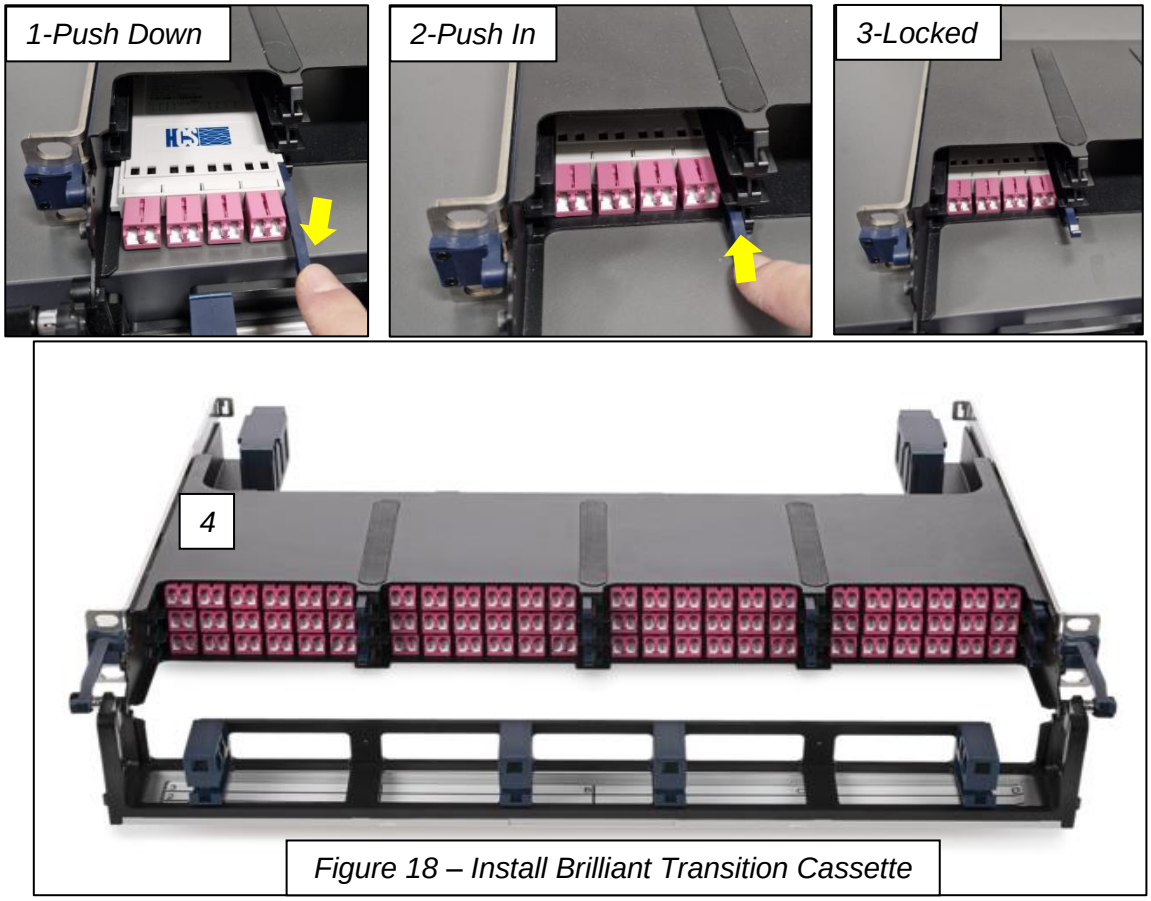


Figure 18 – Install Brilliant Transition Cassette

4.8.2 Into BRILLIANT-1U Panel

CAUTION: *When moving the 1U panel in or out, position yourself in the center of the rack and use both hands to pull out or to push in the 1U panel. Failure to do so may damage the panel slides.*

Step 1: Open and lower the front door.
Step 2: Using the tabs on the side of the front cable management pull out the 1U panel horizontally until reaching hard stop (Figure 16).
Step 3: Release the front cable management captive screws and tilt it down to an angled position.
Step 4: From rear of panel, feed connectorized MPO trunk connector legs through to the front of the panel.
Step 5: From the front of the panel, remove MPO trunk connector legs and cassette adapter dust caps. Clean connectors and adapters using the appropriate cleaning tool. Follow the instructions provided with each tool.
Step 6: Mate the MPO connector(s) into the adapter(s) at the back of the cassette (Figure 17).
Step 7: Starting with the lower left corner (bottom panel, slot A1), as seen from the front, insert the cassette from the front until it locks into place (Figure 19).
Step 8: Repeat for all cassettes.
Step 9: Tilt back the front cable management, close the captive screws and slide back the 1U panel until reaching hard stop, ensuring connector legs are not pinched in the process.

Figure 19 – Install Brilliant Transition Cassette

4.9 Connect Jumpers to BRILLIANT Cassettes

CAUTION: *When moving the 1U panel in or out, position yourself in the center of the rack and use both hands to pull out or to push in the 1U panel. Failure to do so may damage the panel slides.*

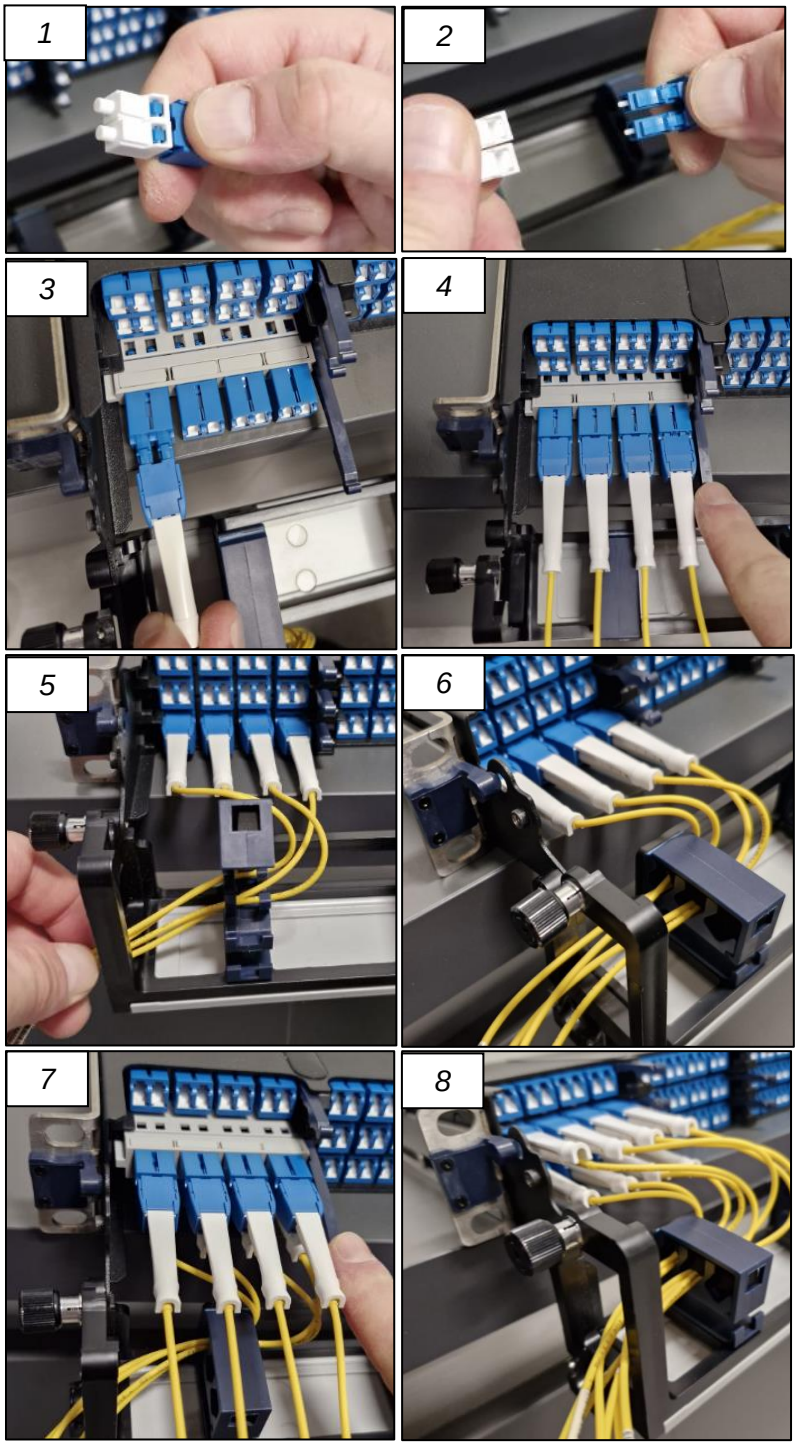
Step 1: Open panel front door and pull out a 1U panel (Figure 20).
Step 2: Using the tabs on the side of the front cable management pull out a 1U panel horizontally until reaching hard stop. Ensure there is enough fiber slack in the rear of the panel to allow for this movement.
Step 3: Release the front cable management captive screws and tilt it down to an angled position.
Step 4: Pull out a cassette to a working position.
Step 5: Clean the shuttered LC or MPO adapters using the LC cleaning tool or the MPO cleaning tool, respectively. Follow the instructions provided with the tool.
Step 6: Remove dust caps from LC or MPO connectors on the jumper cables. Clean the connector end faces using the LC cleaning tool or the MPO cleaning tool, respectively.

NOTE: *Only LC connectors are shown in the cassette illustrations.*

Step 7: Mate the connectors in the adapters.
Step 8: Route jumper legs, half to the right and half to the left side of the panel. Do NOT cross legs in opposite directions. Store the jumper legs in the front cable manager clips at the front of the panel (Figure 20).

NOTE: *Inspect the jumpers during the routing process to ensure no twisting occurred. If a twist has occurred, reroute the jumper leg.*

Step 9: Route the jumper legs per your installation plan to their final destinations.
Step 10: Starting with the lower left corner (bottom panel, slot A1), as seen from the front, insert the cassette from the front until it locks into place.
Step 11: Repeat for the remaining jumpers and cassettes.
Step 12: Tilt back the front cable management, close the captive screws and slide back the 1U panel until reaching hard stop, ensuring connector legs are not pinched in the process.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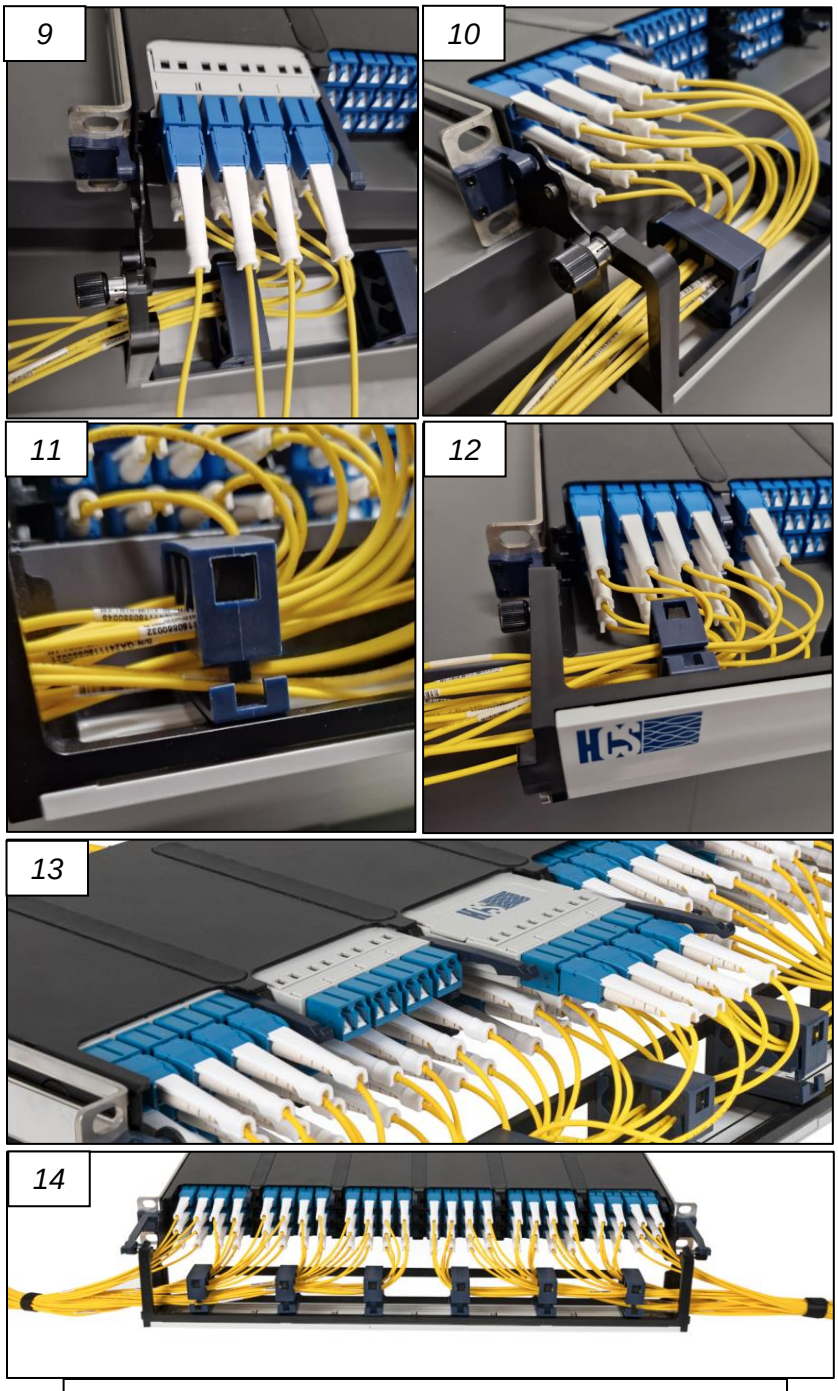

Figure 20 - Install and Route Brilliant Front Jumpers

4.10 Install BRILLIANT Adapter Cassettes

The MPO or LC adapter cassette comes in configurations to support both single-mode (SM) and multimode (MM) applications.
Adapter cassettes may be installed from the front of the BRILLIANT panel.
During the initial installation, it is recommended to install all adapter cassettes into the panels from the front of the panel and all trunk cables into the panels from the rear of the panel.
Install cassettes and trunk cables panel by panel, starting with bottom panel, slot A1.
Additional cassette and trunks should be installed with the same recommendations always working from left to right and bottom to top as seen from the front of the panel.

NOTE: *Only MPO connectors are shown in the cassette illustrations.*

4.10.1 Initial MPO (or LC) Adapter Cassette Installation

Step 1: With the trunk cables securely installed in the panel rear bridge, remove the dust caps from the MPO trunk connector legs and from the MPO adapter cassette (only the rear side). Keep dust caps in place on the front of the adapter cassette, if applicable. Clean connectors using the MPO cleaning tool. Follow instructions provided with the tool.
Step 2: Mate the MPO connector into the rear of the cassette adapter (Figure 21).
Step 3: Repeat for the remaining adapters and connectors for a single cassette. For each cassette, group trunk legs and place them in the fiber retaining fingers. Be careful not to pinch or twist the trunk legs when placing them in the fiber retaining fingers.

TBD

Step 4: With a cassette fully populated, insert cassette from the panel front side until it locks into place.
Step 5: Repeat for all cassettes.
Step 6: Loosely capture fiber slack within the rear cable manager and with hook-and-loop straps in the rear of the panel.

TBD

4.10.2 Connecting MPO Jumper, Harness, or Extender Trunk to Front of MPO Adapter Panels

CAUTION: *When moving the 1U panel in or out, position yourself in the center of the rack and use both hands to pull out or to push in the 1U panel. Failure to do so may damage the panel slides.*

CAUTION: *Do not exert excessive force on the panel. Damage to the trunk cables may occur.*

Step 1: Open the panel front door.
Step 2: Using the tabs on the side of the front cable management pull out a 1U panel horizontally until reaching hard stop. Ensure there is enough fiber slack in the rear of the panel to allow for this movement.
Step 3: Release the front cable management captive screws and tilt it down to an angled position.
Step 4: Pull out a cassette to a working position.

Step 5: Remove dust caps from the front of the MPO adapter in the panel, if applicable, and the MPO connector of the harness, jumper, or trunk. Clean the connector and adapter with the MPO cleaning tool. Follow instructions provided with the tool.
Step 6: Mate the connectors in the adapters (Figure 21). If MPO adapter is equipped with shutter, lower the shutter first, then mate the connectors.
Step 7: Route the connected cables, half to the right and half to the left side of the panel. Do NOT cross cables in opposite directions. Store the cables or legs in the front cable manager clips at the front of the panel.
Step 8: Starting with the lower left corner (bottom panel, slot A1), as seen from the front, insert the cassette from the front until it locks into place.
Step 9: Repeat for the remaining jumpers and cassettes.
Step 10: Tilt back the front cable management, close the captive screws and slide back the 1U panel until reaching hard stop, ensuring connector legs are not pinched in the process.
Step 11: Clean the connectors at the end of the harness, jumper, or trunk and mate in the electronics equipment per instructions provided with that equipment or according to your installation plan.

TBD

5. Recordkeeping

Detailed and accurate recordkeeping enables users to logically “map” fiber terminations within the data center from local equipment to remote equipment. It is recommended that users employ labeling guidelines outlined in ANSI/TIA-606 for mapping the network. Guidelines below provide an analogous solution in accordance with this standard for labeling to be used with the BRILLIANT solution. Additions in the suggested coding are accounted for to identify panels and cassettes.

5.1 Hardware Labeling

• Hardware components come pre-labeled for identification and promote a consistent labeling scheme.
• Users must provide their own label maker and media for the frame or cabinet and hardware.
• Labeling is best supported with use of adhesive backed label makers with media up to 1.27 cm (0.5-inch) in height.
• Cassette positions within each chassis panel are identified by alphabetical characters A through F from left to right.
• Cassettes or MPO panels come assembled with adapters and silkscreened with Fiber and/or Port ID.
• Panel comes equipped with a label card that is easily removable from the inside of the front door and requires no additional fastening to remain in place. This label may be written on, but use of a label maker is better.
• Label card supports adhesive-backed label media and printed labels may be easily adhered or removed for moves, adds, and changes.

Hardware labeling involves a five-step process that identifies the local and remote site. Use the suggested code in Figure 24 and the following steps to map your location. User should print and record the remote location on the provided label card.

TBD

Step 1: Frame/Cabinet Location (Figure 25)
Identify location of frame or cabinet within the floor space grid coordinate system. Preprint labels and adhere to front and back of frame or cabinet at the top and bottom.

Step 2: Panel/Chassis Location (Figure 26)
Identify location within the frame or cabinet (in rack units from the bottom) by locating the top/left corner of the panel/chassis. Print two labels and adhere one to the front chassis door using the crop mark for alignment. Adhere the second label to the label card on the inside of the door.

Step 3: Panel Location (Figure 27)
Identify location of panel within the panel/chassis. Panel come pre-labeled 01 to XX from the bottom to the top of the chassis.

Step 4: Cassette Location with Fiber or Port Range (Figure 28)
Each panel comes pre-labeled A through F to identify cassette position within the panel.

Step 5: Documentation (Figure 29)
Identify remote location termination and determine code to be printed. It should only be necessary to print the remote location. Printed code from label makers may be affixed to the label card on the inside of the front door.

5.2 Cable/Jumper Labeling

Fiber termination identification is equally important in mapping the data center network. Individual fibers (such as jumpers) must be clearly labeled to identify local and remote location. Typically a single jumper will contain two labels on each end of the fiber near the termination point identifying the specific local ID and the remote ID the jumper is patching to. It is important to follow suite with previous defined code indicating rack or cabinet ID, patch panel ID and more specifically the individual port or fiber termination location. One should cross reference the recommended guidelines in ANSI/TIA-606. Proper labeling allows users to easily trace jumpers from one location within the network to the next.
Most common identification methods for individual fiber ID employ the use of flag or wraparound preprinted labels. Barrel or snap-on labels may also be employed but user must select the proper barrel label for the corresponding jumper diameter, e.g., 2.0 mm.
Documentation should clearly identify individual fiber strands of the cable or jumper.


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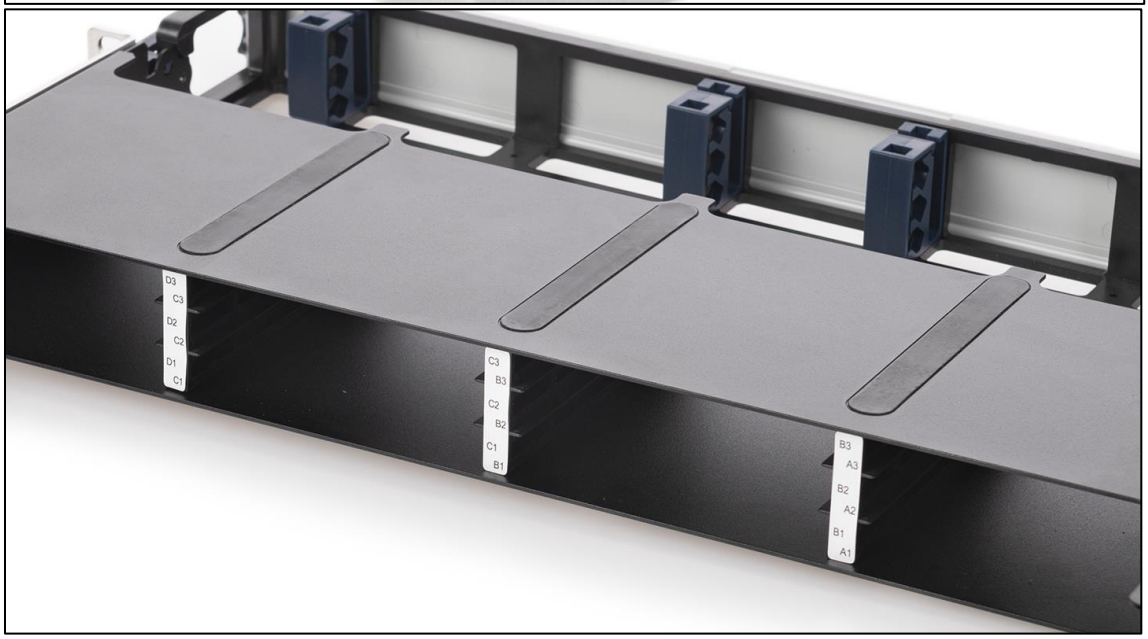
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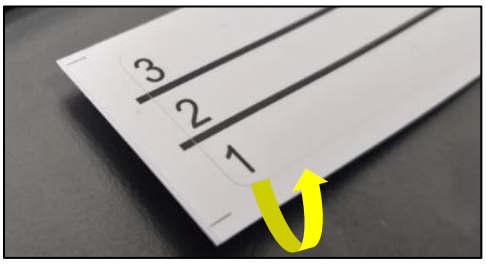
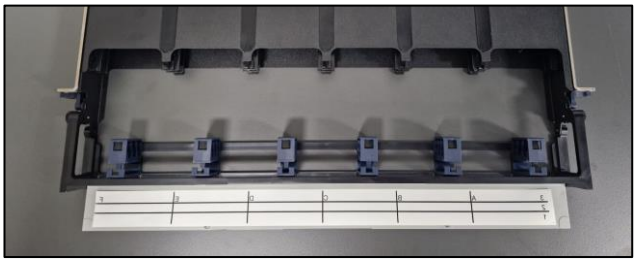
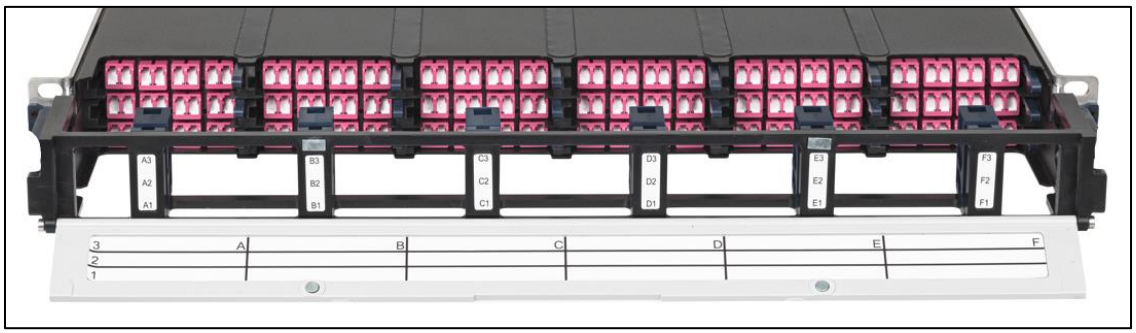
E
F


3
2
1




A3
A2
A1
B3
B2
B1
C3
C2
C1
D3
D2
D1
E3
E2
E1
F3
F2
F1
3
2
1
A
B
C
D
E
F

6. Troubleshooting and Maintenance

6.2 Replace BRILLIANT Cassette

Step 1: Open panel front door and pull out a 1U panel.
Step 2: Using the tabs on the side of the front cable management pull out a 1U panel horizontally until reaching hard stop. Ensure there is enough fiber slack in the rear of the panel to allow for this movement.
Step 3: Release the front cable management captive screws and tilt it down to an angled position.
Step 4: Press the lever on right side of the cassette and pull it out to a working position.
Step 2: Press latch on LC connector and pull connector out (Figure 30). If jumper is equipped with MPO connector, simply grasp connector body and pull connector out of the adapter. (**NOTE:** only LC connectors shown in Figure 30).
Step 3: Press lever on right side of the cassette and pull it out.
Step 4: Unplug MPO connector(s) in rear of cassette.
Step 5: Reverse process to install new cassette (if upgrading the network).

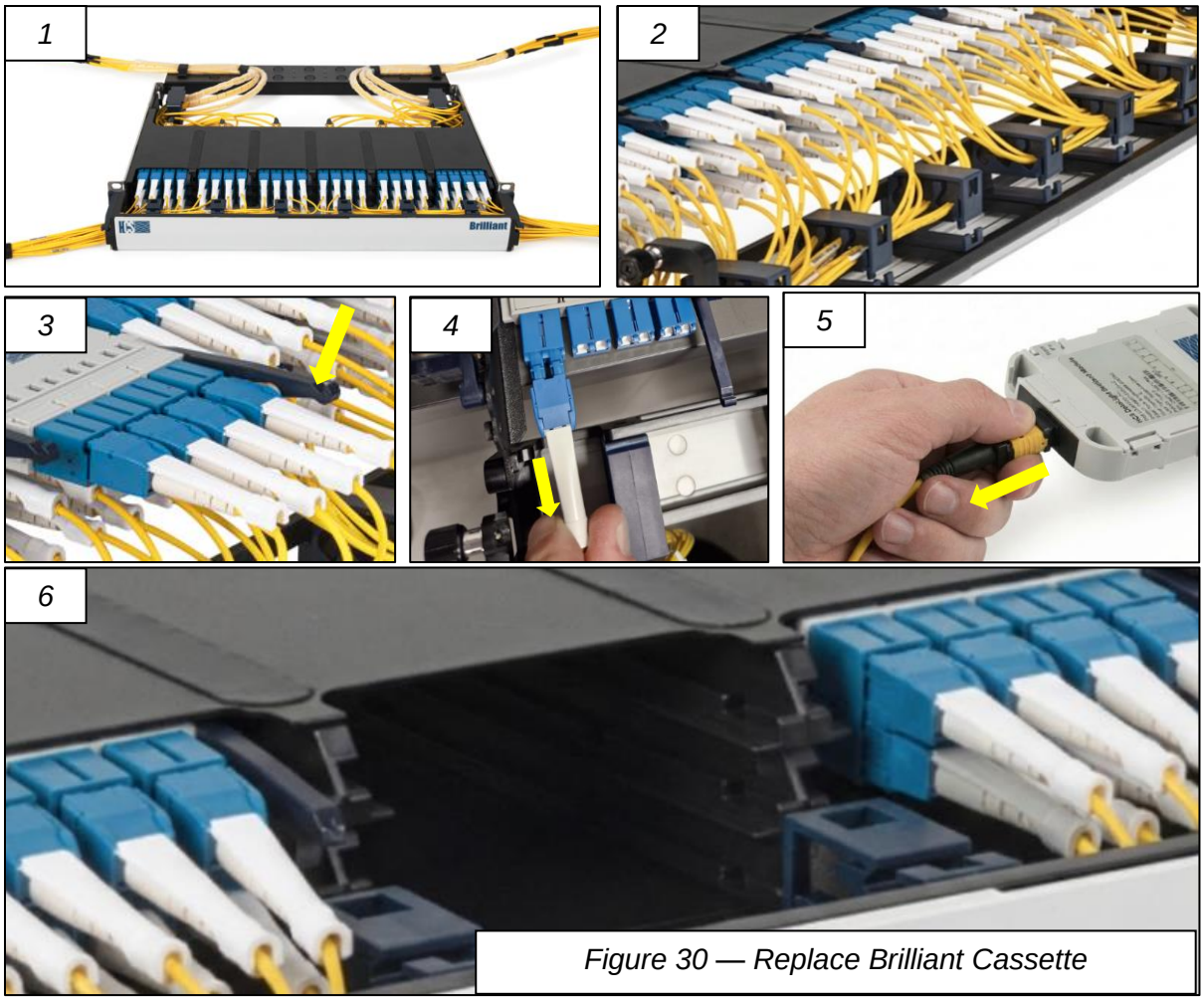


Figure 30 — Replace Brilliant Cassette

6.6 Connector Care and Cleaning

WARNING: *Isopropyl alcohol is flammable with a flashpoint at 54°F. It can cause irritation to eyes on contact. In case of contact, flush eyes with water for at least 15 minutes. Inhalation of vapors irritates the respiratory tract. Exposure to high concentrations has a narcotic effect, producing symptoms of dizziness, drowsiness, headache, staggering, unconsciousness and possibly death.*

• Always keep dust caps on connectors and adapters when not in use.
• Ensure dust caps are clean before reuse.
• Use optical cleaning materials as standardized by your company.
• Clean the connector before every mating, especially for test equipment patch cords (jumpers).
• A minimum level of cleaning is listed below. Local procedures may require more rigorous cleaning methods.
Step 1: Remove plugs from the connector adapter.
Step 2: Wipe the connector ferrule twice with a lint-free wiping material moistened with isopropyl alcohol.
Then wipe across the end of the ferrule.
Step 3: Repeat previous step with a dry wipe.

Figure 31 — Connector Care & Cleaning