NEXT GENERATION
DATA CENTER SOLUTIONS

www.senko.com
DATA CENTER SOLUTIONS

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More and more fibers are required in Data Center applications as the data traffic requirements and bandwidths grow so does the need for new innovative interconnect solutions.

SENKO’s solutions for the future data centers:

**CS^® EZ-FLIP CONNECTOR**
Reach higher density
New duplex connector designed for dual transceiver module types
- Double the density from legacy LC solutions
- Great scalability while maintaining performance
- Specified in QSFP-DD,OSFP for 2x 100/200/400G applications
- Meets GR-326 Objective

**SN^® EZ-FLIP CONNECTOR**
Simplifying Network Cabling
New duplex connector optimized for simplifying the cabling in data center cross connection systems
- Super high density duplex solution
- Specified in QSFP-DD, OSFP for 4x duplex breakout MDI
- Simplifying the Data Center structure to easily make cross connections and mesh structures without cassettes or fan-out assemblies
- Meets GR-326

**LC EZ-FLIP^®**
Polarity Reversible Connectors
Polarity change made easy without opening the housing
- Push-Pull tab option
- Uniboot aids in cable management
- Polarity Reversal without twisting fiber

**MPO-PLUS^®**
Premium Mini Connector
High-density connectors with industry leading low loss MT ferrules.
- GR-1435 compliant
- Polarity Change without tools
- Gender changeable guide pins

---

**Copper vs. Optics**

- **Backplanes**
- **Copper**
- **SMF**
- **MMF**

**Distance (m)**
0.0001 0.001 0.01 0.1 1 10 100

**Data Rate (Gbits/s)**
10 25 50 100 200 400 1000

**Shipments of ethernet optical transceivers by Data Rate**
(historical data and forecast)

*Source: LightCounting*
Reach Higher Density/Capacity with CS®

**Go with CS and Double the Density from LC**

Doubling Density/Capacity in Many Ways

**Doubling Transceiver Density/Capacity**

- **1x CS® transceivers**
  - Current development includes 2x

- **2x LC transceivers**
  - Double the density

**Doubling Switch Density/Capacity**

- **2U**
  - **CS®** 12.8T in 2 RU (64 ports of 2x100G)
  - **LC** 12.8T in 4 RU (64 ports of 2x100G)

- **4U**
  - Double the density

**Doubling Patch Panel Density/Capacity**

- **1U**
  - **FOCIS 19** for 128CH/256F in 1 RU
  - Only 1x CS®

- **2U**
  - **LC** for 128CH/256F in 2 RU
  - At least 2x CS®
**SN® Connector**

**SN Simplified Cabling**
*More Efficient in Performance*

---

**MPO**

- Ferrule end face
- MPO-12
- MPO QSFP/DD MDI

**SN® EZ-FLIP**

- Ferrule end face
- Utilizes proven 1.25 mm ferrule technology for low insertion loss and high return loss
- Single fiber ferrule is easy to clean and maintain

---

**Go with SN and Improve from MPO**

**Leaf-Spine Cross Connection**
*Existing solution with MPO 8F based Transceiver*

- Less connectivity points required
- No fanout or breakout cables are required

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**Simplified Cabling**

- Reduce the number of connection points
- Shuffle or fanout is not required to make cross connection
As you would with your car, choose the right connector for your needs:

### CONNECTOR COMPARISON

<table>
<thead>
<tr>
<th>Connector</th>
<th>LC</th>
<th>CS</th>
<th>SN</th>
<th>MPO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
<td>●●</td>
</tr>
<tr>
<td>Durability</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
</tr>
<tr>
<td>Ease of Use</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
</tr>
<tr>
<td>Ease of Maintenance</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
</tr>
</tbody>
</table>

### Car type

- **Passenger capacity**
  - **Coupe**: ●●
  - **SUV**: ●●
  - **Family**: ●●
  - **Minivan**: ●●

- **Durability**
  - **Coupe**: ⬤(latitude)
  - **SUV**: ⬤(latitude)
  - **Family**: ⬤(latitude)
  - **Minivan**: ⬤(latitude)

- **Ease of Use**
  - **Coupe**: ⬤(latitude)
  - **SUV**: ⬤(latitude)
  - **Family**: ⬤(latitude)
  - **Minivan**: ⬤(latitude)

- **Ease of Maintenance**
  - **Coupe**: ⬤(latitude)
  - **SUV**: ⬤(latitude)
  - **Family**: ⬤(latitude)
  - **Minivan**: ⬤(latitude)

---

### Connector Comparison

<table>
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<td>⬤(latitude)</td>
</tr>
<tr>
<td>Ease of Maintenance</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
<td>⬤(latitude)</td>
</tr>
</tbody>
</table>

**LC**
- **Density**: Large footprint (largest of the 4 connectors) connector for two fibres
- **Durability**: Complies to GR-1435 requirements (similar to LC)
- **Ease of Use**: Larger footprint allows space for finger access
- **Ease of Maintenance**: Standard 1.25mm ceramic ferrule where cleaning & inspection methodology is convenient

**CS**
- **Density**: Medium footprint connector for 2 fibres
- **Durability**: Complies to GR-326 SFF requirements (similar to SC)
- **Ease of Use**: Larger footprint allows space for finger access
- **Ease of Maintenance**: Standard 1.25mm ceramic ferrule where cleaning & inspection methodology is convenient

**SN**
- **Density**: Smallest footprint connector for 2 fibres
- **Durability**: Complies to GR-326 SFF requirements (similar to LC)
- **Ease of Use**: Small footprint with limited space for finger access. Not suitable for glove operation in the field
- **Ease of Maintenance**: Standard 1.25mm ceramic ferrule where cleaning & inspection methodology is convenient

**MPO**
- **Density**: Large footprint connector but for 12, 16, 24, 32 fibres
- **Durability**: Complies to GR-1435 requirements (similar to LC)
- **Ease of Use**: Large footprint allows space for finger access
- **Ease of Maintenance**: Rectangular non-ceramic ferrule where cleaning & inspection methodology is challenging
At SENKO, we are continuously pushing the limits with our ferrule technology to achieve lower losses. When defining your network budget needs, it is important to know what optical losses are required. While using the Single-mode Premium ferrules will help achieve the lowest loss, it may not always be needed. For Connectors like the CS, SN or LC, the following performance can be expected when choosing the right ferrule for your application.

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Single-mode</th>
<th>Multimode</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPC</td>
<td>SM Premium</td>
<td>SM Premium</td>
</tr>
<tr>
<td>APC</td>
<td>Premium</td>
<td>Premium</td>
</tr>
<tr>
<td>MM</td>
<td>Low Loss</td>
<td>Premium</td>
</tr>
<tr>
<td>Typical Insertion Loss (dB) Random Mating</td>
<td>0.05</td>
<td>0.08</td>
</tr>
<tr>
<td>Maximum Insertion Loss (dB) Random Mating</td>
<td>0.15</td>
<td>0.20</td>
</tr>
<tr>
<td>Typical Return Loss (dB)</td>
<td>≥55 dB</td>
<td>≥65 dB</td>
</tr>
<tr>
<td>Operating Temperature (°C)</td>
<td>-40°C to +75°C</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td>&lt;0.2dB typical change, 500 mating's</td>
<td>125µm</td>
</tr>
</tbody>
</table>

The two most critical measurements to meet these losses are:

1. Ferrule hole diameter – For a minimum Insertion Loss, it is better to use the tightest-tolerance ferrule hole diameter available. As an example, if the typical values for a single-mode fiber glass Outer Diameter (OD) are 124.5um to 124.9um the desirable ferrule Inner Diameter (ID) should be 125.0um to 125.5um. Through multiple studies SENKO ensures

2. Ferrule hole concentricity – The shape of the bore hole must be round and in the center of the ferrule. An oval shape instead of perfectly round one will not hold an optical fiber in perfect centered alignment. Additionally, the bore hole should be centered relative to the outside of the ferrule to achieve the best alignment and performance. Ferrule hole concentricity is measured inside diameter to outside diameter (ID to OD).

Therefore, it's important to use ferrules considering the above tolerances for optimum performance.

1. Ferrule hole diameter
2. Ferrule hole concentricity

SENKO offers a range of ferrules including Premium Low Loss, Premium, and Standard connectors that offer varying loss specifications. In most cases SENKO Premium grade ferrules achieve the desired results while keeping cost savings in mind. We suggest contacting your SENKO representative if you have any additional questions.

The manufacturing process of ferrules is focused on making the highest quality ferrule possible with the best possible specifications in terms of ferrule concentricity, and tolerances on the bore hole ID dimensions. However, due to difficulties and complexities of the zirconia ceramic manufacturing process the manufacturers have a secondary operation which is inspection and sorting of produced ferrules. At this stage, 100% of the ferrules are inspected and measured with the state-of-the-art equipment and separated into their respective categories such as SM Premium Low Loss, SM Premium, and Multimode. Typically, the yields for the highest quality ferrules, or Premium Low Loss ferrules are lower when compared to the rest and therefore they command a premium cost.

Is the most expensive Premium Low Loss always better to use over the Premium? The simple answer is, no.

Reasons would include that the Premium Low Loss ferrules typically tighter ID, and if a low-grade fiber is used that has more than typical variation of the cladding OD, it may be difficult to terminate due to potential tolerance overlap and fiber stubbing. In most cases the Premium Low Loss ferrules are used in applications where the optical loss must be the lowest possible. However, the ferrule choice should depend on the end applications optical power loss budget. The optical power loss budget is the allowable amount of loss that a fiber link should have if it is installed properly without external factors such as contamination. The power budget is the determined as the difference between the output power of the transmitter and the minimum input power of the receiver. An average Data Center that utilizes most of the Worlds Interconnect today utilizes transceivers with -18 to -19dBm power output and the receivers with -23 to -24dBm sensitivity. This equates to a dynamic range or data link power budget of about 4 to 6 dB. This means in the typical Data Center deployment the SENKO Premium ferrules would be satisfactory as the average connector loss difference between the SENKO SM Premium Low Loss and SENKO SM Premium is less than 0.1dB which is insignificant for the given power budget.

A new duplex connector designed for dual transceivers which allows the polarity to be switched without connector re-termination.

**EZ-FLIP CONNECTOR**

SENKO Products are RoHS, Reach SVHC and UL 94 V-0 compliant.

**SENKO.com/patents**

**Premium series CS® EZ-FLIP CONNECTOR**

40% HIGHER DENSITY compared to LC Connector

Just Insert the two fibers into the ferrules

PUSH-PULL TAB for superior usability in high density applications and are available in various lengths and styles

<table>
<thead>
<tr>
<th>CONNECTOR TYPE</th>
<th>FERRULE SIZE</th>
<th>HOUSING COLOR</th>
<th>BOOT TYPE</th>
<th>BOOT COLOR</th>
<th>TAB LENGTH</th>
<th>TAB COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>6A4</td>
<td>CS EZ-Flip Connector Preassembled for 2mm/3mm cable</td>
<td>151 SM Premium</td>
<td>1 Blue</td>
<td>1 White</td>
<td>47 mm</td>
<td>W White</td>
</tr>
<tr>
<td>604</td>
<td>CS EZ-Flip Connector Unassembled for 2mm/3mm cable</td>
<td>158 SM Premium Low Loss</td>
<td>5 Aqua</td>
<td>3 0.0 mm</td>
<td>55 mm</td>
<td>W White</td>
</tr>
<tr>
<td>604</td>
<td>CS EZ-Flip Connector Unassembled for 2mm/3mm cable</td>
<td>251 MM Premium</td>
<td>6 Heather violet</td>
<td>4 2.0 mm Flex Boot</td>
<td>62 mm</td>
<td>W White</td>
</tr>
</tbody>
</table>

Just Insert the two fibers into the ferrules

New opposing APC angle design makes polarity changing possible. EZ-ily Flip the CS push-pull tab and connect. Angles maintain the same alignment after polarity change!

**TIME SAVING PREASSEMBLED CS EZ-FLIP SWITCHABLE CONNECTOR**

The CS EZ-Flip connector is available in a preassembled condition. This offers the user the ability to minimize the assembly operations, reduce the risk for damaging the components during assembly and improve assembly yield while reducing assembly labor time.

Note: Preassembled version is currently offered only in UPC configuration.

New opposing APC angle design makes polarity changing possible. EZ-ily Flip the CS push-pull tab and connect. Angles maintain the same alignment after polarity change!

**CLICK TO WATCH THE VIDEO**

**ORDER CODE example**

654 153 3 APC Premium 6 900 µm BTW 1 White 36 36 mm W White
Reach higher density with the CS® CONNECTOR

New duplex connector designed for dual transceiver module types

- 40% higher density compared to LC Connector
- Double the density overall
- 30% vertical space saving

**Features**

- 40% size reduction compared to LC Duplex
- Designed for QSFP/QSFP-DD break out application
- Proven 1.25mm ferrule technology
- Push-pull tab
- Can achieve IEC random mating Grade B performance

**Features and Benefits**

- Solutions for: QSFP-DD and 2 CH adapters
- Quick connect/disconnect of ganged connectors
- Easy removal of clip to allow extraction of individual connector
- Fits within transceiver handle footprint

**Gang Clip Ready**

- PROD CODE example

---

**.connector**

<table>
<thead>
<tr>
<th>CONNECTOR TYPE</th>
<th>FERRULE SIZE</th>
<th>HOUSING COLOR</th>
<th>BOOT TYPE</th>
<th>BOOT COLOR</th>
<th>TAB LENGTH</th>
<th>TAB COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>601 CS Connector UPC</td>
<td>Unassembled for 2mm/3mm cable</td>
<td>151 SM Premium</td>
<td>1 Blue</td>
<td>1 White</td>
<td>47 47 mm</td>
<td>W White</td>
</tr>
<tr>
<td>601 CS Connector APC</td>
<td>Unassembled for 2mm/3mm cable</td>
<td>153 APC Premium</td>
<td>3 Green (APC)</td>
<td>1 White</td>
<td>55 55 mm</td>
<td>W White</td>
</tr>
<tr>
<td>601 CS Connector UPC</td>
<td>Unassembled for 900µm cable</td>
<td>151 SM Premium</td>
<td>1 Blue</td>
<td>1 White</td>
<td>36 36 mm</td>
<td>W White</td>
</tr>
<tr>
<td>601 CS Connector APC</td>
<td>Unassembled for 900µm cable</td>
<td>153 APC Premium</td>
<td>3 Green (APC)</td>
<td>1 White</td>
<td>36 36 mm</td>
<td>W White</td>
</tr>
</tbody>
</table>

**Connector Type**

- CS Connector UPC
- CS Connector APC
- CS Connector UPC for 2mm/3mm cable
- CS Connector APC for 2mm/3mm cable
- CS Connector UPC for 900µm cable
- CS Connector APC for 900µm cable

### APC and UPC 900µm, 2mm, 3mm

- Various push-pull tab lengths for staggered dressing or custom applications.

---

**Table**

- Connectors are RoHS, Reach SVHC and UL 94 V-0 compliant.
**Features**

- Significant space saving
- Minimizing behind the wall (btw) side adapter depth
- Cost effective
- IEC Grade B compatible
- Simplifying connector structure
- Available in UPC, MM, and APC configuration

**Applications**

- Ideal for cassettes, enclosure, on board optics used in plug and play modules
- FTTH, FTTA
- Telecom, Wireless

**Standard CS Connector vs Micro CS size comparison**

Save 19.81mm of space in your cassette when using the Micro CS

**μCS® Connector and Adapter**

<table>
<thead>
<tr>
<th>CONNECTOR TYPE</th>
<th>FLANGE</th>
<th>HOUSING COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>682U Micro CS (4F) Dual Channel Adapter Channel Adapter</td>
<td>1 Adapter with Flange</td>
<td>1 Blue</td>
</tr>
<tr>
<td>682L Micro CS Simple Adapter</td>
<td>2 Adapter No Flange</td>
<td>3 Green</td>
</tr>
<tr>
<td>682L Micro CS Simple Adapter</td>
<td>3 Green</td>
<td></td>
</tr>
<tr>
<td>682L Micro CS Simple Adapter</td>
<td>5 Lime Green OM5</td>
<td></td>
</tr>
<tr>
<td>682L Micro CS Simple Adapter</td>
<td>7 Heather Violet OM4</td>
<td></td>
</tr>
<tr>
<td>682L Micro CS Simple Adapter</td>
<td>9 Aqua</td>
<td></td>
</tr>
</tbody>
</table>
CS & μCS SHUTTER ADAPTERS

FEATURES
- Automatic shutter action
- IP5X dust protection
- Unique twin door shutter closes to prevent any ingress of contamination
- Adapter allows for traceability with Visible Light Source
- Available for both CS and μCS footprint

The CS shutter adapter has been developed to meet the evolving requirements of data centers, telecom, and harsh environment solutions by providing automated dust and laser protection through a built-in internal shutter. The CS shutter adapter maintains the protection from dust while other solutions offer a dust cap that is easily lost. Whether the port is used often, or only used once in a while, the CS shutter adapter provides protection from the number one leading cause of network failure, contamination.

As power increases in networks, the eye safety of installers becomes more of a concern. The CS shutter adapter provides protection from potentially unconnected ports in order to give you peace of mind.

CS SHUTTER ADAPTER

μCS SHUTTER ADAPTER

When trying to trace the adapter using a visible light source, you can see the red light glowing through the adapter sleeve.

CONNECTION TYPE
682S CS Dual Channel (4F) Shuttered Adapter
1 with Flange
2 No Flange
3 Blue
4 Green
5 Lime OM5
6 Heather Violet OM4
7 Aqua OM3
8 Order Code example

CONNECTION TYPE
682US μCS Dual Channel (4F) Shuttered Adapter
1 with Flange
2 No Flange
3 Blue
4 Green
5 Lime OM5
6 Heather Violet OM4
7 Aqua OM3
8 Order Code example
### Standard Adapters

<table>
<thead>
<tr>
<th>CS® ADAPTER Part Number</th>
<th>6CH CS® Adapters</th>
</tr>
</thead>
<tbody>
<tr>
<td>661</td>
<td>Single Channel (2F) Adapter no Flange</td>
</tr>
<tr>
<td>662</td>
<td>Dual Channel (4F) Adapter no Flange</td>
</tr>
<tr>
<td>663</td>
<td>Triple Channel (6F) Adapter no Flange</td>
</tr>
<tr>
<td>664</td>
<td>Quad Channel (8F) Adapter no Flange</td>
</tr>
</tbody>
</table>

#### CS®-LC Hybrid testing adapter
- Single LC Channel
  - P/N: 680-0

#### CS® Loopback
- P/N: LBP-CS-XXX-XX

#### CS® Adapter with External Shutters
- P/N: 682-XX-E22

#### Parking Adapter
- P/N: 681-PRK-01-X

### Founding Members

The CS® Consortium is a group of leading fiber optic component manufacturers that focuses on educating end users and design consultants about the technical advantages of using CS® based high density connectivity solutions. The CS® Consortium represents technology leaders committed to providing the most current, reliable, and vendor neutral information about fiber optics and related technologies for advancing new and better communications solutions.

### Standardization of CS® connector

CS® connector has been adopted to transceiver specifications such as QSFP-DD, OSFP and COBO as one of the fiber optic connector options. CS® connector interface is being specified by TIA as FOCIS 19.

### CS® Consortium aims to promote CS® high density connectivity solutions

The CS® Consortium is a group of leading fiber optic component manufacturers that focuses on educating end users and design consultants about the technical advantages of using CS® based high density connectivity solutions. The CS® Consortium represents technology leaders committed to providing the most current, reliable, and vendor neutral information about fiber optics and related technologies for advancing new and better communications solutions.

### CS Transceiver Licensee List:

#### CS® Ecosystem

For more information about the CS Ecosystem partners offering Transceiver, Cable Assembly, Patch Panel, and Testing solutions please visit our website at: https://www.senko.com/solutions/very-small-form-factor-vsff/.

Or you can also scan this QR code.
**CS® CONNECTOR** Patch Panel Examples

**128CH/256F** Patch Panel in 1RU
- 16 slots x 4 CS Dual (2 Fiber) adapter
- Fully silk screened

**128CH/256F** Cassette Module in 1RU
- 4 x 32CH/6F Cassette Modules
- Silk Screen on each side of cassette

Reach higher density with **CS® CONNECTOR**

New Duplex connector optimized for 400G new generation Data Center

**45RU Rack Comparison**

Double your density with **CS® CONNECTOR**

**Generic LC**

<table>
<thead>
<tr>
<th>128CH/256F Cassette Module Patch in 1RU</th>
<th>128CH/256F Cassette Panel in 2RU</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>1U only</em></td>
<td><em>2U at least</em></td>
</tr>
</tbody>
</table>

**Total Capacity**

<table>
<thead>
<tr>
<th>Single Sided Rack/Cabinet</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2048 CH</strong></td>
</tr>
<tr>
<td><strong>4096 F</strong></td>
</tr>
</tbody>
</table>

**Total Capacity** (single sided rack/cabinet)

<table>
<thead>
<tr>
<th>Total 7RU Cable Management Space</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4352 CH</strong></td>
</tr>
<tr>
<td><strong>8704 F</strong></td>
</tr>
</tbody>
</table>

**Note that the 3 RU wire manager is installed on the bottom rack base plate and the remaining 1 RU space at the bottom of the rack.**
Premium series **SN® EZ-FLIP CONNECTOR**

Simplifying network cabling

A new duplex connector, optimized for 400G which allows the polarity to be switched without connector re-termination.

**Features and Benefits**
- Solutions for QSFP-DD and SFP-DD Transceivers
- Quick connect/disconnect of ganged connectors
- Easy removal of clip to allow extraction of individual connector
- Fits within transceiver handle footprint

**GANG CLIP READY**

**TIME SAVING PREASSEMBLED SN EZ-FLIP SWITCHABLE CONNECTOR**

Because the SN® EZ-Flip comes preassembled, there is no need to detach the ferrules from the inner body during termination. This results into an easier termination process and time saving.

**SN EZ-FLIP CONNECTOR**

The special design of the ferrule angle allows for perfect alignment of the ferrules after polarity change.

**SN EZ-FLIP PREMIUM CONNECTOR**

See Accessories page for more details.
SN® CONNECTOR

Next generation connector

New Duplex connector optimized for 400G new generation Data Center

4xSN® in ONE Transceiver

40% HIGHER DENSITY compared to LC Connector

2x LC STYLE FERRULE for increased reliability

1.6mm ruggedized cable

PUSH-PULL BOOT for superior manageability in high density applications and are available in various lengths and styles

SN® CONNECTOR

LC Duplex, CS, SN Comparison

FEATURES

- LC ferrule base duplex connector
- Ferrule pitch: 3.1mm
- 4x SN® connectors in a QSFP footprint
- 2x SN® connectors in a SFP footprint
- Designed for 4x Duplex break out application
- Push-pull on boot design for better usability

Key Features of SN® connector

Double density compared to LC Duplex

4x SN® in 1 Adapter

- Most dense dual ferrule uniboot connector
- Mechanically Stronger
- Allows better cable management/routing

SN® CONNECTOR

UPC

CONNECTOR TYPE | FERRULE SIZE | HOUSING COLOR | BOOT TYPE | BOOT COLOR
--- | --- | --- | --- | ---
602 SN Connector UPC Unassembled for 1.6mm cable | 121 SM Premium | 1 Blue | 1 Fishtail Boot | 1 White
604 SN Connector UPC Unassembled for 2mm cable | 151 SM Premium Low Loss | 5 Aqua | 3 Round Boot | 2 Blue
251 MM Premium | 6 Heather Violet | 8 Flex Angle Boot | 3 Black

SN® CONNECTOR

APC

CONNECTOR TYPE | FERRULE SIZE | HOUSING COLOR | BOOT TYPE | BOOT COLOR
--- | --- | --- | --- | ---
612 SN Connector APC Unassembled for 1.6mm cable | 133 APC Premium | 3 Green | 1 Fishtail Boot | 1 White
614 SN Connector APC Unassembled for 2mm cable | 153 APC Premium Low Loss | 3 Round Boot | 6 Green

GANG CLIP READY

Features and Benefits

- Solutions for QSFP-DD and SFP-DD Transceivers
- Quick connect/disconnect of ganged connectors
- Easy removal of clip to allow extraction of individual connector
- Fits within transceiver handle footprint

GANG CLIP

P/N 602-CLIP-DD-02 (Quad for QSFP-DD)
P/N 602-CLIP-SX-02 (Duplex for SFP-DD)

note: only for 602/612 Series
SN® Junior Connector is designed for special small duplex connection needs for high density situations such as behind the wall (BTW), cassettes, and modules where space is limited.

**SN® Junior Connector Features**
- Latch locking mechanism
- Accepts 2 x 900 μm buffered fibers
- Uses proven LC ferrule technology
- Extra small for space limited installations

**SN® Adapter with SC Footprint**

- SN SC 2 Channel (4F) Adapter
- SN SC 4 Channel (8F) Adapter
- SN SC 2 Channel (4F) Shuttered Adapter
- SN SC 4 Channel (8F) Shuttered Adapter

**SN Junior Connector**

- SN Connector
- SN Footprint Adapter - 4CH (8F)

**SN® Adapter**

- SN Adapter 1CH (2F) with shutter
- SN Adapter 4CH (8F) with shutter

**SC FOOTPRINT ADAPTER**

- SN SC 2 Channel (4F) with shutter
- SN SC 4 Channel (8F) with shutter

**SN Connectors and Adapters**

- SN Connector
- SN Footprint Adapter - 4CH (8F)

**Space Saving**

SENKO’s SN® Junior connector is designed for special small duplex connection needs for high density situations such as behind the wall (BTW), cassettes, and modules where space is limited. The connector features a latch locking mechanism to confirm engagement prior to deployment.
**SN**® **COMPACT** Connector and Adapter

**SN**® Compact Connector Features
- Latch locking mechanism
- Accepts 2 x 900 μm buffered fibers
- Uses proven LC ferrule technology
- Extra small for space limited installations

---

### SN Compact Connector

<table>
<thead>
<tr>
<th>CONNECTOR TYPE</th>
<th>FIBER SIZE</th>
<th>HOUSING COLOR</th>
<th>BOOT COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>603J SN Compact Connector APC</td>
<td>151</td>
<td>SN Premium</td>
<td>1 White</td>
</tr>
<tr>
<td>613J SN Compact Connector APC</td>
<td>158</td>
<td>SN Premium</td>
<td>2 Blue</td>
</tr>
<tr>
<td>251 MM Premium</td>
<td>5 Aqua</td>
<td>6 Heather Violet</td>
<td></td>
</tr>
<tr>
<td>155 APC Premium</td>
<td>6</td>
<td>6 Heather Violet</td>
<td></td>
</tr>
</tbody>
</table>

*Note: The SN Compact Connector was previously called the BTW2 Connector*

### SN**3CH and 6CH** Compact Adapter

<table>
<thead>
<tr>
<th>ADAPTER TYPE</th>
<th>FLANGE</th>
<th>HOUSING COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>693 SN 3CH Adapter</td>
<td>3 Topmount</td>
<td>1 Blue</td>
</tr>
<tr>
<td>696 SN 6CH Adapter</td>
<td>7 Heather violet (OM4)</td>
<td></td>
</tr>
</tbody>
</table>

---

**VERTICAL SPACE SAVING**
**SN® MINI Connector and Shuttered Adapter**

**SN® MINI Connector Features**
- Latch locking mechanism
- Accepts 2 x 900 μm buffered fibers
- Uses proven LC ferrule technology
- Extra small for space limited installations

### SN MINI Connector

<table>
<thead>
<tr>
<th>CONNECTOR TYPE</th>
<th>FERRULE SIZE</th>
<th>HOUSING COLOR</th>
<th>BOOT COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>609 SN Mini Connector</td>
<td>1.51</td>
<td>1 Blue</td>
<td>1 White</td>
</tr>
<tr>
<td>691 SN Mini APC Connector</td>
<td>1.58</td>
<td>2 Green</td>
<td>2 Blue</td>
</tr>
<tr>
<td>241 MM Premium</td>
<td>2.51</td>
<td>5 Aqua</td>
<td>5 Black</td>
</tr>
<tr>
<td>153 APC Premium</td>
<td>6</td>
<td>6 Heather Violet</td>
<td>6 Green</td>
</tr>
</tbody>
</table>

*Note: SN Mini has no boot*

### SN MINI Shuttered Adapter

<table>
<thead>
<tr>
<th>FOOTPRINT TYPE</th>
<th>SIZE</th>
<th>HOUSING COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>60A SN Mini Adapter</td>
<td>1.51</td>
<td>1 Blue</td>
</tr>
</tbody>
</table>

**SN® SHUTTER ADAPTER**

- Metal shutter for Eye Safety & Dust Resistance
- One-Handed Automatic shutter operation
- Density up to 432F (216CH) per 1RU with SN internal shuttered adapters
- Other footprints coming soon: 2ch SC SX and 4ch SC DX cutout

**Features**

- 14.1mm SPACE SAVING

---

**SN® CONNECTOR**

---

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Material:

UNLESS OTHERWISE SPECIFIED:

DEBURRS ALL SHARP EDGES.

DIMENSIONS ARE AFTER FINISH.

NOTE:

CONNECTOR ADAPTER POSITION DEPENDENT ON PANEL THICKNESS

---

**REV. DESCRIPTION DATE APPROVED**

REV. 1M

SN® MINI Connector and Shuttered Adapter

---

**NOTES:**

ALL MATERIALS TO BE COMPLIANT TO RoHS, REACH SVHC AND UL 94 V-0.
Key Features of SN® connector

**Standardization of SN® connector**

SN® connector has been adopted to transceiver specifications such as QSFP-DD as one of fiber optic connector option. SN® connector interface is being specified by IEC 61754-36.

**SN transceivers licensees**

- SP Source Photonics
- molex
- IVI
- CIG
- Accelink
- Cyntec
- SiFotonics
- INNO LIGHT
- OPTOWAY
- BROADEX
- O-Net Technologies
- eoptolink
- CENTERA
- AOI
- CISCO
- FOCI
- sicoya
- ADVA
- Linktel Technologies
- HGGenuine

**SN® connector and adapter licensees**

- COMMSCOPE®
- AFL

---

**SN® Ecosystem**

For more information about the CS Ecosystem partners offering Transceiver, Cable Assembly, Patch Panel, and Testing solutions please visit our website at: https://www.senko.com/solutions/very-small-form-factor-vsff/.

Or you can also scan this QR code:
**SN-MT CONNECTOR**

Next generation multi-fiber connector

Available in 8F and 16F in one row

**FEATURES**

- Carries a maximum of 16-fibers in a row
- Same connector footprint as SN
- Carries many features from the SN
- The industry's highest density connector solution in a QSFP-DD footprint
- Fiber density per 1RU is improved by
  - 2.7x over MPO-16F
  - 1.3x over MPO-32F
- Insertion loss targeted 0.35dB max for SM

**Footprint size comparison with MPO**

MPO 80-port: total 1280F with MPO-16F, total 2560F with MPO 32F

SN-MT 216-port: total 3456F with SN-MT 16F

**SN-MT Density Comparison with MPO in 1RU Panel**

**SN-MT Product Family (Coming soon)**

**Connectors**
- SN-MT Connector
- SN-MT Bare Ribbon Connector
- SN-MT Behind the Wall

**Adapters**
- SN-MT 1CH Adapter
- SN-MT 1CH Shuttered Adapter
- SN-MT 4CH Adapter
- SN-MT 4CH Shuttered Adapter

**Mid-board interconnect**
- SN-MT Stackable MBMC
- MBMC SN-MT Clip

**Same Footprint**

as SN Connector

4x **SN-MT**
in 1 transceiver

2.7x Density Increase
Compared to MPO-16F
**LC Connector Featured Products**

**LC EZ-FLIP®**

**Polarity Reversible Connectors**

The Duplex LC connector for round cable, which allows the polarity to be switched without connector re-termination or twisting of the fiber.

**How to switch:**

- **REGULAR POLARITY**
- **CROSSED POLARITY**

**FEATURES**

- Push/Pull Tab Ready for High Density applications
- Uniboot Connector aids cable management
- Polarity Reversal without twisting fiber
- Visual indication for Polarity Check
- Short boot design for reduced connector length

**LC Dust Shutter Adapter with Inner Shutter**

**98D SERIES**

**PC 2mm, 3mm**

<table>
<thead>
<tr>
<th>CONNECTOR TYPE</th>
<th>FERRULE SIZE</th>
<th>HOUSING COLOR</th>
<th>BOOT TYPE</th>
<th>BOOT COLOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>9AQ EZ Flip LC Uniboot Premium preassembled</td>
<td>9AQ</td>
<td>1</td>
<td>3.0 mm</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>251</td>
<td>2</td>
<td>3.0 mm</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>251</td>
<td>3</td>
<td>3.0 mm</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>251</td>
<td>6</td>
<td>3.0 mm</td>
<td>6</td>
</tr>
</tbody>
</table>

**ORDER CODE example**

- 9AQ-HDPP-34-W: EZ Flip LC Uniboot, Push-Pull tab 34mm
- 9AQ-HDPP-51-W: EZ Flip LC Uniboot, Push-Pull tab 51mm
- 9AQ-HDPP-67-W: EZ Flip LC Uniboot, Push-Pull tab 67mm

*Push pull tab is optional, connector can be used with/without tabs.*

---

* imagery and text related to LC connectors, features, and usage.*
**LC Adapter with Dust Shutter**

### Featured Products

<table>
<thead>
<tr>
<th>ADAPTER CODE</th>
<th>TYPE</th>
<th>HOUSING COLOR</th>
<th>SLEEVE TYPE</th>
<th>SHUTTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>98D</td>
<td>LC Adapter with Dust Shutter</td>
<td>Blue</td>
<td>Zirconia</td>
<td>LC Shutter</td>
</tr>
<tr>
<td>3</td>
<td>Duplex with Flange</td>
<td>Green</td>
<td>Violet (OM4) (Req)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Duplex No Flange</td>
<td>Aqua</td>
<td>OM3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Quad with Flange</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Quad No Flange</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Features**

- 100% automatic shutter action
- IP5X dust protection
- SC footprint on non-shuttered side
- Compatible with standard LC connectors
- Adapter traceability with Visible Light Source

**Automatic Shutter Mechanism**

When trying to trace the adapter using a visible light source, you can see the red light glowing through the adapter sleeve.

**Fits in SC Footprint**

**Dust Shutter**

**Features**

- 100% automatic shutter action
- IP5X dust protection
- SC footprint on non-shuttered side
- Compatible with standard LC connectors
- Adapter traceability with Visible Light Source

**Ferule not touching the shutter**
**Featured Products**

**MPO PLUS**

**Premium Mini Connector**

Polarity & Gender change made easy without opening the housing

**MPO PLUS**

**Dust Shutter Adapter**

Dust and Laser Protection

**MPO PLUS**

**Connector**

Excellent Connection Anytime

**MPO PLUS**

**8 and 12 Fiber Ferrule**

SENKO’s MPO Plus MT 12 fiber ferrule are the most common used MT Ferrule in the market which gives the best combination of easy-to-use and low insertion loss. The SM Low Loss and MM Low Loss new ferrule guarantees the industry’s lowest insertion loss of 0.25dB, with a typical of greater than 0.1dB, which exceeds the IEC 61755-3-31 Grade B Requirement. Quality, Price, durability and ease of assembly makes the 12 fiber your best choice.

<table>
<thead>
<tr>
<th>Specification</th>
<th>SM Low Loss</th>
<th>SM Standard</th>
<th>MM Low Loss</th>
<th>MM Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL Typical vs Reference connector</td>
<td>0.10dB</td>
<td>0.20dB</td>
<td>0.08dB</td>
<td>0.15dB</td>
</tr>
<tr>
<td>IL Max vs Reference connector</td>
<td>0.20dB</td>
<td>0.70dB</td>
<td>0.25dB</td>
<td>0.50dB</td>
</tr>
<tr>
<td>IL Typical Random Mating</td>
<td>0.10dB</td>
<td>0.20dB</td>
<td>0.10dB</td>
<td>0.15dB</td>
</tr>
<tr>
<td>Random Mating IEC Spec: IEC61755-3-31</td>
<td>Grade B</td>
<td>N/A</td>
<td>Grade C</td>
<td>N/A</td>
</tr>
<tr>
<td>Return Loss</td>
<td>60dB</td>
<td>60dB</td>
<td>25dB</td>
<td>25dB</td>
</tr>
<tr>
<td>Recommended PIN Used</td>
<td>SM Low Loss Pin</td>
<td>SM Pin</td>
<td>MM Pin</td>
<td>MM Pin</td>
</tr>
</tbody>
</table>

**MT 32 Fiber Ferrule**

SENKO MT Ferrule performance

**MPO PLUS**

**24 Fiber Ferrule**

SENKO’s MPO Plus 24 fiber MT Ferrule consists of 2 rows of 12 high precision fiber holes, yielding a high density connection with industry leading insertion loss values. Versions available in SM, MA and Low Loss MM make it the ideal choice for super high-density connections and high speed 100G and 400G parallel optics platforms. SM 24 fiber is recommended to be used with a 10N Spring, and the MM 24 fiber is recommended to be used with a 20N High force spring.

<table>
<thead>
<tr>
<th>Specification</th>
<th>SM Low Loss</th>
<th>SM Standard</th>
<th>MM Low Loss</th>
<th>MM Standard</th>
</tr>
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<tbody>
<tr>
<td>IL Typical vs Reference connector</td>
<td>0.25dB</td>
<td>0.15dB</td>
<td>0.20dB</td>
<td>0.15dB</td>
</tr>
<tr>
<td>IL Max vs Reference connector</td>
<td>1.00dB</td>
<td>0.35dB</td>
<td>0.50dB</td>
<td>0.50dB</td>
</tr>
<tr>
<td>IL Typical Random Mating</td>
<td>0.50dB</td>
<td>0.20dB</td>
<td>0.25dB</td>
<td>0.25dB</td>
</tr>
<tr>
<td>Return Loss</td>
<td>60dB</td>
<td>25dB</td>
<td>25dB</td>
<td>25dB</td>
</tr>
<tr>
<td>Recommended PIN Used</td>
<td>SM Low Loss Pin</td>
<td>SM Pin</td>
<td>MM Pin</td>
<td>MM Pin</td>
</tr>
</tbody>
</table>

**16 and 32 Fiber Ferrule**

SENKO’s MPO Plus MT 16 and 32 fiber ferrules are designed to meet TIA 604-18 standard which addresses 16 fiber hole width MT requirements and are available in single row 16 fiber and 2x16 row 32 fiber configurations. Industry leading 16F SM Low Loss ferrules meet the most demanding insertion loss and return loss requirements for high speed 100G, 400G and beyond parallel optical networks.

<table>
<thead>
<tr>
<th>Specification</th>
<th>SM Low Loss</th>
<th>MM Low Loss</th>
<th>SM Standard</th>
<th>MM Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>IL Typical vs Reference connector</td>
<td>0.15dB</td>
<td>0.35dB</td>
<td>0.25dB</td>
<td>0.60dB</td>
</tr>
<tr>
<td>IL Max vs Reference connector</td>
<td>0.35dB</td>
<td>0.60dB</td>
<td>0.35dB</td>
<td>0.60dB</td>
</tr>
<tr>
<td>Random Mating IEC Spec: IEC61755-3-21</td>
<td>Grade B</td>
<td>N/A</td>
<td>Grade C</td>
<td>N/A</td>
</tr>
<tr>
<td>Return Loss</td>
<td>60dB</td>
<td>25dB</td>
<td>25dB</td>
<td>25dB</td>
</tr>
<tr>
<td>Recommended PIN Used</td>
<td>SM Low Loss Pin</td>
<td>SM Pin</td>
<td>MM Pin</td>
<td>MM Pin</td>
</tr>
</tbody>
</table>

**MT 12 Fiber Ferrule**

**MT 24 Fiber Ferrule**

**MT Ferrule Performance**

MT Ferrule Performance

**GR 1435 COMPLIANT**

**SENKO’s MPO Plus MT 12 Fiber Ferrule** is the most common used MT Ferrule in the market which gives the best combination of easy-to-use and low insertion loss. The SM Low Loss and MM Low Loss new ferrule guarantees the industry’s lowest insertion loss of 0.25dB, with a typical of greater than 0.1dB, which exceeds the IEC 61755-3-31 Grade B Requirement. Quality, Price, durability and ease of assembly makes the 12 fiber your best choice.

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<td>0.50dB</td>
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<td>0.10dB</td>
<td>0.15dB</td>
</tr>
<tr>
<td>Random Mating IEC Spec: IEC61755-3-31</td>
<td>Grade B</td>
<td>N/A</td>
<td>Grade C</td>
<td>N/A</td>
</tr>
<tr>
<td>Return Loss</td>
<td>60dB</td>
<td>60dB</td>
<td>25dB</td>
<td>25dB</td>
</tr>
<tr>
<td>Recommended PIN Used</td>
<td>SM Low Loss Pin</td>
<td>SM Pin</td>
<td>MM Pin</td>
<td>MM Pin</td>
</tr>
</tbody>
</table>

**MT Ferrule Performance**

MT Ferrule Performance

**GR 1435 COMPLIANT**

**SENKO’s MPO Plus MT 24 Fiber Ferrule** consists of 2 rows of 12 high precision fiber holes, yielding a high density connection with industry leading insertion loss values. Versions available in SM, MA and Low Loss MM make it the ideal choice for super high-density connections and high speed 100G and 400G parallel optics platforms. SM 24 fiber is recommended to be used with a 10N Spring, and the MM 24 fiber is recommended to be used with a 20N High force spring.

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<tbody>
<tr>
<td>IL Typical vs Reference connector</td>
<td>0.25dB</td>
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<td>0.20dB</td>
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</tr>
<tr>
<td>IL Max vs Reference connector</td>
<td>1.00dB</td>
<td>0.35dB</td>
<td>0.50dB</td>
<td>0.50dB</td>
</tr>
<tr>
<td>IL Typical Random Mating</td>
<td>0.50dB</td>
<td>0.20dB</td>
<td>0.25dB</td>
<td>0.25dB</td>
</tr>
<tr>
<td>Return Loss</td>
<td>60dB</td>
<td>25dB</td>
<td>25dB</td>
<td>25dB</td>
</tr>
<tr>
<td>Recommended PIN Used</td>
<td>SM Low Loss Pin</td>
<td>SM Pin</td>
<td>MM Pin</td>
<td>MM Pin</td>
</tr>
</tbody>
</table>
MPO PLUS®
Premium Mini Connector

Polarity & Gender change made easy without opening the housing

FEATURES
- SENKO Patent pending design
- All the benefit of the MPO Plus and more
- Industries shortest overall length of 3.7mm for 3mm round
- Polarity change in the field without any tool
- Simple gender change without taking off the housing
- Various boot types available
- Complies with MPO IEC and TIA/EIA Requirements

Push Pull Tab

Ribbon Boots
00 Bare Ribbon
01 Bare Ribbon Short

2.0mm Round Boots
21 2.0mm Boot with Crimp
22 2.0mm Boot without Crimp

3.0mm Round Boots
32 3.0mm Flex Angle
31 3.0mm Short
A1 3.0mm Boot

3.6mm Round Boots
42 3.6mm Flex Angle
41 3.6mm Short

4.5/5.0/5.5 Round
51 4.5mm Boot
52 5.0mm Boot
53 5.5mm Boot

Note: When using Flex Angle Boot, always maintain the proper bend radius per the cable manufacturer’s specification.
**MPOPLUS**

**Polarity Changeable Adapter**

Polarity change made easy without modifying the connector

1. **FEATURES**
   - SENKO Patented Design
   - Compatible with all MPO connectors
   - Standard MPO Foot Print
   - Available in Black, Aqua, Heather Violet and Gray
   - Flanged and Non-Flanged versions available

2. **Note:** Polarity changeable feature recommended for non-angled ferrules only

**Dust Shutter Adapter**

**ADAPTER FLANGE**

1. Flange
2. No Flange

**ADAPTER COLOR**

1. Black
2. Aqua
3. Heather Violet
4. Heather Gray, Aligned Key

**ORDER CODE example**

774 ORDER CODE example

**MPOPLUS**

**Step by Step**

1. **Connector insertion**
   - When the connector is inserted into the adapter, it compresses the springs, opening the internal shutter.

2. **Shutter opening**
   - The internal shutter opens, and due to the special design of the shutter, it will not touch the ferrule end face.

3. **Connector mated with adapter**
   - The opening of the shutter allows for the ferrule to be inserted into the adapter sleeve.

4. **Connector removal**
   - As the connector is removed from the adapter, the shutter spring automatically returns the internal shutter to the closed position.

**BENEFITS**

- Unique twin door shutter closes to prevent any ingress of contamination
- Can be “installed and forgotten” at sites with poor dust control
- 100% automatic shutter mechanism means one-handed connection
- No dust cap required on shutter side – reduced waste
- Standard MPO adapter footprint
- Available in Black, Aqua, Lime, Green, and Gray colours
- Designed to meet GR-1435 requirements
- Can be used in combination with the LC and SC Inner shutter adapter to create a fully dust protected plug and play solution
- Harsh Environment ready
- Fully compliant with IEC dust testing standards
- Compatible with all SENKO MPO+ connectors including HD

**Dust and Laser Protection**

- Automatic shutter mechanism

**Dust Shutter Adapter**

**ADAPTER FLANGE**

1. Flange
2. No Flange

**ADAPTER COLOR**

1. Black
2. Aqua
3. Heather Violet
4. Heather Gray, Aligned Key

**SHUTTER**

1. A with Shutter

**ORDER CODE example**

707 - 1A ORDER CODE example
MPO connectors are highly sensitive to all forms of contamination - with such a large end-face and so many fibers, it is very difficult to ensure pristine condition over the entire surface area of the ferrule. Secondly, the standard MPO connector requires high spring force to achieve physical contact for MT to MT ferrules. The non-contact design of the AirMT™ reduces the sensitivity to contamination and allows for a lower spring force for a repeatable Insertion loss over multiple connections.

**Key Features of AirMT MPO Plus connector**

- **Lower Spring Force**
  - Consistent optical performance with reduced spring force

- **High Density**
  - 40% higher density by FACT footprint

- **Stable Performance**
  - Excellent stable optical performance

- **High Repeatability**
  - Repeatable optical performance

- **Easy Cleaning**
  - Air blow cleaning capable

- **Intermateability with MT Ferrule**
  - Retro-fit with conventional MPO Connector

---

*AirMT™ technology is licensed by Sumitomo Electric Industries, LTD. Trademark of AirMT™ is jointly owned by SENKO ADVANCED COMPONENTS, INC and Sumitomo Electric Industries, LTD.*
**Use Case**

### Indoor – Front Panel

- **EZ-Flip Connector**
  - Polarity reversible in multimode
  - 12/24 compatible
  - Higher density MPO connectivity

- **Dust Shutter Adapter**
  - Dust protection IP5x
  - 100% automatic shutter action
  - Visual light inspection compatible

- **BTW Connector**
  - Behind the Wall connector
  - No boot, no spring needed
  - Easy latch operation for extraction
  - 12/24 compatible

### Onboard Interconnect

- **MBMC Stackable Adapter**
  - Easy stackable design
  - Scalable design by stacking
  - Small footprint design: 27.3mm
  - Mount option: soldering/screw
  - 12/24F compatible

- **Backplane Connector**
  - Blind mating
  - High density
  - High mechanical durability
  - Excellent connection anytime with AirMT™
  - Integrated shutter

### Outdoor High Density Cabling

- **IP21**
  - Factory terminated connector
  - High-fiber count - up to 96F (MT Ferrule x8)
  - Higher durability
  - IP68 rated

- **IP25**
  - Factory terminated connector
  - High-fiber count - up to 96F (MT Ferrule x4)
  - Higher durability
  - IP68 rated

---

**Parameters**

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Single-mode</th>
<th>Multimode¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>APC</td>
<td>≤0.10</td>
<td>≤0.20</td>
</tr>
<tr>
<td>Minimum Insertion Loss (dB)</td>
<td>≤0.60</td>
<td>≤0.25</td>
</tr>
<tr>
<td>Typical Return Loss (dB)</td>
<td>≥55</td>
<td>≥23</td>
</tr>
<tr>
<td>Operating Temperature (°C)</td>
<td>-40°C to +75°C</td>
<td></td>
</tr>
<tr>
<td>Durability</td>
<td>500 matings</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES**

1. Parameters listed for Multimode are target values.
2. AirMT technology is licensed by Sumitomo Electric Industries, LTD.
3. Trademark of AirMT is jointly owned by Senko Advanced Components, Inc. and Sumitomo Electric Industries, LTD.

**APPLICATIONS**

- Telco/DC front panel
- Midboard/backplane Interconnect
- Outdoor high density cabling
- Reliable splicing MPO connectivity

---

**APPLICATIONS**

- Dust protection IP5x
- 100% automatic shutter action
- Visual light inspection compatible

- Blind mating
- High density
- High mechanical durability
- Excellent connection anytime with AirMT™
- Integrated shutter

---

**APPLICATIONS**

- Factory terminated connector
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**APPLICATIONS**

- Telco/DC front panel
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- Reliable splicing MPO connectivity
Senko’s Optical Connector Lineup creates reliability in telecommunications service

Why is cleaning optical connectors so important?

Contamination of the optical connector end face can easily occur. The transmission quality will be affected once the contaminants adhere to the 10µm diameter optical fiber core, and there is increased danger that the fiber end face will be damaged by any high powered light. Cleaning the optical connector end face is extremely important before making a connection.

The cause of numerous problems in optical communication equipment is contamination of the end face of optical connectors. Senko has developed optical fiber cleaners with fiber specifically for optical connectors to help create a reliable telecommunications service. Senko’s optical connector cleaners eliminate even the smallest contaminants that are visible only through magnification.

The Smart Cleaner is a dry cloth cleaner specifically designed to clean connections residing in an adapter, faceplate or bulkhead.

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Cleaning Tool Options for in Adapter and Unmated

<table>
<thead>
<tr>
<th>Tool Name</th>
<th>SN</th>
<th>CS</th>
<th>LC</th>
<th>MPO</th>
</tr>
</thead>
<tbody>
<tr>
<td>NE-CLICK DUPLEX SN Duplex Cleaning</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ONE-CLICK DUPLEX CS Duplex Cleaning</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>SMART CLEANER CS-LC Refillable Dual Purpose Cleaning</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SMART CLEANER MINI 1.25MM Tight Spaces Cleaning</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OPTRES HANDY MPO Fel Cleaning</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>SMART CLEANER MPO 8, 12, 24, 48, 72 F Cleaning</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>SMART CLEANER MPO 16, 32 F cleaning</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Cleaning Cassettes, Wipes, Sticks and Solvents

<table>
<thead>
<tr>
<th>Tool Name</th>
<th>SN</th>
<th>CS</th>
<th>LC</th>
<th>MPO</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMART CLEANER CASSETTE Unpinned MT and Single Fiber SCK-CC-100</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>SMART CLEANER CASSETTE Male MT SCK-CC-200</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>OPTIPOP II Single Slot Unpinned MT and Single Fiber CRE-01 (Refill CRC-RS-01)</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>OPTIPOP II Male MT CRE-03 (Refill CRC-RS-01)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>OPTIPOP II LC Duplex Dual slots for LC Duplex CRE-02 (Refill CRC-RS-01)</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OPTIPES GEL PD CLEANER Gel Cleaning SCK-FT-MPO-01</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>1.25MM NEOCLEAN Sticks Fabric Cleaning Tip CKE-01</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Non-Flammable Solvent Pen Air Ship Safe AFT-A-WEP</td>
<td></td>
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<tr>
<td>4X4 Optical Wipes 100 wipes/bag AFT-A-NW</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

SMART CHECKER

MPO Tester
P/N AFT-G-FC-MPO-02

VFL Visual Fault Locator
P/N AFT-G-FC

- **Powder coated 18 gauge steel housing**
- **LED Polarity Confirmation Light**
- **Fiber Continuity Confirmation Lights**

**What can the VFL be used for?**

1. **Polarity**
   - Use it to check the polarity of a connector assembly.

2. **Light Continuity**
   - Use to quickly check light continuity and locate broken fibers.

3. **Microbend Points**
   - Find the microbend points that are causing loss.

4. **Macrobend Points**
   - Find the macrobend points that are causing loss.

5. **Cross Connections**
   - Use it to check for cross connect.

- **Ideal for use in field or in production**
- **Check continuity and Method A, B or C polarity for 12 fiber MPO assemblies**
- **5 Hour battery life**
Benchtop Inspection, Interferometry and Test

**SUMIX Manta W+**
Benchtop Inspection Scope
P/N SMX-MANTA-W+

- Inspects 12 fiber in 2.6 seconds, 24 fiber in 4.5 seconds
- 0.5µm defect detection
- Inspection tips for MPO, CS, SN, LC available

<table>
<thead>
<tr>
<th>Inspection Tip Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmated Inspect Tip</td>
</tr>
<tr>
<td>SMX-T-1.25/PC-M</td>
</tr>
<tr>
<td>SMX-T-1.25/APC-M</td>
</tr>
<tr>
<td>MNT-W-MPO-PC-M-V2-L</td>
</tr>
<tr>
<td>MNT-W-MPO-APC-M-V2-L</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In Adapter Inspect Tip</th>
</tr>
</thead>
<tbody>
<tr>
<td>MNT-SN-PC-F-A</td>
</tr>
<tr>
<td>MNT-CS-LC-PC-F-A</td>
</tr>
<tr>
<td>SMX-T-LC-PC-F-K</td>
</tr>
<tr>
<td>SMX-T-LC/PC-F-K</td>
</tr>
<tr>
<td>MNT-W-MPO-PC-F-V2</td>
</tr>
<tr>
<td>MNT-W-MPO-APC-F-V2</td>
</tr>
</tbody>
</table>

**SUMIX MAX Quantum**
Interferometer
P/N MAX-QUANTUM

- Inspects 12 fiber in 2.6 seconds, 24 fiber in 4.5 seconds
- 0.5µm defect detection

**SMX-Manta-W+**
Benchtop Holder
P/N MNT-W-STAND

- Works for 8, 12, 24, 48 and 16, 32 fiber MPO
- Auto test and analysis

**SMX-Manta-W+**
MPO Polarity & Continuity Modul
P/N MPO-VERIFIER

- Works for 8, 12, 24, 48 and 16, 32 fiber MPO
- Auto test and analysis
We can help you set-up and enhance your fiber optic interconnect production line

- Content tailored to your needs
- All experience levels welcome
- New or existing product training
- Witness best practices
- Improve company efficiency
- Learn process improvement
- Discover new troubleshooting techniques
- Expand your portfolio

Available in:
- Americas
- Europe
- China
- United Kingdom