SMI-1000-SFP Managed Gigabit

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

- 1000Base-T to 1000Base-X Fiber Media Converters
- Empty slot for **Cisco** and **other industry standard Gigabit Fiber SFPs**
- **Manage via SNMP, CLI - Telnet/SSH, Internet browser**, or **PerleVIEW Central Management Platform**
- Advanced media converter features - Smart **Link Pass-Through**, Fiber Fault Alert, Auto-MDIX and Loopback

Perle's advanced line of **Managed Gigabit SFP Media Converters**, transparently connects Gigabit copper to SFP for multimode or single mode fiber. The pluggable fiber optics port allows for flexible network configurations using **SFP transceivers supplied by Perle**, **Cisco** or other manufacturers of MSA compliant SFPs.

While providing an economical means of extending your existing copper based network connection, these media converters are SNMP manageable to enable complete control and status viewing of your fiber links. Perle **Gigabit SFP Managed Media Converters** come standard with extensive cost and time saving features. In addition, a lifetime warranty and free worldwide technical support make Perle's Managed Gigabit SFP Converters the smart choice for IT professionals.

SMI-1000-SFP Managed Gigabit SFP Media Converter Features

Configuration Mode selection

Select whether to use the on-board DIP switches or the management software for mode selection

Converter Information

- SFP Signaling rate
- SFP Link Reach for :
  - 9/125 fiber
  - 50/125 fiber
  - 62.5/125 fiber
- SFP wavelength
- User configurable converter name
- User configurable fiber port name
- User configurable copper port name
- Hardware revision number
- Firmware version number

DIP switch settings

View hardware DIP switch settings

Low power mode

If enabled it sets the Gigabit copper transceiver into "low power mode" which limits the strength of the signal. (for shorter cable lengths). Default is disabled

Port Control

Enable or disable individual fiber or copper port on the converter

Copper Port Status

- Port Enabled (Yes/No)
- Link Status (Up/Down)
- Auto Negotiation Settings (Disabled, Complete or In Progress)
- Resolved as crossover MDI or MDIX type

SFP Status

- DOM / DMI Optical monitoring of :
  - SFP temperature
  - TX supply voltage
  - TX bias current
  - TX output power
  - RX received optical power
- Port Enabled (Yes/No)
- Connector type (SC, LC, ST, SFP)
- Link Status (Up/Down)
- Far End Fault (OK, Failed)
- Fiber Loopback mode (On/Off)

Control

- Reset
- Reset to factory default
- Ability to specific read/write phy registers
- Update firmware
- Fiber Loopback mode (Yes/No)
- Upload/download configuration

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. Select Symmetrical, asymmetrical TX or asymmetrical RX

Duplex

Full and half duplex operation supported.

Jumbo Packets

Transparent to jumbo packets up to 10KB-default. Jumbo packet support can be disabled.

VLAN

Transparent to VLAN tagged packets. Default Jumbo packet can be disabled.

Remote Loopback

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

SMI-1000 Advanced Management Features

Enterprise and carrier-grade security is available through the support of strong authentication systems such as TACACS+, RADIUS and LDAP. Secure in-band access is assured via SNMPv3, SSH CLI and secure HTTPS Internet browser. This media converter also has many **NERC CIP** compliance features.

SNMP

- Full read/write capabilities via central SNMP servers and **PerleVIEW**
- Send SNMP traps (up to 4 servers)
- SNMPv3, V2C and V1
- SNMPv3 – encryption and authentication for both management and trap support
- RFC1213 MIB II
- Proprietary MIB provided

Telnet / SSH CLI access

In-band command line access via Telnet or **SSH application**

Internet Browser access

- Fast and intuitive graphical web interface for use with common internet browsers such Internet Explorer, Mozilla Firefox and Safari
- HTTP or secure HTTPS
- **PerleVIEW Central Management Platform**

Console port CLI access

- Out-of-band command line access via Cisco compatible RJ45 serial console port using common "rolled" CAT5 cable.
- Console port can be enabled (default) or disabled

Concurrent management sessions

Run multiple management sessions simultaneously for multiple users

Inactivity timeout

Protect secure management sessions by setting an inactivity timeout value

Alert event reporting

Alert level events are stored in the local event log and sent as:
- SNMP traps to up to 4 servers
- SYSLOG messages to a SYSLOG server
- Email to user defined email address

Advanced IP feature set

- IPV4 and IPV6 address support
- DHCP
- DNS
- Dynamic DNS
- NTP
- TFTP
- Telnet
- SSH V2 and V1
- HTTP
- HTTPS

Advanced Management User Authentication with primary and secondary server support

- TACACS+
- RADIUS
- LDAP
- Active Directory via LDAP
- RSA Secure ID-agent or via RADIUS authentification
- Kerberos
- NIS

Advanced Management User Authorization and Accounting

- TACACS+
- RADIUS

Encryption

- AES (256/192/128), 3DES, DES, Blowfish, CAST128, ARCFOUR(RC4), ARCTWO(RC2)
- Hashing Algorithms: MD5, SHA-1, RIPEMD160, SHA1-96, and MD5-96
- Key exchange: RSA, EDH-RSA, EDH-DSS, ADH
- X.509 Certificate verification: RSA, DSA

Access Control List

An access control list can be created which can filter out only those workstations that are authorized to access the management resources. Filter on IP and/or Ethernet MAC addresses

Network Services Filter

Enable only those network services on the management module that are allowed on your network (Telnet, SSH, HTTP, HTTPS, SNMP)

Firmware download

Update the latest level firmware for management and media converter modules via TFTP or **PerleVIEW**

Specifications				
Lifetime limited warranty	**Reach, RoHS and WEEE Compliant**	**HTSUS Number:** 8517.62.0020	**UNSPSC Code:** 43201553	**ECCN:** 5A992

CCATS Number:
G134373

Media Converter Module 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.

Management Module Indicators / reset	
Power	- Blinking green during startup cycle - Steady green: module has power and is ready - Red : error
ALM	Red alarm indicator activated when an alert event occurs
LKC	Green indicator indicating an active Ethernet link. Blinking indicates RX and TX of data
100/1000	- Green - 1000 Mbps link - Yellow - 100 Mbps link - Off - 10 Mbps or no Link
Reset button	Recessed pinhole button resets module
Connectors	
1000Base-T	- RJ45 connector, 4 pair CAT5 UTP cable or better - Magnetic Isolation - 1.5kv
Small Form Factor Pluggable (SFP) slot	- SFP slot models: Empty slot for 100Base-X **SFP modules supplied by Perle**, **Cisco** or other manufacturers of MSA compliant SFPs. - Hot insertion and removable (hot swappable).
Management ethernet port	10/100/1000Base-T - RJ45 - Auto- MDI/MDIX
Management console port	RS232 Serial RJ45 - Cisco pinout for use with standard CAT5 *"rolled cable"* (crossover) 9600 to 115k bps 7/8 bits Odd,even, no parity 1/2 stop bits Hardware/software flow control DCD/DSR monitoring
Packet Transmission Characteristics	
Bit Error Rate (BER)	$<10^{-12}$

Switches: accessible through a side opening in the chassis	
Auto-Negotiation	• *Enabled (Default - Up)* - The media converter uses 802.3u Auto-negotiation on the 10/100/1000Base-T interface. It is set to advertise full duplex, half duplex, pause and remote fault capabilities. • *Disabled* - The media converter sets the port according to the position of the speed and duplex switches.
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. *Normal (Default - Up)* With Fiber Auto Negotiation enabled when the copper link goes down the 1000Base-X link is brought down. The 1000Base-X link will advertise Remote Fault (Link Fault). With Fiber Auto Negotiation disabled the state of the copper link has no effect on the 1000Base-X link. Smart Link Pass Through (Down) With Fiber Auto Negotiation enabled the behavior is as follows. When the copper 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 copper transmitter will be turned off. When the copper receiver is off the 1000Base-X transmitter will be turned off. When the 1000Base-X receiver goes off the copper transmitter will be turned off. With Fiber Auto-Negotiation disabled the behavior is as follows. When the copper receiver is off the 1000Base-X transmitter will be turned off. When the 1000Base-X receiver goes off the copper 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. • *Enabled (Default)* - The Media converter will advertise Pause capable, Asymmetric pause not needed during Auto-Negotiation. • *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 • *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. • *Disabled (Down)*
Duplex	• *Full (Default-Up)* - The media converter will advertise Full Duplex Capable, Half Duplex Capable. • *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. (Default - Up) *Enabled* - The 1000Base-X receiver is looped to the 1000Base-X transmitter. The copper transmitter is taken off the interface.
Configuration Mode Strap	Auto (default) enable management module to overwrite hardware switch settings Switch - Use on-board DIP switches
Power	
Input Supply Voltage	(12 vDC Nominal)
Current	0.42amps at 12vdc
Power Consumption	4.98 watts
Power Connector	5.5mm x 9.5mm x 2.1mm barrel socket
Power Adapter	
Universal AC/DC Adapter	100-240v AC, regulated DC adapter included
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)	17
MTBF (Hours)	• 268,167 Hours without power adaptor • 178,770 Hours with power adaptor *Calculation model based on MIL-HDBK-217-FN2 @ 30°C*
Chassis	Metal with an IP20 ingress protection rating

Mounting	
Din Rail Kit	Optional
Wall / Rack Mount Kit	Optional

Product Weight and Dimensions	
Weight	0.722 kg
Dimensions	175 x 145 x 23 mm

Packaging	
Shipping Weight	1.2 kg
Shipping Dimensions	300 x 200 x 70 mm

Regulatory Approvals	
Emissions	• FCC Part 15 Class A, EN55022 Class A • CISPR 22 Class A • CISPR 32:2015/EN 55032:2015 (Class A) • CISPR 35/EN 55035 • EN61000-3-2
Immunity	EN55024

| Electrical Safety	• UL/EN/IEC 62368-1 • CAN/CSA C22.2 No. 62368-1 • UL 60950-1 • IEC 60950-1(ed 2); am1, am2 • EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013 • CE

Product List

SMI-1000-SFP - Gigabit Ethernet Standalone IP Managed Media Converter. 1000Base-T (RJ-45) [100 m/328 ft.] to 1000Base-X - SFP slot (empty) Managed or unmanaged operation

Power Cord & Part Number(s)

USA	UK	EU	SA	AUS	None
05070174	05070171	05070172	05070175	05070176	05070178

Related Accessories

Accessories
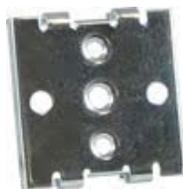
DIN Rail Mounting Kit for 4 & 8 port IOLAN desktop models, all Stand-Alone Media Converters and all Stand-alone Ethernet Extenders. Two of these brackets are required for the 8 port STS8-D model.	Standalone media converter wall / rack mount bracket
04030840	**05059999**

Power Supplies

UK 12VDC / 12W power adapter with Barrel connector for Perle Device Servers, Media Converters, and Ethernet

04031581

EU 12VDC / 12W power adapter with Barrel connector for Perle Device Servers, Media Converters, and Ethernet

04031582

USA 12VDC / 12W power adapter with Barrel connector for Perle Device Servers, Media Converters, and Ethernet

04031584

Australia 12VDC / 12W power adapter with Barrel connector for Perle Device Servers, Media Converters, and Ethernet

04031586