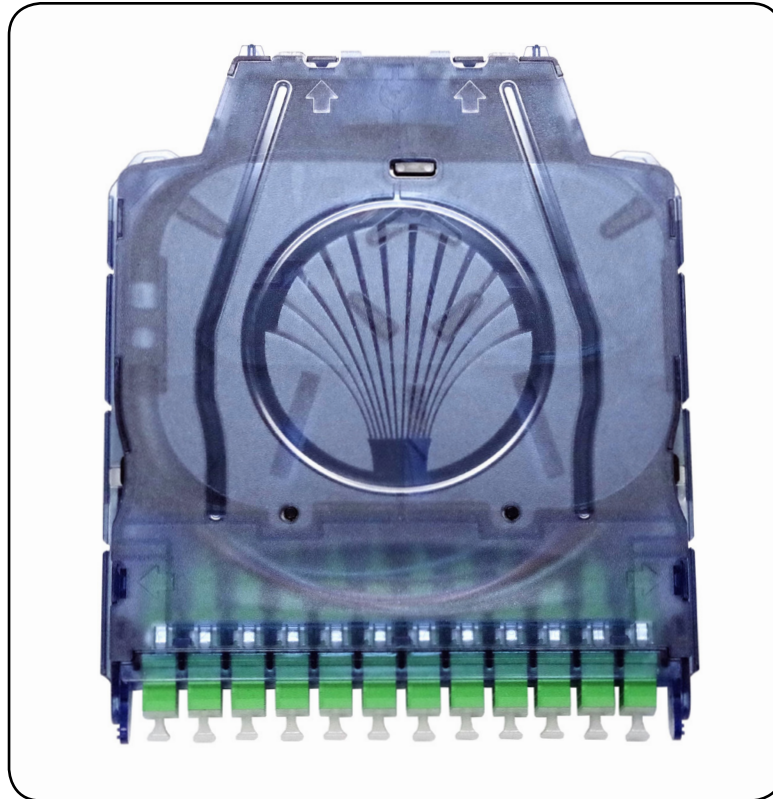


WaveSmart MOC Cassette

Installation Manual



WaveSmart MOC Cassette

Installation Manual



Table of Contents

Optical Component Packaging Options	3
Splitter	3
Wavelength Division Multiplexing	3
Circulator	3
Operating Temperature Guidelines	4
MOC Cassette Mounting Options	6
Mounting Ears	6
Ganging Bracket	9
Ganging Cassettes	11
Connector Cleaning Procedure	12
Standard Warranty	17
Proprietary Notice	18
Technical Support	18

Optical Component Packaging Options

The Optical Components Clearfield offers consist of Splitters, WDM, CWDM, DWDM and Circulators.

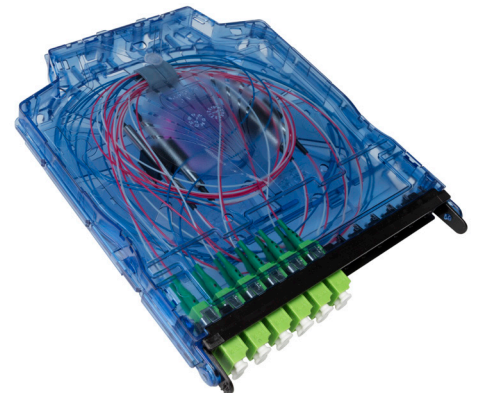
Splitter

Clearfield® provides Planar Lightwave Circuit (PLC) and Fused Biconic Taper (FBT) Splitters in a variety of optical component packages for the network and application need allowing carriers the ability to provide uniform fully passive signal splitting to multiple premises. Available in splits from 1x2 to 1x32. Available packed in the Clearview Blue Cassette, the Clearview xPAK, a 1RU 19" or 23" rack mount, or LGX module.



Wavelength Division Multiplexing

Wavelength Division Multiplexing increases fiber capacity by combining (mux) and separating (demux) multiple input channels over a single fiber output. Wavelength division multiplexers let you expand the bandwidth of optical communication networks and can be used at several locations within each network. Clearfield® provides WDMs for singlemode fiber applications. Available in WDM, CWDM, and DWDM varieties. Available packed in the Clearview Blue Cassette, the Clearview xPAK, a 1RU 19" or 23" rack mount, an LGX module, or unpackaged for use in the enclosure of your choice.



Circulator

The WaveSmart Circulator allows the user to reroute the traffic that traditionally required two fibers (one for each direction of travel) onto a single fiber with bidirectional traffic. This in turn allows the user to reduce the number of required fibers from two to one (four to two for working/protect systems). Available packed in the Clearview Blue Cassette, the Clearview xPAK, an LGX module, or unpackaged for use in the enclosure of your choice.



Operating Temperature Guidelines

Operating Temperature

The Operating Temperature of an optical component is the actual temperature in which the component will work at within a specified temperature range at a specified optical performance level.

Storage Temperature

The Storage Temperature of an optical component is the actual temperature in which an optical component could be stored at without causing any degradation or component failure when it is used in the components specified operating temperature limits. Some storage temperatures are lower or higher than the actual operating temperature of the component.

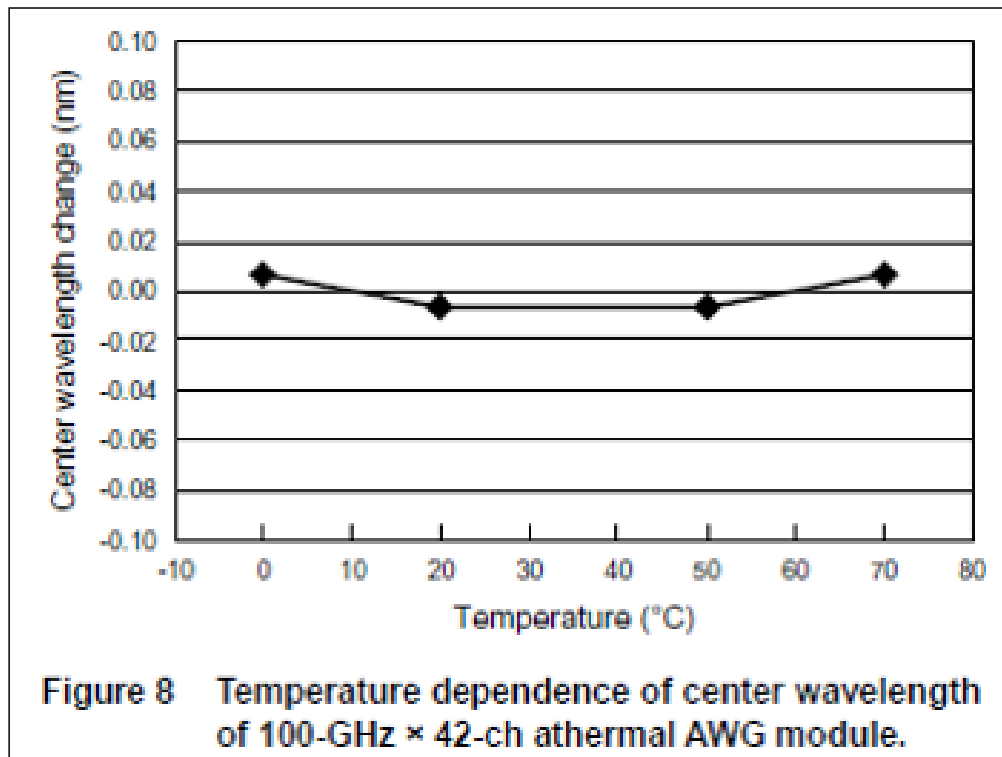
How Temperature can affect an Optical Component

When the temperature of an optical component exceeds the minimum or maximum Storage Temperature or Operating Temperature the optical performance could be affected as follows.

- Increased Insertion Loss
- Wavelength Shift
- Component Failure

DWDM Wavelength Shift

The wavelength can shift due to extremely low and high temperatures. As shown in the example diagram below, as the temperature decreases below 20 degrees the wavelength starts to shift from -0.1nm to $.01\text{nm}$ at zero degrees. As the temperature continues to decrease the wavelength shift will become more dramatic causing the center wavelength to drift out of spec and thus causing signal failure. The same affect can happen at extremely high temperatures as well.



Note: The diagram used is for demonstration purposes only and does not depict the actual test results or measurements found within Clearfield products.

Clearfield Optical Component Temperature Specs

Optical Component	Operating Temperature	Storage Temperature
Circulators	-40c to +85c	-40c to +85c
Fused Biconic Tapered Splitters (FBT Couplers)	-40c to +85c	-40c to +85c
Plannar Lightwave Circuits (PLC Splitters)	-40c to +85c	-40c to +85c
Wavelength Division Multiplexing (WDM FBT or Thin-Film Filtered)	-40c to +85c	-40c to +85c
Course Wavelength Division Multiplexing (CWDM Thin-Film Filtered)	-40c to +85c	-40c to +85c
Dense Wavelength Division Multiplexing (DWDM Thin-Film Filtered)	-40c to +85c	-40c to +85c
Dense Wavelength Division Multiplexing (DWDM Athermal Wave Guide, Guassian Type)	5c to +65c	-40c to +85c

WaveSmart MOC Cassette

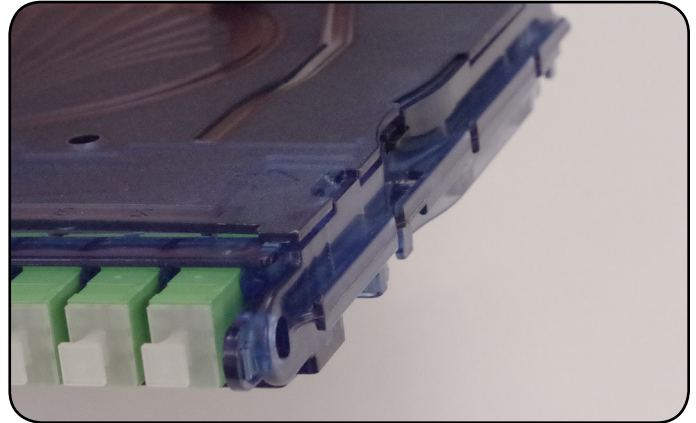
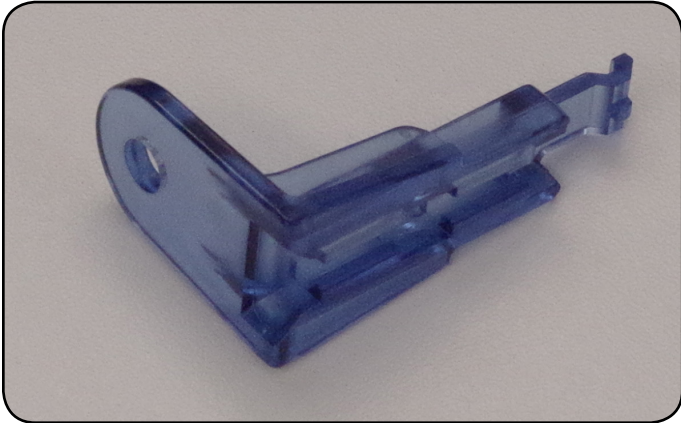
Installation Manual



MOC Cassette Mounting Options

Mounting Ears

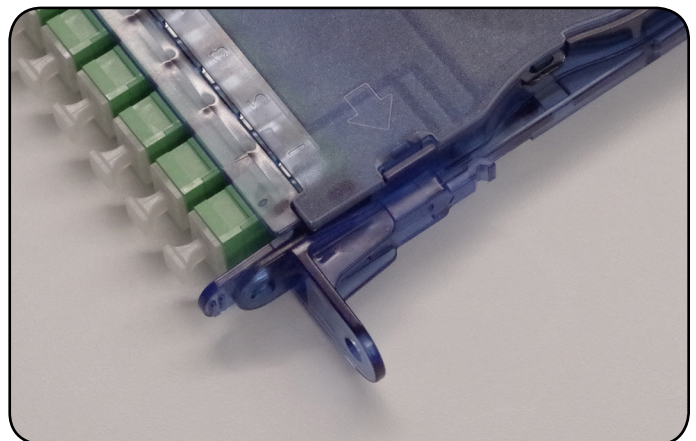
1. The mounting ears will attach to the Clearview Blue Cassette by sliding into place along the t-rails on the sides of the cassette.



2. To attach the mounting ear onto the cassette, align the channel on the side of the mounting ear with the t-rail on the side of the cassette.
3. Press the mounting ear firmly against the t-rail, allowing the lever to flex back and the t-rail to engage with the channel on the mounting ear.



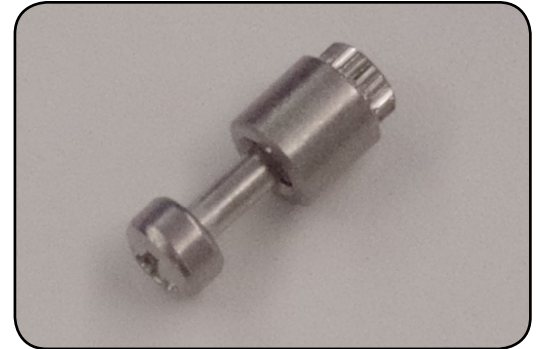
4. Slide the mounting ear up to the t-rail until it comes to a stop and the lever is fully seated into place in the first notch on the t-rail.
5. Repeat for the other side.



Retaining Screws

1. Place the retaining screws into the correct side of the mounting ears depending upon which product the cassette will be installed into.

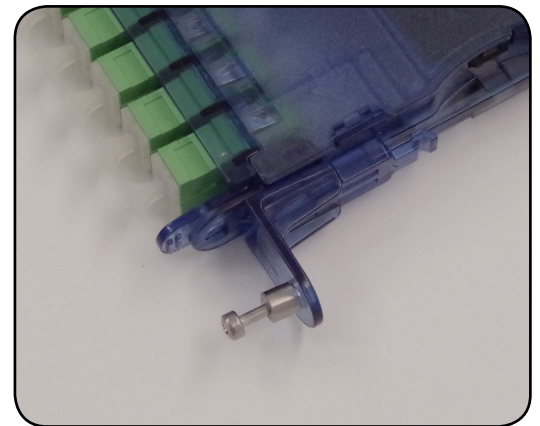
Note: For use in some products, such as cabinets, screws will be mounted into the back of the mounting ears.



2. The ridged front edge of the retaining screw will push into place in the hole located on the tab of the mounting ear.

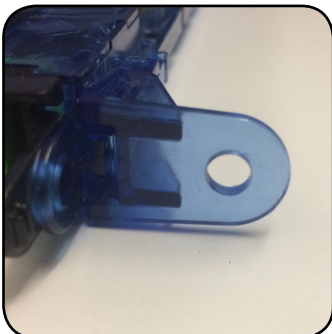
Note: Do not twist the retaining screw into place, push the screw straight in.

3. Repeat the process for the other side and proceed to mounting the cassette.



Push/Pull Plungers

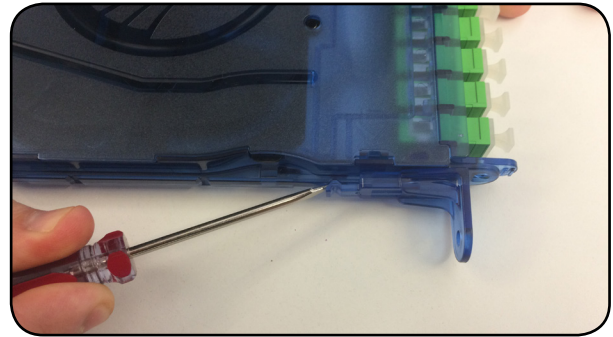
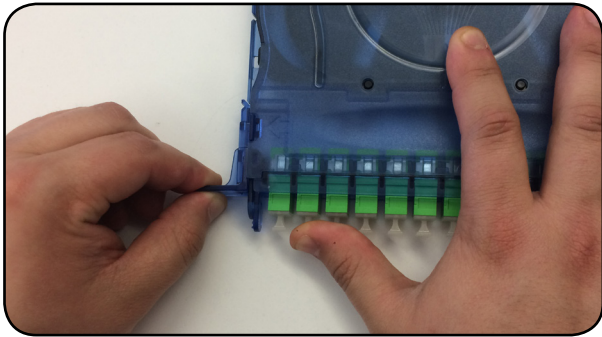
1. If the push/pull plunger is not already installed, insert the first piece of the push/pull plunger (grommet) into the hole in the mounting ear.
2. Follow that by installing the second piece (plunger) of the push/pull plunger into the hole of the first piece.
3. Push the plunger in until it clicks into place, then pull back until the expansion of the grommet disengages.
4. If necessary, repeat the process for the other side.



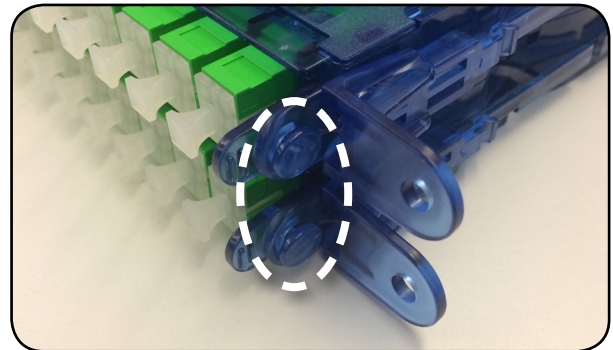
Removing Mounting Ears

1. In order to remove the mounting ears from the Clearview Blue Cassette, grab the mounting ear by the tab and pull in a straight line along the t-rail towards the front of the cassette.

Note: This will take some force, which is intentional. If you are unable to remove it simply by pulling, you may use a tool to release the lever from its notch and then proceed to pulling the mounting ear off the cassette.

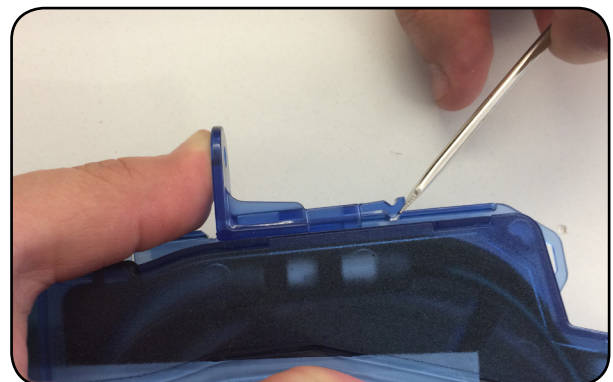


2. If you are attempting to remove the mounting ears from an Optical Component Cassette, or any cassette which uses the Expansion Ring to increase its height, such as the 24 SC Expansion Cassette, the adapter plate will be held into place via locking pins. These will prevent you from removing the mounting ears off of the front of the cassette.



3. In order to remove the mounting ears from cassettes which feature locking pins, you will have to pull them off of the back side of the cassette. Use a tool to release the lever from each of the 3 notches in the t-rails along the way as you slide the mounting ear towards the back of the cassette.

Note: Clearfield does not recommend removing the locking pins from these cassettes.

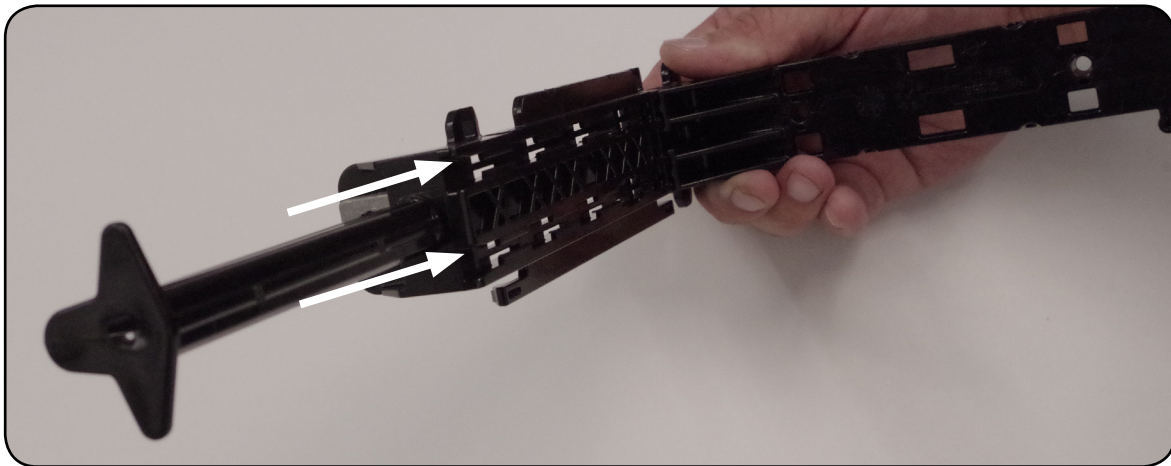


Ganging Bracket

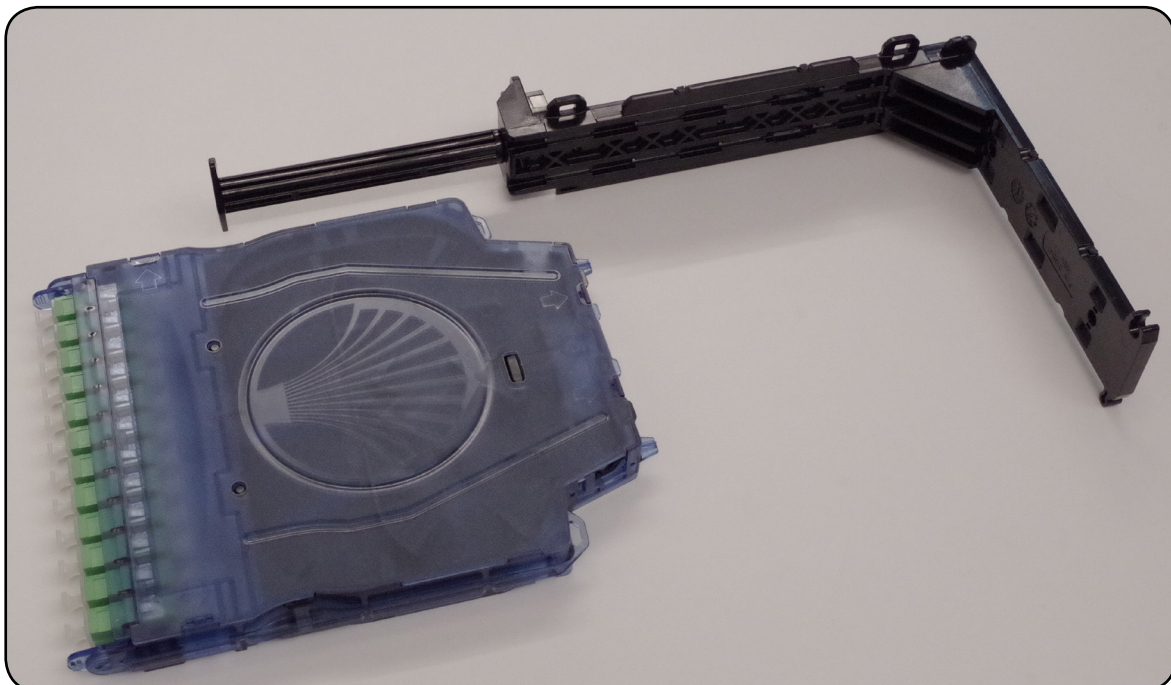
In select products, such as the FxHD Frame, the Clearview Blue Cassette will mount into place with a ganging bracket. Each section of ganging bracket, which are stackable, can hold two Clearview Blue Cassettes and are removable.

The ganging bracket utilizes the cassette's t-rail to hold the cassette in place in conjunction with connection points on the back of the cassette.

Notice the channel on the inside of the ganging bracket, meant for sliding the t-rail of the cassette into.



1. Line up the cassette with the ganging bracket.



WaveSmart MOC Cassette

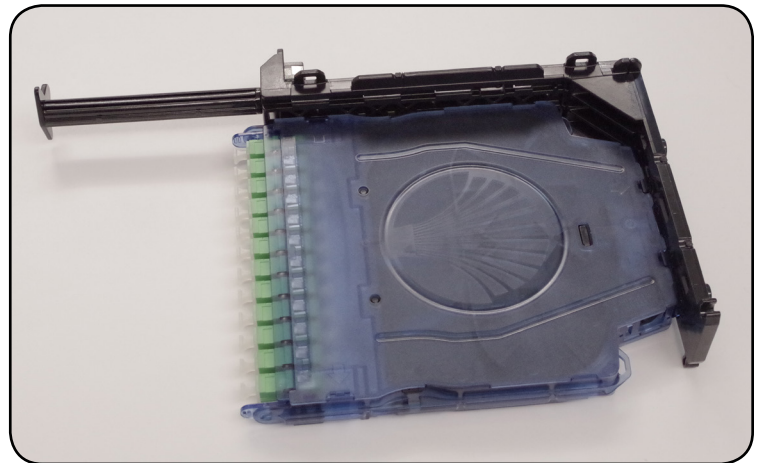
Installation Manual



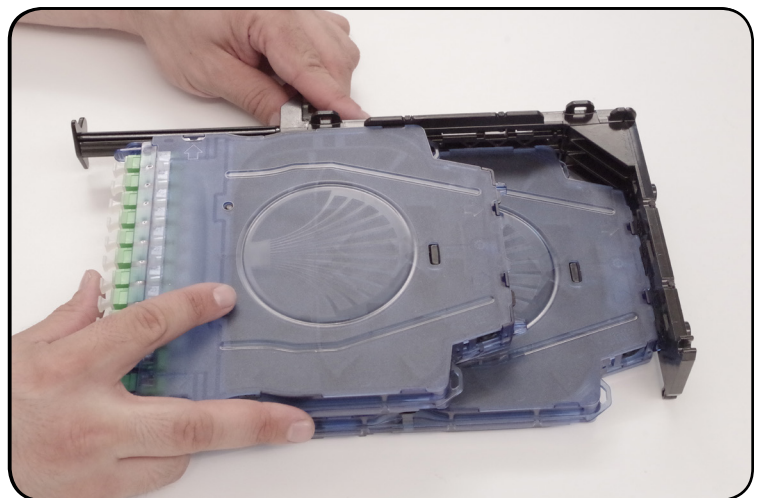
2. Engage the cassette's t-rail with the channel in the ganging bracket, and slide the cassette forward.



3. Push until the cassette snaps into place.



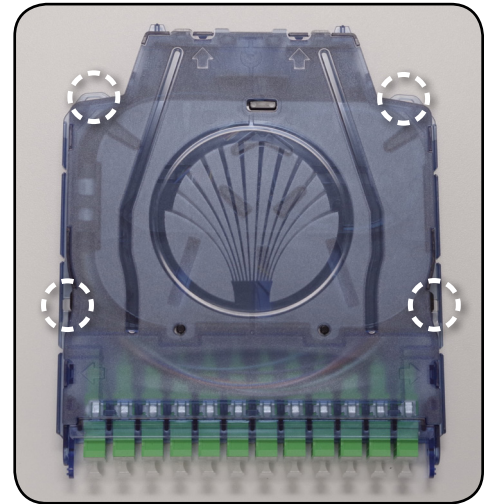
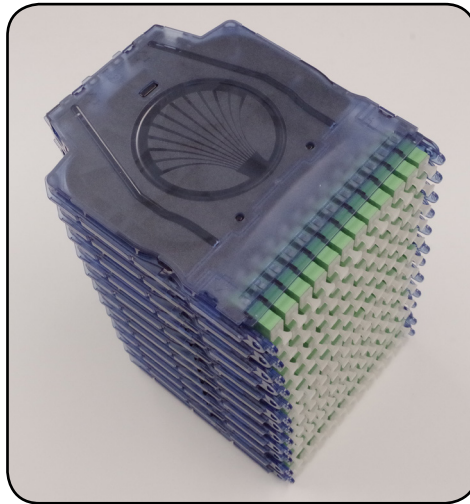
4. A second cassette will slide into place in the remaining slot of the ganging bracket.



Ganging Cassettes

The Clearview Blue Cassette has the ability to be ganged together with multiple other cassettes with cable ties to create a single block that is easier to handle. You can create blocks of any size, though 12 is typical and what will be shown here.

1. Stack the cassettes you wish to gang together.
2. The Clearview Blue Cassette has four points along the outside of the cassette meant for securing the cassettes together, one on each side behind the t-rail and two on the back.



3. Align the cassettes as best as possible and feed a cable tie up through all the cassettes you wish to gang together.
4. Using another cable tie, secure the first cable tie in place.



5. Trim the excess from both cable ties.
6. Repeat these steps for the other 3 cable tie locations to completely secure the block of cassettes.



Connector Cleaning Procedure

Whether factory terminated or field spliced, clean connectors are essential for proper system operation. Even the smallest dust particle can cause transmission problems, so for optimal network performance inspect, and if necessary, clean connectors and adapters prior to mating.

Inspect Then Connect

These are Clearfield recommended products/applications. Use the product you feel will complete your cleaning procedures. Create a “best practice” for your company and follow those procedures.

The use of Chemtronics end face and bulkhead cleaning products and techniques ensures a clean end face, no matter the type of contamination.

Before cleaning any connector, be sure you know what type of contaminate you are cleaning (dry, fluidic, or combination). All the available products are good, it's the process that you need to be aware of. Using a dry cleaning method to clean “dirt” can lead to scratching of the end face. Learn the process of cleaning properly.

Note: It is **NOT** recommended to use isopropyl alcohol to clean the end face.

Cleaning an SC/LC Connector

Cleaning the End Face

- Place one wiping paper on QbE-2 FiberSafe™ Cleaning Platen. (Figure 1)
- Apply small amount of precision cleaner (about 1” in diameter) with Electro-Wash MX pen on to one end of the wipe. (Figure 2)
- Hold end face at a 90 degree angle. For APC connection, adjust by slightly tilting the container or end face. Angle is correct when no drag is felt on the end face. (Figure 3)
- Draw end face from wet to dry part of the wipe 3 times. Use just enough pressure to ensure complete contact between end face and the wipe.

Note: **DO NOT** retrace previous step.



Figure 1



Figure 2



Figure 3

Cleaning the Ferrule

- Lightly moisten the fiber optic swab (2.5mm/38542F or 1.25mm/38040) by spotting a small amount (about 1") of Electro-Wash PX or Electro-Wash MX pen onto the QbE. Hold the swab, 1 side down to the wetted area and hold for a count of 1-2-3-4-5. **(Figure 4)**

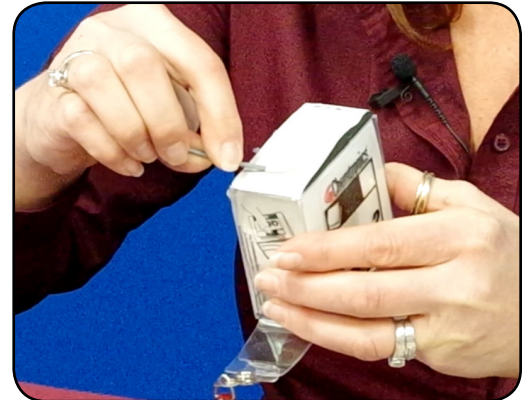


Figure 4

- Insert swab into side of ferrule, wet side to the ceramic ferrule and circle around 2-3 times and remove. Turn swab to dry side and repeat. **(Figure 5)**



Figure 5

Cleaning the Mate Through an Adapter AND the Adapter Itself

- Lightly moisten the fiber optic swab (2.5mm/38542F or 1.25mm/38040) by spotting a small amount (about 1") of Electro-Wash PX or Electro-Wash MX pen onto the QbE. Hold the tip of the swab onto the wetted area and hold for a count of 1-2-3-4-5.
- Insert the swab into the adapter to the connector, press lightly against the connector, twist 2-3 times, remove and discard.
- Dry with a second dry swab.
- Inspect, repeat cleaning if necessary, and test for signal strength.
- Use additional swabs to clean inside the actual adapter. Moisten swab, like above, and insert through hole and remove while twisting. **(Figure 6)**

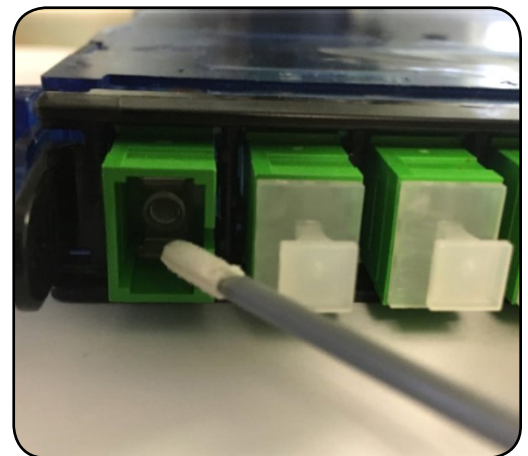


Figure 6

WaveSmart MOC Cassette

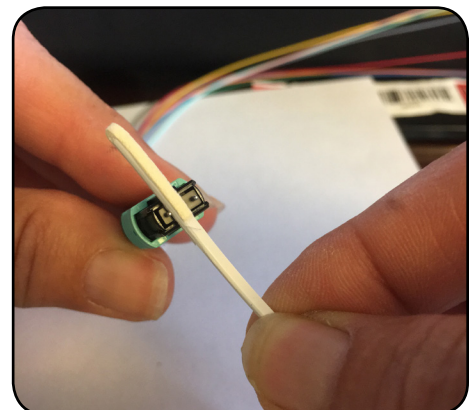
Installation Manual



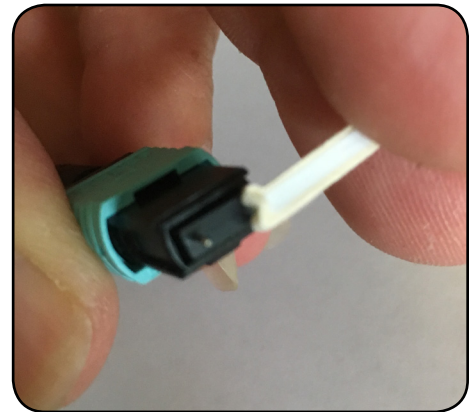
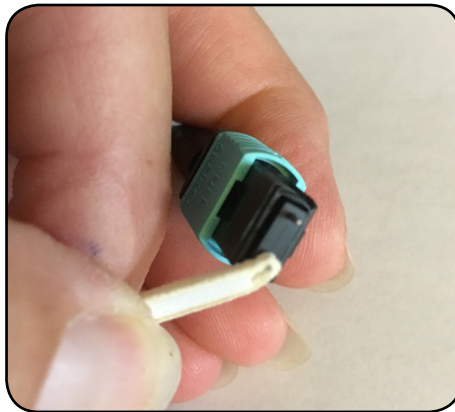
Cleaning an MPO/MTP Connector

Male Connector

- Use of Chemtronics MTP Connector Cleaning Swabs (CC505F) is recommended. Even after cleaning with a probe cleaner, you should always clean the pins with this (or an equivalent) type swab. Cleans ALL MTP/MPO connector end faces. This swab also cleans the “pins” of the male connector
- Lightly “spot” a QbE-2 wipe on the platen with Electro-Wash PX Fiber Optic Cleaner, the FiberWash or MX Pen.
- Lightly touch short side of the MTP/MPO Connector Swab to the wetted area (3-5 secs) to absorb some cleaning solution (DO NOT over saturate the swab).
- Wipe connector areas to be cleaned, sliding pad from bottom of pad across and forward to tip of swab, from 1 side to the other, turn over and use long side to dry in same movement.

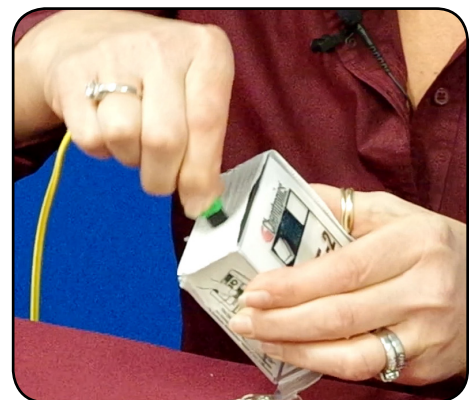


- Use the hole on end of pad to clean one alignment pin, then press the end of the swab into the other pin to clean.
- Check your work with a fiber scope. This can take several attempts to get the endface clean.



Female Connector (without pins)

- Cleaned like a single fiber connector, using a cleaning platform. The receptacles will be cleaned as long as you are using a combination cleaning process as recommended.
- Again, using a platen, moisten the platen with cleaning solvent on one end to accommodate 3 swipes of the MPO female endface.
- Holding the connector (If APC, slightly at an angle to accommodate for 8° angle) swiping with medium pressure, from the wet area into the dry area 3 times, without wiping over previous area.
- Inspect, and if clean, make the connection. If NOT, repeat above steps until clean or if determined that the end face is damaged (based on standards of 5 cleanings per connection), replace.



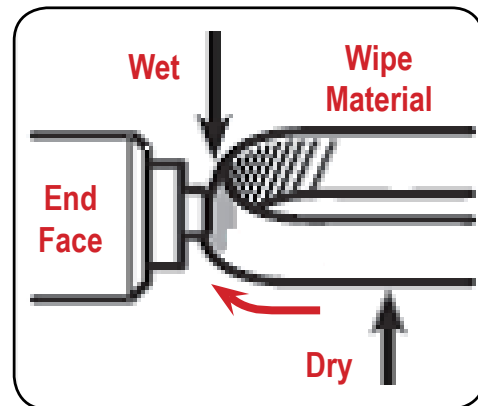
WaveSmart MOC Cassette

Installation Manual

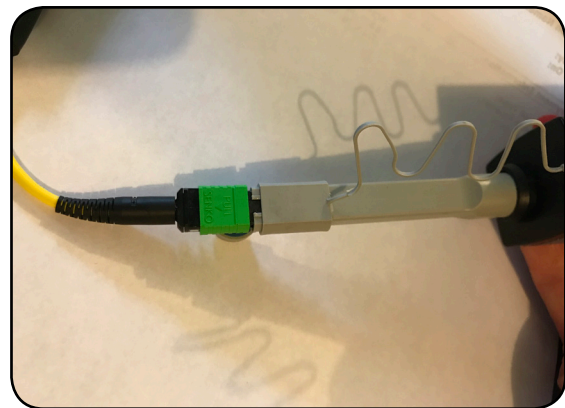
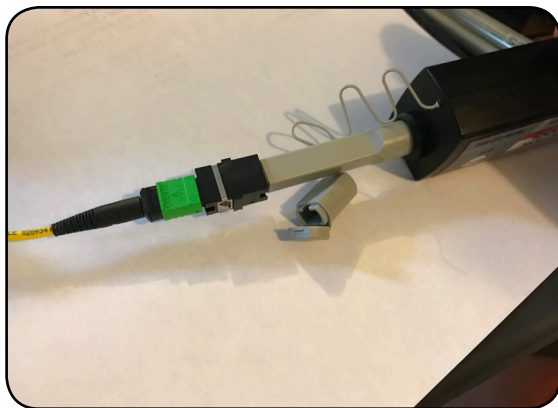


Cleaning Using a Probe-Style Cleaning Tool

- The probe style cleaning tools are capable of cleaning a connector end face separately or through the adapter.
- Slightly engage probe by pulling back but do not allow to click. Lightly “spot” a QbE-2 wipe on the platen with Electro-Wash PX Fiber Optic Cleaner, this will help alleviate “over saturation” of the material.
- Lightly touch the tip of probe and release.



- Insert connector or insert probe through adapter and click 2-3 times to move past the wet area and allow material to dry wipe.



- Inspect connector, repeat if necessary (following standards)
- If cleaning a male connector, clean the pins (see above)



Standard Warranty

Clearfield warrants to the original purchaser of the Product sold hereunder is free from defects in material and workmanship under normal use and service, subject to exceptions stated herein. Product purchased is warranted as follows: Clearfield designed and branded Products are warranted for three (3) years; Products manufactured by Clearfield to customer prints and/or specifications are warranted for one (1) year; and any Product Clearfield acquires from or through a third-party manufacturer or distributor and resells to Customer as the original customer will carry the manufacturer's pass-through warranty, if any. In all cases, the warranty period commences on the date of shipment to the original purchaser.

Warranty Claim Procedure

If any Product purchased from Clearfield is found defective under the above warranty, the following basic procedure must be followed:

1. Customer must contact Clearfield and obtain a Return Materials Authorization
2. Following authorization, the Customer ships the product-freight collect-to Clearfield's manufacturing facility
3. Clearfield shall repair or replace the defective Product at its sole option and discretion, and return the repaired or replacement Product to Customer's site, freight prepaid

Note: If the Product is not found to be defective at Clearfield, the product will be returned to the Customer and the customer billed for freight in both directions.

View our warranty policy here: <https://www.seeclearfield.com/warranty.html>

Limitations of Warranty

Correction of defects by repair or replacement, at the option of Clearfield Inc, shall constitute the exclusive sole remedy for a breach of this limited warranty. Clearfield shall not be liable under any circumstances for any special, consequential, incidental, punitive, or exemplary damages arising out of or in any way connected with the product or with agreement to sell product to buyer, including, but not limited to damages for lost profits, loss of use, or for any damages or sums paid by buyer to third parties. The foregoing limitation of liability shall apply whether the claim is based upon principles of contract, warranty, negligence or other tort, breach of statutory duty, principles of indemnity or contribution, the failure of any limited or exclusive remedy to achieve its essential purpose, or otherwise.

Clearfield will not be responsible for any labor or materials costs associated with installation or incorporation of Clearfield products at customer sites, including any costs of alteration, replacement or defective product, or any field repairs.

Other Limitations

Clearfield assumes no warranty liability regarding defects caused by:

1. Customer's modification of Product, excepting installation activities described in Clearfield documentation
2. Customer re-packaging of Product for shipment to third parties or destinations other than those originally shipped to by Clearfield, or any defects suffered during shipping where the Product has been re-packaged
3. Customer's installation or maintenance, excepting activities described in and performed in accordance with Clearfield documentation
4. Customer's improper or negligent use or application of Product
5. Other causes external to the Product, including but not limited to accidents, catastrophe, acts of God, government action, war, riot, strikes, civil commotion, sovereign conduct, or the acts or conduct of any person or persons not party to or associated with Clearfield
6. Environmental factors and weathering resulting in aging and damage not necessary or applicable to the function of the product

WaveSmart MOC Cassette

Installation Manual



Proprietary Notice

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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.

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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