# C-1000 Gigabit Media Converters

## 1000Base-T to 1000Base-X Fiber Mode Conversion

- 1000Base-T to 1000Base-X Fiber Media Converters
- Extend network distances up to 160km
- Advanced Features: Link Pass-Through, Far-End Fault, Auto-MDIX
- High density applications with Perle **Media Converter Chassis**

Installed in a high density **Perle Media Converter Chassis**, Perle's line of feature rich **Gigabit Media Converter Modules** transparently connect copper to fiber. Our Gigabit Ethernet to Fiber Converters provide an economical path to extend the distance of an existing network, the life of non-fiber based equipment, or the distance between two devices.

Network Administrators can "see-everything" with Perle's advanced features such as Auto-Negotiation, Auto-MDIX, Link Pass-Through, Fiber Fault Alert, and Loopback. This allows for more efficient troubleshooting and less on-site maintenance. These cost and time saving features, along with a lifetime warranty and free worldwide technical support, make **Perle's gigabit ethernet converter modules** the smart choice for IT professionals.

# Gigabit Media Converter Features

### Auto-Negotiation (802.3ab)

The media converter supports auto negotiation. The 1000Base-X fiber interface negotiates according to 802.3 clause 37. The 1000Base-T negotiates according to 802.3 clause 28 and 40. The 1000Base-X will link up with its partner after the highest common denominator (HCD) is reached and the copper has linked up with its partner. The 1000Base-X will continue to cycle through negotiation transmitting a remote fault of offline (provided this is enabled through the switch setting) until the copper is linked up and the HCDs match.

The media converter supports auto-negotiation of full duplex, half duplex, remote fault, full duplex pause, asymmetric pause and Auto MDI-X.

### Auto-MDIX with Skew Correction

Auto-MDIX (automatic medium-dependant interface crossover) detects the signaling on the 1000Base-T interface to determine the type of cable connected (straight-through or crossover) and automatically configures the connection when enabled. The media converter can also correct for wires swapped within a pair.

The media converter will adjust for up to 64ns of delay skew between the 1000Base-T pairs.

## Smart Link Pass-Through

When the Link Mode switch is placed into Smart Link Pass-Through mode, the 1000Base-T port will reflect the state of the 1000Base-X media converter port. This feature can be used whether fiber auto-negotiation is enabled or disabled.

## Fiber Fault Alert

With Fiber Fault Alert the state of the 1000Base-X receiver is passed to the 1000Base-X transmitter. This provides fault notification to the partner device attached to the 1000Base-X interface of the media converter. If the 1000Base-X transmitter is off as a result of this fault it will be turned on periodically to allow the condition to clear should the partner device on the 1000Base-X be using a similar technique. This eliminates the possibility of lockouts that occur with some media converters. Applies only when fiber auto-negotiation is disabled.

## Pause (IEEE 802.3x)

Pause signaling is an IEEE feature that temporarily suspends data transmission between two devices in the event that one of the devices becomes overwhelmed. The media converter supports pause negotiation on the 1000Base-T fiber connection and 1000Base-X fiber connection.

## Duplex

Full and half duplex operation supported.

## Jumbo Packets

Transparent to jumbo packets up to 10KB.

## VLAN

Transparent to VLAN tagged packets.

## Remote Loopback

Capable of performing a loopback on the 1000Base-X fiber interface.

| Specifications | | | | |
|---|---|---|---|---|
| **Lifetime limited warranty** | **Reach, RoHS and WEEE Compliant** | **HTSUS Number:** 8517.62.0020 | **UNSPSC Code:** 43201553 | **ECCN:** 5A991 |



| Indicators | |
|---|---|
| Power / TST | This green LED is turned on when power is applied to the media converter. Otherwise it is off. The LED will blink when in Loopback test mode. |
| Fiber link on / Receive activity (LKF) | This green LED is operational only when power is applied. The LED is on when the 1000Base-X link is on and flashes with a 50% duty cycle when data is received. The LED will slow blink when the 1000Base-X interface has been taken down as a result of a fault on the 1000Base-T interface. |
| Copper link on / Receive activity (LKC) | This green LED is operational only when power is applied. The LED is on when the 1000Base-T link is on and flashes with a 50% duty cycle when data is received. The LED will slow blink when the 1000Base-T interface has been taken down as a result of a fault on the 1000Base-T interface. |
| Switches: On-Board | |
| Auto-Negotiation | • *Enabled (Default)* - In this mode the 1000Base-X and the 1000Base-T will negotiate to the HCD of the two link partners. The 1000Base-X will link up after the negotiation is completed and the 1000Base-T has linked up.<br>• *Disabled* - The 1000Base-X will not use auto negotiation. The 1000Base-T will negotiate to the HCD of the Switch settings and the link partner. |

| | |
|---|---|
| Link Mode | Link Mode provides a transparency to the state of the copper link allowing for simplified trouble shooting from the devices connected to the media converter.<br>*Normal (Default — Up)*<br>• With Fiber Auto Negotiation enabled when the 1000Base-T link goes down the 1000Base-X link is brought down. The 1000Base-X link will advertise Remote Fault (Link Fault).<br>• With Fiber Auto Negotiation disabled the state of the 1000Base-T link has no effect on the 1000Base-X link.<br>*Smart Link Pass Through (Down)*<br>• With Fiber Auto Negotiation enabled the behavior is as follows. When the 1000Base-T link goes down the 1000Base-X link is brought down. The 1000Base-X link will advertise Remote Fault (Link Fault). When Remote Fault (Link Fault) is received on the 1000Base-X interface the 1000Base-T transmitter will be turned off. When the 1000Base-T receiver is off the 1000Base-X transmitter will be turned off. When the 1000Base-X receiver goes off the 1000Base-T transmitter will be turned off.<br>• With Fiber Auto-Negotiation disabled the behavior is as follows. When the 1000Base-T receiver is off the 1000Base-X transmitter will be turned off. When the 1000Base-X receiver goes off the 1000Base-T transmitter will be turned off. |
| Pause | When Fiber Auto Negotiation is disabled Pause should only be enabled when all devices connected to the media converter support pause.<br>• *Enabled (Default)* - The Media converter will advertise Pause capable, Asymmetric pause not needed during Auto-Negotiation.<br>• *Disabled* - The Media converter will advertise that it does not have Pause capability during Auto-Negotiation. |
| Fiber Fault Alert | The Fiber Fault Alert switch has meaning when Auto-Negotiation is disabled<br>• *Enabled (Default - Up)* - When the 1000Base-X receiver is off the 1000Base-X transmitter is turned off. Periodically the 1000Base-X receiver will be turned on for a short period to allow the condition to clear if the 1000Base-X link partner is using a similar feature.<br>• *Disabled (Down)* |

| | |
|---|---|
| Duplex | • *Full (Default-Up)* - The media converter will advertise Full Duplex Capable, Half Duplex Capable.<br>• *AUTO (Down)* - The Media converter will advertise Full Duplex Not Capable, Half Duplex Capable. |
| Remote Loopback | The media converter can perform a loopback on the 1000Base-X fiber interface.<br>• *Disabled (Default - Up)*<br>• *Enabled* - The 1000Base-X receiver is looped to the 1000Base-X transmitter. The 1000Base-T transmitter is taken off the interface. |
| Connectors | |
| 1000Base-T | RJ45 connector, 4 pair CAT5 UTP cable or better |
| Magnetic Isolation | 1.5kv |
| Packet Transmission Characteristics | |
| Bit Error Rate (BER) | $<10^{-12}$ |
| Environmental Specifications | |
| Operating Temperature | 0°C to 50°C (32°F to 122°F) |
| Storage Temperature | minimum range of -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 meters (10,000 feet) |
| Heat Output (BTU/HR) | 10.2 |
| Maximum Power Consumption (Watts) | 3.0 |
| MTBF (Hours) | 609,000 Hours<br>*Calculation model based on MIL-HDBK-217-FN2 @ 30°C* |

| Mechanical - Hot Swapping Card | |
|---|---|
| Edge Connecter | 32 pin DIN 41612 / IEC 60603-2 Type B/2 Male. Fist make, last break for ground and power |
| Card insertion and removal | Captive thumb screws enable fast insertion and removal. Can be further tighten with a screwdriver. |
| **Product Weight** | |
| Weight | 0.15 kg, 0.33 lbs |
| **Packaging** | |
| Shipping Weight | 0.33 kg, .73 lbs |
| Shipping Dimensions | 203 x 38 x 152 mm, 8 x 1.5 x 6 inches |
| **Regulatory Approvals** | |
| Emissions | • FCC Part 15 Class A, EN55022 Class A<br>• CISPR 22 Class A<br>• CISPR 32:2015/EN 55032:2015 (Class A)<br>• CISPR 35/EN 55035<br>• EN61000-3-2 |
| Immunity | EN55024 |
| Electrical Safety | • UL/EN/IEC 62368-1<br>• CAN/CSA C22.2 No. 62368-1<br>• UL 60950-1<br>• IEC 60950-1(ed 2); am1, am2<br>• EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013<br>• CE |
| Laser Safety | • EN 60825-1<br>• Fiber optic transmitters on this device meet Class 1 Laser safety requirements per IEC-60825 FDA/CDRH standards and comply with 21CFR1040.10 and 21CFR1040.11. |

# Product List

**C-1000-M2SC05 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-SX 850nm multimode (SC) [550 m/1804 ft.]

**Part Number(s)**
**05051000**

**C-1000-M2LC05 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-SX 850nm multimode (LC) [550 m/1804 ft.]

**Part Number(s)**
**05051010**

**C-1000-M2ST05 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-SX 850nm multimode (ST) [550 m/1804 ft.].

**Part Number(s)**
**05051100**

**C-1000-M2SC2 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-LX 1310nm Extended multimode (SC) [2km /6562 ft.]

**Part Number(s)**
**05041940**

**C-1000-M2ST2 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-LX 1310nm Extended multimode (ST) [2km /6562 ft.]

**Part Number(s)**
**05041950**

**C-1000-M2LC2 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-LX 1310nm Extended multimode (LC) [2km /6562 ft.]

**Part Number(s)**
**05041960**

**C-1000-S2SC10 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-LX/LH 1310 nm single mode (SC) [10 km/6.2 miles] or multimode (SC) [550 m/1804 ft.] using a mode conditioning patch co

**Part Number(s)**
**05051030**

**C-1000-S2LC10 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-LX/LH 1310 nm single mode (LC) [10 km/6.2 miles] or multimode (LC) [550 m/1804 ft.] using a mode conditioning patch co

**Part Number(s)**
**05051020**

**C-1000-S2ST10 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-LX/LH 1310 nm single mode (ST) [10 km/6.2 miles] or multimode (ST) [550 m/1804 ft.] using a mode conditioning adapter.

**Part Number(s)**
**05051110**

**C-1000-S2SC40 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-EX 1310 nm single mode (SC) [40 km/24.9 miles].

**Part Number(s)**
**05051090**

**C-1000-S2LC40 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-EX 1310 nm single mode (LC) [40 km/24.9 miles]

**Part Number(s)**
**05051040**

**C-1000-S2ST40 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-EX 1310 nm single mode (ST) [40 km/24.9 miles].

**Part Number(s)**
**05051120**

**C-1000-S2SC70 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-ZX 1550 nm single mode (SC) [70 km/43.5 miles]

**Part Number(s)**
**05051050**

**C-1000-S2LC70 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-ZX 1550 nm single mode (LC) [70 km/43.5 miles]

**Part Number(s)**
**05051060**

**C-1000-S2ST70 - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-ZX 1550 nm single mode (ST) [70 km/43.5 miles]

**Part Number(s)**
**05051130**

**C-1000-S2SC120 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-EZX 1550 nm single mode (SC) [120 km/74.6 miles]

**Part Number(s)**
**05051150**

**C-1000-S2LC120 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-EZX 1550 nm single mode (LC) [120 km/74.6 miles]

**Part Number(s)**
**05051160**

**C-1000-S2ST120 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-EZX 1550 nm single mode (ST) [120 km/74.6 miles]

**Part Number(s)**
**05051140**

**C-1000-S2SC160 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-ZX 1550 nm single mode (SC) [160 km/100 miles]

**Part Number(s)**
**05051790**

**C-1000-S2LC160 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-ZX 1550 nm single mode (LC) [160 km/100 miles]

**Part Number(s)**
**05051800**

**C-1000-S2ST160 - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-ZX 1550 nm single mode (ST) [160 km/100 miles]

**Part Number(s)**
**05051780**

**C-1000-M1SC05U - Gigabit Ethernet Media Converter Module.** 1000BASE-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1310nm TX / 1550nm RX single strand fiber, multimode (SC) [550 m/1804 ft]

**Part Number(s)**
**05041890**

**C-1000-M1SC05D - Gigabit Ethernet Media Converter Module.** 1000BASE-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1550nm TX / 1310nm RX single strand fiber, multimode (SC) [550 m/1804 ft]

**Part Number(s)**
**05041880**

**C-1000-S1SC10U - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1310nm TX / 1490nm RX single strand single mode (SC) [10 km/6.2 miles]

**Part Number(s)**
**05051070**

**C-1000-S1SC10D - Gigabit Ethernet Media Converter Module for MCR Chassis.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1490nm TX / 1310nm RX single strand single mode (SC) [10 km/6.2 miles]

**Part Number(s)**
**05051080**

**C-1000-S1SC20U - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1310nm TX / 1490nm RX single strand fiber, single mode (SC) [20 km/12.4 miles]

**Part Number(s)**
**05051810**

**C-1000-S1SC20D - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1490nm TX / 1310nm RX single strand fiber, single mode (SC) [20 km/12.4 miles]

**Part Number(s)**
**05051820**

**C-1000-S1SC40U - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1310nm TX / 1490nm RX single strand fiber, single mode (SC) [40 km/25 miles]

**Part Number(s)**
**05051830**

**C-1000-S1SC40D - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1490nm TX / 1310nm RX single strand fiber, single mode (SC) [40 km/25 miles]

**Part Number(s)**
**05051840**

**C-1000-S1SC80U - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1510nm TX / 1590nm RX single strand fiber, single mode (SC) [80 km/50 miles]

**Part Number(s)**
**05051850**

**C-1000-S1SC80D - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1590nm TX / 1510nm RX single strand fiber, single mode (SC) [80 km/50 miles]

**Part Number(s)**
**05051860**

**C-1000-S1SC120U - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1510nm TX / 1590nm RX single strand fiber, single mode (SC) [120 km/75 miles]

**Part Number(s)**
**05051870**

**C-1000-S1SC120D - Gigabit Ethernet Media Converter Module.** 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-BX 1590nm TX / 1510nm RX single strand fiber, single mode (SC) [120 km/75 miles]

**Part Number(s)**
**05051880**