



Perle Fast Ethernet Fiber to Fiber

Media Converter

Module

Installation Guide

C-100MM-XXXXX

Unmanaged Module

CM-100MM-XXXXX

Managed Module



Overview

This document contains instructions necessary for the installation and operation of the Perle Fast Ethernet Fiber to Fiber Media Converter Module(s) (C-100MM and CM-100MM) that are used in conjunction with a Perle MCR chassis. The C-100MM are the unmanaged media converter modules, and the CM-100MM are the managed versions. These products allow dissimilar 100Base-X fiber interfaces to connect to each other.

These are the fiber to fiber conversion models:

- Multimode to Multimode (MM)
- Multimode to Single Mode (SM)
- Multimode to Single Mode Single Strand (SM)

These media converter modules operate over different wavelengths and distances, depending on the model selected (See tables below). For information on the management options of the CM-100MM converter module, refer to the MCR-MGT Module User's Guide.

Fiber port 1 – MM1

Model	Connector	Mode	Distance	Wavelength (TX/RX)
All models	SC/ST/LC	MM.	2 km/1.2 mi.	1310 nm

Fiber port 2 – MM2/SM2

Model	Connector	Mode	Distance	Wavelength (TX/RX)
C-100MM-M2xx2 CM-100MM-M2xx2	SC/ST/LC	MM	2 km/1.2 mi.	1310 nm
C-100MM-S2xx20 CM-100MM-S2xx20	SC/ST/LC	SM	20 km/12.4 mi	1310 nm
C-100MM-S2xx40 CM-100MM-S2xx40	SC/ST/LC	SM	40 km/24.9 mi	1310 nm
C-100MM-S2xx80 CM-100MM-S2xx80	SC/ST/LC	SM	80 km/49.7 mi	1550 nm
C-100MM-S2xx120 CM-100MM-S2xx120	SC/ST/LC	SM	120 km/74.6mi	1550 nm
C-100MM-S1SC20U CM-100MM-S1SC20U	SC	SM	20 km/12.4 mi.	1310/1550 nm

C-100MM-S1SC20D CM-100MM-S1SC20D	SC	SM	20 km/12.4 mi.	1550/1310 nm
C-100MM-S1SC40U CM-100MM-S1SC40U	SC	SM	40 km/24.9 mi.	1550/1310 nm
C-100MM-S1SC40D CM-100MM-S1SC40D	SC	SM	40 km/24.9 mi.	1550/1310 nm

Note: Please refer to Perle's web site for the most up to date Installation guides, models and specifications

<http://www.perle.com/>

Installation

The media module comes equipped with a bank of DIP switches and jumpers for setting configuration. The default DIP switch settings (all switches in the UP position) and jumper settings will work for most installations.

The following steps are used to configure the Perle Fast Media Converter Module:

- Set the Auto-Config jumper. (CM-100MM only) (optional)
- Set the DIP switch settings. (optional).
- Insert the media module into the chassis.
- Connect fiber cable 1 to port MM1.
- Connect fiber cable 2 to port MM2/SM2.

Auto-Config Jumper (CM-100MM only)

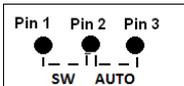
The Auto-Config jumper is J5.

Refer to the diagram below for labelling. This jumper only applies to the CM-100MM converter module.

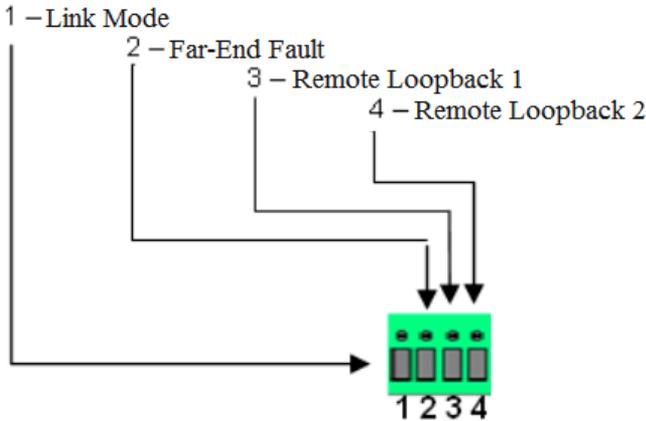
Auto (Pin 2 and Pin 3 are strapped): When set to Auto. At power up the media module will, check its internal flash memory to see if configuration information has been downloaded to it from a management module. If so, the media module will use this configuration as its running configuration. If there is no configuration in flash, the media module will read the settings of the DIP switches and use those settings as its running configuration.

SW (Pin 1 and Pin 2 are strapped): When set to SW (Switch). At power up, the media module will read the settings of the DIP switches and use those settings as its running configuration. The media module will ignore any configuration information in its flash memory.

Note: The default jumper setting is Auto



DIP Switch Settings



Note: All switch changes take effect immediately and will result in a link reset on both fiber ports.

Link Mode (Switch 1)

Switch Position	Mode
Up (default)	Link Pass-Through Mode
Down	Standard Mode

Link Pass-Through: In this mode, the link state on one fiber connection is directly reflected through the media module to the other fiber connection.

Standard Mode: In this mode, each fiber link can be brought up and down independently of each other. A loss of link on either fiber connection can occur without affecting the other fiber connection.

Far End Fault (Switch 2)

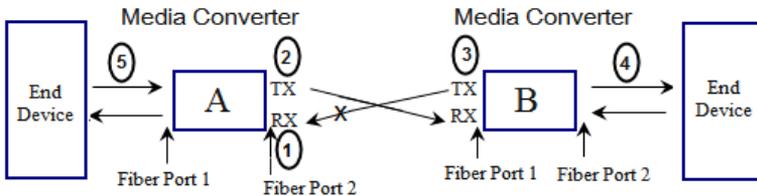
Switch Position	Mode
Up (default)	Enabled
Down	Disabled

Enabled: If the media module detects a loss of fiber signal on the fiber receiver, the media module will immediately send a FEF on the transmitter of its fiber link to the remote end module. This, in effect, notifies the fiber link partner that an error condition exists on the fiber connection.

Note: This switch needs to be set to either generate or detect the Far-End Fault signal.

Disabled: The media module will not monitor for, or generate Far End Fault.

Illustration of the FEF feature



Media Converter A Configuration

Link Mode—Standard Mode

Far-End Fault—Enabled

Media Converter B Configuration

Link Mode—Link Pass Through Mode

Far-End Fault—Enabled

Sequence of Events

1. Media module **A** loses fiber connection (RX) on MM2/SM2.
2. Media module **A** sends FEF on transmitter (TX) MM2/SM2.
3. Media module **B** detects loss of fiber link on receiver RX – MM2/SM2.
4. Media module **B** turns off transmitter (TX) on MM1.
5. Media module **A** MM1 is not affected.

Remote Loopback Fiber 1 (Switch 3)

Switch Position	Mode
Up (default)	Disabled
Down	Enabled

Disabled: This is the normal position for regular operation. The switch must be set to this position in order for data to pass through the media module.

Enabled: This is a test mode. All data received on the receive (RX) fiber connection is looped back to the transmit (TX) fiber connection.

Note: Only one fiber interface can be in loopback at a time.

Remote Loopback Fiber 2 (Switch 4)

Switch Position	Mode
Up (default)	Disabled
Down	Enabled

Disabled: This is the normal position for regular operation. The switch must be set to this position in order for data to pass through the media module.

Enabled: This is a test mode. All data received on the receive (RX) fiber connection is looped back to the transmit (TX) fiber connection.

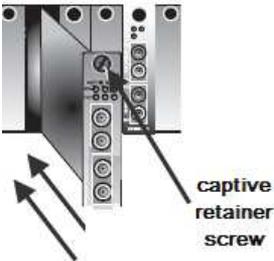
Note: Only one fiber interface can be in loopback at a time.

Installing Media Converter Modules

Caution: Observe electrostatic discharge precautions when installing the media module(s) into the chassis. Failure to observe this caution could result in damage to the module(s) and/or chassis.

The Perle media module can be installed in any available slot and in any order within the MCR chassis.

- Remove the media module from its packaging.
- Using a cross-head screwdriver, remove the screw holding the face plate to the chassis to reveal the slot opening.
- Set the jumpers and DIP switches on the media module to the desired operating mode. (optional)
- Locate the top and bottom alignment guides inside the MCR chassis.
- Using the module alignment guides gently slide the module into the slot until it becomes flush with the front of the chassis. Light pressure may be needed to seat the module. Do not force the module as you might cause damage. If there is resistance, remove the module and check the module connector for damaged or incorrectly aligned pins. If these are not damaged, retry to insert the module.
- Tighten the captive retainer screw to ensure the media module is locked in place.
- Remove the dust caps from the fiber connectors and connect the fiber cables.



Removing Media Convert Modules

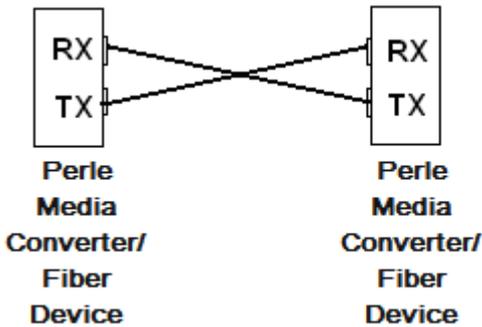
Loosen the captive retainer screw on the front of the media module and gently pull the module towards you.

If not inserting a replacement media module cover the opened slot with a face plate and secure the screw.

Installing the Duplex Fiber Cable

Locate a 100Base-X compliant duplex (2 strands) fiber cable with the appropriate connectors.

Connect the fiber cables from the media module to the other media module/switch/fiber device ensuring that the RX and TX are reversed at the opposite end.



Installing the Simplex Fiber Cable

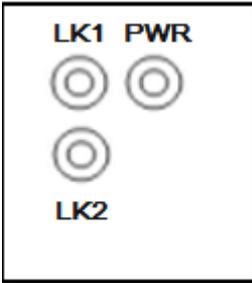
Locate a 100Base-X compliant simplex (1 strand) fiber cable with appropriate connectors.

Connect the fiber cable from one media module to another media module/converter/switch/fiber device.

Operation

Status LED

The Perle Fast Ethernet Media Converter modules have three single colored status LEDs located on the face plate of the module.



PWR - Power/Test

- **On**- Power is on, the module is operating normally.
- **Blinking- slowly**: the module is in loopback mode.
- **Blinking- quickly**: the module has a hardware error.

LK1 – MM1 (Fiber Link 1) Activity

- **On**- Fiber link present.
- **Blinking- quickly**: Fiber link present and receiving data.
- **Off**- No fiber link present.

LK2 – MM2/SM2 (Fiber Link 2) Activity

- **On**- Fiber link present.
- **Blinking- quickly**: Fiber link present and receiving data.
- **Off**- No fiber link present

Troubleshooting

General

- Ensure the module is correctly seated to the backplane in the MCR chassis. The PWR LED should be on solid.
- Ensure all cabling is of the correct type and is in good working order.
- Ensure both devices on either end of the fiber are compatible. If using a simplex fiber connection, ensure that you have both an Upstream (U) and Downstream (D) media module.
- For duplex fiber connections, ensure the RX and TX has been reversed between the two media converter module.

No connectivity

If unable to get full connectivity with all DIP switches in the UP position, these methods are recommended for troubleshooting.

Note: If troubleshooting a CM-100, setting the Auto-Config jumper (J5) to SW will ensure the DIP switches are being read.

Method 1

1. Set the Link mode to Standard (SW1 – Down) on both media converter module. Leave all other switches in the Up position.
2. Connect the near end device to the MM1 port. The LK1 should be lit to indicate a good fiber connection. If the LK1 LED is not lit, then check the fiber cable and the attached device.
3. Repeat step 2 for the MM2/SM2 port
4. Return the media module to the desired configuration.

Method 2:

The fiber connection can also be verified by configuring the remote media module for loopback mode. The LEDs on both media converter module should be lit. Data should pass through the local module, over the fiber connection to the remote media module. At the remote media module, the data will be looped back and passed through MM2/SM2 transmit fiber link.

Technical Specifications

The following applies to all C-100MM and CM-100MM media converter modules:

Power Input/Consumption	12V DC /3.5 W
Operating Temperature:	0°C to 50°C (32°F to 122°F)
Storage Temperature:	-25°C to 70°C (-13°F to 158°F)
Operating Humidity:	5% to 90% non-condensing
Storage Humidity:	5% to 95% non-condensing
Operating Altitude:	Up to 3,048 m (10,000 ft)
Weight:	0.15 kg (0.33 lbs)
MTBF: (C-100MM)	484,202 hours
(CM-100MM)	489,076 hours

Fiber Optic Specifications

Fiber port 1 – MM1

Model	Mode	Wave length (nm)	TX Power (dB)	RX Power (dB)	Budget (dB)
C-100MM-M2SC2 CM-100MM-M2SC2	MM	TX: 1310 RX: 1310	Min: -20 Max: -12	Min: -31 Max: -14	11

Fiber port 2 – MM2/SM2

Model	Mode	Wave length (nm)	TX Power (dB)	RX Power (dB)	Budget (dB)
C-100MM-M2SC2 CM-100MM-M2SC2	MM	TX: 1310 RX: 1310	Min: -20 Max: -12	Min: -31 Max: -14	11
C-100MM-M2ST2 CM-100MM-M2ST2	MM	TX: 1310 RX: 1310	Min: -20 Max: -12	Min: -31 Max: -14	11
C-100MM-M2LC2 CM-100MM-M2LC2	MM	TX: 1310 RX: 1310	Min: -20 Max: -12	Min: -30 Max: -14	10
C-100MM-S2SC20 CM-100MM-S2SC20	SM	TX: 1310 RX: 1310	Min: -18 Max: -7	Min: -32 Max: -3	14
C-100MM-S2ST20 CM-100MM-S2ST20	SM	TX: 1310 RX: 1310	Min: -15 Max: -8	Min: -32 Max: -3	17
C-100MM-S2LC20 CM-100MM-S2LC20	SM	TX: 1310 RX: 1310	Min: -15 Max: 0	Min: -34 Max: -5	19
C-100MM-S2SC40 CM-100MM-S2SC40	SM	TX: 1310 RX: 1310	Min: -5 Max: 0	Min: -34 Max: -3	29

Model	Mode	Wave length (nm)	TX Power (dB)	RX Power (dB)	Budget (dB)
C-100MM-S2ST40 CM-100MM-S2T40	SM	TX: 1310 RX :1310	Min: -5 Max: 0	Min: -34 Max: -3	29
C-100MM-S2LC40 CM-100MM-S2LC40	SM	TX: 1310 RX :1310	Min: -5 Max: 0	Min: -34 Max: -3	29
C-100MM-S2SC80 CM-100MM-S2SC80	SM	TX: 1550 RX: 1550	Min: -5 Max: 0	Min: -34 Max: -3	29
C-100MM-S2ST80 CM-100MM-S2ST80	SM	TX: 1550 RX: 1550	Min: -5 Max: 5	Min: -34 Max: -3	29
C-100MM-S2LC80 CM-100MM-S2LC80	SM	TX: 1550 RX: 1550	Min: -5 Max: 0	Min: -34 Max: -3	29
C-100MM-S2SC120 CM-100MM-S2SC120	SM	TX: 1550 RX: 1550	Min: 0 Max: 5	Min: -35 Max: -3	35
C-100MM-S2ST120 CM-100MM-S2ST120	SM	TX: 1550 RX: 1550	Min: 0 Max: 5	Min: -35 Max: 0	35
C-100MM-S2LC120 CM-100MM-S2LC120	SM	TX: 1550 RX: 1550	Min: 0 Max: 5	Min: -35 Max: -3	35
C-100MM-S1SC20U CM-100MM-S1SC20U	SM	TX: 1310 RX: 1550	Min: -14 Max: -8	Min: -32 Max: -3	18
C-100MM-S1SC20D CM-100MM-S1SC20D	SM	TX: 1550 RX:1310	Min: -14 Max: -8	Min: -32 Max: -3	18
C-100MM-S1SC40U CM-100MM-S1SC40U	SM	TX: 1310 RX:1550	Min: -8 Max: -3	Min: -33 Max: -3	25
C-100MM-S1SC40D CM-100MM-S1SC40D	SM	TX: 1550 RX:1310	Min: -8 Max: -3	Min: -33 Max: -3	25

Fiber Cabling Requirements:

MM: 50/125 microns or 62.5/125 microns

SM: 9/125 microns

Note: Please refer the product page on the Perle website for the most up to date specifications.

<http://www.perle.com/>

Compliance Information

FCC

This product has been found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions in this Guide, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his/her own expense.

EN 55022, Class A,

WARNING This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EN 55024, Class A

Laser Safety – IEC 60825-1:2007

This product meets Class I Laser safety requirements per IEC-60825-1:2007 standard and complies with FDA/CDRH 21 CFR1040.10 and 21 CFR1040.11.

WARNING: Visible and invisible laser radiation may be present when cables are not connected. Do not stare into the beam or view the beam directly with optical instruments. Failure to observe this warning could result in an eye injury or blindness.

WARNING: Use of controls, adjustments or the performance of procedures other than those specified herein may result in hazardous radiation exposure.

Warranty / Registration

Perle's standard Lifetime Warranty provides customers with return to factory repairs for Perle products that fail under the conditions of the warranty coverage. Details can be found at:

http://www.perle.com/support_services/warranty.shtml

Contacting Technical Support

Contact information for the Perle Technical Assistance Center (PTAC) can be found at the link below. A Technical Support Query may be made via this web page.

www.perle.com/support_services/support_request.shtml

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