

Charles Fiber Sealed Drop Closure FSDC Series General Description and Installation

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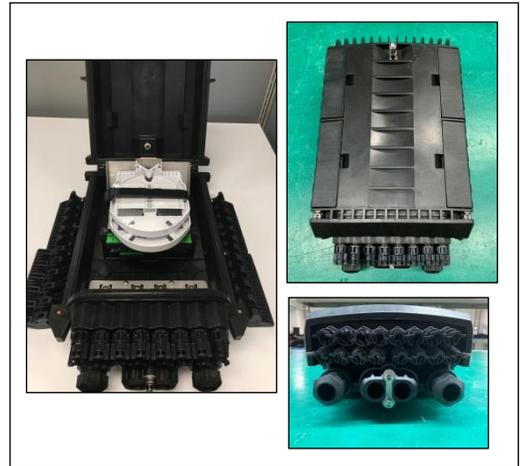


Figure 1 FSDC

1. GENERAL INTRODUCTION

1.1 Document Purpose

This document provides installation instructions for the Charles Fiber Sealed Drop Closure (FSDC). A typical FSDC is shown in Figure 1.

-NOTE-

Hereafter the Charles Fiber Sealed Drop Closure Series will be referred to as the "FSDC" or "closure."

1.2 Product Purpose

The FSDC is a sealed splice closure (IP68 rated) used in fiber splicing applications where a single feed fiber must be split into multiple drop connections.

1.3 Product Mounting and Location

The FSDC is a sealed unit that can be aerial strand mounted, pole mounted, or below grade mounted. Brackets for aerial and pole mounting are sold separately.

2. PRODUCT DESCRIPTION

The FSDC is a closure that allows splicing operations for splitting signals and creating branch cable lines. The FSDC includes multiple splicing trays. The tray can be equipped with an optical tap or a fiber splitter, which allows a single feed signal to be split into multiple drop signals.

The FSDC dimensions are shown in Figure 2. The FSDC ships with a number of tools and accessories, shown in Figure 3.

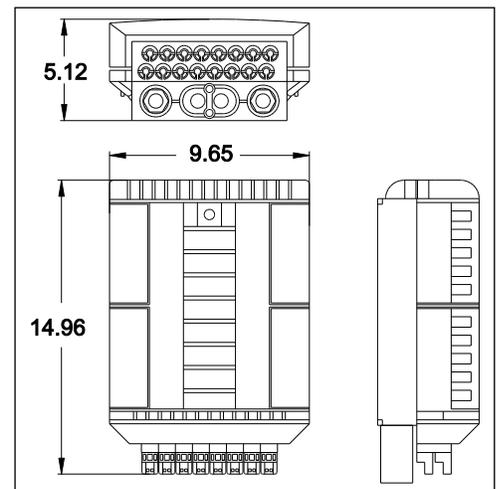


Figure 2 FSDC Dimensions

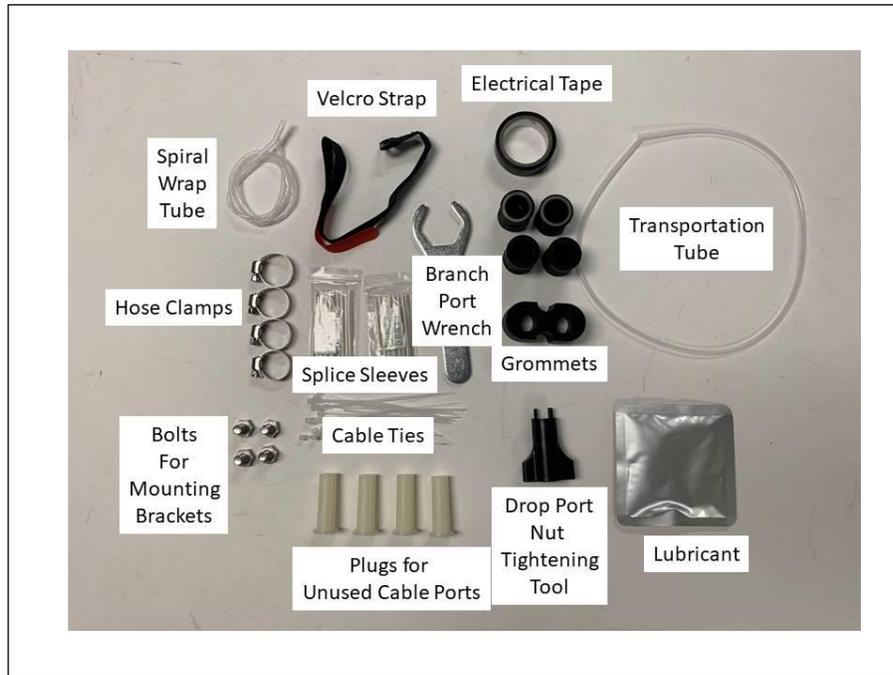


Figure 3 Tools and Accessories

3. SAFETY PRECAUTIONS



— WARNING —

Risk of serious eye damage! Never look into the end of a fiber optic line or use a magnifier in the presence of laser light or radiation. Exercise caution when installing, testing or maintaining live circuits. If eyes are exposed to laser light or radiation occurs, immediately seek treatment by a medical professional.



— WARNING —

Cable and fiber cleaning solvents may contain hazardous or harmful materials. Maintain good housekeeping practices and refer to the SDS when working with cleaning solvents or similar products.

Shards and cleaved glass fibers are very sharp and can easily pierce the skin. Use tweezers to pick up cut glass fibers and place them in a specifically designated container. Do not consume any food products near the cable installation site.

Corrugated metal or armor in feed cables is very sharp when cut or exposed. Exercise extreme caution to prevent personal injury. Use protective work gloves when handling armored cable.



— CAUTION —

Perform all bonding and grounding prior to making any electrical and communications connections.

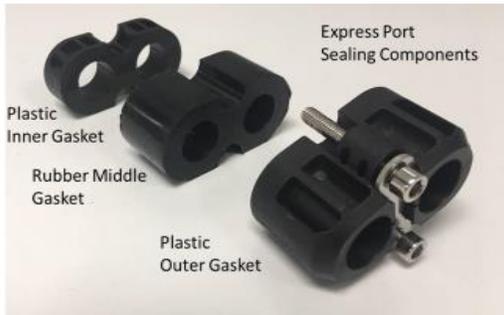
Be careful not to damage any buried cables or service wires while digging either to expose cables or to prepare a hole or trench, or while driving stakes. Buffer tubes and fibers are sensitive to excessive bending, pulling, and crushing forces. To avoid kinking of buffer tubes and fiber damage or breakage, exercise great care when working with fiber, and do not exceed or violate minimum bend radius requirements for fibers, buffer tubes, and cables.

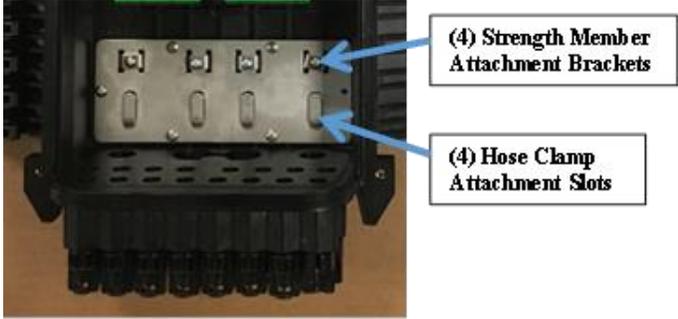
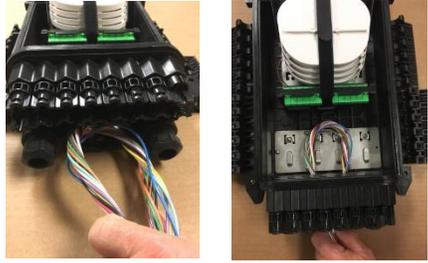
4. INSTALLATION

Gather the following equipment to perform the FSDC installation.

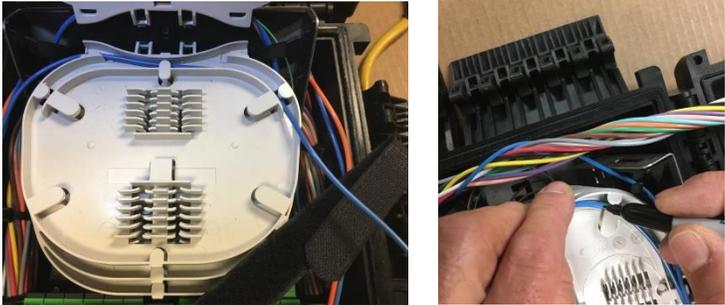
- Philips and flathead screwdrivers
- 5 mm (or 3/16") Allen wrench (ball-ended ,T-handle is recommended)
- Measuring tape
- Hose clamps
- Cable marking tool
- Assorted cable ties
- Bag of accessories (provided with the FSDC)
- Knife or snips (to cut grommets)
- Buffer tube stripper tool (score/cut buffer tubes)
- Fiber optic stripper tool
- Fiber splicing tools and equipment
- Safety glasses and work gloves

4.1 Route Express Cable Loop into Closure

Step Number	Instruction	
1	<p>Use a flathead screwdriver to pry open the four hinged latches that hold the FSDC closed.</p> <p>Note: The accessory bag includes a closure cover stop, which can be placed in the door hinge to hold the door securely open.</p> 	
2	<p>Locate the express port (oval port) on the bottom of the FSDC. Use a 5 mm (or 3/16") Allen wrench to remove the sealing components.</p> <p>Note: The express port can accommodate cable with OD from 10 to 17.5 mm (0.394 to 0.689 inches).</p>   	
3	<p>Slit the rubber middle gasket apart on the outsides.</p> <p>Separate the pieces of the plastic inner gasket.</p> <p>Set these gaskets aside.</p>  	

<p>4</p>	<p>Set aside the screws from the plastic outer gasket.</p> <p>Remove the metal compression plate that seals the express loop plug in the port.</p> <p>Disassemble the plastic outer gasket and set the components aside.</p>	
<p>5</p>	<p>Locate the attachment plate in the FSDC closure.</p> <p>There are four brackets for securing a strength member and four slots for attaching a hose clamp. The brackets and slots on the far left and far right are used for branch cables. The two in the middle are for the express loop cables.</p> <p>Note: If a model with a ground stud is being installed, the installer can choose to attach the ground cable to the stud at this time. Remove the nut from the inside of the ground stud in the lower right corner of the FSDC, slide a lug from one of the ground cables onto the stud, and replace the nut, tightening the nut fully (see section 4.3 for more information).</p>	
<p>6</p>	<p>Pull a 6.5 to 7.0 foot length of unsheathed cable into the express loop hole.</p>	
<p>7</p>	<p>Guide the strength members on each side of the cable loop under the strength member clips, using a Philips screwdriver to tighten the clips in place. If necessary, peel back the black coating on the strength members to fit under the clips. Use a hose clamp on each cable to secure in place (clamps included in the accessory bag).</p>	
<p>8</p>	<p>Take the plastic inner gasket and connect the pieces around the sheathed cables. Push this grommet inward into the express loop port.</p> <p>Fit the rubber middle gasket around the cables. Push this gasket into the express loop port.</p>	
<p>9</p>	<p>Reassemble the plastic outer gasket around the cables. Put the metal compression plate back in place and retrieve the express port screws. Use the 5 mm (or 3/16") Allen wrench to secure the express port sealing components together in the express loop port. To ensure a good seal, tighten by hand until the screws will not tighten further.</p>	

4.2 Branch Cable Installation or Sealing

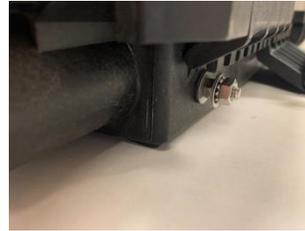
Step Number	Instruction	
1	<p>Use the branch port wrench from the bag of tools to open the branch port nut.</p> 	
2	<p>Select a grommet of the proper size for the branch cable (either the grommet from the branch port or another from the accessory bag). Insert the branch cable through the nut and through the grommet. Push branch cable into the FSDC until the unsheathed section of cable is inside the splice case. Note: if the grommet is not snug on the cable, add sealing tape around the cable sheathing.</p> <p>Push the grommet into the branch cable port. Use the branch port wrench to fully tighten the branch port nut into position.</p> 	
3	<p>Guide the strength member under the clamps, and then use a screwdriver or nut driver to tighten the clamps in place.</p> <p>Use the hose clamps included in the accessory bag to secure the cables in place.</p> 	
4	<p>Route the buffer tube once around the trays, then route into the tray.</p> <p>Mark the point on the buffer tube where it enters the tray.</p> <p>Use a buffer tube slitting tool to remove the sheathing.</p> 	

4.3 FSDC with Optional Grounding Stud (Select Models Only)

The FSDC can be ordered with a factory installed grounding stud for use with armored cables. These part numbers typically end in “G” (e.g. FSDCBS16SA8L8MG). These “G” part numbers include two 5-inch #6 internal ground cables. To ensure any charge build-up is drained off of the cable, the armored cable shielding must be properly bonded and grounded.

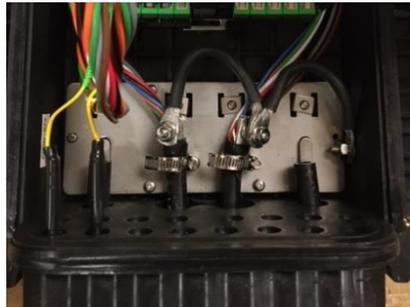


Inside of Ground Stud



Outside of Ground Stud

1. Prepare the feed armored cable for installation as previously shown in section 4.1.
2. Attach shield bond clamps (customer supplied, 3M Scotchlok 4460 or similar) to the shielding on each end of the armored fiber cable (input and output). Position the shield bond clamps so that the cable shielding passes between the two plates on the connector and install per manufacturers’ instructions.
3. Attach one of the Charles 5-inch ground cables from one bond shield clamp to the other.
4. Attach the second Charles ground cable from the right side shield bond clamp to the ground stud on the inside right front of the housing.
 - a. Loosen and remove the keps nut on the end of the stud.
 - b. Slide the ground cable lug onto the ground stud.
 - c. Replace the keps nut and tighten to 15 in-lbs.



5. When the closure is ready for field installation, attach a customer supplied ground cable to the external side of the ground stud.



4.4 Route and Splice Fiber Inside Closure

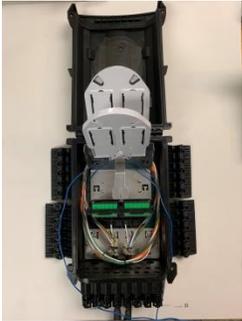
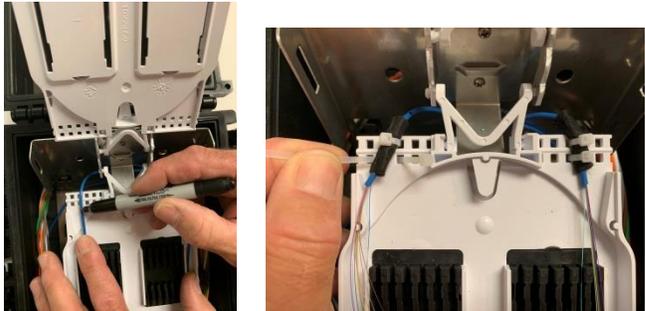
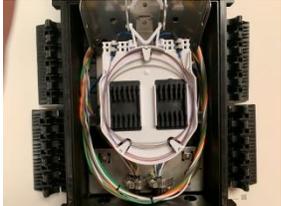
A Charles splitter tray or optical tap tray may be installed into the FSDC version with the Charles hinged tray bracket. Charles splitter trays are available in two sizes: short (4"x6"), and long (4"x9"). Charles optical tap trays are only available in the 4"x9" size. If using a 4"x9" tray, it must be installed in the top position of the hinged bracket.

Charles offers splitter trays with 1x2, 1x4, 1x8, or 1x16 splitters with 250µm fiber stub input. Output is either stubbed tails or 900µm SC/APC connectorized tails. Charles splitter trays can be purchased as a separate item or ordered kitted with the closure under a single part number for customer convenience. See the table in section 6 for part numbers.

When a splitter is installed in the FSDC, route a single buffer tube into the tray. Select the assigned fiber from this buffer tube to splice to the splitter or tap input (white) fiber. Generally, this input fiber is placed on the left side of the tray. With a connectorized splitter, connect the output tails of the splitter or drop tails of the tap by plugging these connectors into the back side of the adapter panel inside the closure. With fiber stubbed output tails, the fiber must be spliced to the drop cable fiber. Un-connectorized splitter tails must be spliced to the drop cable fibers.'

4.4.1 Using the FSDCBT/BS/2S Versions with Charles Hinged Trays

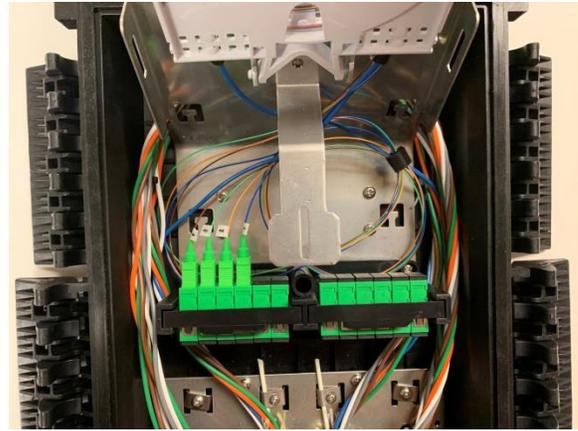
The FSDCBT can accept either two short (4"x6") splice trays or one long (4"x9") splice tray in the top position and one short splice tray in the bottom position.

<p>Attach trays to the hinge bracket.</p> <p>If using a long tray (second image), then it must be attached at the top position on the hinge.</p>	
<p>Route buffer tube in the basket underneath the trays. Buffer tubes must pass under the hinge bracket to avoid kinking.</p>	
<p>Mark the point where the buffer tube will enter and exit the tray using a permanent marker.</p> <p>Strip the buffer tube sheathing between these two points to expose the fibers.</p> <p>Secure the buffer tube at its entry and exit points using felt and cable ties.</p> <p>Ensure that the cable ties are positioned over the ends of the buffer tube sheathing, not over bare fibers.</p>	
<p>Route fibers inside the tray.</p> <p>Perform splicing operations in the tray.</p>	

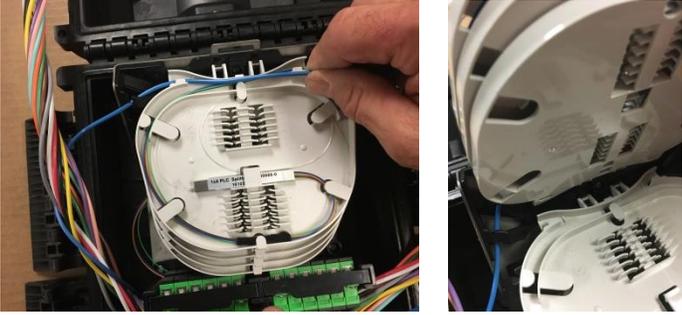
If using connectorized output fibers, then lift the trays out of the way to access the adapter panel below the fiber basket.

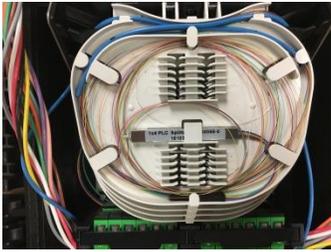
Connect the SC/APC adapters to the ports on the backside of the adapter panel.

Use a piece of Velcro to secure the fibers together in the fiber basket. This helps avoid kinking as the trays are lifted and lowered.

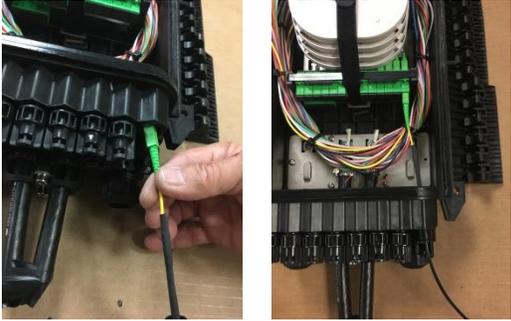


4.4.2 Using the FSDC4T Version with Four Mini (5"x4") Trays

Step Number	Instruction	
1	Separate a single buffer tube from the cable bundle to be used in splicing operations.	
2	Route this buffer tube into both sides of the splicing tray. Route buffer tube slack into the slack storage area underneath all the splicing trays.	
3	Mark the points of the buffer tube where it enters each side of the splicing tray. Use a buffer tube slitting tool to remove the marked section of sheathing.	

<p>4</p>	<p>Route the loose fibers in the splicing tray.</p>	
<p>5</p>	<p>Perform splicing operations to splice the selected fiber to the splitter fiber (splicing not pictured).</p> <p>Place a cover on the splicing tray. At this point, anchor the buffer tubes using cable ties inside the closure.</p>	
<p>6</p>	<p>Connect the splitter fibers to the feed side (top side) of the adapters found under the splicing trays.</p>	

4.5 Route Drop Cable into Closure

Step Number	Instruction	
1	<p>Locate the drop cable ports on the front of the closure. The FSDC tool bag includes a drop port nut tool specially fit for removing and tightening the nuts that seal these ports.</p> <p>For those drop ports that will be used, remove the nut and set it aside.</p> <p>Note: all drop ports have a thin membrane inside that helps to seal from environmental intrusion. If a drop port will not be used in the installation, then DO NOT PIERCE this membrane.</p>	
2	<p>The FSDC includes three sizes of drop port grommets: small (for 3-4 mm cable), medium (for 4.5-6 mm cable), and large (for 7mm round or flat drop cable, nominal 8 x 4.5mm for flat drop cable).</p> <p>Standard units come configured with either a) 8 large drop port grommets in the top row of ports & 8 medium drop port grommets in the bottom row of drop ports or b) 16 large drop port grommets in all drop ports. If other drop port grommets are needed, order the grommet retrofit kit.</p> <p>If using un-connectorized drop cable, then run the cable through the grommet.</p> <p>If using pre-connectorized drop cable, then cut a slit through the side of the grommet and insert the cable into the grommet.</p>	
3	<p>Route the drop cable through the drop cable port into the FSDC.</p> <p>If using un-connectorized cable, terminate a connector onto the end of the cable.</p> <p>Plug the connector into the drop side adapter that corresponds to the appropriate feed fiber connection.</p>	

4 Push the grommet into the drop cable port.
Reattach the drop cable port nut. Use the tightening tool to tighten the nut just until snug. Overtightening may push the nut past its sealing point and possibly damage the threads on the nut.
Tip: when installation is complete, use Velcro or some other fastener to secure the nut tightening tool inside the closure for future use.



4.6 Closing the FSDC

When securing the four hinged latches on the cover, it is important to use care to avoid pinching the skin.

	<p>USE CAUTION WHEN CLOSING THE HINGED LATCHES.</p>
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6. To close the latch, place a hand on the exterior side of the latch. Ensure that the hand is entirely clear of the interior side (Figure 4).
7. Push the latch toward the center of the FSDC until the latch snaps into place (Figure 5).
8. When all latches are closed, use an Allen wrench to tighten the securing screws in the upper right and left corners of the FSDC. This tightens the latches to ensure a proper seal (Figure 6).



Figure 4 Closing the Hinged Latch



Figure 5 Latch After Closing

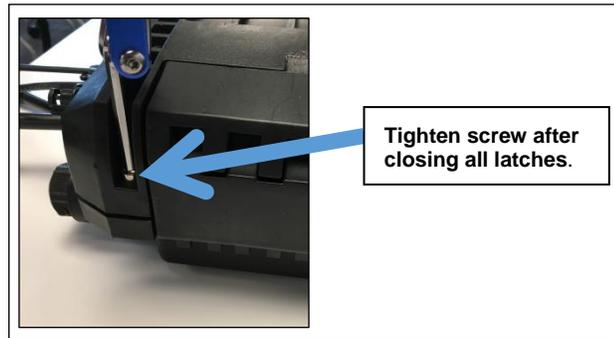


Figure 6 Tighten Screws

4.7 Mounting the Closure

The FSDC has bolts on the back for attaching mounting brackets for either aerial strand or pole mounting. The mounting bolts are shown in Figure 7.

4.7.1 Aerial Mounting

The FSDC can be mounted on an aerial strand using the mounting kit 97-FSDCAMKT, which includes two tap brackets.

9. Attach the tap brackets using the included mounting bolts on the back of the FSDC (Figure 8).
10. Loosen the screws on the tap brackets so that the clamps can be hung over the strand.
11. Tighten the clamps around the strand to suspend the FSDC (Figure 9). The tap brackets can accommodate strands of 1/4" to 3/8" diameter.



Figure 7
Mounting Points for Brackets

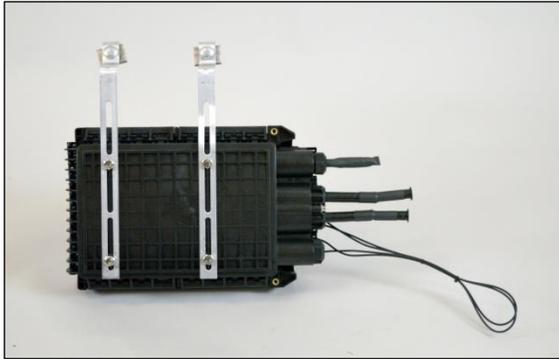


Figure 8 FSDC with Strand Mounting Brackets

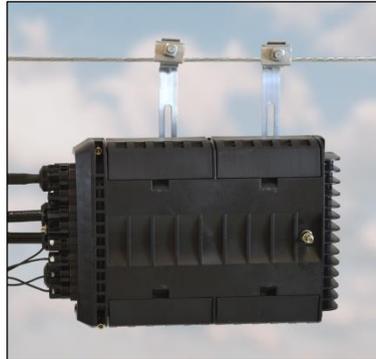


Figure 9
FSDC Aerial Strand Mounting

4.7.2 Pole Mounting with Bands

To mount the FSDC on a pole with bands, order the pole mounting kit 97-FSDCPLKTA, which includes two mounting brackets and two mounting bands.

1. Attach the pole mounting brackets using the included mounting bolts on the back of the FSDC (Figure 10).
2. Route the two mounting bands through the brackets and around the pole and tighten (Figure 11).



Figure 10 Pole Mounting Brackets



Figure 11 Pole Mounted FSDC

4.7.3 Pole Mounting with Lag Bolts

To mount the FSDC on a pole with lag bolts, order the pole mounting kit 97-FSDCPLKTB, which includes two mounting brackets.

1. Attach the pole mounting brackets using the included mounting bolts on the back of the FSDC.
2. Position the FSDC where it will be mounted and mark the lag bolt positions on the pole for drilling.
3. Drill holes for lag bolts.
4. Use customer supplied lag bolts and washers to secure the FSDC to the pole.

4.7.4 Wall Mounting

The FSDC can be wall mounted using the pole mounting bracket kits. To mount horizontally, use kit 97-FSDCPLKTA (Figure 12). To mount vertically, use kit 97-FSDCPLKTB (Figure 13).

The installer must supply corrosion resistant expansion screws or anchors appropriate for the wall type (e.g., concrete, brick, wood).

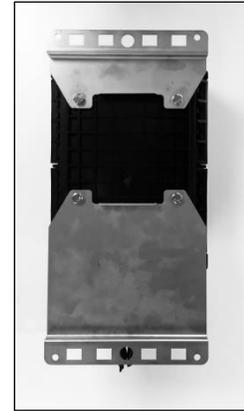


Figure 14
Brackets for Pole Mounting

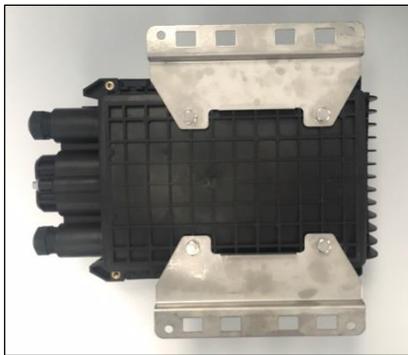


Figure 13
Brackets for Horizontal Mounting



Figure 14
Brackets for Vertical Mounting

5. TECHNICAL ASSISTANCE AND REPAIR SERVICE

For questions on product repair or if technical assistance is required, contact Charles Technical Support.

847-806-8500

techserv@charlesindustries.com (email)

<http://www.charlesindustries.com/techserv.htm>

6. MODEL NUMBER INFORMATION

FSDC Closure Configurations				
Part Number	Housing	Drop Port Grommets	Splice Trays	Additional Notes
FSDC4T16SA8L8MV	FSDC housing with 16 SC APC adapters	8 LRG & 8 MED	4 mini 12-splice trays	
FSDC4T16SA16LV	FSDC housing with 16 SC APC adapters	16 LRG	4 mini 12-splice trays	
FSDCBT16SA8L8MV	FSDC housing with 16 SC APC adapters	8 LRG & 8 MED	None (Charles tray bracket only)	
FSDCBS16SA8L8MV	FSDC housing with 16 SC APC adapters	8 LRG & 8 MED	1 Charles 24-splice 4"x6" tray	
FSDCBS16SA16MV	FSDC housing with 16 SC APC adapters	16 LRG	1 Charles 24-splice 4"x6" tray	
FSDCBS16SA8L8MG	FSDC housing with 16 SC APC adapters and ground stud	16 LRG	1 Charles 24-splice 4"x6" tray	
FSDCBS16LMP104A	FSDC housing with 16 SC APC adapters	8 LRG & 8 MED	1 Charles 24-splice 4"x6" tray	Kitted with CFST-S11040A, 1x4 splitter tray
FSDCBS16LMP108A	FSDC housing with 16 SC APC adapters	8 LRG & 8 MED	1 Charles 24-splice 4"x6" tray	Kitted with CFST-S11080A, 1x4 splitter tray
FSDCBS16LMP104G	FSDC housing with 16 SC APC adapters and ground stud	8 LRG & 8 MED	1 Charles 24-splice 4"x6" tray	Kitted with CFST-S11040A, 1x8 splitter tray
FSDCBS16LMP108G	FSDC housing with 16 SC APC adapters and ground stud	8 LRG & 8 MED	1 Charles 24-splice 4"x6" tray	Kitted with CFST-S11080A, 1x8 splitter tray
Optional Accessories				
Part Number	Description			
97-FSDCPLKTA	FSDC pole mount kit for band mounting with two brackets and two pole bands			
97-FSDCPLKTB	FSDC pole mount kit for lag bolt mounting with standard and extended bottom brackets			
97-FSDCAMKT	FSDC aerial strand mount kit with two adjustable tap brackets			
BDO206-E300	Charles 12" BDO pedestal with universal mounting bracket for FSDC			
106SS07-4000200	Charles LVP106 Pedestal with universal mounting bracket for FSDC			
104SS07-21012BK	Charles NLVP104 Pedestal with universal mounting bracket for FSDC			
97-FSDCLGR4	Replacement large size 7mm drop grommets (kit of 4 pc)			
97-FSDCMGR4	Replacement medium size 4.7mm drop grommets (kit of 4 pc)			
97-FSDCSGR4	Replacement small size 3mm drop grommets (kit of 4 pc)			
97-FIBR24HTRAY	Charles 4"x9" 24-fiber splice tray kit			
97-SMHTRAY	Charles 4"x6" 24-fiber splice tray kit			

97-FSDCGNDKIT	FSDC field retrofit grounding kit with grounding stud, ground cables, and bonding connectors
CFST-S11040A	1 x 4 PLC splitter tray with 900 um input fiber and SC/APC 900 μm 22" output pigtails in 4"x6" hinged tray
CFST-S11080A	1 x 8 PLC splitter tray with 900 um input fiber and SC/APC 900 μm 22" output pigtails in 4"x6" hinged tray
CFST-S11160A	1 x 16 PLC splitter tray with 900 um input fiber and SC/APC 900 μm 22" output pigtails in 4"x6" hinged tray
97-SCA12LF3M	12 fiber fan-out kit: SC APC loose tube 22" breakout, single-mode bend insensitive fiber, 900μ color-coded buffer, 3m
97-SCA08FL3M	8 fiber fan-out kit: SC APC loose tube 22" breakout, single-mode bend insensitive fiber, 900μ color-coded buffer, 3m
97-SCA06FL3M	6 fiber fan-out kit: SC APC loose tube 22" breakout, single-mode bend insensitive fiber, 900μ color-coded buffer, 3m
97-SCBFM03-9AB	12 fiber pigtail kit, SM bend-insensitive fiber, simplex, 900 μm color-coded buffer, 3 meters
97-SCBFM03-9A8	8 fiber pigtail kit, SM bend-insensitive fiber, simplex, 900 μm color-coded buffer, 3 meters
97-SCBFM03-9A6	6 fiber pigtail kit, SM bend-insensitive fiber, simplex, 900 μm color-coded buffer, 3 meters