



Optical Connectivity Fiber Optic Systems Guide

First Edition

Emerson Network Power – *Your Comprehensive resource for Data Communications & Power.*



Optical Connectivity Division

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Fiber Optic Networking

Fiber optic networks are used to support many of applications including the Local Area Network (LAN), Wide Area Networks (WAN), Storage Area Network (SAN), Network Attached Storage (NAS) as well as Enterprise datacenter networking. Each of these networks has unique requirements and the products and methods used to implement them are often different. For example the Enterprise datacenter systems are composed of very high-performance computers, servers and network storage systems. Because of the demanding nature of these systems they require specialized fiber optic interconnect often including parallel optics to support the required bandwidth.

On the other hand, local area networking is well established and the products used to connect together optical interfaces are based on existing standards. Products used in this environment must be of high quality and be extremely cost competitive to meet the LAN cost/performance requirements.

The Emerson Network Power Optical Connectivity Division builds products suited for the LAN, SAN, WAN and datacenter markets. These products are separated into two product families: (a) the Fiber-Conn Cable Management System and (b) the Enterprise Fiber Optic System. In this way we are able to provide the product to fit the requirements of each market without compromising performance. The products are correctly priced to fit the customers' needs and expectations for price/performance.

This guide provides a summary of the available fiber optic systems components used to network the high-performance optical interfaces of today's communications equipment. Section 1 is focused on the Fiber-Conn Cable Management System needed to support the optical fiber used in the LAN environment. Section 2 covers the Enterprise datacenter and SAN optical networking products. Both systems can exist in the same network providing the optimum products needed to do the job.

Section 1. Fiber-Conn Cable Management System

Introduction

This document is intended to provide you with guidelines for the physical management of your fiber optic installation. The importance of selecting the right fiber optic media is closely followed by the importance of choosing the right mechanical subsystem to support the installation. The following pages provide a view to the structure of the optical network and how the components can be used to develop a complete solution.

Figure 1 shows the networking hierarchy from the Main Cross-Connect to the end-user workstation. Most building LANs involve both vertical and horizontal distribution environments. There can also be optional distribution points (zoned distribution) to provide connections to workgroup systems. When planning your installation or upgrade, you need to consider these environments and how best to support them.

Optical Connectivity specializes in fiber optic interconnect products and solutions. There are many ways to build an optical network. Figure 2 shows a number of highly structured, yet flexible, solutions that can be considered to support the network. Today, optical networks are expected to support expanding demand for bandwidth. Many of the depicted solutions can be classified as “Plug-and-Play”. This means that no field-terminated fiber is used. The fiber interconnect components have been built in the factory to exacting specifications to ensure that they will support the current and future network needs while substantially reducing field labor costs and time.

Figure 3 is an example of a method for using the “Plug-and-Play” components to build your network. There are numerous methods that can be deployed to build the optical connection as shown in figure 2. All these adapter panels and optical cassettes are supported within the rack mount and wall mount enclosures. This makes it easy to organize the optical network and upgrade it in the future by adding, and in some cases reusing, what has been installed.

Once you have been introduced to the basic components used to build the optical network, it can be seen in Figure 4 that you can incorporate these mechanical systems into a real network to provide an organized solution that will expand as your network grows.

Looking closely at the horizontal wiring in Figure 5 we see a typical application of an optical network in the workgroup. Notice that this can coexist with copper cabled networks.

The same basic components are used throughout the network, from the simple workgroup to the most complex campus or WAN network as shown in Figure 6. Optical Connectivity provides the best in class optical cabling and mechanical systems to support your growing needs.

See the Page 12 for a summary of part number information covering Fiber-Conn fiber optic patch cables and mechanical systems. For more information please visit our WEB site (www.fiberconn.com/products.html) or call 1-800-879-3384 for more information.

Why “Plug-and-Play”?

Networking is expanding rapidly with continually evolving technology being deployed to provide needed resources. These constant changes require a fiber optic network that is easier to build and modify. Fiber-Conn has developed a set of products and systems that support the “Plug-and-Play” deployment of the optical network. This greatly improves the quality of the each connection, minimizes labor and controls cost. These products allow the installed network to meet the current demands and to grow gracefully. Nothing has to be thrown away; the “Plug-and-Play” components can be redeployed to meet new demands.

Fiber Optic Mechanical Hierarchy (Figure 1.)

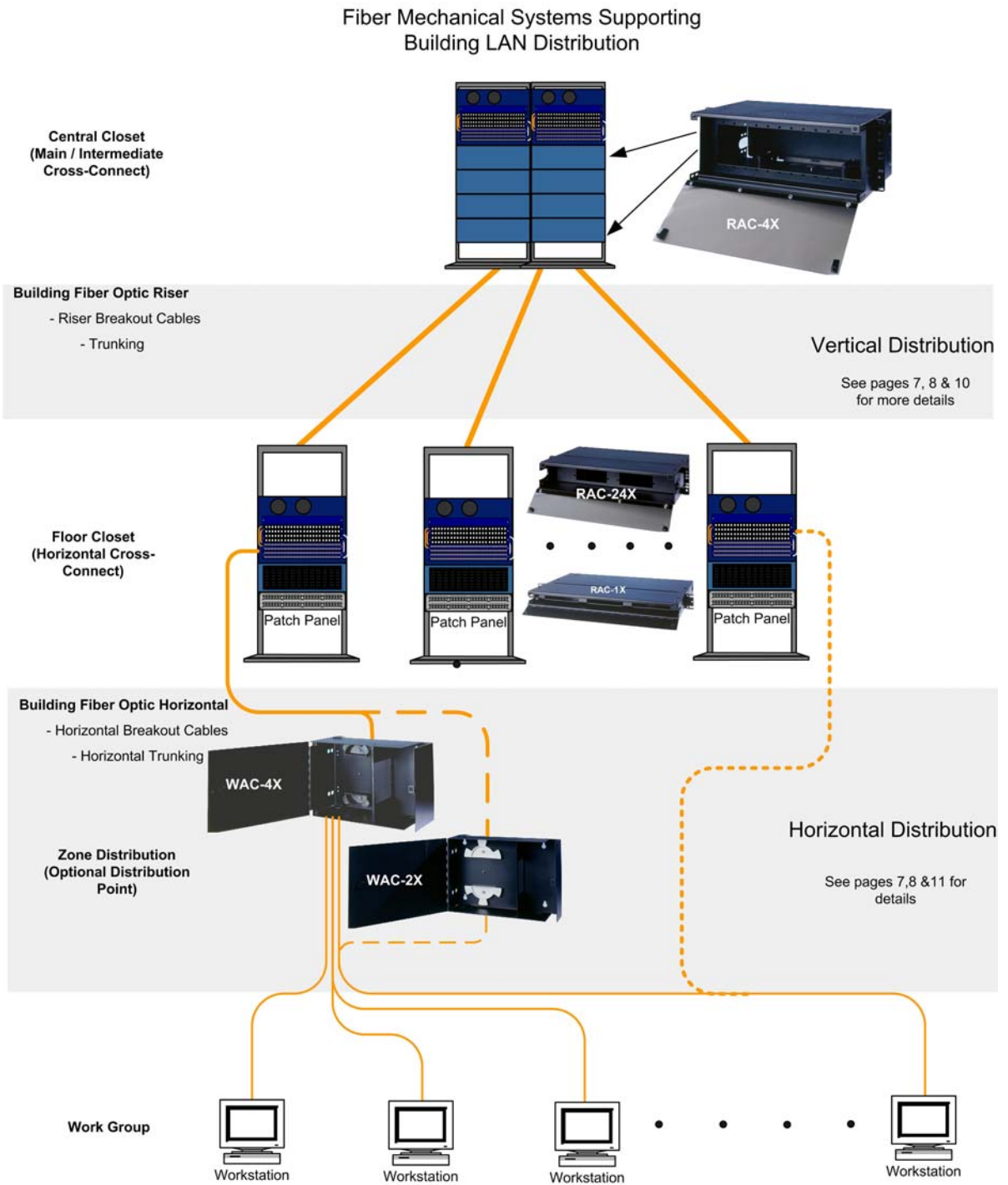


Figure 1.

LAN Connections, Field versus Factory Termination (Figure 2.)

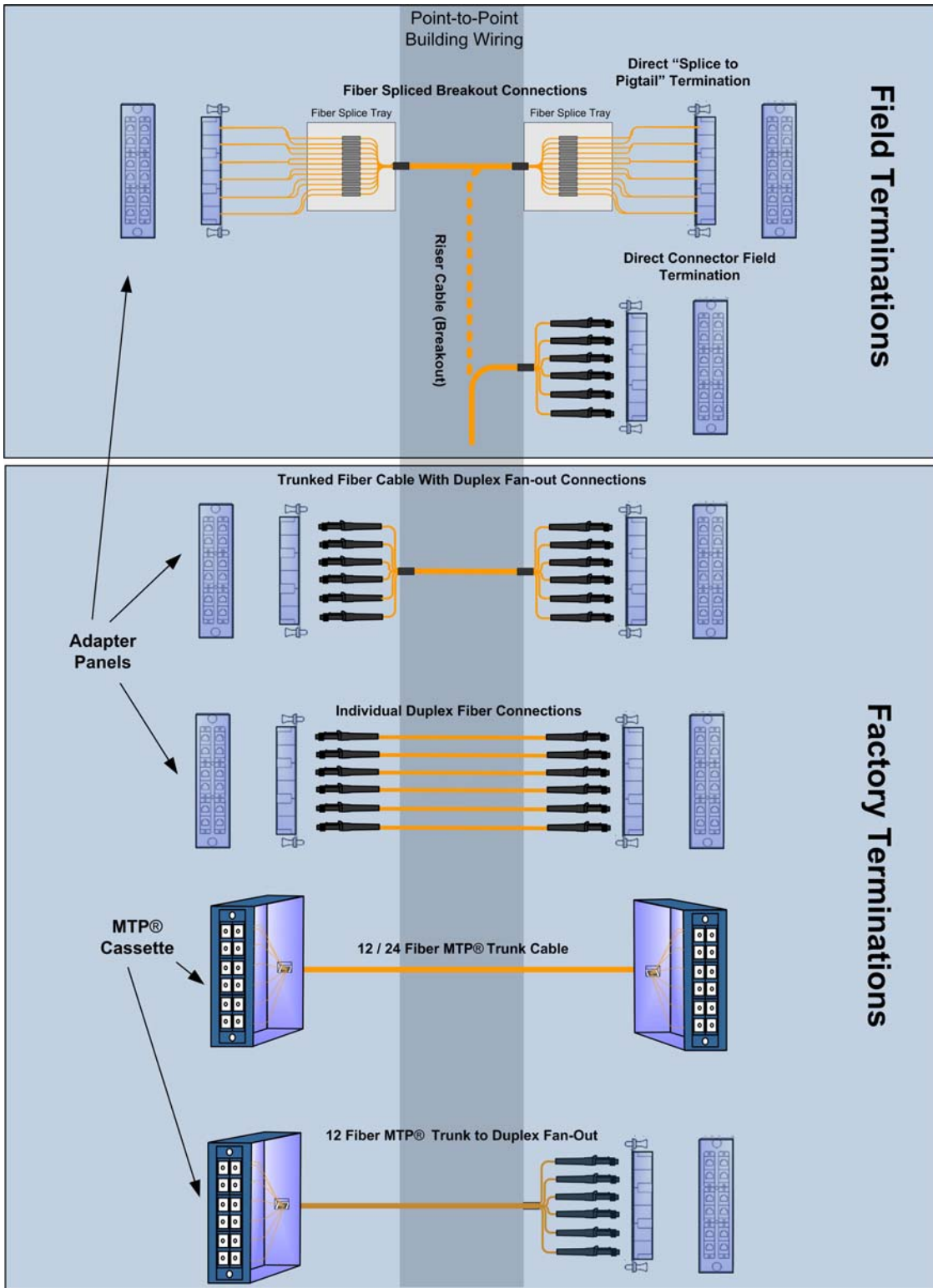
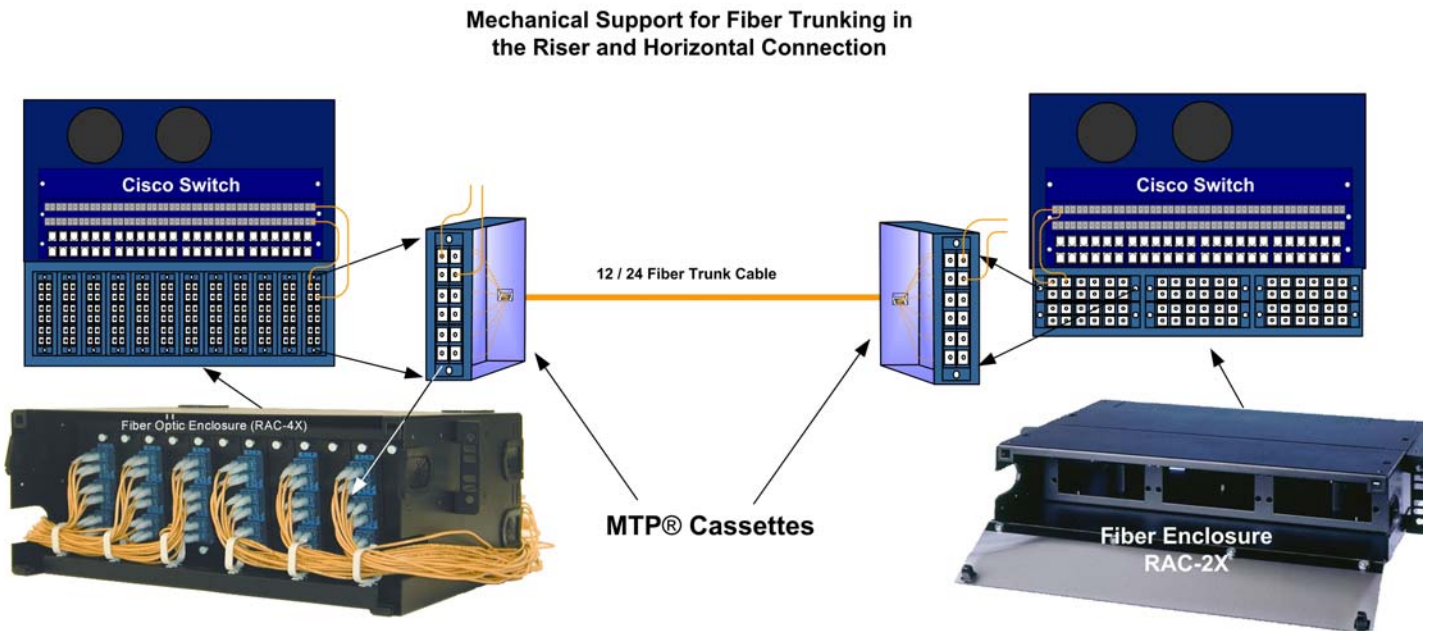


Figure 2.

Note: MTP® is a registered trademark of US Conec

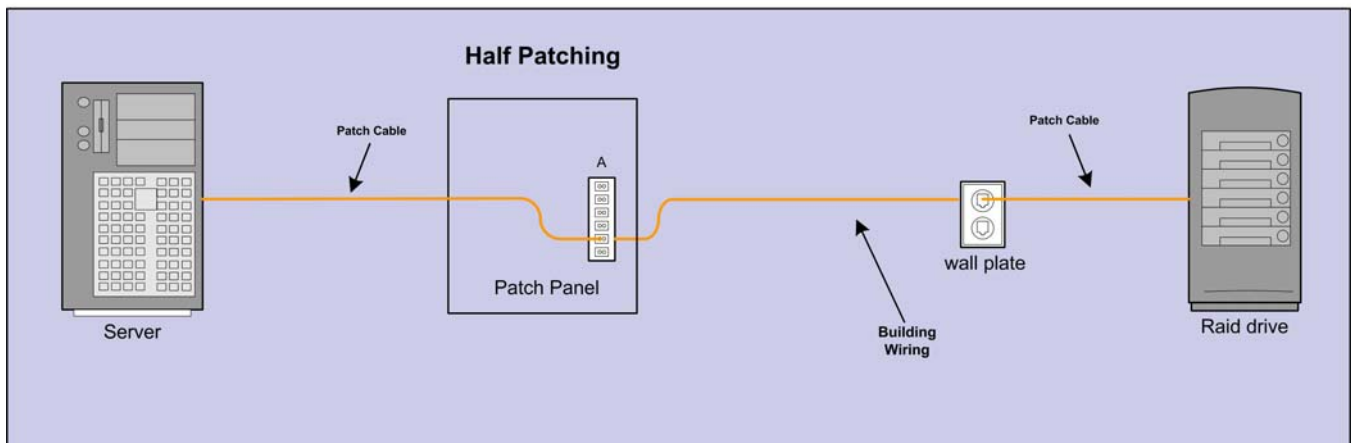
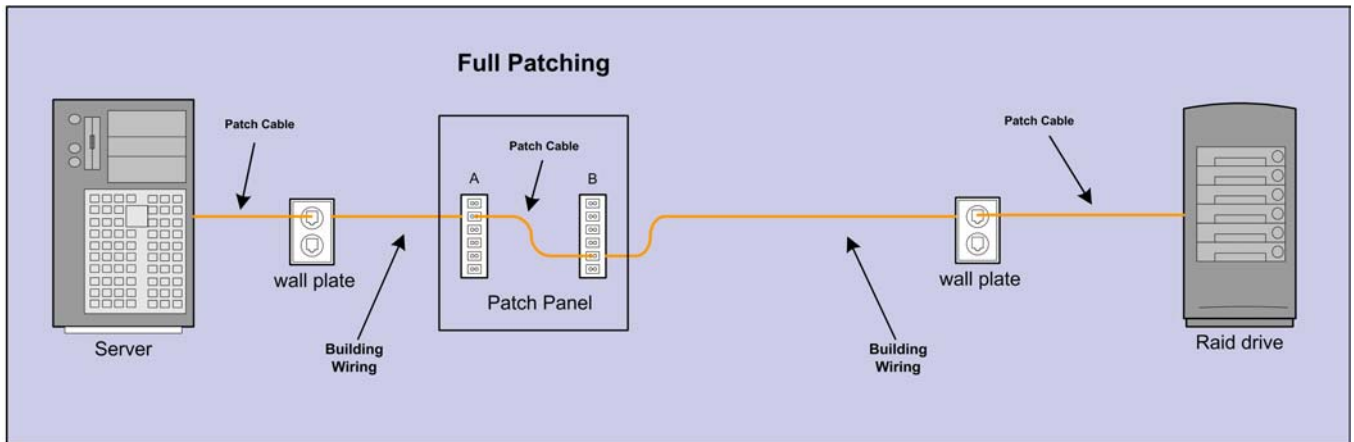
Fiber Optic Trunking (Figure 3.)



MTP® Cassette Part numbers	Description
CAQM-C2FB1-020	6 duplex SC adapters to the front terminating to 12-fiber multimode ribbon to 1 male MTP® connector with adapter at the rear
CAQM-42AB1-000	6 male MTRJ adapters to the front terminating to 12-fibers multimode ribbon to 1 male MTP® connector with adapter at the rear
CAQM-62FB1-020	6 duplex LC adapters to the front terminating to 12-fiber multimode ribbon to 1 male MTP® connector with adapter at the rear
CAQM-A2FB1-020	6 duplex ST adapters to the front terminating to 12-fiber multimode ribbon to 1 male MTP® connector with adapter at the rear
CAQM-42AF1-000	12 male MTRJ adapters to the front terminating to 24-fiber multimode ribbon to 2 male MTP® connectors with adapters at the rear
CAQM-62FF1-020	12 duplex LC adapters to the front terminating to 24-fiber multimode ribbon to 2 male MTP® connectors with adapters at the rear.

Figure 3.

Full versus Half Patching (Figure 3A)



Multi-Floor building Wiring Example (Figure 4.)

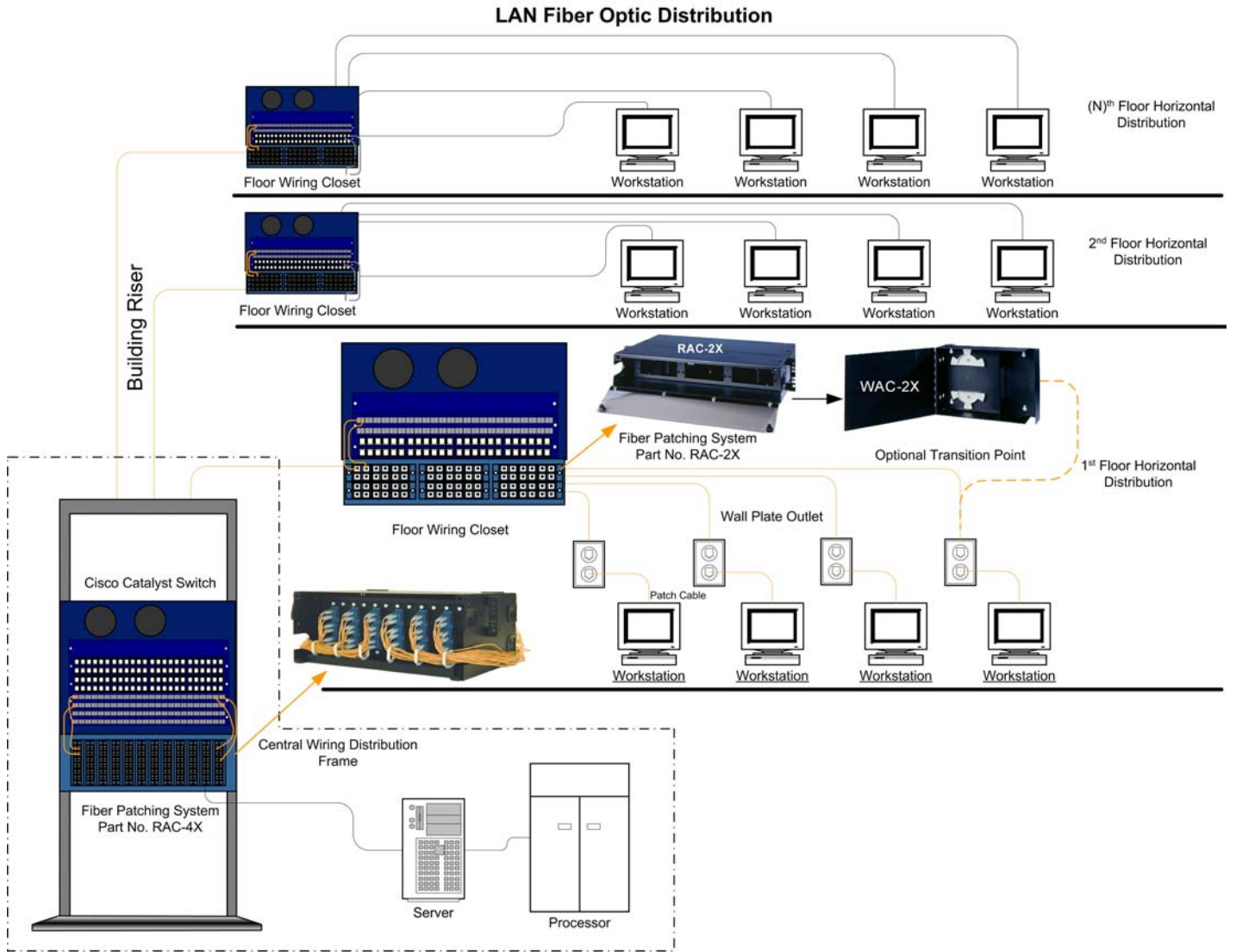


Figure 4.

Horizontal Fiber Optic Distribution (Figure 5.)

Horizontal Fiber Optic Distribution Within the Building

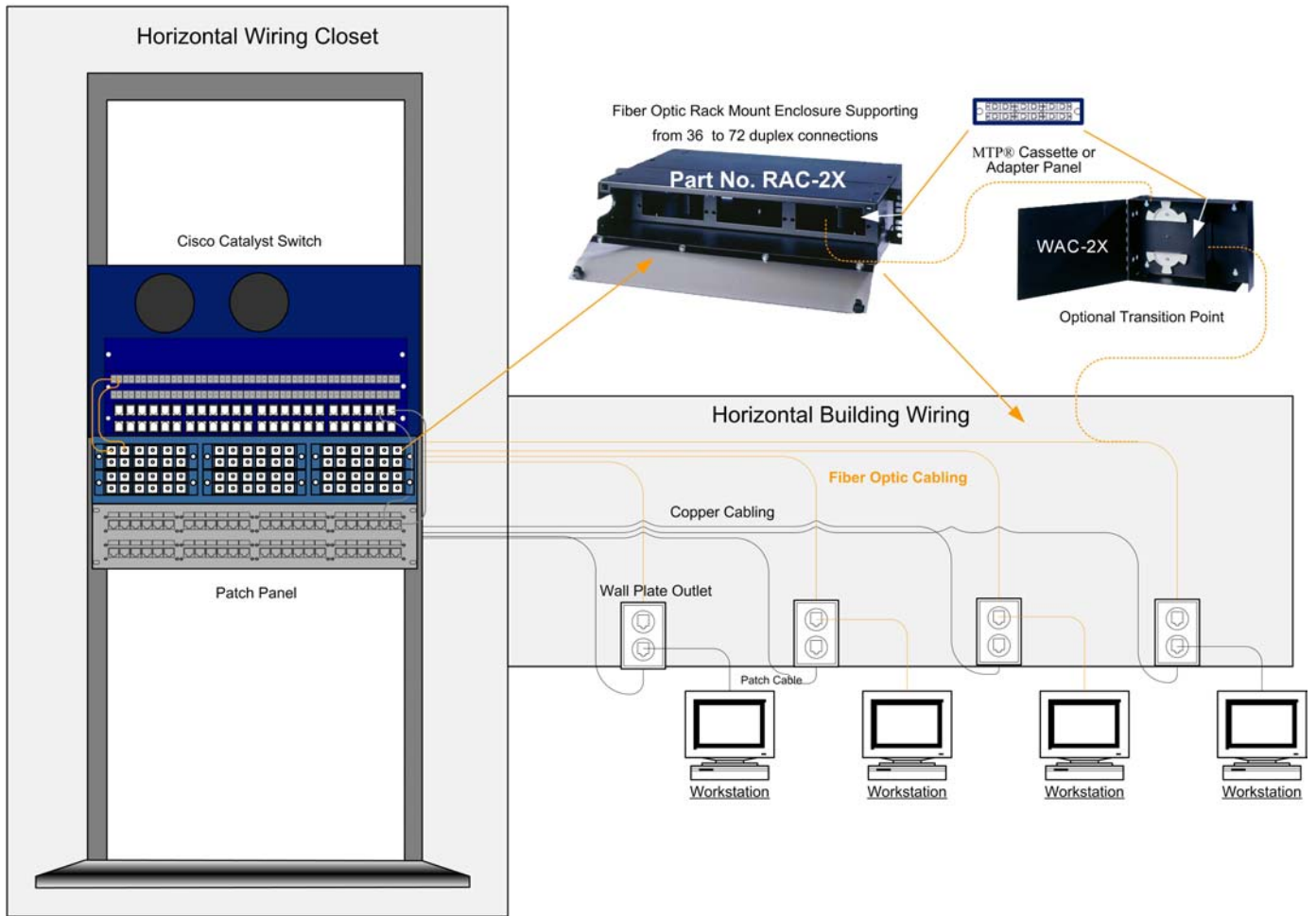


Figure 5.

An Example of a Campus / WAN Fiber Optic Network (Figure 6.)

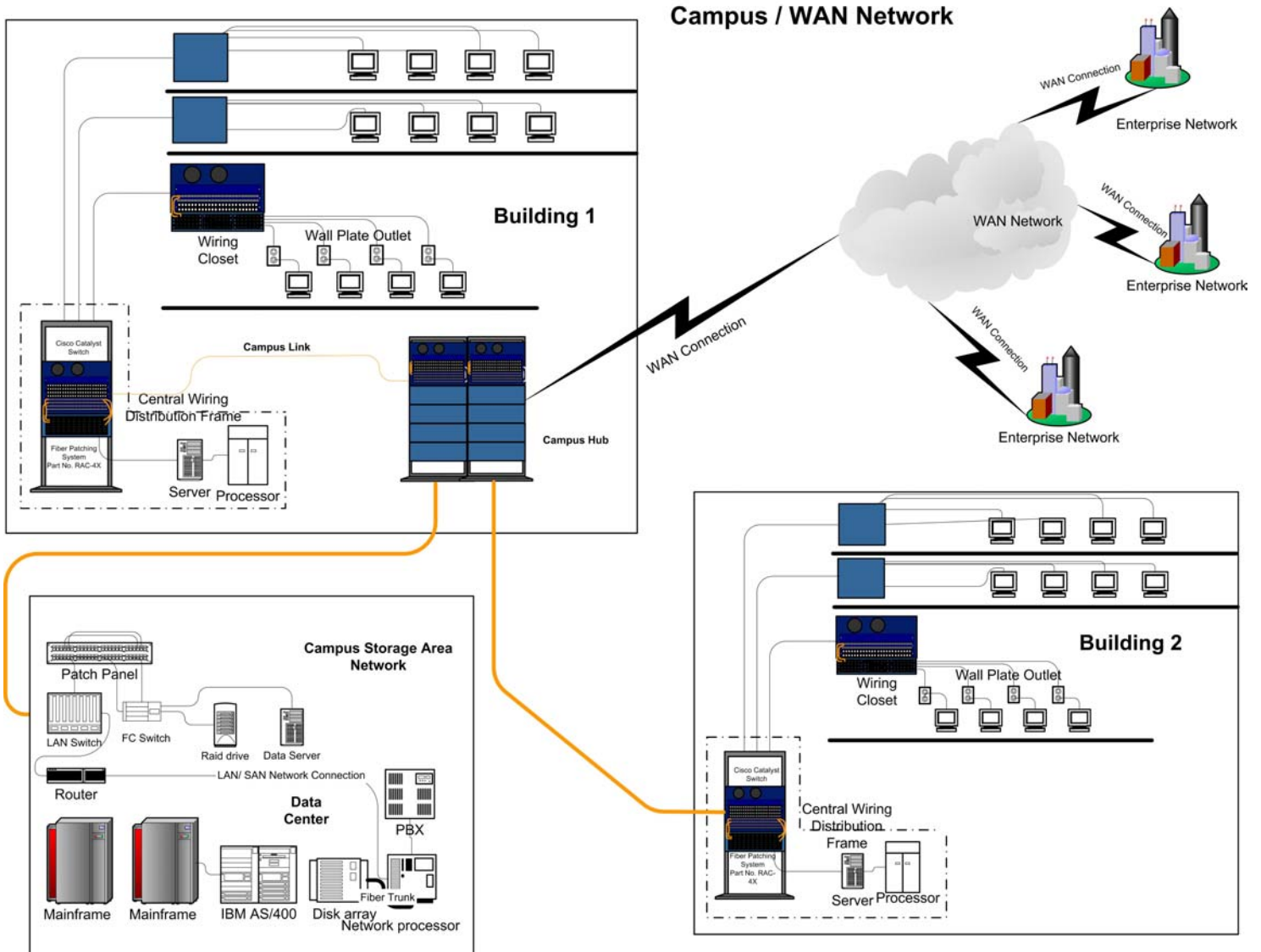


Figure 6.

Optical LAN Patch Cable Assemblies:

Note:

If you would like to order cables or need information on other fiber optic cables call 1-800-879-3384 or visit www.fiberconn.com/catalog.html

62.5/125 um, Multi-Mode Fiber Cable Part Number Matrix

Connector Type	MTRJ	SC	LC	Length in Meters
SC	V3H2VCJ2G12241007	VCJ3VCJ3G122M1007	VCJ256D2G12241007	2
	V3H2VCJ2G12241010	VCJ3VCJ3G122M1010	VCJ256D2G12241010	3
	V3H2VCJ2G12241017	VCJ3VCJ3G122M1017	VCJ256D2G12241017	5
	V3H2VCJ2G12241023	VCJ3VCJ3G122M1023	VCJ256D2G12241023	7
	V3H2VCJ2G12241033	VCJ3VCJ3G122M1033	VCJ256D2G12241033	10
LC	V3H256D2G12241007	VCJ256D2G12241007	56D256D2G12241007	2
	V3H256D2G12241010	VCJ256D2G12241010	56D256D2G12241010	3
	V3H256D2G12241017	VCJ256D2G12241017	56D256D2G12241017	5
	V3H256D2G12241023	VCJ256D2G12241023	56D256D2G12241023	7
	V3H256D2G12241033	VCJ256D2G12241033	56D256D2G12241033	10
ST	V3H2VAJ2G12241007	VAJ3VCJ3G122M1007	VAJ256D2G1224007	2
	V3H2VAJ2G12241010	VAJ3VCJ3G122M1010	VAJ256D2G1224010	3
	V3H2VAJ2G12241017	VAJ3VCJ3G122M1017	VAJ256D2G1224017	5
	V3H2VAJ2G12241023	VAJ3VCJ3G122M1023	VAJ256D2G1224023	7
	V3H2VAJ2G12241033	VAJ3VCJ3G122M1033	VAJ256D2G1224033	10
MTRJ	V3H2V3H2G12241007	V3H2VCJ2G12241007	V3H256D2G12241007	2
	V3H2V3H2G12241010	V3H2VCJ2G12241010	V3H256D2G12241010	3
	V3H2V3H2G12241017	V3H2VCJ2G12241017	V3H256D2G12241017	5
	V3H2V3H2G12241023	V3H2VCJ2G12241023	V3H256D2G12241023	7
	V3H2V3H2G12241033	V3H2VCJ2G12241033	V3H256D2G12241033	10

50/125 um, Multi-Mode Fiber Cable Part Number Matrix

Connector Type	SC	LC	Length in Meters
SC	VCD2VCD2G12244007	VCD256D2G12244007	2
	VCD2VCD2G12244010	VCD256D2G12244010	3
	VCD2VCD2G12244017	VCD256D2G12244017	5
	VCD2VCD2G12244023	VCD256D2G12244023	7
	VCD2VCD2G12244033	VCD256D2G12244033	10
LC	VCD256D2G12244007	56D256D2G12244007	2
	VCD256D2G12244010	56D256D2G12244010	3
	VCD256D2G12244017	56D256D2G12244017	5
	VCD256D2G12244023	56D256D2G12244023	7
	VCD256D2G12244033	56D256D2G12244033	10



9/125 um, Single-Mode Fiber Cable Part Number Matrix

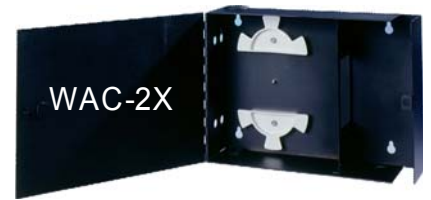
Connector Type	SC	LC	Length in Meters
SC	VCG3VCG3U132M2007	VCG256G2U13242007	2
	VCG3VCG3U132M2010	VCG256G2U13242010	3
	VCG3VCG3U132M2017	VCG256G2U13242017	5
	VCG3VCG3U132M2023	VCG256G2U13242023	7
	VCG3VCG3U132M2033	VCG256G2U13242033	10
LC	VCG256G2U13242007	56G256G2U13242007	2
	VCG256G2U13242010	56G256G2U13242010	3
	VCG256G2U13242017	56G256G2U13242017	5
	VCG256G2U13242023	56G256G2U13242023	7
	VCG256G2U13242033	56G256G2U13242033	10



Fiber Optic Mechanical Systems Parts Summary

Rack Mounted Fiber Optic Enclosures

Part Number	Product Description
RAC-1X	Unloaded 1U rack mount enclosure, supporting up to 3 adapter panels
RAC-12X	Unloaded 2U rack mount enclosure, supporting up to 2 adapter panels
RAC-24X	Unloaded 2U rack mount enclosure, supporting up to 4 adapter panels
RAC-2X	Unloaded 2U rack mount enclosure, supporting up to 6 adapter panels
RAC-4X	Unloaded 4U rack mount enclosure, supporting up to 12 adapter panels



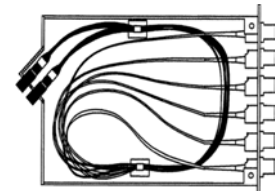
Wall Mount Fiber Optic Enclosures

Part Number	Product Description
WAC-1X	Unloaded wall-mount enclosure, supporting 1 adapter panel
WAC-2X	Unloaded wall-mount enclosure, supporting up to 2 adapter panels
WAC-4X	Unloaded wall-mount enclosure, supporting up to 4 adapter panels
WAC-8X	Unloaded wall-mount enclosure, supporting up to 8 adapter panels



MTP® Fiber Optic Cassettes - Prewired

Part number	Description
CAQM-C2FB1-020	6 duplex SC adapters to the front terminating to 12-fiber multimode ribbon to 1 male MTP® adapter at the rear, PB alignment sleeves
CAQM-42AB1-000	6 male MTRJ adapters to the front terminating to 12-fibers multimode ribbon to 1 male MTP® adapters at the rear
CAQM-62FB1-020	6 duplex LC adapters to the front terminating to 12-fiber multimode ribbon to 1 male MTP® adapter at the rear
CAQM-A2FB1-020	6 duplex ST adapters to the front terminating to 12-fiber multimode ribbon to 1 male MTP® adapter at the rear
CAQM-42AF1-000	12 male MTRJ adapters to the front terminating to 24-fiber multimode ribbon to 1 male MTP® adapters at the rear
CAQM-62FF1-020	12 duplex LC adapters to the front terminating to 24-fiber multimode ribbon to 1 male MTP® adapters at the rear.



MTP® Cassettes

Fiber Optic Adapters Panels used on Available Enclosures

Preloaded Adapter Panels	
Part No.	Description
AP-106ST	6 pack ST, Phosphorous Bronze insert MM/SM
AP-108ST	8 pack ST, Phosphorous Bronze insert MM/SM
AP-106SC	6 pack SC, Phosphorous Bronze insert MM/SM
AP-108SC	8 pack SC, Phosphorous Bronze insert MM/SM
AP-104DSC	4 pack SC duplex, Phosphorous Bronze insert MM/SM
AP-106DSC	6 pack SC duplex, Phosphorous Bronze insert MM/SM
AP-106MT-RJ	6 pack MT-RJ mating sleeve MM/SM
AP-106LC	6 pack LC duplex, Phosphorous Bronze insert MM/SM
AP-106FC	6 pack FC, Zirconia Ceramic insert MM
AP-108FC	8 pack FC, Zirconia Ceramic insert SM

Unloaded adapter panels are also available. Please call **1-800-879-3384** for more information.

We can also custom build adapter panels that are compatible with enclosures from other major manufacturers.



Preloaded Adapter Panels (Corning CCH Compatible)	
Part No.	Description
AP-106SC-CH	6 pack SC, Phosphorous Bronze insert MM/SM
AP-106DSC-CH	6 pack SC duplex, Phosphorous Bronze insert MM/SM
AP-106DSC-CH	6 pack (12 fiber) MT-RJ mating sleeve MM/SM
AP-112MTRJ-CH	12 pack (24 fiber) MT-RJ mating sleeve MM/SM
AP-106DLC-CH	6 pack (12 fiber) duplex LC, Phosphorous Bronze insert MM/SM
AP-106QLC-CH	6 pack (24 fiber) Quad LC, Phosphorous Bronze insert MM/SM



Preloaded Adapter Panels (Superior, Leviton Compatible)	
Part No.	Description
AP-106ST-SP	6 pack ST, Phosphorous Bronze insert MM/SM
AP-106SC-SP	6 pack SC, Phosphorous Bronze insert MM/SM
AP-106DSC-SP	6 pack SC duplex, Phosphorous Bronze insert MM/SM
AP-106MTRJ-SP	6 pack (12 fiber) MT-RJ mating sleeve MM/SM
AP-112MTRJ-SP	12 pack (24 fiber) MT-RJ mating sleeve MM/SM
AP-106LC-SP	6 pack LC duplex, Phosphorous Bronze insert MM/SM
AP-106FC-SP	6 pack FC, Zirconia Ceramic insert SM
AP-112FC-SP	12 pack FC, Zirconia Ceramic insert SM



Adapter Panels

Adapters	
Part No.	Description
516-00001	SC simplex, Phosphorous Bronze MM/SM
516-00002	SC simplex, Zirconia Ceramic SM
516-00003	SC simplex APC, Zirconia Ceramic SM
516-00004	SC duplex, Phosphorous Bronze MM/SM
516-00011	ST simplex, Phosphorous Bronze MM/SM
516-00012	ST simplex, Zirconia Ceramic SM
516-00013	ST duplex, Phosphorous Bronze MM/SM
516-00014	ST duplex, Zirconia Ceramic SM
516-00020	MT-RJ (SC footprint)
516-00030	FC simplex, Phosphorous Bronze, D-shape type MM/SM
516-00031	FC simplex, Zirconia Ceramic, D-shape type SM
516-00032	FC simplex APC, Phosphorous Bronze, D-shape type MM/SM
516-00033	FC simplex APC, Zirconia Ceramic, D-shape type SM
516-00034	FC simplex, Phosphorous Bronze, Square type MM/SM
516-00035	FC simplex, Zirconia Ceramic, Square type SM
516-00036	FC simplex APC, Phosphorous Bronze, Square type MM/SM
516-00037	FC simplex APC, Zirconia Ceramic, Square type SM
516-00040	LC simplex, Phosphorous Bronze MM/SM
516-00041	LC simplex, Zirconia Ceramic SM
516-00042	LC duplex, Phosphorous Bronze MM/SM
516-00043	LC duplex, Zirconia Ceramic SM



Fiber Optic Adapters

Hybrid Adapters	
Part No.	Description
516-00060	SC-ST simplex, Phosphorous Bronze MM/SM
516-00061	SC-ST simplex, Zirconia Ceramic SM
516-00062	SC-ST duplex, Phosphorous Bronze MM/SM
516-00063	SC-ST duplex, Zirconia Ceramic SM
516-00064	SC-FC simplex, Phosphorous Bronze MM/SM
516-00065	SC-FC duplex, Zirconia Ceramic SM

Unloaded Adapters Panels	
Part No.	Description
<p>Unloaded adapter panels are also available. Please call Fiber-Conn customer representatives for more information at 1-800-879-3384.</p>	

Section 2. Enterprise Fiber Optic Systems

Introduction

Storage Area Network (SAN) Defined

The basic assumption is that the SAN supports the connection of computing and storage devices using the serial SCSI protocol. This protocol can be transmitted using the traditional Fibre Channel connections or the new iSCSI protocol. Today the SAN and LAN are separate networks supporting different tasks. The SAN is designed to optimize the connection of mass storage systems to computers connected to the network. When iSCSI is deployed, the SAN and LAN functions can coexist on the same network.

The development of the serial SCSI protocol used over the Fibre Channel connection solves many of the limitations of the original parallel SCSI connections. The parallel SCSI protocol has been used to connect computers (servers) to the mass storage systems. When connecting to the storage systems using parallel SCSI there is a limit to the number of computers that can be connected and the distances supported. The serial SCSI protocol used in Fibre Channel networks has removed these limitations

SAN / NAS Cabling Considerations

When planning for the installation of a new optical network, serious consideration should be given to installing the fiber optic network with 50/125 μm optical fiber. SAN networks historically use 50/125 glass fiber while LAN structures historically have used 62.5/125 glass. When connecting 62.5/125 μm and 50/125 μm fiber wiring systems, as could happen when SAN and NAS applications are using the same installed fiber network there is added loss and reduced bandwidth. If the network is installed with 50 μm fiber only then both the SAN and NAS applications will have the same network structure and will benefit from the improved performance of 50 μm fiber.

While it is technically possible to use both 62.5/125 and 50/125 glass together in one network, it is our recommendation that mixing optical glass sizes should be avoided wherever possible. We recommend that Fibre Channel optical cabling guidelines be followed.

Fiber Optic Equipment and Patching Cables

When installing a new Host Bus Adapter (HBA), you will need to select the right cable to connect the HBA to the network. Table (1) describes the two types of duplex connectors that are typically used on the HBA products. Depending on the HBA option, you will

need to connect using either an SC or LC type duplex cable to interface the HBA port. Referring to the figures that are found on pages (22) and (23), you will see two examples of network connections that need to be made. You will also need to know what connector type that is used at the other end of the cable. This guide is intended to help you select the right cable.

Starting on page (26) of this guide, you will find a listing of the fiber optic cables that are available from the Enterprise Unit of the Optical Connectivity Division, Emerson Network Power. You will need to consider the following when selecting the cable:

- The connector type on the HUB, Fabric Switch or Director
- The connector used on the HBA
- The fiber type i.e., 50/125 μm , 62.5/125 μm multimode fiber or 8.3/125 μm singlemode.
 - Remember that it is necessary to match the fiber size to the fiber used in the network to avoid adding loss to the interconnect system.
- Distance limitations of the installed fiber.
 - This may limit the length of the cable you select and the placement of active equipment.

Fiber Optic Speed/Distance Characteristics (Table 1)

Fiber Optic Cable	Maximum Length
62.5/125 μm (multimode)	300 meters at 1.0625 Gb/s 150 meters at 2.125 Gb/s
50/125 μm (multimode)	500 meters at 1.0625 Gb/s 300 meters at 2.125 Gb/s
8.3/125 μm (single mode)	10,000 meters at 1.0625 Gb/s 10,000 meters at 2.125 Gb/s

Note: For information on 4 Gbps and 10 Gbps applications please call

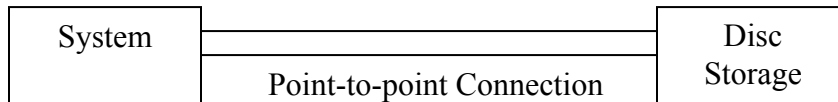
Optical Fiber Bandwidth versus Distance

When transmitting digital information through a multimode graded index fiber, the signal is affected by modal-dispersion. This causes the digital impulse to spread out as it travels through the fiber. At some point, the adjacent bits begin to interfere and information is lost. This is why the maximum lengths depicted in the table on this page show that the fiber lengths are reduced as the signal rate increases. Notice also that 62.5 μm fiber cable supports shorter distances than 50 μm fiber. This is because the modal path and other causes of dispersion are greater in the 62.5 μm fiber than in 50 μm fiber. 62.5/125 μm glass has higher dispersion and therefore has lower bandwidth per kilometer of fiber and typically higher attenuation. 50/125 glass on average performs better than 62.5/125 glass at the 850 nm wavelength which is the wavelength of the VCSELs (Vertical Cavity Surface Emitting Lasers) used in many Fibre Channel links. For these reasons, 50/125 μm glass is commonly used in Fibre Channel applications and should be considered when planning your network.

Fibre Channel Topologies

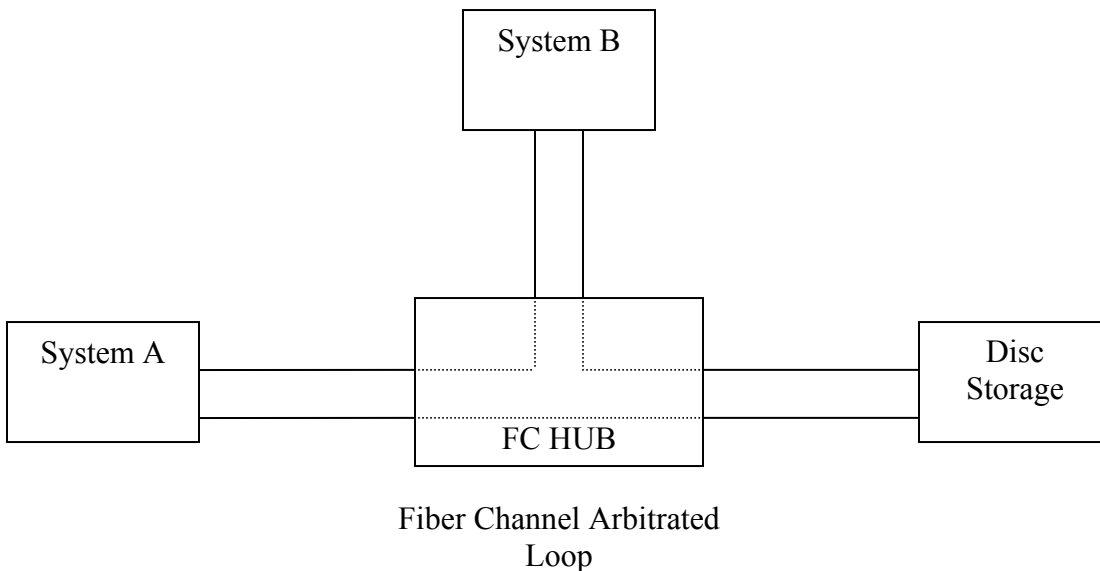
Point-to-Point

Allows the connection of an N_Port on one device to a corresponding N_Port on a second device to form the simplest Fibre Channel network.



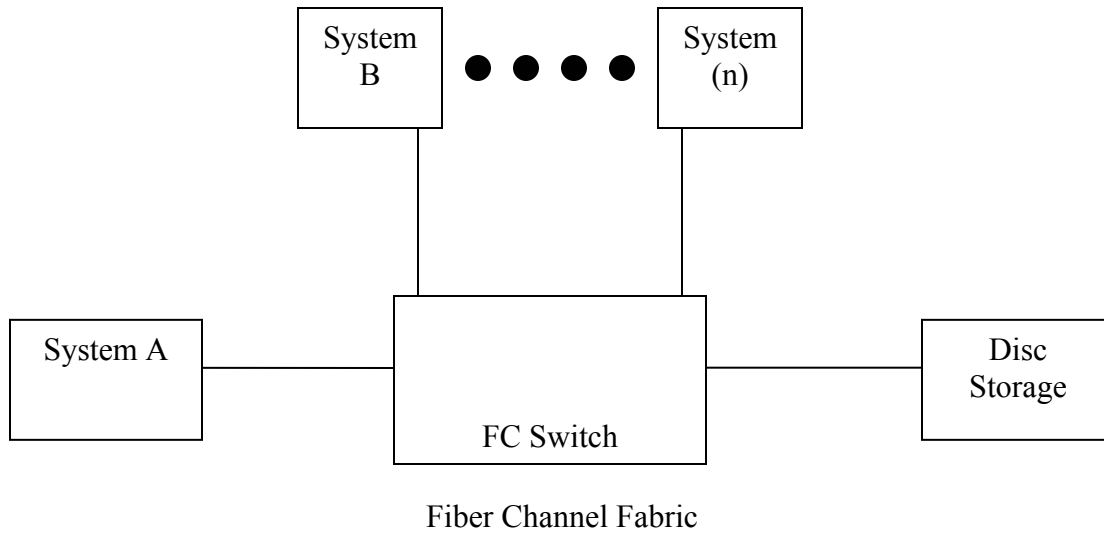
Arbitrated Loop

This configuration was added to the topology to lower the cost of connecting multiple systems into the Fibre Channel network. The connection between systems is via the NL_Port and another NL_Port on a second device or the FL_Port of a Fiber Channel switch or NL_Port of a HUB. The wiring used when connecting through a FC HUB is referred to as “star” wiring. In the Arbitrated Loop all attached devices share the same medium therefore each device must arbitrate for access to the network. Every node in the Arbitrated Loop must share the bandwidth of the channel that it connects to; therefore the performance is limited by the number of devices on the network. A maximum of 126 nodes can be connected to the loop.



Fabric

Systems connected into the Fabric topology connect from an N_Port of the device to an F_Port of the Fabric Switch. Each device is assigned a 24 bit address and can operate at the full speed of the Fibre Channel port. In theory up to 16 million nodes could be connected to the fabric.



Section 2. (Planning Considerations)

Typical Connector Types used in Fibre Channel and Datacenter Networks



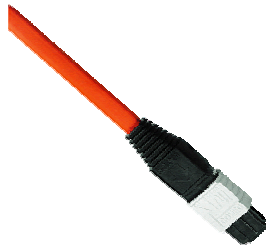
SC styles:

Originally developed by NTT, the SC connector has a push/pull snap fit. The duplex SC connector uses the same mating profile as the simplex design. A number of SC suppliers actually clip simplex SC connectors together to form the duplex version. The ceramic ferrule diameter is 2.5 mm



LC style:

a small form factor ceramic based connector developed by Lucent, uses a 1.25 mm ceramic ferrule.



MTP® style:

A connector supporting multiple fibers in a ribbon configuration. This interface can support 12 or more fibers and is used for connecting fiber trunks in a datacenter or SAN network.

Exhibit 1.

SC, LC & MTP® Fiber Optic Connector Types Predominantly Used in Storage Area Networks

Typical SAN Logical Diagram

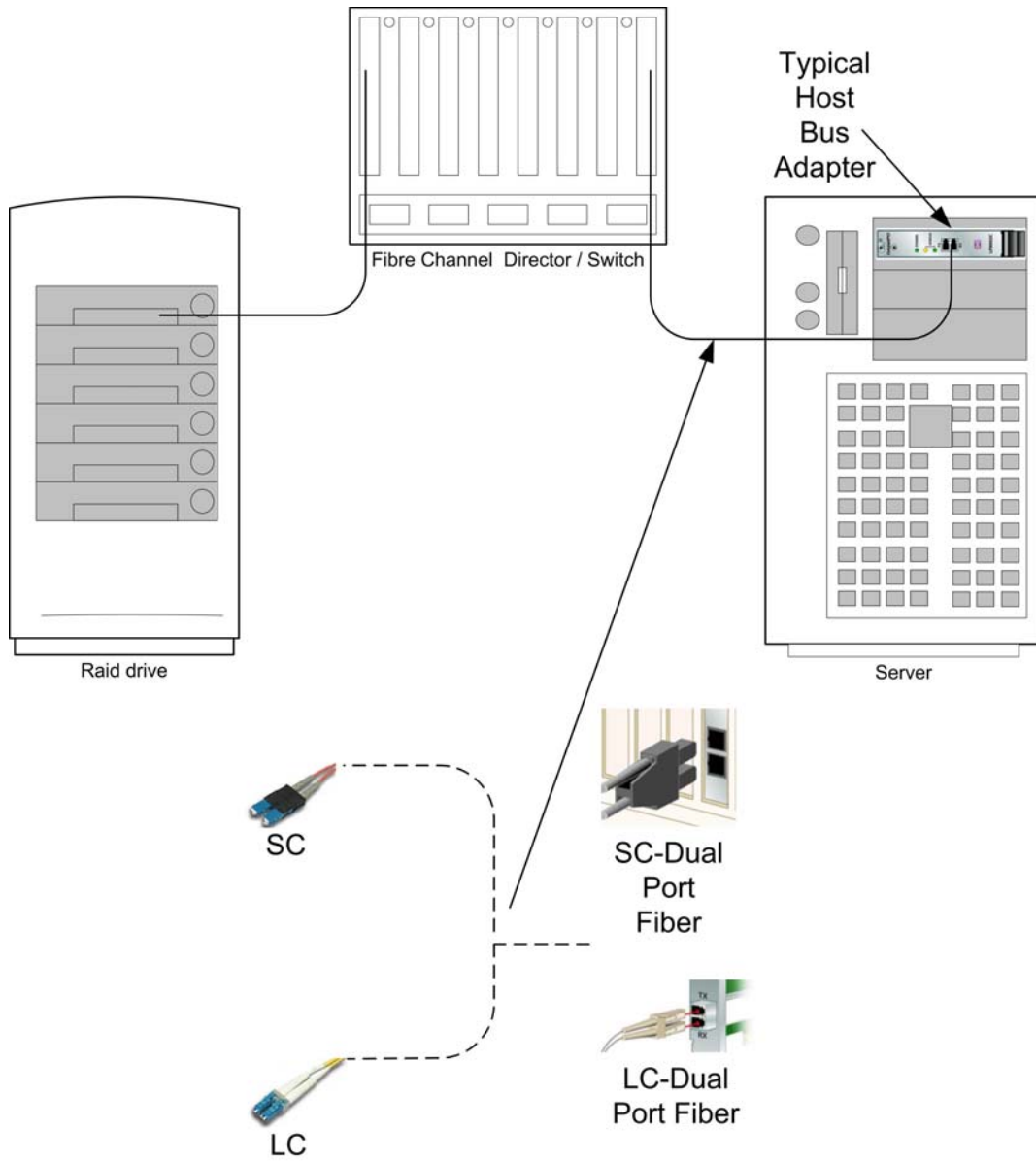
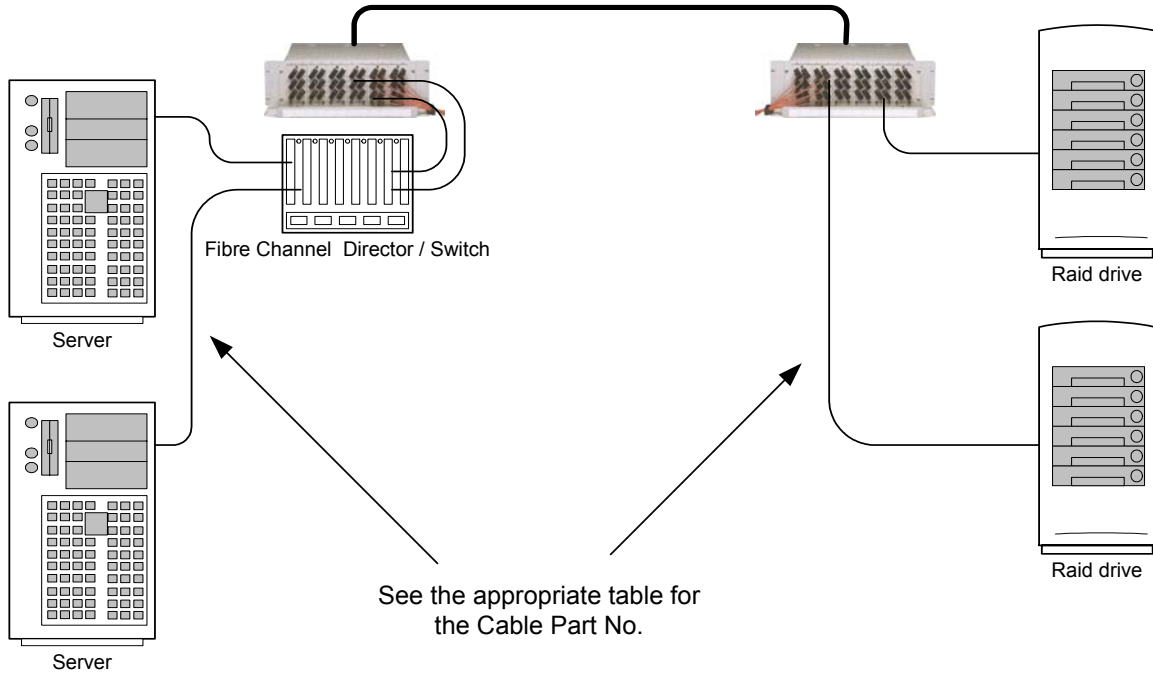


Figure 1.

HBA - Fibre Channel Logical Diagram

Example Network Diagram

See the Fiber Optic Trunking Section for Information on Enclosures



See Pages 26-29 for the cable part numbers

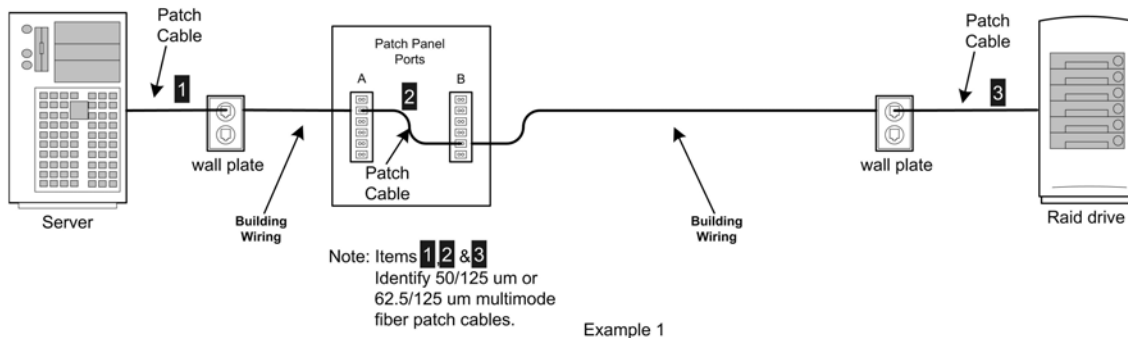
Fiber Optic Cabling in the Enterprise

How Many Cables are needed?

Refer to pages (22) & (23). The first figure depicts a simplified logical diagram. This diagram shows the end-to-end connection but not the detail needed to plan for your cabling needs. As stated earlier, you need to understand the connectors used at every interface so that the correct cables can be ordered. The detailed design drawing on page 23 identifies every connector interface in the system. Your network documentation should list the distances and fiber type for every point-to-point link in the network. Now that you know the type of fiber and the installed cable length, you can determine if there is a channel available for you to use and how much cable can be added to the link without exceeding the maximum length. If equipment is being added to support your server or storage device then there may be more patching and equipment cables required to make the connections to the network. Remember that each mated connector pair adds loss (attenuation), typically 0.5dB and that these losses can reduce the link distance. Check with your equipment manufacturer for more information.

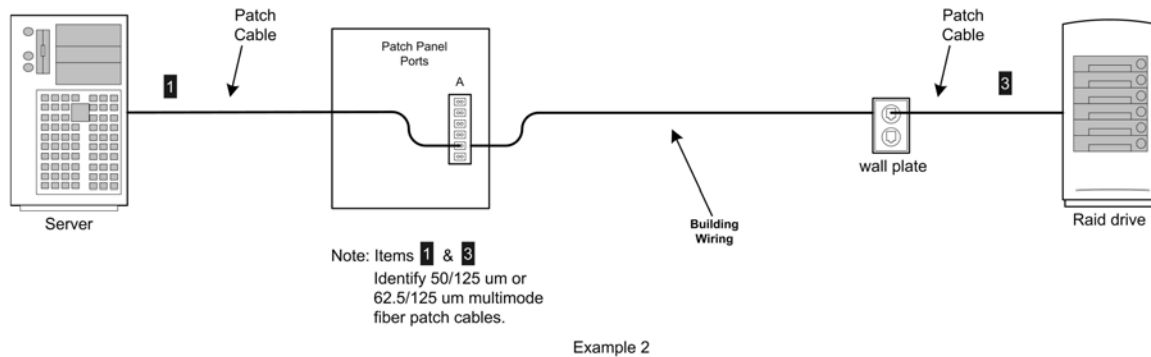
Example Link Configurations

Refer to the following examples showing some of the configurations that may be used in your Fibre Channel network. Reviewing these examples will highlight some of the things that need to be considered when ordering the cables that you need to connect your system components.



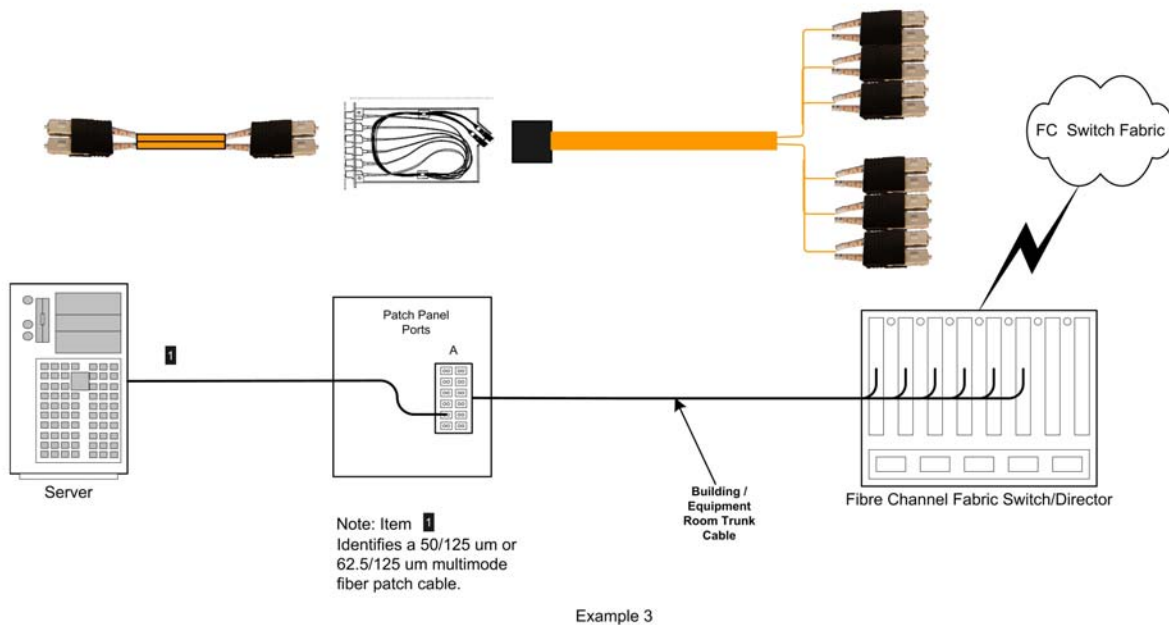
Example (1) shows a configuration where the server is not located near the storage device and therefore the connection must be made using the building wiring. This is a point-to-point connection, which is the simplest Fibre Channel network type. Notice that there is a patch panel field used in this configuration. This allows the building wiring on the floor to be terminated and managed with a patch cable (2) being used to complete the point-to-point connection. In this example you will need three fiber optic patch cable

assemblies to connect the systems. The connectors used on the patch cables must match the connectors at each connector interface. It is important to survey your specific network to be sure that the correct cables are ordered.



Example (2) shows another point-to-point Fibre Channel network but in this case the server is located near the patch panel and therefore can connect directly to the panel using a fiber optic patch cable. In this example the storage device is located in another room and the building wiring is used to make the connection. Notice that two patch cords are required (**1** & **3**).

MTP® Trunking Example:



The final example, example 3, shows a Fibre Channel network built using a fabric switch. This is the most versatile FC network and can in theory connect millions of nodes. In this example the connection to the switch is accomplished using a fiber optic trunk cable. The trunk cable shown in this diagram supports twelve fibers (six duplex fiber connections). Fiber optic trunk cables and associated termination hardware systems are also available.

Optical Connectivity (Cable Assembly Lists)

SC Cable Assemblies:

Part Number

<i>LC-SC 50μm Multimode Fiber</i>	Length in Meters	Type
JZ2-050LS002C	2	Riser
JZ2-050LS003C	3	Riser
JZ2-050LS005C	5	Riser
JZ2-050LS007C	7	Riser
JZ2-050LS010C	10	Riser
JZ2-050LS015PC	15	Plenum
JZ2-050LS020PC	20	Plenum
JZ2-050LS025PC	25	Plenum

<i>LC-SC 62.5μm Multimode Fiber</i>	Length in Meters	Type
JZ2-062LS002C	2	Riser
JZ2-062LS003C	3	Riser
JZ2-062LS005C	5	Riser
JZ2-062LS007C	7	Riser
JZ2-062LS010C	10	Riser
JZ2-062LS015PC	15	Plenum
JZ2-062LS020PC	20	Plenum
JZ2-062LS025PC	25	Plenum

<i>LC-SC 8.3μm Singlemode Fiber</i>	Length in Meters	Type
JZ2-010LS002C	2	Riser
JZ2-010LS003C	3	Riser
JZ2-010LS005C	5	Riser
JZ2-010LS007C	7	Riser
JZ2-010LS010C	10	Riser
JZ2-010LS015PC	15	Plenum
JZ2-010LS020PC	20	Plenum
JZ2-010LS025PC	25	Plenum

SC-SC 50μm Multimode Fiber	Length in Meters	Type
JZ-050SS002C	2	Riser
JZ-050SS003C	3	Riser
JZ-050SS005C	5	Riser
JZ-050SS007C	7	Riser
JZ-050SS010C	10	Riser
JZ-050SS015PC	15	Plenum
JZ-050SS020PC	20	Plenum
JZ-050SS025PC	25	Plenum

SC-SC 62.5μm Multimode Fiber	Length in Meters	Type
JZ-062SS002C	2	Riser
JZ-062SS003C	3	Riser
JZ-062SS005C	5	Riser
JZ-062SS007C	7	Riser
JZ-062SS010C	10	Riser
JZ-062SS015PC	15	Plenum
JZ-062SS020PC	20	Plenum
JZ-062SS025PC	25	Plenum

SC-SC 8.3μm Singlemode Fiber	Length in Meters	Type
JZ-010SS002C	2	Riser
JZ-010SS003C	3	Riser
JZ-010SS005C	5	Riser
JZ-0102SS007C	7	Riser
JZ-010SS010C	10	Riser
JZ-010SS015PC	15	Plenum
JZ-0102SS020PC	20	Plenum
JZ-0102SS025PC	25	Plenum

LC Cable Assemblies:

Part Number

<i>LC-SC 50μm Multimode Fiber</i>	Length in Meters	Type
JZ2-050LS002C	2	Riser
JZ2-050LS003C	3	Riser
JZ2-050LS005C	5	Riser
JZ2-050LS007C	7	Riser
JZ2-050LS010C	10	Riser
JZ2-050LS015PC	15	Plenum
JZ2-050LS020PC	20	Plenum
JZ2-050LS025PC	25	Plenum

<i>LC-SC 62.5μm Multimode Fiber</i>	Length in Meters	Type
JZ2-062LS002C	2	Riser
JZ2-062LS003C	3	Riser
JZ2-062LS005C	5	Riser
JZ2-062LS007C	7	Riser
JZ2-062LS010C	10	Riser
JZ2-062LS015PC	15	Plenum
JZ2-062LS020PC	20	Plenum
JZ2-062LS025PC	25	Plenum

<i>LC-SC 8.3μm Singlemode Fiber</i>	Length in Meters	Type
JZ2-010LS002C	2	Riser
JZ2-010LS003C	3	Riser
JZ2-010LS005C	5	Riser
JZ2-010LS007C	7	Riser
JZ2-010LS010C	10	Riser
JZ2-010LS015PC	15	Plenum
JZ2-010LS020PC	20	Plenum
JZ2-010LS025PC	25	Plenum

LC-LC 50μm Multimode Fiber	Length in Meters	Type
JZ2-050LL002	2	Riser
JZ2-050LL003	3	Riser
JZ2-050LL005	5	Riser
JZ2-050LL007	7	Riser
JZ2-050LL010	10	Riser
JZ2-050LL015P	15	Plenum
JZ2-050LL020P	20	Plenum
JZ2-050LL025P	25	Plenum

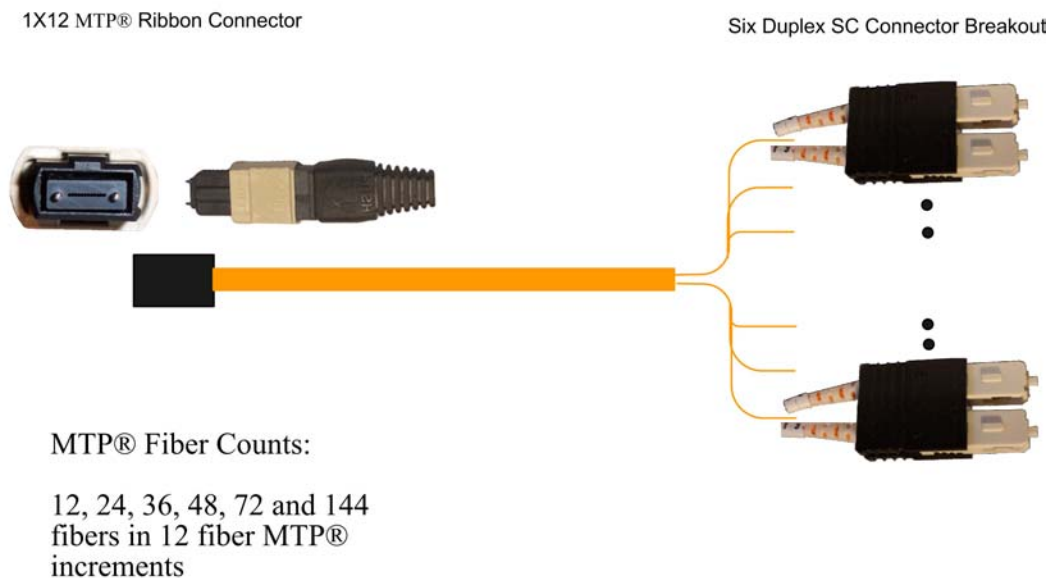
LC-LC 62.5μm Multimode Fiber	Length in Meters	Type
JZ2-062LL002	2	Riser
JZ2-062LL003	3	Riser
JZ2-062LL005	5	Riser
JZ2-062LL007	7	Riser
JZ2-062LL010	10	Riser
JZ2-062LL015P	15	Plenum
JZ2-062LL020P	20	Plenum
JZ2-062LL025P	25	Plenum

LC-LC 8.3μm Singlemode Fiber	Length in Meters	Type
JZ2-010LL002	2	Riser
JZ2-010LL003	3	Riser
JZ2-010LL005	5	Riser
JZ2-010LL007	7	Riser
JZ2-010LL010	10	Riser
JZ2-010LL015P	15	Plenum
JZ2-010LL020P	20	Plenum
JZ2-010LL025P	25	Plenum

Fiber Optic Trunking

Page (9) shows an example of a system designed to use fiber optic trunking. This is an ideal way to build a network with preinstalled connectors for a plug-and-play environment. It assures maximum performance with minimum onsite labor required to install the network. Refer to the following pages for a list of some of the available cable assembly products used to build this type of system. There are many more products and options available from Connectivity-Solution, Emerson Network Power. For additional information and design support contact our LoDan Totowa, NJ office.

MTP®-SC Fiber Trunk Cable Example



Note: Fiber trunking solutions are built to order. The lengths that are shown in the parts list are for reference only.

Contact Information: Optical Connectivity, Enterprise Unit
20-F Commerce Way
Totowa, NJ 07512
USA
Tel: 973-890-1606
Fax: 973-890-1610

<http://www.conn-solutions.com/solutions.htm>

Fiber Trunks: MTP® - MTP® Multimode - 50/125

Part No.	Description	Length
J72-050MM050F	MTP®-MTP® 36 Channel/72 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	50 feet
J72-050MM050PF	MTP®-MTP® 36 Channel/72 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	50 feet
J144-050MM050F	MTP®-MTP® 72 Channel/144 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	50 feet
J144-050MM050PF	MTP®-MTP® 72 Channel/144 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	50 feet
J144-050MM100PF	MTP®-MTP® 72 Channel/144 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	100 feet
J144-050MM100F	MTP®-MTP® 72 Channel/144 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	100 feet
J72-050MM100PF	MTP®-MTP® 36 Channel/72 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	100 feet
J72-050MM100F	MTP®-MTP® 36 Channel/72 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	100 feet
J72-050MM150F	MTP®-MTP® 36 Channel/72 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	150 feet
J72-050MM150PF	MTP®-MTP® 36 Channel/72 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	150 feet
J144-050MM150F	MTP®-MTP® 72 Channel/144 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	150 feet
J144-050MM150PF	MTP®-MTP® 72 Channel/144 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	150 feet

Fiber Trunks: SC - MTP® Multimode - 50/125

Part No.	Description	Length
J72-050MS050CF	SC-MTP® 36 Channel/72 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	50 feet
J72-050MS050PCF	SC-MTP® 36 Channel/72 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	50 feet
J72-050MS100PCF	SC-MTP® 36 Channel/72 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	100 feet
J72-050MS100CF	SC-MTP® 36 Channel/72 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	100 feet
J72-050MS150CF	SC-MTP® 36 Channel/72 Fiber 50/125u Mic RISER Leadtime: Typically 3 weeks.	150 feet
J72-050MS150PCF	SC-MTP® 36 Channel/72 Fiber 50/125u Mic Plenum Leadtime: Typically 3 weeks.	150 feet

Fiber Trunks: MTP® - SC Direct Attach Multimode - 50/125

Part No.	Description	Length
V23857-B2069-A3	MTP®-SC DIRECT ATTACHED HARNESS 50/125u RISER Leadtime: Typically 3 weeks.	8.5 feet
V23857-B2069-A4	MTP®-SC DIRECT ATTACHED HARNESS 50/125u RISER Leadtime: Typically 3 weeks.	12 feet

Fiber Trunks: MTP® - MTP® Multimode - 62.5/125

Part No.	Description	Length
J72-062MM050F	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	50 feet
J72-062MM050PF	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	50 feet
J144-062MM050F	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	50 feet
J144-062MM050PF	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	50 feet
JR72-062MM050PF	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u RIBBON Plenum Leadtime: Typically 3 weeks.	50 feet
JR144-062MM050PF	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u RIBBON Plenum Leadtime: Typically 3 weeks.	50 feet
JR144-062MM100PF	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u RIBBON Plenum Leadtime: Typically 3 weeks.	100 feet
JR72-062MM100PF	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u RIBBON Plenum Leadtime: Typically 3 weeks.	100 feet
J144-062MM100PF	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	100 feet
J144-062MM100F	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	100 feet
J72-062MM100PF	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	100 feet
J72-062MM100F	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	100 feet
J72-062MM150F	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	150 feet
J72-062MM150PF	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	150 feet

Part No.	Description	Length
J144-062MM150F	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	150 feet
J144-062MM150PF	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	150 feet
JR72-062MM150PF	MTP®-MTP® 36 Channel/72 Fiber 62.5/125u RIBBON Plenum Leadtime: Typically 3 weeks.	150 feet
JR144-062MM150PF	MTP®-MTP® 72 Channel/144 Fiber 62.5/125u RIBBON Plenum Leadtime: Typically 3 weeks.	150 feet

Fiber Trunks: SC - MTP® Multimode - 62.5/125

Part No.	Description	Length
J72-062MS050CF	SC-MTP® 36 Channel/72 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	50 feet
J72-062MS050PCF	SC-MTP® 36 Channel/72 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	50 feet
J72-062MS100PCF	SC-MTP® 36 Channel/72 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	100 feet
J72-062MS100CF	SC-MTP® 36 Channel/72 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	100 feet
J72-062MS150CF	SC-MTP® 36 Channel/72 Fiber 62.5/125u Mic RISER Leadtime: Typically 3 weeks.	150 feet
J72-062MS150PCF	SC-MTP® 36 Channel/72 Fiber 62.5/125u Mic Plenum Leadtime: Typically 3 weeks.	150 feet

Fiber Trunks: MTP® - SC Direct Attach Multimode - 62.5/125


Part No.	Description	Length
V23857-B2069-A3	MTP®-SC DIRECT ATTACHED HARNESS 62.5/125u RISER Leadtime: Typically 3 weeks.	8.5 feet
V23857-B2069-A4	MTP®-SC DIRECT ATTACHED HARNESS 62.5/125u RISER Leadtime: Typically 3 weeks.	12 feet

Note: See the Emerson Network Power, Optical Connectivity WEB Site for information on fiber trunks and harnesses used with the enclosure system. The pictures in the following tables are intended to be representative but may vary from the actual products.

www.conn-solutions.com/catalog/index.asp

Enterprise Fiber Optic Mechanical Systems




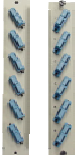



Fiber Enclosure 6-U

	Part No. Description
	FB6-ENCL Fiber Enclosure 6U high, not loaded Leadtime: Typically 1 week.
	FB6-Blank Blank Faceplate Leadtime: Typically 1 week.

Fiber Enclosure 6-U (Continued)

	<p>FB6-MOD-QN-62 Module, 6U high, loaded with (1) 6 ESCON to 1 MTP® male internal harness, 62.5/125um Leadtime: Typically 1 week.</p>
	<p>FB6-MOD-QN-50 Module, 6U high, 6 ESCON to 1 MTP® male internal harness, 50/125um Leadtime: Typically 1 week</p>
	<p>FB6-MOD-KN-62 Module, 6U high, 12 MTRJ male to 2 MTP® male internal harnesses, 62.5/125um Leadtime: Typically 1 week.</p>
	<p>FB6-MOD-KN-50 Module, 6U high, 12 MTRJ male to 2 MTP® male internal harnesses, 50/125um Leadtime: Typically 1 week</p>
	<p>FB6-MOD-LN-62 Module, 6U high, 12 LC to 2 MTP® male harnesses, 62.5/125um Leadtime: Typically 1 week</p>
	<p>FB6-MOD-LN-50 Module, 6U high, 12 LC to 2 MTP® male internal harnesses, 50/125um Leadtime: Typically 1 week</p>
	<p>FB6-MOD-SN-62 Module, 6U high, 6 SC duplex to 1 MTP® male internal harness, 62.5/125um Leadtime: Typically 1 week</p>
	<p>FB6-MOD-SN-50 Module, 6U high, 6 SC duplex to 1 MTP® male internal harness, 50/125um Leadtime: Typically 1 week</p>

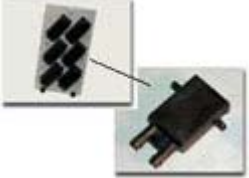


6U Faceplates

	Part No. Description
	FB6-QQ-MM Faceplate, 6U high, 6 ESCON to ESCON multimode adapters Leadtime: Typically 1 week
	FB6-QT-MM Faceplate, 6U high, 6 ESCON to ST multimode adapters Leadtime: Typically 1 week
	FB6-SS-MM Faceplate, 6U high, 6 SC duplex to SC duplex multimode adapters Leadtime: Typically 1 week
	FB6-SS-SM Faceplate, 6U high, 6 SC duplex to SC duplex singlemode adapters Leadtime: Typically 1 week
	FB6-ST-MM Faceplate, 6U high, 6 SC duplex to ST multimode adapters Leadtime: Typically 1 week
	FB6-LL-MM Faceplate, 6U high, 12 LC duplex to LC duplex multimode adapters Leadtime: Typically 1 week
	FB6-LL-SM Faceplate, 6U high, 12 LC duplex to LC duplex singlemode adapters Leadtime: Typically 1 week
	FB6-RR-MM Faceplate, 6U high, 12 MTRJ to MTRJ multimode adapters Leadtime: Typically 1 week


Fiber Enclosure 4-U

	Part No. Description
	<p>FB4-ENCL Enclosure, 4U high, not loaded Leadtime: Typically 1 week.</p>
	<p>FB4-MOD-QN-62 Module, 4U high, 6 ESCON to 1 MTP® male internal harness, 62.5/125um Leadtime: Typically 1 week.</p> <p>FB4-MOD-QN-50 Module, 4U high, 6 ESCON to 1 MTP® male internal harness, 50/125m Leadtime: Typically 1 week.</p>
	<p>FB4-MOD-SN-50 Module, 4U high, 6 SC duplex to 1 MTP® male internal harness, 50/125um Leadtime: Typically 1 week.</p> <p>FB4-MOD-SN-62 Module, 4U high, 6 SC duplex to 1 MTP® male internal harness, 62.5/125um Leadtime: Typically 1 week.</p> <p>FB4-MOD-SH-10 Module, 4U high, 6 SC duplex to 1 MTP® male internal harness, 8.3~10/125um Leadtime: Typically 1 week.</p>
	<p>FB4-MOD-LN-50 Module, 4U high, 12 LC duplex to 2 MTP® male internal harnesses, 50/125um Leadtime: Typically 1 week.</p> <p>FB4-MOD-LN-62 Module, 4U high, 12 LC duplex to 2 MTP® male internal harnesses, 62.5/125um Leadtime: Typically 1 week.</p> <p>FB4-MOD-LH-10 Module, 4U high, 12 LC to 2 MTP® male internal harnesses with singlemode 8.3~10/125 glass Leadtime: Typically 1 week.</p>

Fiber Enclosure 4-U (Continued)

	<p>FB4-MOD-KN-50 Module, 4U high, 12 MTRJ male to 2 MTP® male internal harnesses, 50/125um Leadtime: Typically 1 week.</p>
	<p>FB4-MOD-KN-62 Module, 4U high, 12 MTRJ male to 2 MTP® male internal harnesses, 62.5/125um Leadtime: Typically 1 week.</p>
	<p>FB4-QT-MM Escon-ST multimode Faceplate 6 Channel Leadtime: Typically 1 week.</p>
	<p>FB4-QQ-MM Escon-Escon multimode Faceplate 6 Channel Leadtime: Typically 1 week.</p>
	<p>FB4-ST-MM SC Duplex-ST multimode Faceplate 6 Channel Leadtime: Typically 1 week.</p> <p>FB4-ST-SM SC duplex-ST singlemode Faceplate 6 Channel Leadtime: Typically 1 week.</p>

Fiber Enclosure 4-U (Continued)

	<p>FB4-Blank Blank Faceplate Leadtime: Typically 1 week.</p>
-----------------------------------------------------------------------------------	-----------------------------------------------------------------------------

Fiber Enclosure 1-U

	Part No. Description
	FB1-EN-TOUM-24 1U Enclosure (24) Channel SC to ST Duplex Adapters MM Unloaded, No MPO Couplers Or Harnesses Included Leadtime: Typically 1 week.
	FB1-EN-SOUM-24 1U Enclosure (24) Channel SC to SC Duplex Adapters MM Unloaded, No MPO Couplers Or Harnesses Included Leadtime: Typically 1 week.
	FB1-EN-LOUM-24 1U Enclosure (24) Channel LC to LC Duplex Adapters MM Unloaded, No MPO Couplers Or Harnesses Included Leadtime: Typically 1 week.
	FB1-EN-ROUM-24 1U Enclosure (24) Channel MTRJ to MTRJ Adapters MM Unloaded, No MPO Couplers Or Harnesses Included Leadtime: Typically 1 week.
	FB1-EN-TOUS-24 1U Enclosure (24) Channel SC to ST Duplex Adapters SM Unloaded, No MPO Couplers Or Harnesses Included Leadtime: Typically 1 week.
	FB1-EN-SOUS-24 1U Enclosure (24) Channel SC to SC Duplex Adapters SM Unloaded, No MPO Couplers Or Harnesses Included Leadtime: Typically 1 week.
	FB1-EN-LOUS-24 1U Enclosure (24) Channel LC to LC Duplex Adapters SM Unloaded, No MPO Couplers Or Harnesses Included Leadtime: Typically 1 week



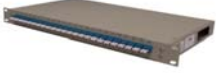
1U Faceplate Panels

	Part No. Description
	<p>FB1-FP-TM-24 Faceplate Only 24 Channel SC to ST Duplex Adapters Multimode, 50/125 or 62.5/125 Leadtime: Typically 1 week.</p>
	<p>FB1-FP-SM-24 Faceplate Only 24 Channel SC to SC Duplex Adapters Multimode 50/125 or 62.5/125 Leadtime: Typically 1 week.</p>
	<p>FB1-FP-LM-24 Faceplate Only 24 Channel LC to LC Duplex Adapters Multimode, 50/125 or 62.5/125 Leadtime: Typically 1 week.</p>
	<p>FB1-FP-RR-24 Faceplate Only 24 Channel MTRJ to MTRJ Duplex Adapters Multimode, 50/125 or 62.5/125 Leadtime: Typically 1 week.</p>
	<p>FB1-FP-TS-24 Faceplate Only 24 Channel SC to ST Duplex Adapters Singlemode, 8.3~10/125 Leadtime: Typically 1 week.</p>
	<p>FB1-FP-SS-24 Faceplate Only 24 Channel SC to SC Duplex Adapters Singlemode, 8.3~10/125 Leadtime: Typically 1 week.</p>
	<p>FB1-FP-LS-24 Faceplate Only 24 Channel LC to LC Duplex Adapters Singlemode, 8.3~10/125 Leadtime: Typically 1 week.</p>

Prewired Fiber Enclosure 1U

	Part No. Description
	<p>FB1-EN-CTMLM 1U fiber enclosure, (12) Channel SC to (2) MTP®, loaded w/(2) 62.5/125 um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-CQMLM 1U fiber enclosure, (12) Channel ESCON to (2) MTP®, loaded w/(2) 62.5/125 um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-BTMLM 1U fiber enclosure, (12) Channel SC to (2) MTP®, loaded w/(2) 50/125um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-CTMLM-24 1U fiber enclosure, (24) Channel SC to (4) MTP®, loaded w/(4) 62.5/125 um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-CLMLM-24 1U fiber enclosure, (24) Channel LC to (4) MTP®, loaded w/(4) 62.5/125 um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-CRMLM-24 1U fiber enclosure, (24) Channel MTRJ to (4) MTP®, loaded w/(4) 62.5/125 um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-BTMLM-24 1U fiber enclosure, (24) Channel SC to (4) MTP®, loaded w/(4) 50/125 um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-BLMLM-24 1U fiber enclosure, (24) Channel LC to (4) MTP®, loaded w/(4) 50/125 um harnesses Leadtime: Typically 1 week.</p>

Prewired Fiber Enclosure 1U (Continued)

	<p>FB1-EN-BRMLM-24 1U fiber enclosure, (24) Channel MTRJ to (4) MTP®, loaded w/(4) 50/125 um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-ATMLS-24 1U fiber enclosure, (24) Channel SC to (4) MTP®, loaded w/(4) 10/125 um harnesses Leadtime: Typically 1 week.</p>
	<p>FB1-EN-ALMLS-24 1U fiber enclosure, (24) Channel LC to (4) MTP®, loaded w/(4) 10/125 um harnesses Leadtime: Typically 1 week.</p>



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