

FieldSmart FxDS Installation Manual

FieldSmart Fiber Crossover Distribution System (FxDS) Installation Manual

Frame System
Patch Panels
Miscellaneous

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Technical Support

Clearfield, Inc. can be contacted for any issues that arise with the supplied product.

If you need to return the supplied product, you must contact the Clearfield, Inc. Customer Service Department to request a Returned Materials Authorization (RMA) number.

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Introduction

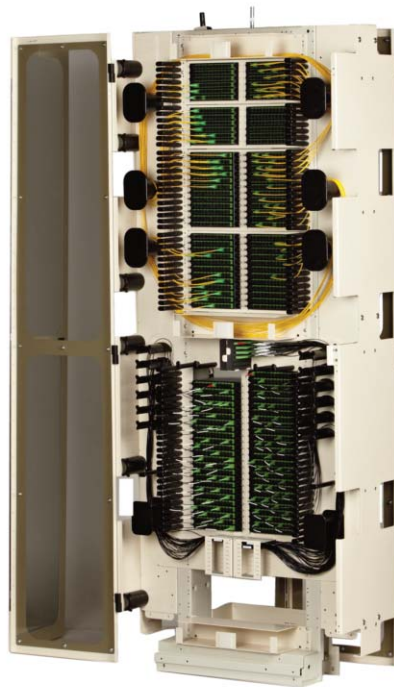
Proprietary Notice

About FxDS Product Line Application

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Its purpose is to provide the user with adequately detailed documentation to efficiently install the equipment supplied. Every effort has been made to keep the information contained in this document current and accurate as of the date of publication or revision. However, no guarantee is given or implied that the document is error free or that it is accurate with regard to any specification.

Fiber Crossover Distribution System (FxDS) - Overview
FxDS Frame Solution

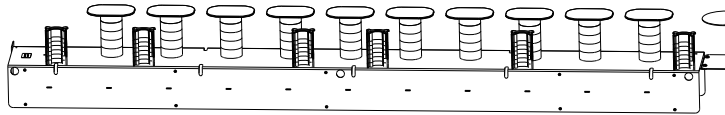


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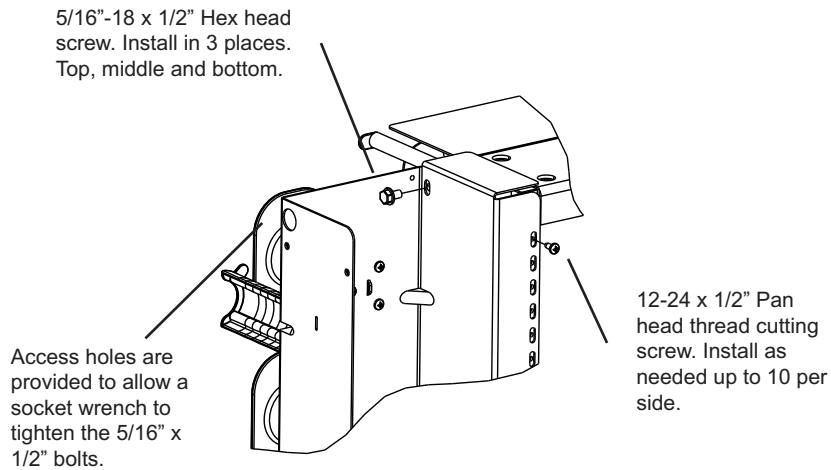
FxDS Frame Installation Part # 010802

For detailed kit drawings, see drawings enclosed in the desicard envelope.

1. Remove the frame from the crate by removing the bolts at either end of the crate.
2. Remove various small packages from between the interbays on the bottom of the crate and set aside.
3. Locate the floor mounting hardware and the isolation kit.
4. Install the frame to the floor of the facility using the included hardware and isolation kit. (Note: The frame has a total width of 36 inches when fully assembled.)
5. Remove the interbays from the floor of the crate by removing the shipping screw that secures them to the floor.

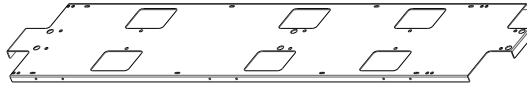


6. Hang the interbay from the top of the frame as shown below, and attach with the included hardware.



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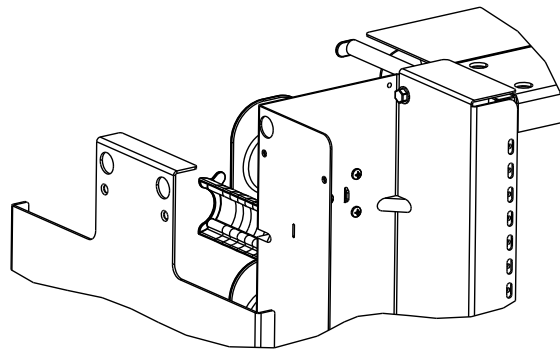
7. Locate the endguards located in the side compartments of the crate enclosed in cardboard.



8. The endguards can now be installed by hanging them on the interbay and installing the included hardware. Note: The endguard is labeled with "TOP" on the inside of the interbay to help with alignment

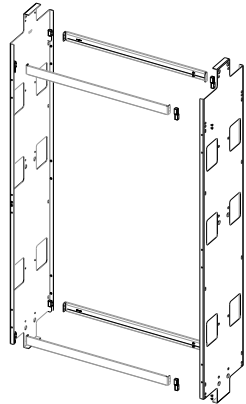
12-24 1/2" Flat
Head Socket
Screw (black). This
requires 1/8" Allen
Wrench to install.

Endguard Plate
with top side up
showing hanging
ledge.

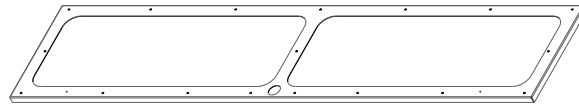


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11. After the hinges are installed, you will need to install the endguard supports in both the top and bottom locations of each side of the frame kit, by sliding the bars into place and engaging the pin and socket hinges.

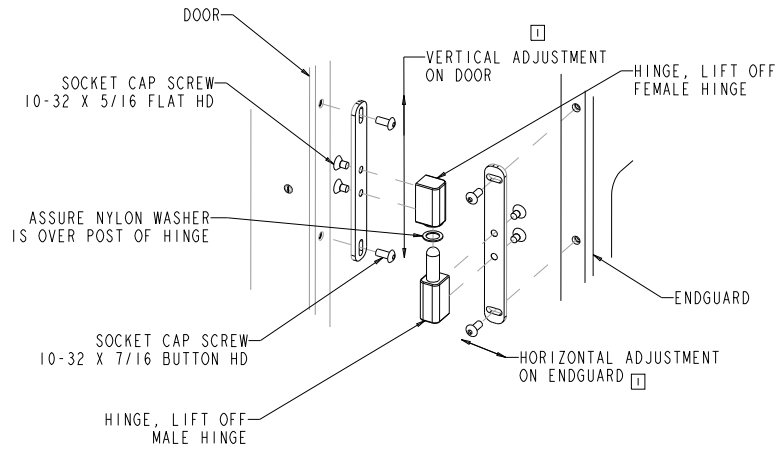


12. Locate the doors inside the shipping crate.



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13. Begin by installing the pin side of the hinges to the endguard and the pocket side to the door. It may be helpful to stand the door up in the position you intend to install it, in order to ensure that the door hinges face the correct direction.

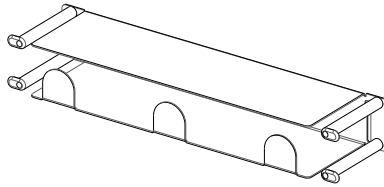


14. The door can then be lifted into place by aligning the pins and pockets of the hinges and allowing the door to settle into place.

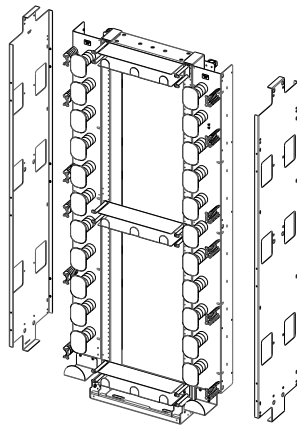
15. Install the desicard envelope to the inside of the front door by removing the nut from the center of the door and securing the envelope to the door with the nut.

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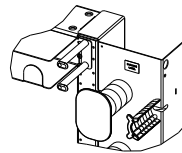
16. Locate the troughs in the shipping crate.



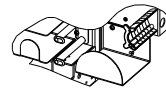
17. Install in the locations shown below using the provided hardware.



Align with the marks
on the interbay



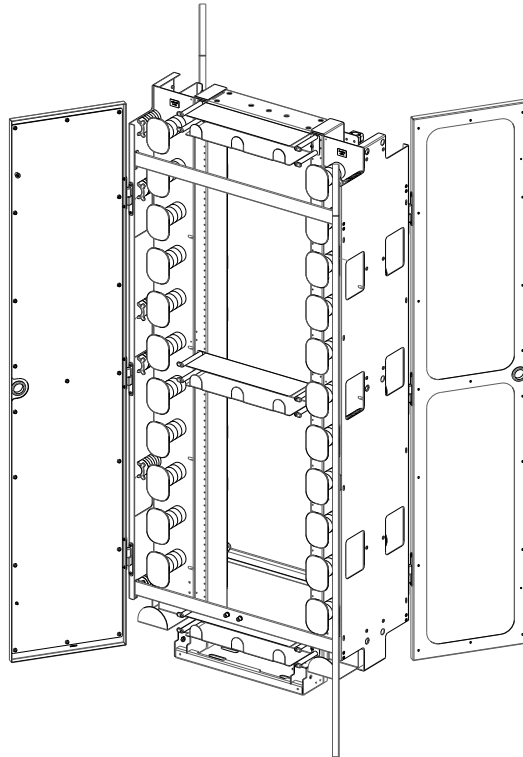
Align with kickplate on
bottom



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18. The ground bar enclosed in the crate can be installed at either the top or bottom of the frame.

19. The final assembly is shown below.



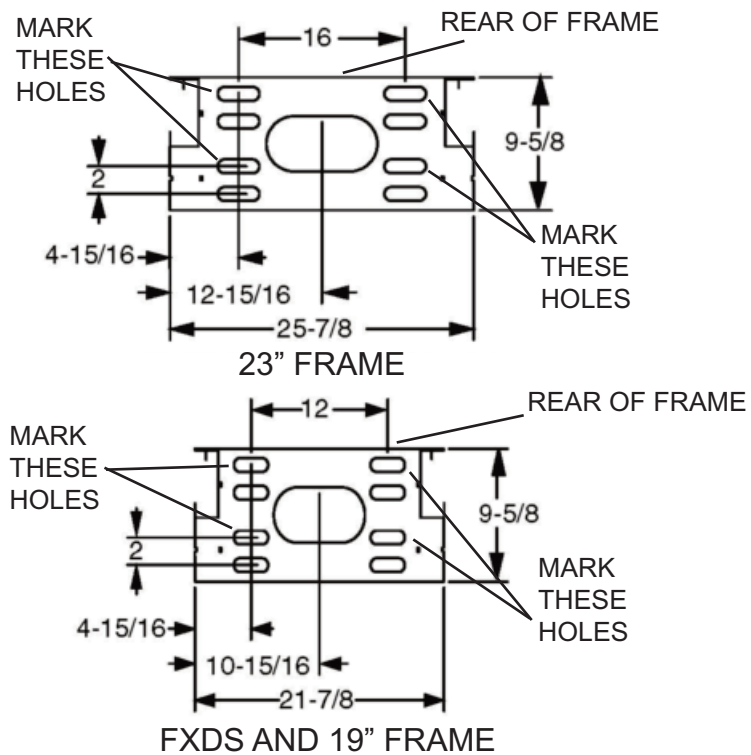
Mounting Clearfield Frames to the Floor

Tools (required or recommended):

1. Hammer (or rotary) drill (with depth guage recommended)
2. 5/8 masonry drill bit
3. Blowout air bulb or vacuum with small diameter tube.

Installation procedure:

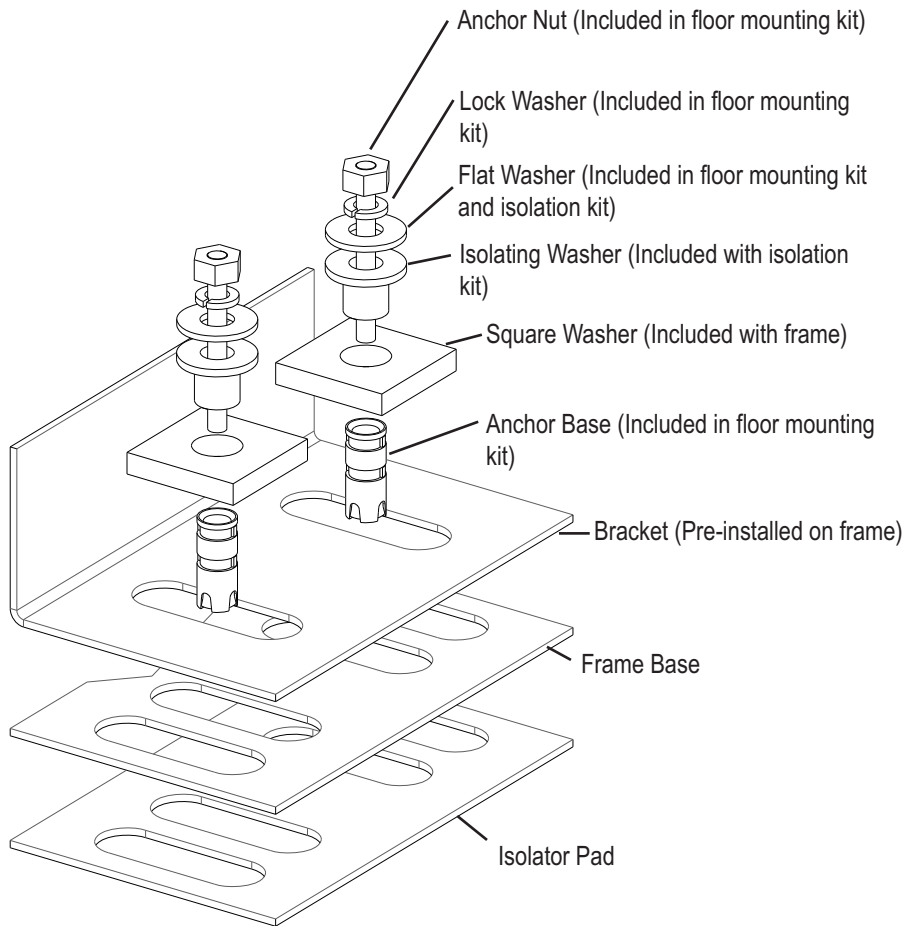
1. Using the frame base as a template (drawing template found at www.clearfieldconnection.com/resource-center/manuals), mark the four (4) hole locations to be drilled. Holes should be as far apart as possible within each cutout (refer to the floor mounting details for the frame being installed).



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2. Using a 5/8" masonry bit, drill the four required holes to a minimum depth of 100 mm (approx. 4").
3. Thoroughly clean the dust from each hole, using an air blowout or vacuum device.
4. Verify that the anchor's minimum embedment depth of 80 mm (approx. 3") using the seismic anchors. This is marked by a ring on the sleeve of the anchor.
5. To not degrade the anchor's installed performance, any unused anchor holes (or other nearby holes) in the concrete, within 3" must be filled with an epoxy filler (pour stone) or equivalent. Filled holes must be fully cured before anchors are installed and torqued.
6. If not already in place, install the anchor brackets inside the frame base. Secure the anchor brackets (left hand and right hand respectively) to the frame's uprights using two (2) grade 5 or better 1/2"-13 x 1-1/2" cap screws, lock washers and hex nuts in each anchor bracket. Tighten each bolt to 65 ft-lbs., +10, -0 ft-lbs. See *image A*.
7. Place the frame over the predrilled holes and align as necessary. If an Isolation Pad is used, the pad is placed between the frame and the floor. See *image A*.
8. Ensure that the anchor's expansion shield is not expanded. Place the end of the anchor into the predrilled hole. Repeat for the other drilled holes.
9. Align the edges of the 2" square washer parallel with the slots in the frame base to obtain the maximum material overlap. Once aligned, tap each anchor/washer assembly until it is seated in the hole and firmly against the 2" square washer.
10. Pre-tighten each anchor with a socket wrench or box-end wrench; do not use an open-end wrench (which could easily slip off and cause injury). Before final tightening, ensure that the frame is properly aligned (in the row and with any adjacent frames).
11. Torque each anchor to 60 ft-lbs. When using the break off type anchor, a torque wrench is not required since the anchor's (red) torque cap shears off at a predetermined torque value (apprx. 60 ft-lbs.), leaving a green seal on the bolt head, indicating proper tightening.

Image A



Caution:

Anchor brackets must be properly installed (bolted to the frame upright with bolts properly torqued to 65 ft-lbs., +10, -0 ft-lbs.) and the frame must be properly secured to the concrete floor using the appropriate seismic floor mounting kit. Installing the frame in any other manner may reduce the load and/or seismic performance of the installation. Fastening to adjacent frames, securing the frame to overhead structure, etc., may also be added, but these do not replace proper installation of the seismic floor mounting kit.

Adjusting the Interbays and Doors

The interbays and doors are adjustable to account for uneven flooring. Once everything is loosely assembled and in place look at the intersection of two adjacent end guards. If one is higher than the other, tighten the fasteners on the higher one.

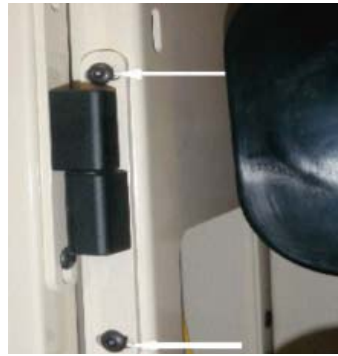
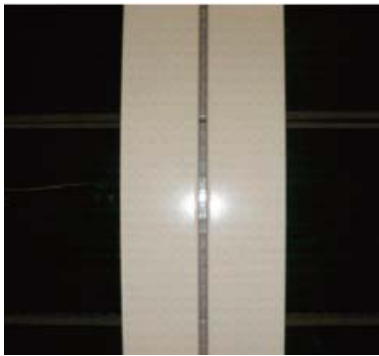


Then carefully lift the lower interbay until it is even and then tighten the fasteners to lock into place. Notice each interbay has adjustment slots built into the sheet metal to allow for movement in installation.

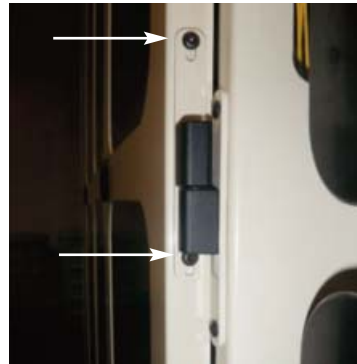


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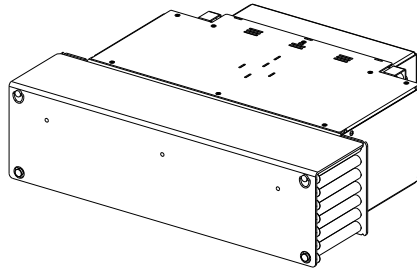
To adjust the door, first align the doors so that there is an even gap around 1/8" from the top of the doors to the bottom. This can be done by adjusting the screws holding the hinges to the endguards. (Start with the screw in the center of the slot as most applications will not need adjustment afterward.)



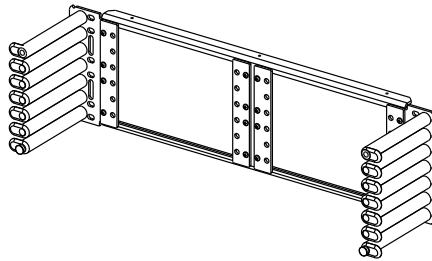
After the horizontal adjustments have been made, then adjust the doors to be even vertically. This is done in the same fashion as the interbay by locking down the higher door and then adjusting the lower door to match.



FxDS Panel Assembly and Installation



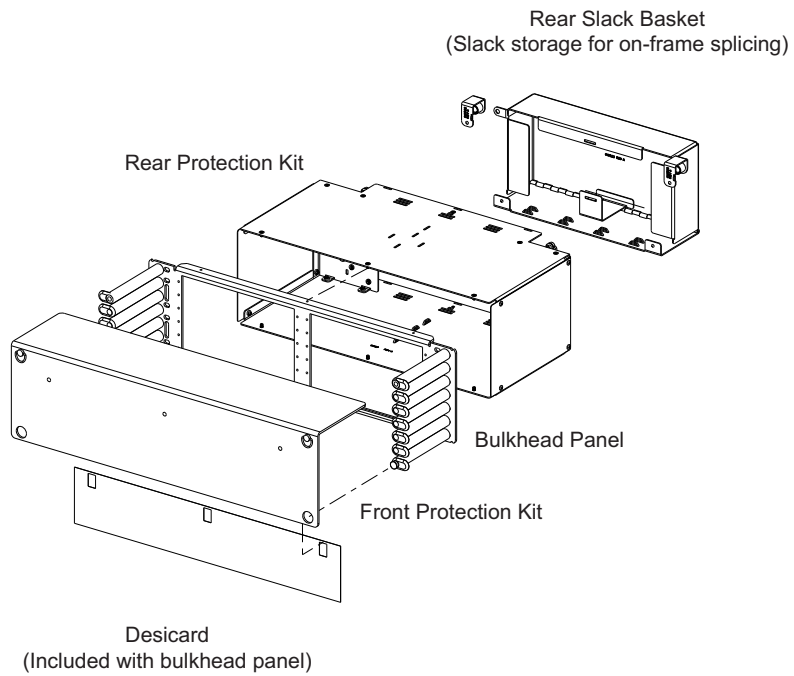
FxDS Bulkhead Panel (144) with front protection, rear protection and slack basket kits installed. Traditional fiber management panel.



FxDS Bulkhead Panel with no protection kits installed for FxDS Frame, data cabinet, or OSP cabinet applications.

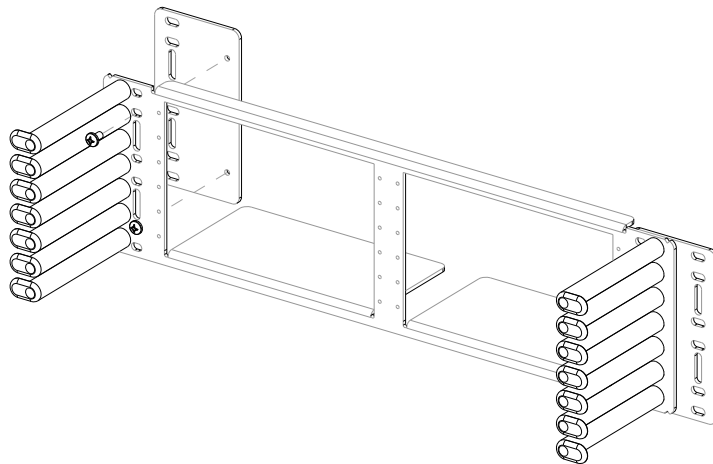
FxDS Panel Protection Options

Based on the level of protection needed, there are several protection kits available to upgrade the bulkhead panel.



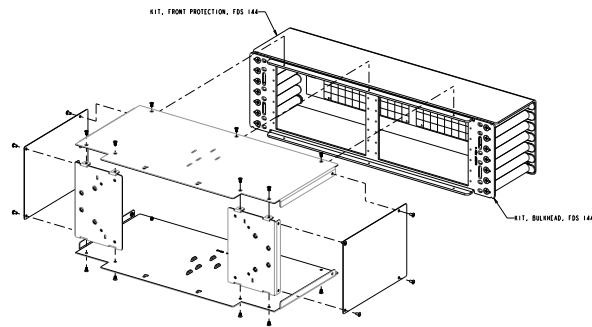
23" Extension Brackets

Panels (with or without protection kits) are installed into the FxDS frame as delivered (19" network bay). Stand alone panels can be mounted in traditional 19" network frames or 23" network frames, with use of extension brackets, using two 12x24x1/2" screws on each side.



Panel Protection Kit Assemblies

Each protection kit, if purchased separately, is delivered with a drawing showing how to assemble the kit and attach it to the bulkhead panel. Below is a representation from the 144-port panel with the rear protection kit.



Note: The shaded or dotted portions represent the existing equipment. The darker bold lines represent the portion to be assembled. If you are missing a drawing, or would like to order a protection kit, you can request one from Clearfield based on the following chart.

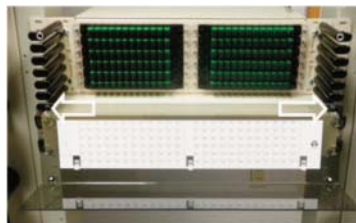
Panel Size	Front Protection	Rear Protection Patch only	Slack Basket Patch & Splice
24	010596	011206	011206
72	010647	011204	011203
96	010806	011201	011200
144	010531	011198	011197
288	010584	011195	011194

Front Protection Kits

The door on the front protection kit can be removed by turning the quarter-turn fasteners and lifting the door away from the panel. The door can then be set aside or hung upside down on the knobs extending from the lowest radius finger.

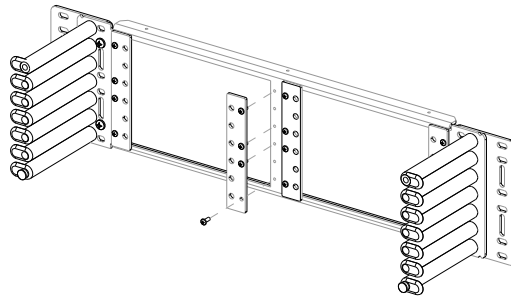


Door retainer on bottom radius finger



Tie Panel Kits

The bulkhead panel can be modified into a tie panel kit by the addition of a tie panel kit. Each kit installs with 6-32 x 3/8" screws through a reducing bracket into the cassette mounting holes of the panel.



Tie panel kits are available for all panel sizes in a variety of connector sizes. They can all be referenced and ordered per the following chart. It is suggested that you use the corresponding rear protection kit when using the panel as a tie panel.

Panel Size	SCUPC	SCAPC	LCUPC	LCAPC
24	010916	011021	011039	011044
72	010917	011022	011040	011045
96	010918	011023	011041	011046
144	010919	011024	011042	011047
288	010920	011025	011043	011048

Mounting the Panel: FxDS frame, traditional frame, data cabinet, or OSP cabinet

The panel is mounted into the frame by using the provided 12-24 x 1/2" thread cutting screws. It is recommended that two screws are used on each side. In order to help align the panel, it is also recommended that vertical and horizontal holes are used on each side for mounting.

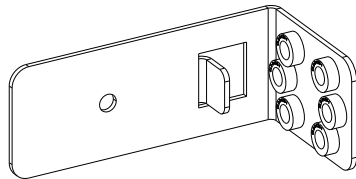


Mounting the Incoming Cable

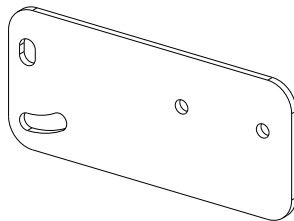
Choose a green clamp shell that is close to the same size but slightly bigger than the cable you plan to mount. The difference in size can be made up by either wrapping the cable with some of the provided grommet tape, or laying a small strip of tape in the bottom of the side of the clamp shell.



Each panel comes with two types of cable mounting brackets. One is used for applications where you have access to pre-drilled and tapped holes in the back of the frame, and one is for instances where these holes are not available.



This bracket is for frames with no rear mounting holes.



This bracket is for frames equipped with rear mounting holes.

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If rear mounting holes are available, the bracket and clamp are mounted as shown below. Note: The angle of cable mounting can be adjusted by pivoting the bracket on one of the mounting holes and securing it down with the other. A greater range of angles can be achieved by flipping the bracket over.



If no rear mounting holes are available, the other bracket can be used. You will need to hold the bracket up to the frame and drill a #10 size hole into the frame as shown. Then, you can mount the bracket using the self-tapping screw included with the panel. The angle of the cable can be adjusted by using different sets of threaded holes in the bracket.



Drill here



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If you are mounting the cable to the back of the rear protection panel, the green clamp shells are mounted to the back of the panel using the pre-threaded holes.



If using a 24-port panel, the cable can be mounted to the back of the rear protection kit using the included P-clip.

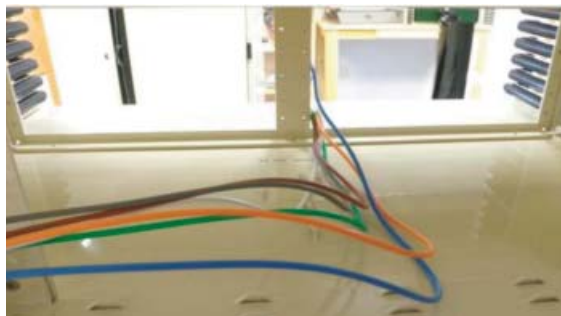


Storing Slack in FxDS Panels With the Rear Protection Kit Installed

Use the included mounting screws to fasten the clamp shells and cable to the rear cable bracket. The cable should be mounted so that the breakout is slightly beyond the end of the clamp.



Feed the buffer tubes for all ports on the left side of the panel, through the front of the panel, to the right side of the bulkhead (when looking from the rear of the panel.)



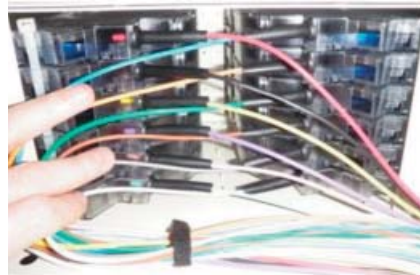
After splicing the fibers into the cassettes, feed the buffer tubes back through the bulkhead and install the cassette into the bulkhead in the appropriate port location.

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Feed the right side buffer tubes in order, through the front of the panel, starting at the top and alternating every other tube with the existing buffer tubes on the right. Note: Buffertubes from the right and left sides should be interwoven as shown.

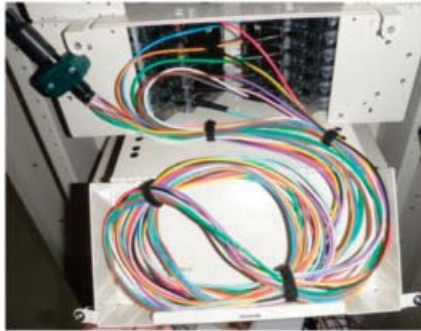


Splice and install the cassettes for the right side of the panel, in the same fashion as the right side, until the panel is fully spliced in.



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Coil the buffer tube slack in loops that will fit into the slack storage basket and be retained by the tabs as shown. After the buffer tubes are coiled, use the included Velcro to secure the buffer tubes in the locations shown.



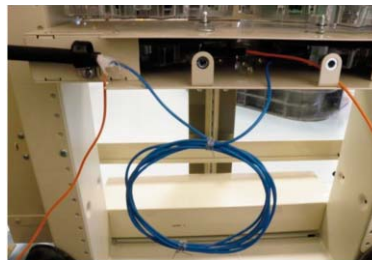
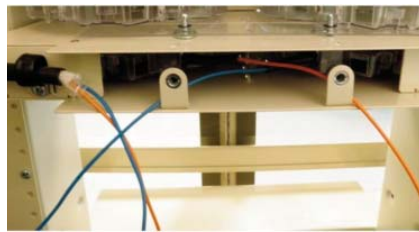
Carefully close and latch the slack storage basket, paying attention to not damage the buffer tubes.



1 RU or 2 RU Routing

When using the 1 RU panel, please use the following steps to store the buffertube slack in the panel after splicing. After splicing the cassettes and reinserting them into the bulkhead, start by coiling up the buffertubes from each cassette into a coil around 6-8" in diameter. The coil can be secured with the provided Velcro.

Note: If the buffertube used in splicing a 2 RU panel is too stiff to coil in the slack basket, the slack can be stored in the same fashion as the 1 RU panel.



The buffertubes can then be inserted—one above and one below the cassettes—in the panel.



Storing Slack in FxDS Panels Without the Rear Protection Kit Installed

Buffertube slack can also be stored on the back of the frame using frame mounted spools (010600).



Splicing in the Clearview Cassette

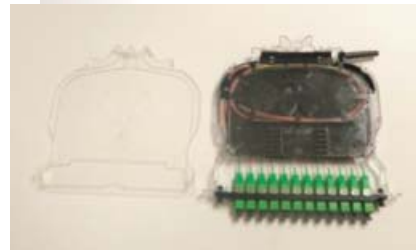
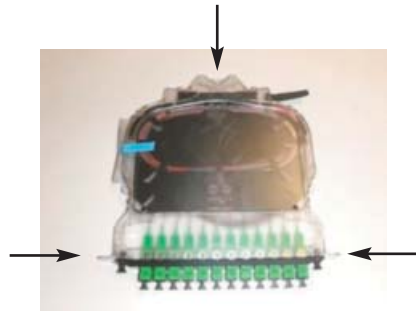
1. The Clearview Cassette comes delivered with the 900 micron fiber routed and preloaded into adapters at the front of the cassette and a buffer tube protection boot, exiting on the left of the rear of the cassette.



2. The mounting screws for the cassette are enclosed in a small bag and taped to the side of the cassette. Remove them and set aside for future use.



3. Remove the cover by pressing the tabs on the sides and rear of the cassette and lifting it from the base.

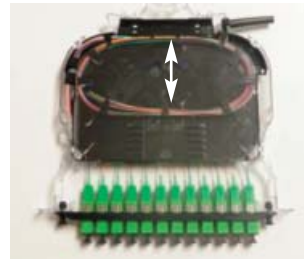


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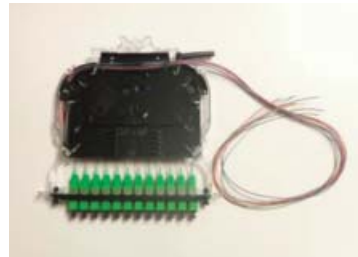
4. The splice tray cover can be removed by lifting up on the two tabs in the corners of the cover, then moving it slightly forward.



5. The preloaded spliceable 900 um pigtails come pre-stored in the outer raceway of the splice tray.



6. Remove the 900 um slack from the splice tray and set to one side.

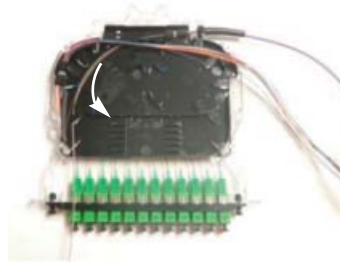


7. Remove the protection boot from the cassette and insert the buffertube to be spliced into the boot. Move the boot beyond the previously desired tie-down mark. Prep the cable to the desired tie down mark.

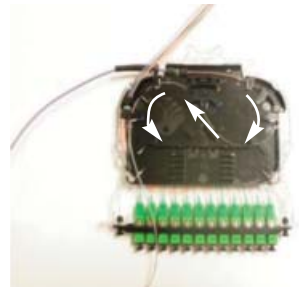


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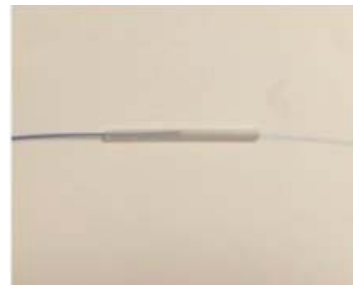
8. Based on your application, insert the boot into the cassette and tie the buffertube to the cassette with the cable exiting the appropriate direction. If entering from the right hand side of the cassette, the 250 um fiber will naturally flow into the logo side of the splice tray for storage after splicing.



9. If entering the cassette from the left hand side of the cassette, you will be required to do a small redirect "S" in the splice tray, to translate the 250 um fiber into the logo side of the splicing tray for storage after splicing.



10. Individually splice the 250 um fibers to the 900 um fibers.



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11. If a 3M brand fiber lock splice sleeve is to be used, the small supports in the splice tray will need to be removed with a side cutter or utility knife.

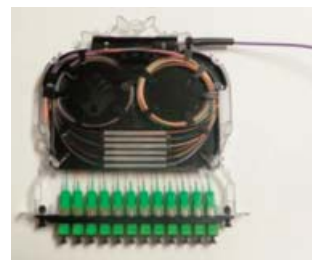


12. A bead of silicone can then be applied to the center of the splice sleeve holder. This silicone is necessary for 40 mm splice sleeves and the fiber loc brand splice sleeve.



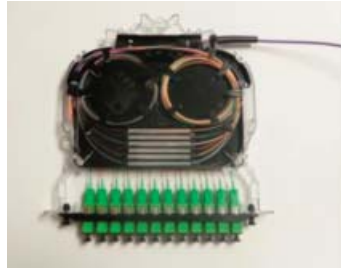
*Note: Silicone is not necessary for 60mm splice sleeves.

13. The spliced fiber can then be stored in the splice tray as shown.



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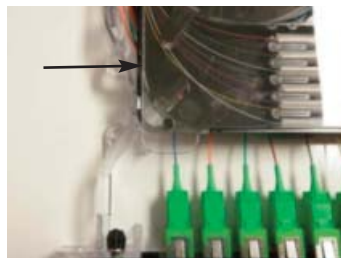
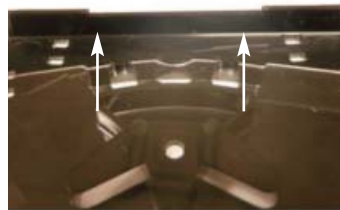
14. Continue to splice the fibers and store the slack until the cassette is fully spliced. The sleeves will need to be double stacked in order to accommodate all 12 splices.



15. The 3M fiber loc sleeves will lay on their side in the storage area.



16. Replace the splice tray cover by inserting the back edge under the holding tabs and pressing the holes in the cover, until fully seated on the pressure fit posts at the front of the tray.

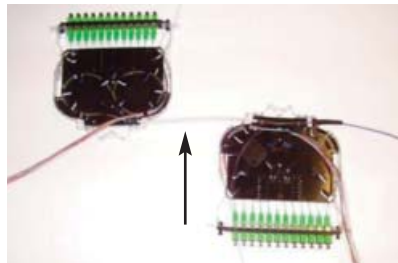


FieldSmart FxDS Installation Manual

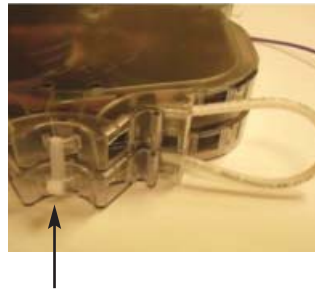
17. Replace the top cover, assuring the three tabs are fully latched. The cassette is ready to be mounted into the appropriate chassis using the provided screws.



18. If a 24 fiber buffertube is to be used, a 8-10" piece of tubing can be used to connect two cassettes as shown. This allows the first 12 fibers to be spliced in the first cassette and the second 12 to carry through the tube into the second cassette.



19. After you have finished splicing, you can then fold the cassettes onto each other and zip tie them together using the three provided loops.



Using the Panel as a Tie Panel

If using multi-fiber cable, you can attach the cable to the rear of the panel in the same fashion as previously described.



If using jumpers, the cables can either be bundled and wrapped in foam tape to clamp to the back of the panel, or tied to the provided bridge lances.



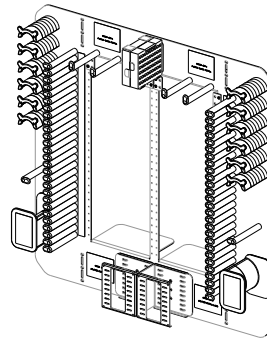
Included in each tie panel assembly are self-adhesive foam separators and cable management clips.

These accessories can be used to help manage the cables in the interior of the panel. Shown below is one example of routing a multi-fiber cable. Note: Top is removed to show routing.



FxDS PON Kit

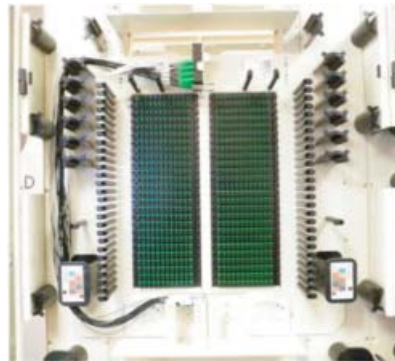
The FxDS PON Kit allows the user to have the ability to install up to 36 1x32 PON circuits onto an FxDS frame system. It is comprised of 2 576-port bulkhead panels that are self contained with specialized fiber management for the 1x 32 ruggedized splitters.



In order to install the PON kit, you will need to remove the interbay spools on the frame that would interfere with the bulkhead.



The bulkhead panel can now be installed using the provided hardware.



FieldSmart FxDS Installation Manual

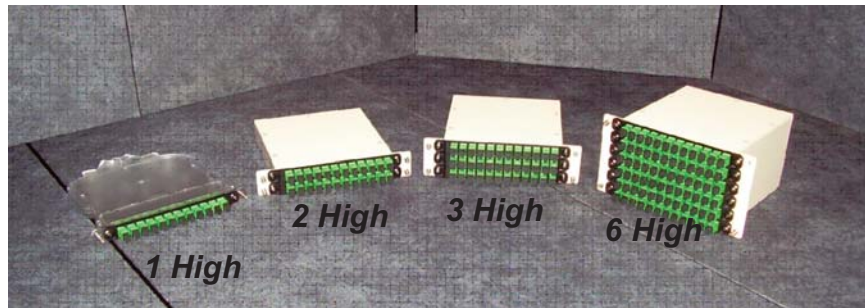
Optical splitters can then be installed by first inserting the splitter into the provided splitter cage, and routing around the outside of the panel to the top parking lot bracket.



In the bottom left and right corner of the panel, you will find a routing guide to help determine the proper spool to route the splitter legs over when deploying. You will notice that the provided desicard has corresponding color coded squares. Simply route the cable over the spool associated with the color of the port you intend to activate and the slack will be properly addressed.



FieldSmart Horizontal Modular Optical Components

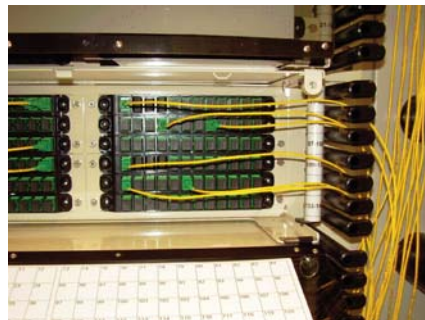


FieldSmart horizontal optical component cassettes are available in 4 sizes and can accommodate a variety of different splitter/wdm configurations.

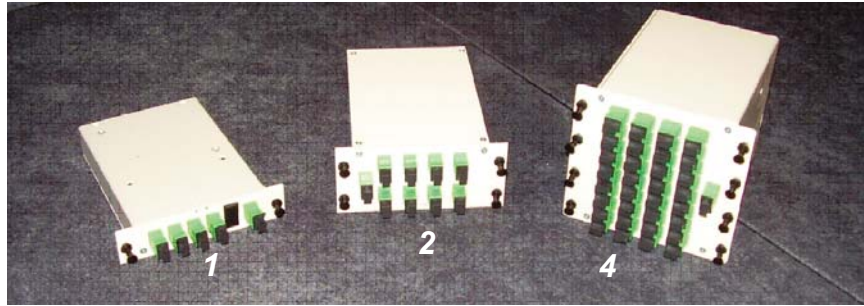
To install the cassettes, insert the cassette into the chassis and secure it using the captive fasteners. Be careful not to overtighten.



Jumpers can then be routed either left or right, out of the cassette and into the vertical cable management of the frame.



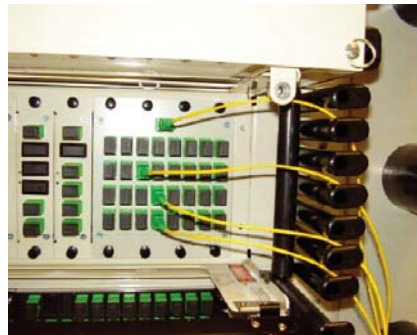
FieldSmart LGX Modular Optical Components



LGX compatible optical component cassettes are available in 3 sizes and can accommodate a variety of different splitter/wdm configurations.

To install the cassettes, pull the push-pull grommet out, then insert the cassette into the chassis. Finally, push the grommet back in to secure the cassette in the chassis.

Jumpers can then be routed either left or right of the cassette, and into the vertical cable management of the frame.



6 Drawer Splice Deck Overview and Installation

1. Splice Drawers
2. Open Brackets
3. Latches
4. Splice Tray
5. Bend Limiters



NOTE: Splice decks are only offered with open brackets.

Splice Deck — Mounting Panel into Frame

The splice deck is installed by inserting the panel from the front of the frame and securing with the enclosed #12-24 screws (Fig. A).



Fig. A

NOTE: In order to assure the panel is centered in the frame, install at least one screw in a vertical slot on the bracket. To assure the panel is installed level in the frame, be sure to insert a screw in like horizontal slots of both brackets (Fig. B).

Splice Deck — Access

To access the splicing drawers, first open and remove the door by pulling on the push-pull connectors (Fig. C) in each corner and lifting the door from the hinges. Set aside the door.



Fig. B

Open a splicing drawer by pushing both black locks toward the center of the drawer and pulling the drawer straight out (Fig. D).

NOTE: The drawer will not come completely out of the panel.



Fig. C
Push-Pull
Plunger



Fig. D

6 Drawer Splice Deck Cable Routing

NOTE: The 12-fiber distribution pigtailed that will be spliced into the splice deck should be routed in the rear of the frame (Fig. E).

NOTE: Pigtailed are inserted into the drawers at the time of installation, not tied into the drawers.

Tie pigtailed to the back of the panel using the enclosed grommet tape and wax coated string. Route pairs of 12-fiber pigtailed smoothly around the radius spool without crossing.



Fig. E

Ensure that the pigtailed are NOT TIGHT around the radius spool when tying off. Tie the pairs of pigtailed as shown (Fig. F)--piggy backed vertically.



Fig. F

Splice Deck — Cable Routing in the Rear

Tie off points with extra string are located in the drawer and back of panel (Fig. G). If panel and splice tray are purchased separately, leave extra string when tying down IFC tails. This string will be used later for tying down OSP sub-units.



Fig. G

Splice Deck — Fiber Routing in the Drawers

NOTE: When routing into the drawer, assure the pigtailed stay uncrossed as they pass through the slack take-up slide and enter the panel.

NOTE: Depending on your cable entry, the slack take-up slide can be reversed by disconnecting the spring and reconnecting it to the alternative anchor point on the opposite side of the drawer (Fig. H). Orient the slack take-up slide BEFORE routing cable through it.



Fig. H

With a splice drawer fully opened, tie the two pigtails to the splice drawer. Pull the pigtails toward you and outward against the slack take-up-slide until the rivet in the slack take-up-slide aligns with the arrow on the slack take-up label (Fig. I). Maintaining the tension on the pigtails, mark them where they intersect the tie-off point. Cut and apply the supplied grommet tape to the pigtails at the mark. Apply tension to the pigtails and tie them to the drawer (Fig. J). This will allow the spring to take up the slack in the drawer when it is closed. Leave approximately 6" of extra wax string for later tying of the OSP sub-units.



Fig. I



Fig. J

Splice Deck — Clamping the Incoming Cable

NOTE: The incoming OSP cable can be clamped either directly to the splice deck (Fig. K) or to the frame itself (Fig. I) using the enclosed mounting hardware. For either method, use the following instructions:

1. Remove the desired amount of outer jacket.
2. Locate the green clamp shells and corresponding mounting screws from the ship-along hardware.
3. Determine which clamp best fits the cable to be installed. The clamp shells are used in the same size pairs. Avoid using a clamp that is too small and does not easily close around the cable. Use the next larger clamp and grommet tape.



Fig. K



Fig. I

FieldSmart FxDS Installation Manual

Adhere a strip of foam tape (included in the ship-along hardware) to at least one side of the clamp (Fig. J).



Fig. J

Use the included mounting screws to fasten the clamp shells and cable to the appropriate cable bracket. The cable should be mounted so that the breakout is slightly beyond the clamp (Fig. K).



Fig. K

The OSP buffer tubes are then routed on top of the IFC tails and secured with the remaining wax string and grommet tape (Fig. I).



Fig. I

IFC and loose tube slack should be routed in the same direction as seen in Fig. M.

NOTE: All fiber should enter a splice deck and drawers from the same side to allow proper drawer operation.

1. Strip the jacket off of both the IFC and OSP fibers.
2. Clean the fibers.
3. Splice the fibers.



Fig. M