

## CORNING OPTICAL COMMUNICATIONS GENERIC SPECIFICATION FOR BASE 12 PRE-TERMINATED HD SOLUTIONS

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*Corning Optical Communications reserves the right to update this specification without prior notification.*

**Master Format 27 13 23      Communications Optical Fiber Backbone Cabling**  
**or      27 15 23      Communications Optical Fiber Horizontal Cabling**  
**27 11 16      Communications Cabinets, Racks, Frames and Enclosures**

### 1 Systems: General

Base-12 Pre-terminated systems include factory-terminated system components which can be quickly mated to form an end-to-end optical link between patching locations and/or equipment ports. The solution is a high density system with rapid installation time that enables migration to parallel transmissions from 40G all the way to 400G systems.

- Base-12 Pre-terminated systems are modular solutions that include fiber trunks terminated with 12-fiber MTP® array connectors which mate at each end to a transition harness or transition module. Harnesses are cable assemblies which transition from a 12-fiber MTP array connector to single-fiber connectors. Modules have an identical configuration but they are protected in a modular case. Modular system solutions offer more flexibility in managing equipment moves, adds, or changes. An example of this type of system is given in Figure 1.

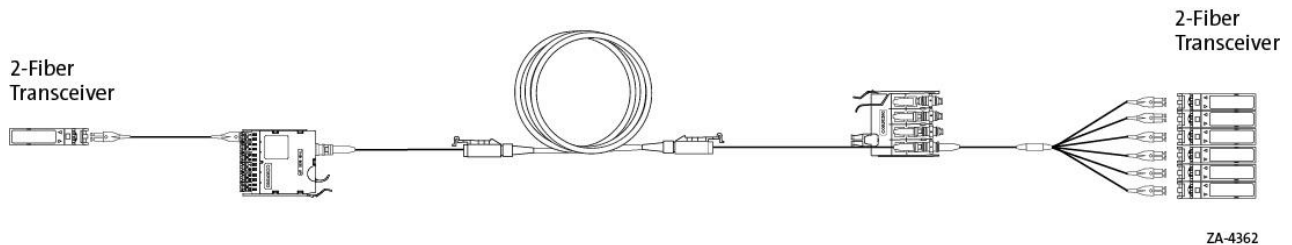


Figure 1: Modular Base-12 Pre-Terminated System connected to Transceiver Ports with jumpers and harnesses.

- 1.1 To maintain proper system polarity, components shall be specified to comply with Universal wiring as described in Section 8 for new builds.
- 1.2 Insertion loss specifications of individual components represent the expected performance when mated to other system components of like specification.

## 2 Trunk Specifications and Options

### 2.1 Trunk Function and Construction

- 2.1.1 The operational temperature range for trunks shall be -10°C to +60°C.
- 2.1.2 The installation temperature range for trunks shall be 0°C to +60°C.
- 2.1.3 Trunks shall be all-dielectric construction.
- 2.1.4 Trunks shall be constructed with MTP® connectors at both ends. Hybrid Trunks shall be terminated with MTP® connectors on one end and LC Uniboot duplex connectors on the other.
- 2.1.5 Trunks, including standard trunk, hybrid trunk and extender trunk assemblies, shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the trunks until the first connector mating.
- 2.1.6 MTP-MTP indoor trunk fiber count shall be specified as 12, 24, 36, 48, 72, 96, 144, 192, , 288, 384, 432, or 576.
- 2.1.7 Trunks shall be furcated (subdivided) into 12-fiber legs (subunits). Standard leg length shall be 840 mm (+70/-0 mm).
- 2.1.8 Hybrid Trunks standard leg length shall be 33 in. +3.5/-1.0 in. (840 mm +70/-0 mm) on the MTP end and 300 mm, 600 mm, 1000 mm or 1200 mm (+70/-0 mm) on the LC end.
- 2.1.9 Extender trunks shall have a standard leg length of 840 mm (+70/-0 mm) on the module end and a leg length of 1500 mm (+70/-0 mm) on the other end of the cable assembly.
- 2.1.10 Hybrid extender trunks standard leg length shall be 840 mm (+70/-0 mm) on the MTP end and 300 mm, 600 mm, 1000 mm or 1200 mm (+70/-0 mm) on the LC end.
- 2.1.11 Hybrid trunk and hybrid extender trunk (MTP-LC) fiber count shall be specified as 12, 24, 36, 48, 72, 96, or 144.
- 2.1.12 Single fiber connector trunks (LC-LC) fiber count shall be specified as 12, 24, 36, 48, 72, 96 or 144.
- 2.1.13 Single fiber connector trunks (LC-LC) shall be 300 mm, 600 mm, 1000 mm or 1200 mm (+70/-0 mm).
- 2.1.14 Trunk length shall be specified as the distance between furcation points at each end of the cable and shall not be inclusive of the length of the legs at each end.
- 2.1.15 Dielectric trunk furcation plugs shall consist of a molded outer shell filled with an epoxy encapsulant.
- 2.1.16 The furcation plugs for dielectric trunks with fiber counts up to 144 fibers shall be square in order to facilitate plug rotation in 90 degree increments. This feature allows mounting the trunk into the hardware in any orientation and avoids standing torsional forces applied to the cable.
- 2.1.17 192-576 fiber dielectric indoor LSZH trunks utilize a heat shrink furcation. Dielectric trunks will utilize a single strain relief location in the housings.

- 2.1.18 The furcation plug shall accommodate a toolless field installable snap on device to secure the plug into the hardware. A single and double stack snap on devices shall be offered for the square furcations. Double stack snap on devices allow securing twice the trunk density within the hardware.
- 2.1.19 The trunk shall incorporate a flexible boot at the back of the epoxy plug, to provide a uniformly smooth transition between the plug and the trunk cable.
- 2.1.20. For trunks (192-576 fibers), a single wide snap on device shall be offered.
- 2.1.21 Trunk furcation plugs shall provide a mounting point for a protective pulling grip and shall be capable of sustaining the rated tensile load of 100 lbs (450 N).
- 2.1.22 Trunk furcation plugs shall incorporate mechanically designed features that allow securing the trunks inside or outside a connector housing.
- 2.1.23 The trunk components shall be ROHS compliant.
- 2.1.24 Trunk cables shall be manufactured with ultra-bendable fiber and meet the fiber performance mentioned in Table 2.
- 2.1.25 The trunk cable shall have a minimum bend radius of five times the cable outside diameter.
- 2.1.26 LSZH rated trunk cables shall meet the application requirements of Low Smoke (IEC 60134), Zero Halogen (IEC 60754-1), Flame Retardant (IEC 60332-3) and Non-Corrosive (IEC 60754-1).

LSZH rated trunk cables must equally meet the CRP requirements of EN 50575 and have a minimum CPR rating of C<sub>ca</sub>, s1a, d1, a1.

- 2.1.27 The trunk cable shall meet the outer diameters specified in table 1.

Table 1: Trunks cable outer diameter

Trunk Fiber Count	Indoor Trunk Cable OD(mm)
12	4.5
24	7.2
36	7.5
48	8.5
72	9
96	10
144	11.1
192	12.9 mm
288	15.2 mm
384	15.2 mm
432	17.6 mm
576	25.5 mm

- 2.1.28 The trunk legs shall be round and have a 2.0mm outer diameter with no preferential bend for easy routing.
- 2.1.29 Trunks shall meet the connector performance specifications of TIA/EIA-568.3-D, *Optical Fiber Cabling Components Standard*, (normative) Annex A.

Property	Multimode			Single-mode
	OM3 Ultra-Bendable optimized 50um (850/1300nm)	OM4 Ultra-Bendable optimized 50um (850/1300nm)	OM5 Ultra-Bendable optimized 50um (850/1300nm)	OS2 Bend-Improved Single-mode (1310/1550nm)
Cabled Fiber Attenuation, max (dB/Km)	2.8/1.0	2.8/1.0	2.8/1.0	0.4/0.3
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km) <sup>1</sup>	1500/500	3500/500	3500/500	-/-
Minimum Effective Modal Bandwidth (EMB) (MHz*km) <sup>2</sup>	2000/-	4700/-	4700/-	-/-
Jacket Color	Aqua	Aqua	Lime Green	Yellow

2.2 Trunk Fiber Types, Optical Specifications, and Jacket Color

2.2.1 Available fiber types and their optical performance specifications shall be as indicated in Table 2.

2.2.2 Trunk jacket color shall be as indicated in Table 2.

2.2.3 SECURE jacket color scheme is different to the one shown in table 2. Color scheme for SECURE represents different security levels specified by the customer. Available jacket colors are highlighted in table 2a.

2.2.4 SECURE coloring is available for trunks in fiber counts 432 and below.

Table 2: Trunks - Available Fiber Types, Optical Specifications, Jacket Colors.

Note (1): As predicted by RML BW, per TIA/EIA 455-204 and IEC 60793-1-41, for intermediate performance laser based systems (up to 1 Gb/s).

Note (2): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for high performance laser-based systems (up to 10 Gb/s).

Table 2a: Trunk SECURE jacket color options

<b>MTP Trunk SECURE Jacket Color Options</b>	<b>Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	White
	Red
	Black
	Yellow
	Violet
	Rose
	Aqua

## 2.3 Trunk Connectivity

- 2.3.1 Where modular trunks are specified, connectors shall be MTP® having 12 fibers per ferrule.
- 2.3.2 MTP terminated primary trunks shall comply with TIA/EIA 568.3-D Type B array cable.
- 2.3.3 MTP terminated primary trunks shall have non-pinned MTP connectors on both ends.
- 2.3.4 MTP terminated extender trunks shall have pinned MTP connectors on the end to be interconnected with a primary trunk and non-pinned MTP connectors on the other end.
- 2.3.5 MTP terminated extender trunks shall comply with TIA/EIA 568.3-D Type A array cable.
- 2.3.6 Where specified in Hybrid trunks, LC Uniboot duplex connectors are used.
- 2.3.7 SECURE color scheme for keyed and color MTPs represent different security levels specified by the customer. Available colors and keys are highlighted in table 2b and 2c.
- 2.3.8 SECURE color scheme for keyed and color LCs represent different security levels specified by the customer. Available colors and keys are highlighted in table 2d
- 2.3.9 SECURE connectivity coloring and MTP connector keying is available for trunks in fiber counts 144 and below.

Table 2b: MTP SECURE Colored Options

<b>MTP Connector Housing Colored Options</b>	<b>Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	White
	Red
	Black
	Yellow
	Violet
	Rose
	Aqua

Table 2c: MTP Keyed Color Options

<b>MTP Connector Housing Keyed Colored Options<sup>1</sup></b>	<b>Keyed Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	Red

	Yellow
	Violet
	Rose
	Aqua

Table 2d: LC Colored Options

<b>LC Color Options</b>	<b>Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	White
	Red
	Black
	Yellow
	Violet
	Rose
	Aqua


#### 2.4 Trunk Protective Pulling Grips and Covers

- 2.4.1 Both ends of a trunk shall have a protective packaging over the furcation plug, legs, and connectors. Customer may specify a protective pulling grip on one end, both ends, or neither end.
- 2.4.2 Pulling grips shall be fastened to the epoxy furcation plug in a manner that isolates the cable assembly components (connectors and legs) from tension, torsion, crush, and bending loads encountered when following recommended installation practices.
- 2.4.3 For size 1 and size 2 furcations, the pulling grip consists of three components. The components include a zipper bag, a corrugated tube and two coupling shelves that allow quick and easy removal of the pulling grip.
- 2.4.4 The pulling grip for trunks that utilize a heat shrink furcation consists of three components. The components include a expand mesh, a corrugated tube, and a heat shrink that allow quick and easy removal of the pulling grip.
- 2.4.5 Pulling grips shall withstand a maximum pulling force of 100 lbs (450 N).
- 2.4.6 Trunk pulling grip diameter and minimum allowable bend radius shall be as indicated in Table 3.
- 2.4.7 The pulling grip shall be a three components design. The components include a zipper bag, a corrugated tube and two coupling shelves that allow quick and easy removal of the pulling grip.

Table 3: Pulling Grip Specifications –MTP Terminated Trunks

Cable Type/ Fiber count (FRNC/LSZH)	Grip Outer Diameter (in/mm)	Recommended Minimum Duct Size with 18-in Elbow
Non-Armored 12-36 Fibers	1.6/41	2.5 in
Non-Armored 48-144 Fibers	2.2/56	3.0 in
Non-Armored 192-288 Fibers	1.5/39	2.0 in
Non-Armored 432-576 Fibers	1.9/49	2.5 in

## 2.5 Trunk Packaging

- 2.5.1 Non-armored trunks up to 144 fibers that are 30 m in length or less shall be packaged in a plastic bag inside a cardboard box.
- 2.5.2 Non-armored trunks up to 144 fibers greater than 30 m shall be placed on a plastic reel.
- 2.5.3 Non-armored trunks from 192 to 576 fibers less than 30 m, depending on fiber count, shall be packaged inside a cardboard box.
- 2.5.4 Non-armored trunks from 192 to 576 fibers longer in length than 30 m, depending on fiber count, shall be packaged on either a corrugated plastic or plywood reel. The trunk shall be secured to the reel with shrink wrap.
- 2.5.5 The plastic bag and reel shall be made of/constructed with 100% recyclable polypropylene  material.

## 3 Harness Specifications and Options

### 3.1 Harness Function and Construction

- 3.1.1 Harnesses shall be 12-fiber cable assemblies used as a transition between MTP® terminated trunk legs and end equipment ports or patch panels.
- 3.1.2 The operational temperature range for harnesses shall be -10°C to +60°C.
- 3.1.3 The installation temperature range for harnesses shall be 0°C to +60°C.
- 3.1.4 Harness cable shall be available with LSZH rating and comply to a minimum CPR rating of E<sub>ca</sub>.

- 3.1.5 The harness shall provide a means to transition from MTP connectors to LC duplex connectors. The break-out legs shall be 2 mm and use a single two-fiber non-preferential bend cable terminated with LC Uniboot connectors and share a single boot.
- 3.1.6 Harnesses shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the harness until the first connector mating.
- 3.1.7 The harness break-out point shall be a molded epoxy plug.
- 3.1.8 Harness shall be color coded according to Table 5.
- 3.1.9 Five specific break-out leg lengths with stagger shall be offered to match the majority of the electronic equipment port layouts.
- 3.1.10 Staggered harnesses shall be offered in lengths of 1 m to 6 m. Nonstaggered harnesses shall be available in lengths from 1 m to 60 m.
- 3.1.11 Harness length shall be measured from the MTP connector to the end of the furcation point.

3.2 Harness Fiber Types and Optical Specifications

- 3.2.1 Available fiber types and their optical performance specifications shall be as indicated in Table 5.
- 3.2.2 SECURE jacket color scheme is different to the one shown in table 5. Color scheme for SECURE represents different security levels specified by the customer. Available jacket colors are highlighted in table 4a.

Table 4a: Harness SECURE jacket color options

<b>Harness SECURE Jacket Color Options</b>	<b>Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	White
	Red
	Black
	Yellow
	Violet
	Rose
	Aqua

3.3 Harness Connectivity

- 3.3.1 Harnesses shall be terminated with a pinned or non-pinned MTP® PRO connector with a Push-Pull boot depending on the application and legs shall be terminated with duplex LC Uniboot style connectors.
- 3.3.2 The MTP PRO connector shall have the ability to either add or remove pins with the field tool for MTP PRO connectors.



- 3.3.3 The MTP PRO connector shall have the ability to reverse polarity on MM MTPs utilizing the field tool for MTP PRO connectors without the need to remove the MTP housing.
- 3.3.4 The MTP PRO connector shall be equipped with a Push-Pull boot to enable easier mating/unmating in extremely dense applications.
- 3.3.5 SECURE color scheme for keyed and color MTPs represent different security levels specified by the customer. Available colors and keys are highlighted in table 4b and 4c.
- 3.3.6 SECURE color scheme for colored LCs represent different security levels specified by the customer. Available colors and keys are highlighted in table 4d.

Table 4b: MTP SECURE Color Options

<b>MTP Connector Housing Colored Options</b>	<b>Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	White
	Red
	Black
	Yellow
	Violet
	Rose
	Aqua

Table 4c: MTP Keyed Color Options

<b>MTP Connector Housing Keyed Colored Options</b>	<b>Keyed Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	Red
	Yellow
	Violet
	Rose
	Aqua

Table 4d: LC Colored Options

	<b>Colors Available</b>
	Blue
	Orange
	Green
	Brown

<b>LC Colored Options</b>	Slate
	White
	Red
	Black
	Yellow
	Violet
	Rose
	Aqua

Table 5: Components Optical Specifications - Available Fiber Types, Colors.

Property	Multimode			Single-mode
	OM3 Ultra-Bendable optimized 50um (850/1300nm)	OM4 Ultra-Bendable optimized 50um (850/1300nm)	OM5 Ultra-Bendable optimized 50um (850/1300nm)	OS2 Bend-Improved Single-mode (1310/1550nm)
Fiber Attenuation, max (dB/Km)	2.8/1.0	2.8/1.0	2.8/1.0	0.4/0.3
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km) <sup>1</sup>	1500/500	3500/500	3500/500	-/-
Minimum Effective Modal Bandwidth (EMB) (MHz*km) <sup>2</sup>	2000/-	4700/-	4700/-	-/-
Jacket Color	Aqua	Aqua	Lime Green	Yellow
Break-out leg Color	Aqua	Aqua	Lime Green	Yellow

Note (1): As predicted by RML BW, per TIA/EIA 455-204 and IEC 60793-1-41 for intermediate performance laser based systems (up to 1 Gb/s).

Note (2): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for high performance laser-based systems (up to 10 Gb/s).

## 4 LC and MTP Jumper Specification

### 4.1 LC Duplex-LC Duplex Jumper Specification

- 4.1.1 The jumper shall be a 2-fiber cable assembly useful as a transition between the LC side of a harness or module and end equipment ports.
- 4.1.2 Jumper shall be FRNC/LSZH rated. Jumper shall have duplex LC connector and share a single boot for both connectors.
- 4.1.3 Jumpers shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the jumpers until the first connector mating.

- 4.1.4 The boot shall have an overall length from the connector to the boot of 65 mm.
  - 4.1.5 The jumper should have a mechanism that allows changing the polarity in the field. A way to identify if the jumper polarity has been flipped should be provided on the connector.
  - 4.1.6 The jumper shall be constructed with a single 2 mm round cable with no preferential bend that allows easy routing and reduces jumper congestion in the housings and vertical managers.
- 4.2 MTP-MTP Jumper Connectivity
- 4.2.1 MTP jumpers shall be terminated with a pinned or non-pinned MTP® PRO connector with a Push-Pull Boot depending on the application.
  - 4.2.2 The MTP PRO connector shall have the ability to either add or remove pins with the field tool for MTP PRO connectors.
  - 4.2.3 The MTP PRO connector shall have the ability to reverse polarity on MM MTPs utilizing the field tool for MTP PRO connectors without the need to remove the MTP housing.
  - 4.2.4 The MTP PRO connector shall be equipped with a Push-Pull boot to enable easier mating/unmating in extremely dense applications.
  - 4.2.1 MTP jumpers shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the MTP jumpers until the first connector mating.
  - 4.2.2 SECURE color scheme for keyed and color MTPs represent different security levels specified by the customer. Available colors and keys are highlighted in table 4b and 4c.
- 4.3 LC and MTP Jumper Fiber types and Optical Specifications.
- 4.3.1 Available fiber types and their optical performance specifications shall be as indicated in Table 5.

## 5 Adapter Panel Specification

### 5.1 Adapter panel function and construction

- 5.1.1 Panels shall meet the following dimensions 125 mm x 100 mm x 9 mm (L x W x H).
- 5.1.2 Panels shall provide a means for joining MTP® terminated trunks entering the back of an MTP adapter panel to a pinned MTP terminated extender trunk or harness entering at the front of the panel.
- 5.1.3 Panels shall be dimensionally compatible with rack-mountable connector housings.
- 5.1.4 Panel design shall permit front and rear installation into the housings.
- 5.1.5 The MTP adapters on the panels shall have the capability to be changed from a TIA/EIA Type A adapter to a TIA/EIA Type B adapter and vice versa, without the need of any tools. This does not apply to keyed adapters.

- 5.1.6 Panel shall have VFL compatible shuttered adapters at the front plane with the exception of SECURE keyed versions. The shutter adapter shall eliminate the need to remove and re-install dust caps at the front. The MTP adapter shall be color coded as indicated in Table 6.
- 5.1.7 72f panel shall have two trunk leg retainers that help with adequate trunk leg routing when exiting the rear of the panel.
- 5.1.8 Panels shall be offered from 12 to 72 fibers.
- 5.1.9 SECURE keyed adapter panel color scheme is different to the one shown in table 6. Color scheme for keyed panels represent different security levels specified by the customer. Available colors and keys are highlighted in table 6a and 6b
- 5.1.10 Keyed adapters are available up to 48 fibers and colored adapters are available up to 72 fibers.

## 6 Module Specifications and Options

### 6.1 Module Function and Construction

- 6.1.1 Modules shall provide a means for joining MTP terminated trunks entering the back of an appropriately designed connector housing to LC jumpers or cables entering the front of the housing.
- 6.1.2 The operational and installation temperature range for modules shall be -10°C to +60°C.
- 6.1.3 Modules shall contain one 12-fiber cable assembly within a protective housing.
- 6.1.4 Modules shall have shutter LC adapters at the front.
- 6.1.5 Modules shall be dimensionally compatible with rack-mountable connector housings.
- 6.1.6 The small form module shall meet the following dimensions 125 mm x 92 mm x 12 mm (L x W x H). It shall provide a high density solution when loaded into the 01U, 02U and 04U housings.
- 6.1.7 Modules shall permit front and rear installation into the housings.
- 6.1.8 When uninstalling a module from the back; a rear accessible retention trigger and finger handle must be present in order to facilitate this operation. An I.D. and warranty seal label shall be affixed to every module.
- 6.1.9 When mounted in a connector housing, the adapter sleeves shall be accessible from the front, thus providing a cross-connection point with other modules.
- 6.1.10 Modules shall contain discrete fiber and port identification. This fiber and port identification shall be pad printed on top and bottom of the modules.

### 6.2 Module Connectivity

- 6.2.1 Cable assemblies within modules shall be terminated with MTP® pinned connector at the back and LC connector at the front.
- 6.2.2 Each module shall contain 12 fiber terminations.
- 6.2.3 All connectors shall be inside the module but shall be accessible for mating through adapter sleeves mounted through the wall of the module.

- 6.2.4 Module connectivity shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the module connectors until the first connector mating. Keyed LC connectivity is excluded from this process.
- 6.2.5 Module shall have self-retracting shutter adapter mechanism that allows a single hand operation. The shutter adapter shall eliminate the need to remove and re-install dust caps. The shutter adapter shall be VFL compatible. The adapter sleeves shall be color coded as indicated in Table 6.
- 6.2.6 SECURE color scheme for keyed and color MTPs represent different security levels specified by the customer. Available colors and keys are highlighted in table 6a and 6b.
- 6.2.7 SECURE color scheme for keyed and color LCs represent different security levels specified by the customer. Available colors and keys are highlighted in table 6c.

6.3 Module Fiber Types and Optical Specifications

- 6.3.1 Available fiber types and their optical performance specifications shall be as indicated in Table 6. Module insertion loss performance shall be as indicated in table 7.

Table 6: Modules - Available Fiber Types, Optical Specifications, Adapter Colors

Property	Multimode			Single-mode
	OM3 Ultra-Bendable optimized 50um (850/1300nm)	OM4 Ultra-Bendable optimized 50um (850/1300nm)	OM5 Ultra-Bendable optimized 50um (850/1300nm)	OS2 Bend- Improved Single-mode (1310/1550nm)
Fiber Attenuation, max (dB/Km)	2.8/1.0	2.8/1.0	2.8/1.0	0.4/0.3
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km) <sup>1</sup>	1500/500	3500/500	3500/500	-/-
Minimum Effective Modal Bandwidth (EMB) (MHz*km) <sup>2</sup>	2000/-	4700/-	4700/-	-/-
Adapter color: LC MTP®	Aqua Aqua	Aqua Aqua	Lime Green	Blue Black

Table 6a: Panels - Available Adapter Colors

MTP Adapter Colored Options	Colors Available
	Blue
	Orange
	Green
	Brown
	Slate
	White

	Red
	Black
	Yellow
	Violet
	Rose
	Aqua

Table 6b: Panels - Available Keyed Adapter Colors

<b>MTP Adapter Keyed Colored Option</b>	<b>Keyed Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	Red
	Yellow
	Violet
	Rose
	Aqua

Table 6c: LC Adapter SECURE Color Options

<b>LC Adapter<sup>1</sup></b>	<b>Colors Available</b>
	Blue
	Orange
	Green
	Brown
	Slate
	White
	Red
	Black
	Yellow
	Violet
	Rose
	Aqua

Note (1): No shutters available for keyed LC adapters

#### 6.4 Module packaging

- 6.4.1 The modules shall be packaged in compact blister packs.
- 6.4.2 The blister packs shall have the ability to be stored in a box or hung when using hook merchandising storage device.

## 7 Components Insertion Loss Specifications

All components shall meet the maximum insertion loss values indicated in table 7.

Table 7: Components Optical Specifications - Available Fiber Types

Property	Multimode			Single-mode
	OM3 Ultra-Bendable optimized 50um (850/1300nm)	OM4 Ultra-Bendable optimized 50um (850/1300nm)	OM5 Ultra-Bendable optimized 50um (850/1300nm)	OS2 Bend-Improved Single-mode (1310/1550nm)
Insertion Loss, max (dB) <sup>(1)</sup>				
MTP Mated Pair LL <sup>(2)</sup>	0.35	0.35	0.35	0.75
LC Mated Pair LL	0.15	0.15	0.15	0.25
Module LL	0.50	0.50	0.50	1.0
Insertion Loss, max (dB) <sup>(1)</sup>				
MTP Mated Pair ULL <sup>(3)</sup>	0.25	0.25	0.25	0.35
LC Mated Pair ULL	0.10	0.10	0.10	0.25
Module ULL	0.35	0.35	0.35	0.60

Note (1): Insertion loss specifications when mated to other system components of a like performance specification.

Note (2): LL stands for Low Loss

Note (3): ULL stands for Ultra Low Loss

## 8 Conversion Module

### 8.1 Module Function and Construction

- 8.1.1 Modules shall provide connectivity for 12 fiber based MTP® terminated trunks entering the back of an appropriately designed connector housing to MTP jumpers or cables entering the front of the housing.
- 8.1.2 The operational and installation temperature range for modules shall be -10°C to +60°C.
- 8.1.3 Modules shall contain a cable assembly within a protective housing that provides two or four 12-fiber MTP connectivity at the back of the module to three or six 8-fiber MTP connectivity at the front respectively. This conversion shall allow fully utilizing all the fibers at the trunk backbone in 40 Gig applications.
- 8.1.4 Modules shall have reversible polarity shutter MTP adapters at the front. This shutter adapter shall be VFL compatible.

- 8.1.5 Modules shall be dimensionally compatible with EDGE rack-mountable connector housings.
- 8.1.6 The small form module shall meet the following dimensions 144 mm x 90 mm x 12 mm (L x W x H). It shall provide a high density solution when loaded into the 01U, 02U and 04U EDGE housings.
- 8.1.7 Modules shall permit front and rear installation into the EDGE housings.
- 8.1.8 When uninstalling a module from the back; a rear accessible retention trigger must be present in order to facilitate this operation.
- 8.1.9 An I.D. and warranty seal label shall be affixed to every module.
- 8.1.10 Modules shall contain port identification. This port identification shall be pad printed on top and bottom of the module.

## 8.2 Module Connectivity

- 8.2.1 Cable assemblies within modules shall be terminated with MTP® pinned connector at the back and at the front.
- 8.2.2 Conversion module connectivity shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the conversion module until the first connector mating.
- 8.2.3 All connectors shall be inside the module but shall be accessible for mating through adapter sleeves mounted through the wall of the module.
- 8.2.4 Module shall have shutter adapters at the front of the module. The shutter adapter shall eliminate the need to remove and re-install dust caps. The shutter adapter shall be VFL compatible. The adapter sleeves shall be color coded as indicated in Table 8.

## 8.3 Module Fiber Types and Optical Specifications

- 8.3.1 Available fiber types and their optical performance specifications shall be as indicated in Table 1. Module insertion loss performance shall be as indicated in table 9.

Table 8: Modules - Available Fiber Types, Optical Specifications, Adapter Colors.

Property	Multimode
	OM4 Ultra-Bendable Multimode 50 µm (850/1300 nm)
Fiber Attenuation, max (dB/Km)	2.8/1.0
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km)	3500/500
Minimum Effective Modal Bandwidth (EMB) (MHz*km)	4700/-
Adapter color MTP®	Aqua



Note (1): As predicted by RML BW, per TIA/EIA 455-204 and IEC 60793-1-41, for *intermediate performance laser based systems* (up to 1 Gb/s).

Note (2): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for *high performance laser-based systems* (up to 10 Gb/s)

#### 8.4 Module packaging

8.4.1 The modules shall be packaged in compact blister packs.

8.4.2 The blister packs shall have the ability to be stored in a box or hung when using hook merchandising storage device.

#### 8.5 Components Insertion Loss Specifications

All components shall meet the maximum insertion loss values indicated in table 9.

Table 9: Components Optical Specifications - Available Fiber Types.

Property	Multimode
	OM4 Ultra-Bendable Multimode 50 μm (850/1300 nm)
Insertion Loss, max (dB) <sup>(1)</sup>	
MTP® mated pair loss	0.25
Module Loss	0.5

Note (1): Insertion loss specifications when mated to other system components of a like performance specification.

## 9 Mesh Module Specifications and Options

### 9.1 Module Function and Construction

9.1.1 Modules shall provide connectivity for 8 or 12 fiber based MTP® terminated trunks entering the back of an appropriately designed connector housing to MTP jumpers or cables entering the front of the housing.

9.1.2 Modules shall contain a cable assembly within a protective housing that provides 4 x 8-fiber MTP connectivity at the back of the module to four 8-fiber MTP connectivity at the front respectively. This allows the breakout of 40 Gig SR4 ports to create a 10G fabric eliminating the need to break the MTP into LC connectivity.

9.1.3 Modules shall have reversible polarity shutter MTP adapters at the front. This shutter adapter shall be VFL compatible.

9.1.4 Modules shall be dimensionally compatible with Corning EDGE rack-mountable connector housings.

- 9.1.5 The small form module shall meet the following dimensions 124 mm x 90 mm x 12 mm (L x W x H). It shall provide a high density solution when loaded into the 01U, 02U and 04U EDGE housings.
- 9.1.6 Modules shall permit front and rear installation into the housings.
- 9.1.7 When uninstalling a module from the back; a rear accessible retention trigger must be present in order to facilitate this operation.
- 9.1.8 An I.D. and warranty seal label shall be affixed to every module.
- 9.1.9 Modules shall contain port identification. This port identification shall be pad printed on top and bottom of the module.

## 9.2 Module Connectivity

- 9.2.1 Cable assemblies within modules shall be terminated with MTP® pinned connector at the front and back or MTP® pinned connector at the front and non-pinned in the back.
- 9.2.2 All connectors shall be inside the module but shall be accessible for mating through adapter sleeves mounted through the wall of the module.
- 9.2.3 Module shall have shutter adapters at the front of the module. The shutter adapter shall eliminate the need to remove and re-install dust caps. The shutter adapter shall be VFL compatible. The adapter sleeves shall be color coded as indicated in Table 10.

## 9.3 Module Fiber Types and Optical Specifications

- 9.3.1 Available fiber types and their optical performance specifications shall be as indicated in Table 1. Module insertion loss performance shall be as indicated in table 11.

Table 10: Modules - Available Fiber Types, Optical Specifications, Adapter Colors.

Property	Multimode	Single-mode
	OM4 Ultra-Bendable Multimode 50 μm (850/1300 nm)	OS2 Bend-Improved Single-mode (1310/1550nm)
Fiber Attenuation, max (dB/Km)	2.8/1.0	0.4/0.3
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km)	3500/500	-/-
Minimum Effective Modal Bandwidth (EMB) (MHz*km)	4700/-	-/-
Adapter color MTP®	Aqua	Black

Note (1): As predicted by RML BW, per TIA/EIA 455-204 and IEC 60793-1-41, for intermediate performance laser based systems (up to 1 Gb/s).

Note (2): As predicted by minEMBC, per TIA/EIA 455-220 and IEC 60793-1-49 for high performance laser-based systems (up to 10 Gb/s)

## 9.4 Module packaging

9.4.1 The modules shall be packaged in compact blister packs.

9.4.2 The blister packs shall have the ability to be stored in a box or hung when using hook merchandising storage device.

## 9.5 Components Insertion Loss Specifications

All components shall meet the maximum insertion loss values indicated in table 11.

Table 11: Components Optical Specifications - Available Fiber Types.

Property	Multimode	Single-mode
	OM4 Ultra-Bendable Multimode 50 μm (850/1300 nm)	OS2 Bend-Improved Single-mode (1310/1550nm)
Insertion Loss, max (dB) <sup>(1)</sup>		
MTP® mated pair loss	0.25	0.5
Module Loss	0.5	1.0

Note (1): Insertion loss specifications when mated to other system components of a like performance specification.

## 9.6 Module polarity Management

9.6.1 Module shall be wired with Universal, Type-B wiring.

# 10 Port Tap Module

## 10.1 Module Function and Construction

10.1.1 The port tap modules shall be dimensionally compatible with Corning Optical Communications EDGE® rack-mountable connector housings.

10.1.2 The port tap module shall have dimensions of 124mm x 90mm x 12 mm (L x W x H).

10.1.3 The port tap modules shall permit front and rear installation into the housing. When uninstalling a module from the back; a rear-accessible retention trigger must be present in order to facilitate this operation.

10.1.4 The port tap module shall have a label providing part number, serial number, human and machine readable barcode affixed to it for identification.

10.1.5 The port tap module shall contain splitters for dividing the optical power signal, one output of the splitter provides signal to the live network and the other(s) to the monitoring port.

10.1.6 The port tap module shall be available in three configurations:

10.1.6.1 Configuration A – The port tap module shall provide connectivity for LC connectors entering at the front, having four live duplex LC ports providing connectivity to the live network and two duplex LC tap ports providing connectivity to the monitoring devices. The LC ports shall be constructed with LC shuttered-adapter

10.1.6.2 Configuration B - The port tap module shall support two MTP® connectors entering the back of the module and six LC adapters in the front. One MTP® port provides connectivity to the live network link, and the other MTP® provides connectivity to monitoring devices. The front of the module shall provide LC shuttered-adapter connectivity to the live network.

10.1.6.3 Configuration C – The port tap module shall support one live MTP® connector entering the back of the module and another live MTP® connector entering at the front of the module providing connectivity to the live network link. The module shall also have an MTP port located at the front or the back of the module providing connectivity to monitoring devices.

10.1.7 The Bi-Di port tap module shall be available only with 50/50 split ratio, OM4 fiber and in two different configurations:

10.1.7.1 Bi-Di Configuration A – The port tap module shall provide connectivity for LC connectors entering at the front, having 2 live LC ports providing connectivity to the live network and two LC tap ports providing connectivity to the monitoring devices. The LC ports shall be constructed with LC internal shuttered-adapters.

10.1.7.2 Bi-Di Configuration B - The port tap module shall support three MTP® connectors entering the back of the module and six LC adapters in the front. One MTP® port provides connectivity to the live network link, and the other two MTPs® provide connectivity to monitoring devices. The front of the module shall provide LC shuttered-adapter connectivity to the live network.

## 10.2 Module Connectivity

10.2.1 Cable assemblies within the modules shall be terminated with MTP® pinned connectors or LC connectors.

10.2.2 Multimode port tap modules shall be constructed using thin-film splitter technology. The single-mode splitters shall use biconical-taper splitter technology to ensure optimal performance of the module. The splitter shall be qualified to the environmental and mechanical test as defined in Telcordia GR1209/1221-CORE)

10.2.3 The adapter sleeves shall be colored as indicated in Table 12.

- 10.2.4 The tap modules utilizing LC connectivity shall have a self-retracting LC shutter adapter mechanism that allows a single hand operation. The shuttered adapter shall be VFL compatible. The LC adapter sleeves shall be color coded as indicated in Table 12.
- 10.3 Module Fiber Types, Optical Specifications, and Component Loss Specifications
- 10.3.1 Completed module assembly shall meet the specifications of TIA 568.3-D for New Product IL, Low temperature, Temperature Life and Humidity Aging. The completed module assembly shall also meet Vibration specification per GR-326.
- 10.3.2 Splitter devices in the port tap module shall meet specification of TELCORDIA GR-1209/1221-CORE.
- 10.3.3 Available fiber types and their optical performance specifications shall be as indicated in Table 12.

Table 12: Modules - Available Fiber Types, Optical Specifications, Component Loss Specifications, and Adapter Colors.

Property	OM4 Ultra-Bendable 50 µm Multimode (850/1300 nm)	OS2 Bend-Improved Single-mode (1310/1550 nm)
Fiber Attenuation, max (dB/km)	2.8/1.0	0.4/0.3
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km) <sup>(1)</sup>	3500/500	-/-
Minimum Effective Modal Bandwidth (EMB) (MHz*km) <sup>(2)</sup>	4700/-	-/-
MTP <sup>®</sup> mated pair max loss (dB) <sup>(3)</sup>	0.35	0.75
LC mated pair max loss (dB) <sup>(3)</sup>	0.15	0.25
Splitter 50/50 max loss (dB) <sup>(4)</sup>	3.50	3.50
Splitter 70/30 (Live/Tap) max loss (dB)	2.40/5.80	2.10/5.80
Splitter 80/20 (Live/Tap) max loss (dB)	1.30/7.30	1.30/7.80
Adapter color LC Live Port MTP <sup>®</sup> Live Port MTP <sup>®</sup> /LC Tap Port	Aqua Aqua Red	Blue Black Red


Note (1): As predicted by RML BW, per TIA/EIA 455-204 and IEC 60793-1-41, for intermediate performance laser based systems (up to 1 Gb/s).

Note (2): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for high performance laser-based systems (up to 10 Gb/s).

Note (3): Insertion loss specifications when mated to other system components of a like performance specification

Note (4): Bi-Di port tap module is only used in OM3 and OM4 networks with a 50/50 split ratio.

## 10.4 Module packaging

- 10.4.1 The modules shall be packaged in compact blister packs.
- 10.4.2 The blister packs shall have the ability to be stored in a box or hung when using a hook merchandising storage device.
- 10.4.3 The blister pack shall be constructed and marked with 100% recyclable Polyethylene Terephthalate  material.

## 11 Tap Harness Specifications

### 11.1 Tap harness function and construction

- 11.1.1 The tap harnesses shall be 12-fiber cable assemblies used to break out the 12-fiber MTP® tap port at the rear of the tap module into LC simplex connectors.
- 11.1.2 The break-out legs shall be 2 mm in diameter and shall be terminated with LC connectors
- 11.1.3 The operational temperature range for harnesses shall be -10°C to +60°C.
- 11.1.4 The installation temperature range for harnesses shall be 0°C to +60°C.
- 11.1.5 Harnesses shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the harness until the first connector mating.
- 11.1.6 The harness break-out point shall be a heat shrink furcation.
- 11.1.7 Tap harnesses shall be available in non-staggered lengths from 2 m to 60 m) in length.
- 11.1.8 Harness length shall be measured from the MTP connector to the end of the furcation point.

### 11.2 Harness Connectivity

- 11.2.1 Harnesses shall be terminated with a non-pinned MTP® PRO connector with Push-Pull boot depending on the application and legs shall be terminated with simplex LC connectors.
- 11.2.2 The MTP PRO connector shall have the ability to either add or remove pins with the field tool for MTP PRO connectors.
- 11.2.3 The MTP PRO connector shall have the ability to reverse polarity on MM MTPs utilizing the field tool for MTP PRO connectors without the need to remove the MTP housing.

## 12 Conversion Harness Specifications and Options

### 12.1 Conversion Harness Function and Construction

- 12.1.1 Harnesses shall be able to be constructed in a two 12 fiber MTP® connectors to three 8 fiber MTP® connectors configuration that shall allow full utilization of all the fibers at the trunk backbone.

- 12.1.2 The operational temperature range for harnesses shall be -10°C to +60°C.
- 12.1.3 The installation temperature range for harnesses shall be 0°C to +60°C.
- 12.1.4 Harnesses shall be 24-fiber cable assemblies used as a transition between MTP® 12-fiber or 8-fiber terminated trunk legs and QSFP equipment ports.
- 12.1.5 Harness cable shall be plenum rated.
- 12.1.6 The harness cable shall be round with a 3.1mm O.D. Harness break-out legs shall be also round with a 2.6mm O.D.
- 12.1.7 The harness break-out point shall be a molded epoxy plug.
- 12.1.8 Harness shall be color coded according to Table 13.
- 12.1.9 Harness length shall be measured from the end of the furcation point to the end of the furcation point.
- 12.1.10 Harness shall be available with 600 mm and 900 mm breakout legs.
- 12.1.11 The harness shall be offered up to 60 m length.

12.2 Harness Fiber Types and Optical Specifications

12.2.1 Available fiber types and their optical performance specifications shall be as indicated in Table 13.

12.3 Harness Connectivity

12.3.1 Conversion harnesses shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the harness until the first connector mating.

Table 13: Components Optical Specifications - Available Fiber Types, Colors.

Property	Multimode	
	OM3 Ultra-Bendable Multimode 50µm (850/1300 nm)	OM4 Ultra-Bendable Multimode 50 µm (850/1300 nm)
Fiber Attenuation, max (dB/Km)	2.8/1.0	2.8/1.0
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km)	1500/500	3500/500
Minimum Effective Modal Bandwidth (EMB) (MHz*km)	2000/-	4700/-
Jacket Color Leg Color	Aqua Aqua	Aqua Aqua

Note (1): As predicted by RML BW, per TIA/EIA 455-204 and IEC 60793-1-41, for intermediate performance laser based systems (up to 1 Gb/s).

Note (2): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for high performance laser-based systems (up to 10 Gb/s).

### 13 Y-Harness Specifications and Options

#### 13.1 Y-Harness Function and Construction

- 13.1.1 Harnesses shall be able to be constructed in a one 24 fiber MTP® connector to two 12 fiber MTP® connectors configuration that shall allow full utilization of all the fibers at the trunk backbone.
- 13.1.2 The operational temperature range for harnesses shall be -10°C to +60°C.
- 13.1.3 The installation temperature range for harnesses shall be 0°C to +60°C.
- 13.1.4 Harnesses shall be 24-fiber cable assemblies used as a transition between MTP® 12-fiber terminated trunk legs and 20-fiber/24-fiber equipment ports.
- 13.1.5 Harness cable shall be plenum rated.
- 13.1.6 The harness cable shall be round with a 3.1mm O.D with a minimum CPR Rating Dca- s2, d0, a2. Harness break-out legs shall be also round with a 2.6 mm O.D. The harness break-out point shall be a molded epoxy plug.
- 13.1.7 Harness shall be color coded according to Table 13.
- 13.1.8 Harness length shall be measured from the end of the furcation point to the end of the furcation point.
- 13.1.9 The harness shall be available with 600 mm and 900 mm breakout legs.
- 13.1.10 The harness shall be offered up to 60 m length.

#### 13.2 Harness Fiber Types and Optical Specifications

- 13.2.1 Available fiber types and their optical performance specifications shall be as indicated in Table 14.

#### 13.3 Harness Connectivity

- 13.3.1 Conversion harnesses shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the harness until the first connector mating.
  - 13.3.1.1 Only the multimode configurations of the Y-harnesses shall be manufactured with this proprietary connector cleaning process.

Table 14: Components Optical Specifications - Available Fiber Types, Colors.

Property	Multimode	Single-mode
	OM4 Ultra-Bendable Multimode 50µm (850/1300 nm)	OS2 Bend-Improved Single-mode (1310/1550 nm)
Fiber Attenuation, max (dB/Km)	2.8/1.0	0.4/0.3
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km)	3500/500	-/-



Minimum Effective Modal Bandwidth (EMB) (MHz*km)	4700/-	-/-
Jacket Color Leg Color	Aqua Aqua	Yellow Yellow

Note (1): As predicted by RML BW, per TIA/EIA 455-204 and IEC 60793-1-41, for intermediate performance laser based systems (up to 1 Gb/s).

Note (2): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for high performance laser-based systems (up to 10 Gb/s)

## 14 24 Fiber MTP® Breakout Harness Specifications and Options

### 14.1 24 Fiber MTP® Breakout Harness Function and Construction

14.1.1 Harnesses shall be able to be constructed in an MTP to MTP configuration or an MTP to LC configuration as follows:

14.1.1.1 MTP to MTP configuration: The harness shall be constructed in a one 24-fiber MTP connector to three 8-fiber MTP connectors configuration

14.1.1.2 MTP to LC configuration (24-fiber): The harness shall be constructed in a one 24-fiber MTP connector to twelve LC duplex connectors configuration

14.1.1.3 MTP to LC configuration (20-fiber): The harness shall be constructed in a single MTP connector to ten LC duplex connectors configuration

14.1.2 The operational temperature range for harnesses shall be -10°C to +60°C.

14.1.3 The installation temperature range for harnesses shall be 0°C to +60°C.

14.1.4 MTP to MTP configured harnesses shall be used as a transition between 8-fiber MTP connectivity to 24-fiber equipment ports

14.1.5 MTP to LC configured harnesses shall be used as a transition between LC connectivity and 24-fiber equipment ports

14.1.6 Harness cable shall be plenum rated.

14.1.7 The harness cable shall be round with a 3.1mm O.D with a minimum CPR rating of D<sub>ca</sub>- s2, d0, a2. Harness break-out legs shall be also round with a 2.6 mm O.D.

14.1.8 The harness break-out point shall be a molded epoxy plug.

14.1.9 Harness shall be color coded according to Table 13.

14.1.10 Harness length shall be measured from the end of the furcation point to the end of the furcation point.

14.1.11 The harness shall be available with 600 mm and 900 mm breakout legs.

14.1.12 The harness shall be offered up to 60 m length.

14.2 Harness Fiber Types and Optical Specifications

14.2.1 Available fiber types and their optical performance specifications shall be as indicated in Table 14.

14.3 Harness Connectivity

14.3.1 Breakout harnesses shall be manufactured utilizing a proprietary connector cleaning process and shall be shipped with optimized dust caps that are engineered to maintain connector end-face cleanliness of the harness until the first connector mating.

14.3.1.1 Only the multimode configurations of the breakout harnesses shall be manufactured with this proprietary connector cleaning process.

Table 14: Components Optical Specifications - Available Fiber Types, Colors.

Property	Multimode	Single-mode
	OM4 Ultra-Bendable Multimode 50µm (850/1300 nm)	OS2 Bend-Improved Single-mode (1310/1550 nm)
Fiber Attenuation, max (dB/Km)	2.8/1.0	0.4/0.3
Minimum Over Filled Launch (OFL) Bandwidth (MHz*km)	3500/500	-/-
Minimum Effective Modal Bandwidth (EMB) (MHz*km)	4700/-	-/-
Jacket Color Leg Color	Aqua Aqua	Yellow Yellow

Note (1): As predicted by RML BW, per TIA/EIA 455-204 and IEC 60793-1-41, for intermediate performance laser based systems (up to 1 Gb/s).

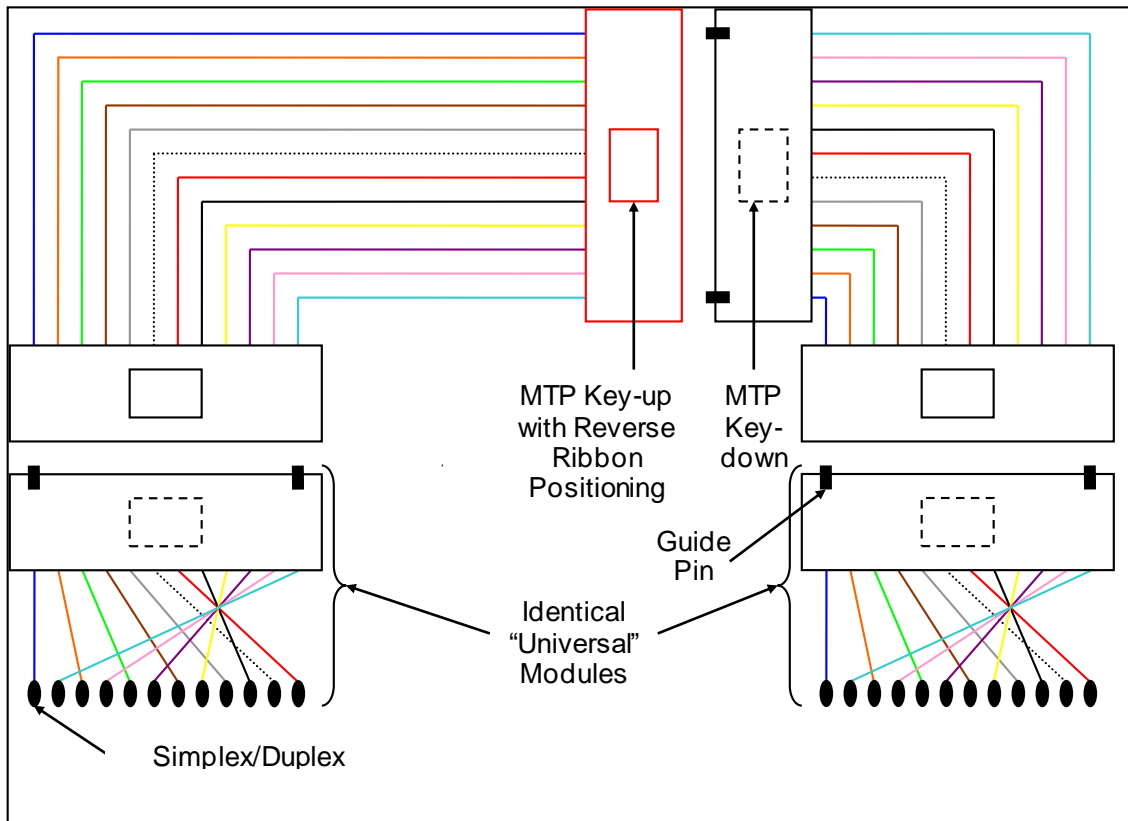
Note (2): As predicted by minEMBc, per TIA/EIA 455-220 and IEC 60793-1-49 for high performance laser-based systems (up to 10 Gb/s)

15 Universal Polarity Management System

15.1 Trunks, modules, harnesses shall follow the fiber routing schematic of Figure 2 and Figure 3.

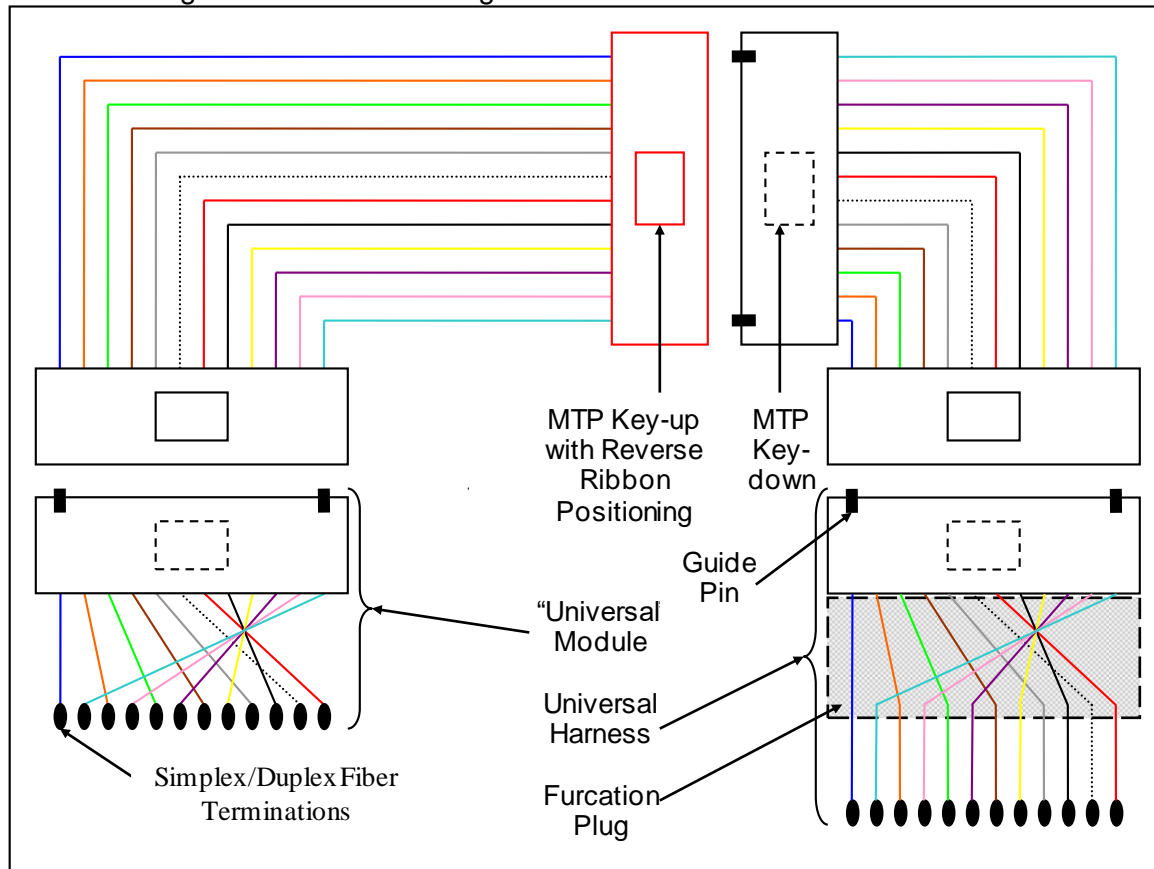
15.1.1 Standard Ribbon Position is defined as having the end face of the blue fiber on the left of the MTP connector as the MTP end face is viewed in the key up position.

- 15.1.2 Reverse Ribbon Position is defined as having the end face of the blue fiber on the right of the MTP® connector as the MTP end face is viewed in the key up position.
- 15.1.3 Keys schematically represented in the down position are drawn with a dashed line.
- 15.2 All MTP connectors shall mate key-up to key-down.
- 15.3 Primary trunks shall have MTPs on one end oriented in the Standard Ribbon Position and MTPs on the other end oriented in the Reverse Ribbon Position.
- 15.4 Extender trunks shall have both MTP connectors installed in the Standard Ribbon Position.
- 15.5 Modules and harnesses shall contain MTPs in the Standard Ribbon Position.
- 15.6 Modules shall have polarity-managed fiber routing as shown in Figure 2.
- 15.7 Harnesses shall have polarity-managed fiber routing within a furcation plug as shown in Figure 3.



Note (1): All MTP connectors shall be installed in standard ribbon position except as noted.  
Note (2): Extender trunk shown in upper right corner is optional.

Figure 2: Universal Wiring Scheme – Modules on Both Ends



Note (1): All MTP® connectors shall be installed in standard ribbon position except as noted.  
Note (2): Extender trunk shown in upper right corner is optional.

Figure 3: Universal Wiring Scheme – Harness on One End

## 1. Rack Mountable Housings

### 1.1. Reference

Housings shall be mountable in an EIA-310 compatible 465 mm (18.3”) rack. One EIA rack space or panel height (denoted as 1U) is defined as being 44.45 mm (1.75”) in height.

### 1.2. 01U Housing Construction

- 1.2.1. Housings shall be available in a 01U size.
- 1.2.2. The housing shall be modular allowing the installation of Base 12 modules in order to provide scalability in increments of 12 when loaded with LC modules.
- 1.2.3. The maximum housing density shall be 72 LC Duplex ports (144 fibers) when is fully loaded with MTP-LC modules and 72 MPO/MTP® ports (864 fibers) when is fully loaded with MTP-MTP modules.
- 1.2.4. The unit shall have a frontal projection of 94 mm (3.69”) when mounting brackets are installed in the standard position.

- 1.2.5. The unit shall not exceed a depth requirement of 460 mm (18.12”) when mounting brackets are installed in the standard position.
- 1.2.6. Mounting brackets shall allow installation of the housing in twelve different frontal and rear projection positions.
- 1.2.7. The unit shall meet the design requirements of ANSI/TIA/EIA-568 and the plastics flammability requirements of UL 94 V-0.
- 1.2.8. Housings shall be manufactured using 20-gauge cold rolled steel or equivalent for structural integrity and shall be finished with a reflective silver powder coat for durability. The rack mounting screws shall be included, shall be black in color and include # 12-24 and #10-32.
- 1.2.9. The housing shall include two field installable slack management brackets at the front of the housing. The brackets shall provide jumper slack management at the front of the housing and shall allow easy tray deployment when the tray is fully loaded with jumpers.
- 1.2.10. The housing color shall be Silver, RAL9006.
- 1.2.11. The housing shall have dimensions of 432 mm x 561 mm x 44 mm (W x D x H).
- 1.2.12. The housing shall have an integrated, 90 degrees rotatable rear trunk mounting plate.
- 1.2.13. The housing shall have side cable access with dust protection brushes
- 1.2.14. The housing shall have slidable modules trays with a capacity of 4 preterminated modules per tray
- 1.2.15.

**9.0 Quality Assurance Provisions**

- 9.1 The manufacturer shall be TL 9000 registered

**10.0 Miscellaneous**

- 10.1 At the request of the customer, the manufacturer shall provide installation procedures and technical support concerning the items contained in this specification

**Gen Spec PGS098 Revision History**

Revision #	Date	Reason for Change
0	6/23/09	Initial creation
1	12/01/09	Changed minimum OFL bandwidth for Pretium 500 fiber from 1500 to 3500 MHz.km.
2	0912/10	Updated mated pair insertion loss table with new performance.
3	11/02/11	Changed mated pair IL performance for SM to 1.3dB. Added reversible polarity jumper feature.
4	3/7/2014	Changed Evolved density growth enabled to Pretium EDGE. Changed fiber loss to 2.8 db/km. Updated trunk cable ODs to match spec sheet. Included size 2 double stack cradles.
5	??	??
6	9/07/2017	Added SECURE colored and keyed panels, updated with Master Format info.

7	11/29/2017	Added 192-576f trunks, WBMMF, MTP PRO, colored LC adapters on modules, keyhole adapter mounting bracket for heat shrink furcations, new harness furcation, and trunk packaging matrix. Combined AO gen spec
8	3/28/2018	Added jumper connectivity, MTP PRO to jumper, SECURE module, Hybrid and Extender trunks
9	11/15/2018	Added operational and installation temperature to trunks, jumpers, harnesses, and modules
10	Dec. 2020	Updated products that feature proprietary cleaning process and optimized dust caps. Added Y-harnesses, breakout harnesses, conversion harnesses, tap harnesses, tap modules. Updated trunk specifications to include updated available cable configurations and packaging information. Updated SECURE and colored options to align with available product offerings.
11	03/11/2021	Updated to reflect EU CPR reference for LSZH cables and product features specific to EMEA.