Perle Cx-10GRT-SFP
Media Converter
Modules

Installation Guide
C-10GRT-SFP
CM-10GRT-SFP

Overview

This document contains instructions necessary for the installation and operation of the Perle C/CM-10GRT Media Converter. The Perle Media Converter chassis contains one pluggable transceiver port that permits insertion of a SFP/SFP+(1G/10G) and one integrated rate converting RJ-45 (copper port (10/100/1G/2.5G/10G port. The Perle Media Converter can use either Perle Systems or third party MSA compatible modules. See the Technical Specifications section in this guide for supported modules.

| Model	Port 1	Port 2	Type
C-10GRT-SFP	SFP/SFP+	RJ-45	unmanaged
CM-10GRT-SFP	SFP/SFP+	RJ-45	managed

The C model media converters are the unmanaged modules and the CM models are the managed media converters. For information on the management options of the CM models 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 specifications

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

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

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

Front View

Captive Retainer Screw
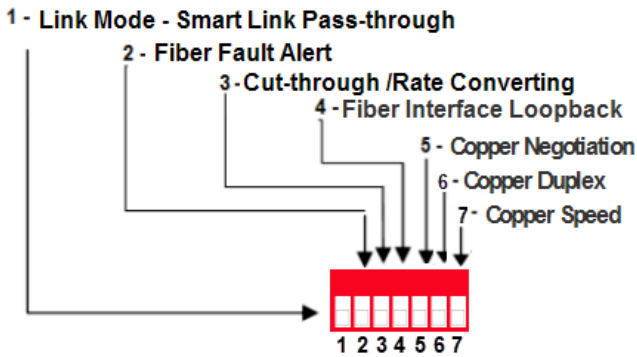
LEDs

SFP/SFP+

RJ45 10M/100M/1G/2.5G/10G
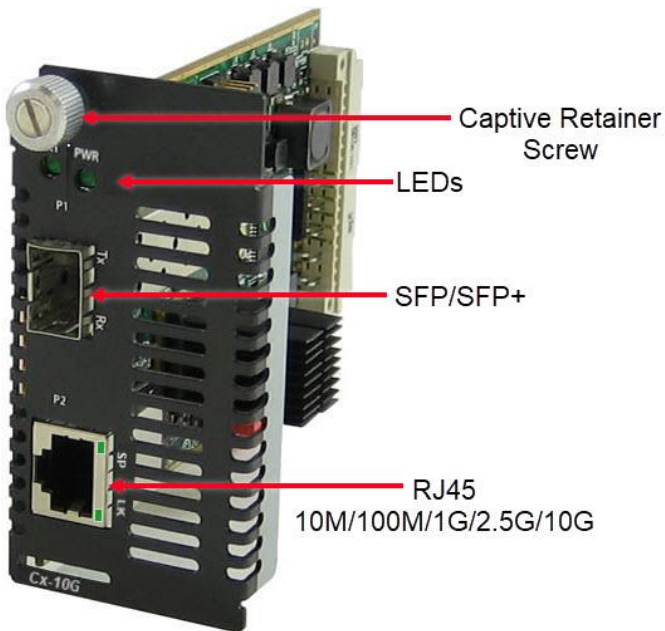
Installation

The default switch setting (all switches in the UP position) will work for most installations. (Refer to the Auto-Config Jumper section for CM models).

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

1. Set the DIP switch settings. (optional)
2. Install the module into the chassis.
3. Insert the appropriate SFP/SFP+ into the transceiver port.
4. Connect the fiber cable.
5. Connect the RJ-45 (copper cable).

DIP Switches.

1 - Link Mode - Smart Link Pass-through
2 - Fiber Fault Alert
3 - Cut-through /Rate Converting
4 - Fiber Interface Loopback
5 - Copper Negotiation
6 - Copper Duplex
7 - Copper Speed

1 2 3 4 5 6 7

DIP Switch Settings

The DIP switches are located on the module.

Link Mode (Switch 1)

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

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: 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.
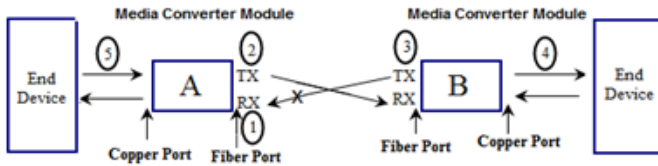
Fiber Fault Alert (Switch 2)

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).

Cut-through / Rate converting (Switch 3)

Switch Position	Type
Up (default)	Rate converting
Down	Cut-through

Rate converting: Both ports can operate at the same or different speeds.

Cut-through: Both ports need to be the same speed and in full duplex mode.

Fiber Interface Loopback (Switch 4)

Switch Position	Mode
Up (default)	Disabled
Down	Enabled

Enabled: When enabled, the media converter module will be in Fiber loopback mode.
Disabled: When disabled, the media converter module will not be in Fiber loopback mode.

Copper Negotiation (Switch 5)

Switch Position	Mode
Up (default)	Auto
Down	Manual

Auto: The media converter module will auto negotiate copper link parameters.
Manual: The media converter module will use the link parameters as defined by Switches 6 and 7.

Copper Duplex (Switch 6)

Switch Position	Mode
Up (default)	Full Duplex
Down	Half Duplex

Note Switch 5 must be set to manual for this setting to take affect.

UP: The copper port will be set to Full Duplex mode.
Down: The copper port will be set to Half Duplex mode.

Copper Speed (Switch 7)

Switch Position	Mode
Up (default)	100Mbps
Down	10Mbps

Note Switch 5 must be set to manual for this setting to take affect.
UP: The copper port will be fixed at 100 Mbps.
Down: The copper port will be fixed at 10 Mbps.

Note: For 1000Mbps and 10G, the copper link must be auto negotiated.

AUTO-Config Jumper (CM model 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
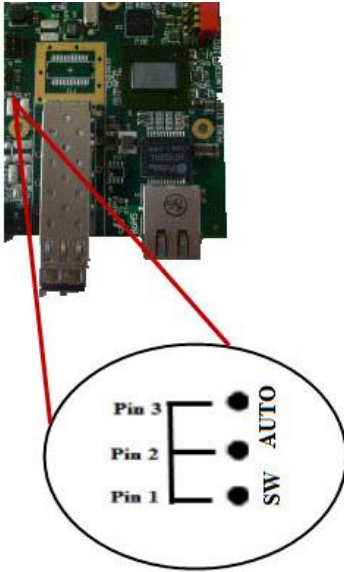
SGMII Interface Hardware Support (C Model only)

Both the C/CM models support a SGMII module on the SFP interface for SFPs that require 1000 Mbps SGMII.

For the Managed CM-10GRT-SFP the configuration must be set within the software. Refer to the Perle MCR-MGT User's Guide that came with your Perle Management Module.

The unmanaged model the C-10GRT-SFP supports the SGMII via the jumper setup as shown below. The SGMII jumper is located on the outer edge, at the midpoint of the card (P3). Jumper Pins 1 and 2 to select SGMII for port 1.
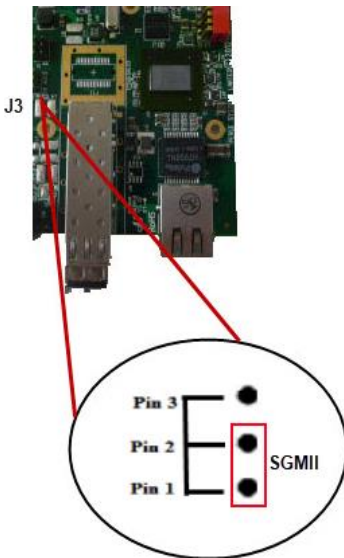
Operation

Status LED

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

Green On: 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 Solid: Hardware error detected. (See PWR Red LED Errors)
Red Blinking quickly: Error detected. (See LK1/LK Errors)

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.
Off: No fiber link present.

SP – Port 2 Speed

Green: 2.5G/10G
Yellow: 100M/1G
Off: 10M

LK – 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.
Off: No copper link present.

LK1/LK Error Codes

LK1	LK	Meaning
Off	Off	Incompatible SFP/SFP+
On	On	Internal Error
Off	On	Mismatch in Cut-though mode
On	Off	SFP/SFP+ communication error

## *PWR Red LED Errors*

LK1	LK	Meaning
Blinking	Blinking	Blinking one second on, 3 seconds off: the maximum specified operating temperature within the inserted module has been exceeded
Off	Off	Internal Hardware.

Installing or Replacing Media Converter Modules

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

The Perle Media Converter Modules can be installed in any available slot and in any order within the chassis.

1. Remove the media converter module from its packaging.

2. Using a cross-head screwdriver, remove the screw holding the face plate to the chassis to reveal the slot opening.

3. Set the jumpers and DIP switches on the media converter module to the desired operating mode.

4. Locate the top and bottom alignment guides inside the chassis.

5. 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 some damage. If there is resistance, remove the module, check the module connector for damaged or incorrectly aligned pins, if there is no damage, retry to insert the module.

6. Tighten the captive retainer screw to ensure the media converter module is locked in place.

7. Remove the dust cap from the fiber connector and connect the fiber and copper cables.

captive
retainer screw
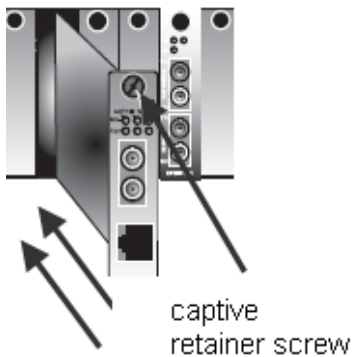
## Removing Media Converter Modules

1. Loosen the captive retainer screw on the front of the media converter module and gently pull the media converter module out.
2. If not inserting a replacement, cover the opening slot with a face plate and secure the screw.

Installing the SFP/SFP+ Fiber Module

1. Locate appropriate fiber module and insert into opening.
2. Ensure the SFP/SFP+ module is properly seated.
3. SFP module may be inserted before or after the media converter module is inserted into the chassis.
4. Proceed with fiber cable connection.

Installing the Duplex Fiber Cable

1. Locate a 1000/10GBase-X compliant duplex (2 strands) fiber cable with appropriate connectors.
2. Connect the fiber cables from the SFP/SFP+ to the other media converter/switch/fiber device ensuring that the RX and TX are reversed (crossed) at the opposite end.

Perle Media Converter Module   Perle Media Converter Module
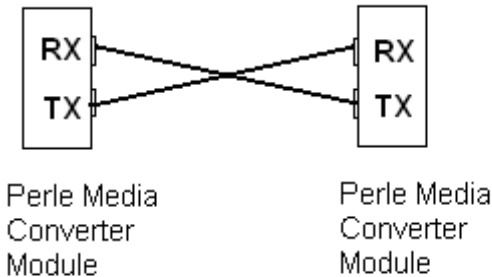
Installing the Simplex Fiber Cable

1. Locate a 1000/10GBase-X compliant simplex (1-strand) fiber cable with appropriate connectors.
2. Connect the fiber cable from the SFP/SFP+ to the other media converter/switch/fiber device.

Installing the Copper Cable

1. Locate 10/100/1000/10GBase-T compliant copper cables with male, RJ-45 connectors installed at both ends.
2. Connect the RJ-45 cable between the Perle media converter module and the device.

Note: The Perle Media Converter Module supports Auto-MDIX which allows a straight-through or cross-over Ethernet cable.

Module Temperature Protection

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

Loopback Mode

Perle C/CM-10GRT media converter modules can be put into Loopback mode for diagnosis purposes. A packet generator and analyzer must be used to generator and capture the packets in this mode.

Technical Specifications

Maximum power consumption (watts)	14.0 watts, includes modules
Copper 10/100/1G/2.5 GBase-T (RJ45)	10GBase-T based on IEEE 802.3an 2.5GBase-T based on IEEE 802.3bz
Pluggable Fiber Transceiver	IEEE 802.3ae (10G-Base-R) 10 Gigabit SFP+ slot support 10GBase-R Standard SFP Power level 1 (1 watt) and level 2 (1.5 watts) as per SFP-8431
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)
Weight:	0.12kg, 0.26 lbs

The following applies to the Perle Cx-10GRT SFP Media Converter module.
*Actual rating is dependent on the power consumption of the SFP/SFP+ module inserted.

Supported 10 Gigabit Fiber pluggable transceivers

IEEE 802.3as compliant
- 10GBase-SR
- 10GBase-LMR
- 10GBase-LR
- 10GBase-ER
- 10GBase-ZR

Supported 10 Gigabit Copper pluggable transceivers

SFP+ Direct Attach Cable (DAC). Also known as:
- Twinax
- 10GBase-CU
- 10GSFP+Cu
- 10GBase-CX1
- 10GBase-CR1

Note: Passive and Active cable types are supported

Supported Gigabit Fiber SFP's

- 1000Base-SX
- 1000Base-LX/LH
- 1000Base-EX
- 1000Base-ZX
- 1000-Base-BX

CWDM/DWDMBase

Fiber Cabling Requirements

MM: 50/125 microns or 62.5/125 microns

SM: 9/125 microns

Copper Cable Requirements

- Category 6A for 10G speeds, 5/5e used for speeds under 10G
- Straight through or Ethernet crossover

Note: Please refer the product page on the Perle website for the most up to date specifications.
http://www.perle.com/

Troubleshooting

General

- ✓ Ensure that the SFP+ module is inserted correctly into the transceiver port.
- ✓ Ensure that the copper cabling (RJ-45) meets Ethernet copper cabling requirements.

No connectivity

Set all DIP switches to the Up position.

Loopback Mode

The media converter module has the ability to be put into Loopback mode for diagnosis purposes. A packet generator and analyzer must be used to generate and capture the packets in this mode.

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 55032 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

For information and details about product warrantee and registration, please refer to

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