



Perle 10GT Media Converter Modules

Installation Guide

C-10GT-SFP

CM-10GT-SFP

C-10GT-XFP

CM-10GT-XFP



P/N 5500337-10

Overview

This document contains instructions necessary for the installation and operation of the Perle C/CM-10GT Media Converter modules. These models are used in conjunction with a Perle Media Converter chassis. Each module contains one pluggable transceiver port that permits insertion of a SFP+ or a XFP fiber module and one integrated RJ-45 (copper) port. These media converter modules can use either Perle Systems or third party MSA compatible 10G XFP or SFP+ modules including support for the following standards: 10GBase-SR, 10GBase-LR, 10GBase-ER, 10GBase-LRM and 10GBase-ZR. The C/CM-10GT-SPF supports one low power transceiver (SFP+), whereas the C/CM-10GT- XFPH supports one high power transceiver (XFP) (up to power level 4). These modules take two slots within a Perle Media Converter chassis

The C model modules are the unmanaged modules and the CM models are the managed modules. For information on the management options of the CM modules refer to the Perle MCR-MGT User's Guide that came with your Perle Management Module. All combination of modules within the chassis cannot exceed the chassis power input consumption. The full power consumption for Perle Media Converter chassis can be found on the Perle website.

Model	Port 1	Port 2	Type
C-10GT-SFP	SFP+	RJ-45	unmanaged
CM-10GT-SFP	SFP+	RJ-45	managed
C-10GT-XFPH	XFP	RJ-45	unmanaged
CM-10GT-XFPH	XFP	RJ-45	managed

Note: *The C/CM-10GT-SFP media converter module can operate as a 1G media converter module if a 1G fiber transceiver has been inserted into the SFP+ transceiver port.*

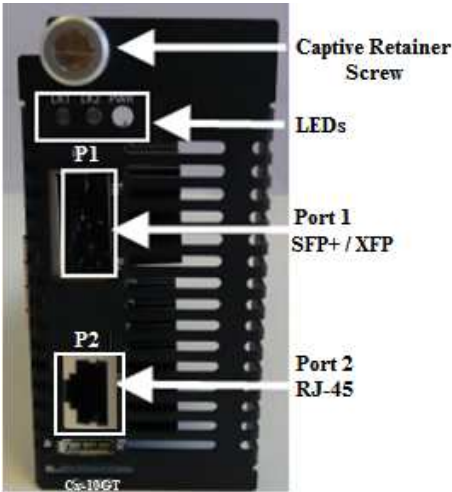
Visit Perle's web site for the most up to date Installation guides, models and specifications: <http://www.perle.com/>

Getting to know your C/CM-10GT Media Converter

Your C/CM-10GT Media Converter package consists of the following items:

- C/CM-10GT module with one transceiver port (SFP+ or XFP) and one RJ-45 (copper) port.
- This guide

Front View



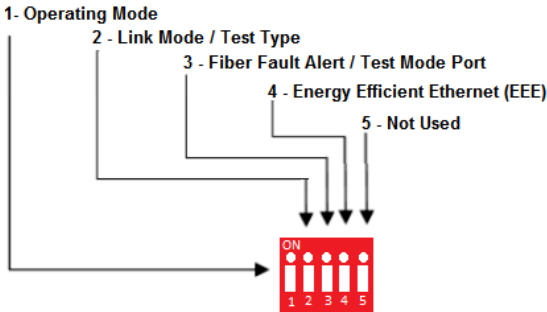
Installation

The default switch setting (all switches in the UP position) will work for most installations. The Auto-Jumper is set to Auto for Ethernet Auto detection.

These are the steps required to configure the Perle C/CM-10GT module.

1. Set the Auto-Jumper switch. (optional)
2. Set the DIP switch settings. (optional)
3. Install the module into the chassis. See [Installing Modules.](#)
4. Insert the appropriate SFP+/XFP into the transceiver port.
5. Connect the fiber cable.
6. Connect the RJ-45 (copper cable). See [Copper Cable Requirements.](#)

C/CM-10GT-SFP or C/CM-10GT-XFPH



DIP Switch Settings

The DIP switches are located on the module.

Note: Switch changes made when the module is powered up take effect immediately and will result in a link reset on both ports.

Operating Mode (Switch 1)

Switch Position	Mode
Up (default)	Data
Down	Test

Data: In Data mode, data will flow between the fiber connection and the copper connection.

Test: Test Mode is used to run diagnostics, enable loopback and for running the Built In Link Tests.

Note: The Operation Mode (Switch 1) affects the function of DIP Switches 2 and 3 when in Test mode.

Link Mode (Switch 2 – Data Mode)

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

Smart Link Pass-Through: In this mode, the link state on one port connection is directly reflected through the media converter to the other port connection. If link is lost on one of the connections, then the other link will be brought down by the media converter.

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

Test Function (Switch 2 – Test Mode)

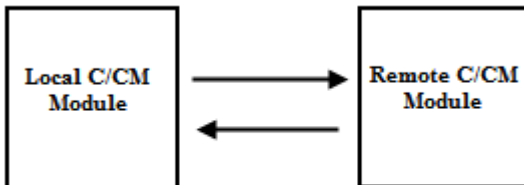
Switch Position	Type
Up (default)	Built In Link Test (BILT)
Down	Loopback

Built In Link Test: Set Switch 2 to the Up position for the C/CM-10GT media converter module to initiate the Built In Link Test on port 1. These tests consist of the media converter module generating test patterns to be sent out on port 1 to the remote media converter module. If the remote media converter module is also a compatible 10GBaseT media converter module then the remote media converter module will automatically be put into test mode.

Note: The BILT can operate on 10G modules. This feature can also be used with Perle S-10G media converters

Loopback: If Switch 2 is down, the specified port will be forced into loopback mode (switch 3 determines the port number). Data received on the receiver (RX) will be looped back to the transmitter (TX) connection. This mode is not used in conjunction with BILT. It can be used when other data generation methods are used.

Illustration of the Built In Link Test



Built In Link Test

Local C/CM-10GT Configuration

Test Mode (Switch 1 – Down)

Test Function (Switch 2 –Up)

Remote-C/CM-10GT Configuration

All switches in the Up position

Sequence of Events

1. The Local C/CM-10GT media converter module sends the Remote C/CM-10GT media converter module a signal to go into test mode.
2. The Remote C/CM-10GT media converter module turns on test mode.
3. Built In Link Test data is sent from the Local C/CM-10GT media converter module to the Remote C/CM-10GT media converter module.
4. The Remote C/CM-10GT media converter module analyses the received test data and sends its own test data plus a diagnostic code back to the Local C/CM media converter module.
5. If the PWR LED on the Local C/CM media converter module blinks red, this connection may require further testing. The PWR LED should flash green to indicate that there have been no errors in the last second.
6. The Built in Link Test continues to run until Switch 1 on the Local C/CM-10GT media converter module is set to Data mode.

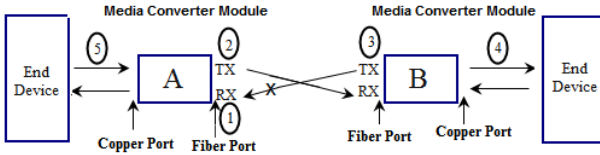
Fiber Fault Alert (Switch 3 – Data Mode)

Switch Position	Mode
Up (default)	Enabled
Down	Disabled

Enabled: If the media converter module detects a loss of signal on the fiber port, the media converter module notifies the link partner on that same port that an error condition exists by bringing down the link.

Disabled: The media converter module will not monitor for fiber fault.

Fiber Fault Alert Sample Config



Media Converter Module A Configuration

Link Mode—Standard Mode

Fiber Fault Alert

Media Converter Module B Configuration

Link Mode—Smart Link Pass through Mode

Fiber Fault Alert

Sequence of Events

1. Media Converter Module **A** loses fiber connection (RX).
2. Media Converter Module **A** notifies the remote Media Converter Module that there is a fault on the Link.
3. Media Converter Module **B** detects loss of fiber link on receiver (RX).
4. Media Converter Module **B** turns off transmitter (TX).

Port Selection (Switch 3 – Test Mode)

Switch Position	Port
Up (default)	1
Down	2

When Loopback mode is selected (Switch 1 and Switch 2 down), this switch specifies which port to enable loopback mode on.

EEE (Energy Efficient Ethernet)

Switch Position	Mode
Up (default)	Enabled
Down	Disabled

Enabled: When enabled, the media converter will auto negotiate this capability with the attached EEE compliant devices/servers.

Disabled: The media converter will not auto negotiate this capability with the attached EEE compliant devices/servers.

Installing Modules

1. Set any jumpers and/or DIP switches on the module to the desired operating mode.
2. 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 damage the module. If there is resistance, remove the module and check the module's backplane connector for damage to the pins. If the module's backplane connector is not damaged, try to reinsert the module again.
3. Tighten the Captive retainer screw to ensure the module is locked in place.

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

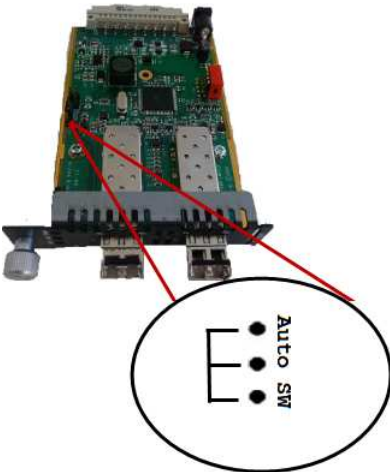
AUTO-Config Jumper (CM models only)

The Auto-Config jumper is located on the outer edge, at the midpoint of the module. Jumper the top and middle pin to select Auto mode. Jumper the middle and bottom pin to select SW mode.

AUTO: When set to Auto the module will, at power-up, check its internal flash memory to see if configuration information has been downloaded to it from a management module. If so it will use this configuration as its running configuration. If there is no configuration in flash it will read the settings of the DIP switches and use those as its running configuration.

SW: When set to SW (Switch), the module will, at power-up, read the settings of the DIP Switches and use those as its running configuration. It will ignore any configuration information in its flash memory.

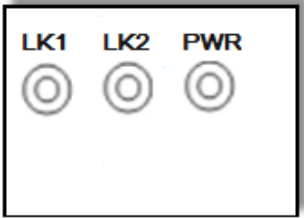
NOTE: *The default jumper setting is AUTO*



Operation

Status LED

The Perle C/CM 10GT Media converters modules have three status LEDs located on the faceplate of the module.



PWR - Power/Test

Green On: Power is on and the module is in normal operation mode.

Green blinking *slowly*: the module is in test or loopback mode.

Red blinking *slowly while in Test mode*: indicates an error within the last second.

Red Solid: During power up - hardware error detected.

Red Blinking *quickly*: Error detected. (See LK1 LK2 Error Codes).

LK1- Port 1 Activity

On: Fiber link present.

Blinking *quickly*: Fiber link present and receiving data.

Blinking *slowly*: The fiber link has been taken down as a result of Smart Link Pass-Through.

Blinking one second on, 3 seconds off: the maximum specified operating temperature within the inserted module has been exceeded.

Off: No fiber link present.

LK2 – Port 2 Activity

On: Copper link present.

Blinking *quickly*: Copper link present and receiving data.

Blinking *slowly*: The copper link has been taken down as a result of Smart Link Pass-Through.

Blinking one second on, 3 seconds off: the maximum specified operating temperature within the inserted module has been exceeded.

Off: No copper link present.

LK1 LK2 Error Codes

LK1	LK2	Meaning
Off	Off	Incompatible SFP+ or XFP
Off	On	Power Budget exceeded – XFP's requesting more power than specified port rating.
On	Off	SFP+ or XFP communication error – C/CM-10GT unable to communicate with module
On	On	Internal Error

Troubleshooting

General

- ✓ Ensure that the SFP+ or XFP module is inserted correctly into the transceiver port.
- ✓ Ensure that the copper cabling (RJ-45) meets Ethernet copper cabling requirements. See [Copper Cable Requirements](#) in this guide.

No connectivity

If unable to get full connectivity with all DIP switches in the UP position, these procedures can be used for troubleshooting.

Built In Link Test

The Built In Link Test requires two 10GBaseT modules/converters.

Choose one side of the link to generate the test data (master side) and one side to receive and analyse the test data (slave side).

1. Set Switch 1 down and Switch 2 to the Up position (Built In Link Test) on the master side.
2. The master side automatically sends test data to the slave side.
3. The slave side analyses the received test data and sends its own test data plus a diagnostic code back to the master side.
4. If the PWR LED on the master side blinks red then this connection may require further testing.
5. If the PWR LED on the master side blinks green after several seconds of testing, then the SFP+/XFP link is passing the Built In Link Test.
6. The Built in Link Test continues to run until Switch 1 on the master side is set back to Data mode.

Loopback Test

This mode is not used in conjunction with BILT.

1. If either media converter module is not a Perle 10GT module then you need to set loopback mode on one of the media converter modules. (See the User's Guide that came with that media converter module).
2. Use an alternative way to generate data to the unit set in loopback mode. Data received on the receiver (RX) will be looped back to the transmitter (TX) connection. Use a third party application to analyse the received data.

Module Temperature Protection

All C/CM-10GT modules come equipped with module temperature protection. Should an inserted SFP+ or XFP module operate above its specified maximum operating temperature, the C/CM-10GT will reduce the power to that module. The C/CM-10GT will continue to monitor the modules' temperature until the temperature is below the maximum operating temperature and then the C/CM-10GT will return the module to normal operating mode.

Technical Specifications

Power Input/Consumption 9-30VDC

SFP+	1.1A Max, 0.8A at 12VDC
Operating Temperature	0°C -50°C (32°F - 122°F)
Storage Temperature	-25°C -70°C (-13°F -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)

Power Input/Consumption 9-30VDC

XFP	1.7A Max, 1.25A at 12VDC
Operating Temperature	-40°C -75°C (-40°F - 167°F)
Storage Temperature	-40°C -85°C (-40°F -185°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)

SFP+ and XFP Feature Set

- MSA Compliant SFP/SFP+
- MSA complaint Class 1,2,3 and 4 XFP modules for the C/CM-10GT-XFP
- 1G copper modules
- 1G fiber modules
- SFP+ supports CX1 modules
- XFP supports CX4 modules

Fiber Cabling Requirements

MM: 50/125 microns
62.5/125 microns

SM: 9/125 microns

Copper Cable Requirements

- Category 6A
- Straight through or Ethernet crossover

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

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

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

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