SMI-1000-SFP Managed Gigabit

perle.com/products/gigabit-sfp-managed-media-converters.shtml

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

- 1000Base-T to 1000Base-X Fiber SFP Media Converters
- Empty slot for Cisco and other industry standard Gigabit Fiber SFPs
- Manage via SNMP, CLI - Telnet/SSH, Internet Browser, or PerleVIEW Centralized Management Package
- 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-SFP 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.

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 Centralized Management Package

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
<u>Advanced Management User Authorization and Accounting</u>	• 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

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	Empty slot for 1000Base-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)* - 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 without power adaptor 178,770 with power adaptor
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 24:2010/EN 55024:2010
	EN61000-3-2
Immunity	EN55024
Electrical Safety	UL 60950-1
	IEC 60950-1(ed 2); am1, am2 EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
	CE

| Laser Safety	EN 60825-1:2007
	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.
Environmental	Reach, RoHS and WEEE Compliant
Other	ECCN: 5A992
	HTSUS Number: 8517.62.0020
	CCATS: G134373
	Perle Limited Lifetime Warranty

*Calculation model based on MIL-HDBK-217-FN2 @ 30 °C

## Managed Ethernet to Fiber Links

Manage your copper to fiber link with a Managed Standalone Media Converter. Ideal for use in managed networks with low density fiber applications. A Managed Standalone Media Converter is connected across a fiber link to a remote media converter. The copper and fiber link on the managed standalone unit can provide vital information and status to network management tools such as SNMP.
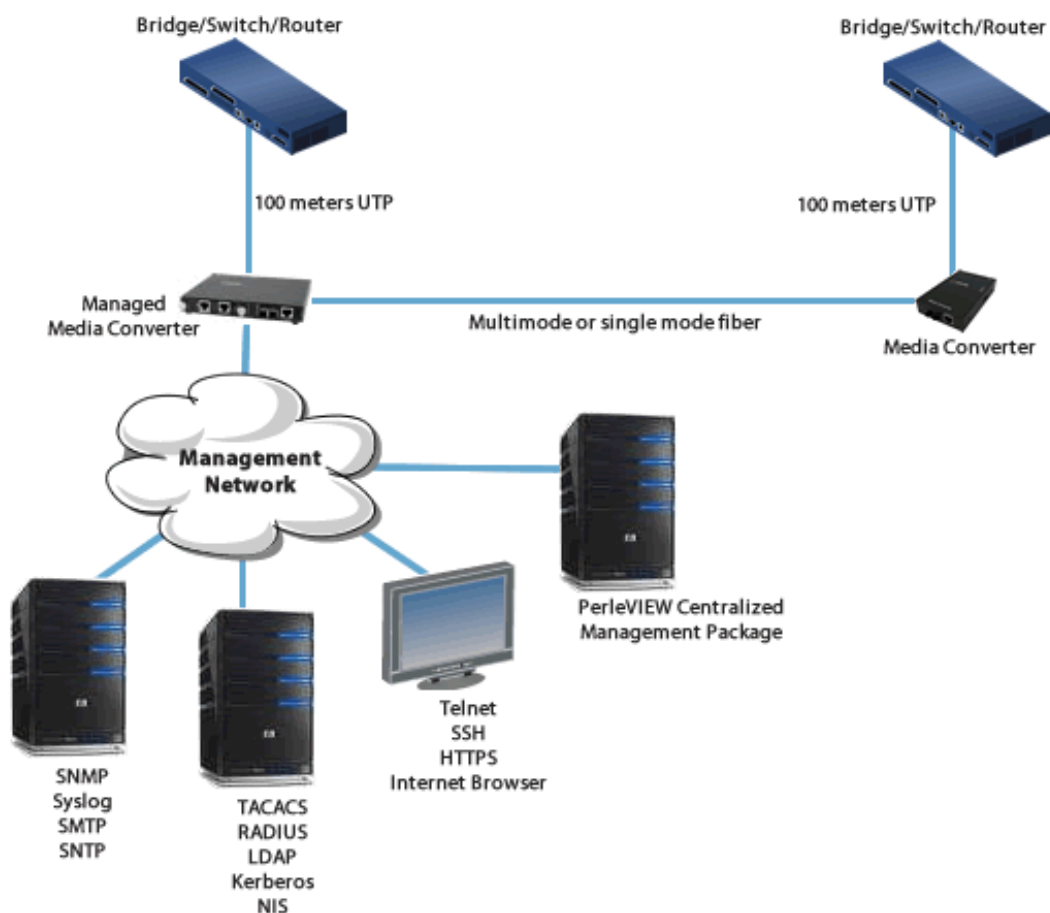
Extend between two TP Gigabit Switches

Extend the network distance between two twisted pair Gigabit Switches
Two Gigabit Ethernet Media Converters can extend the distance between 1000Base-T Switches across a fiber link up to 120km in length.
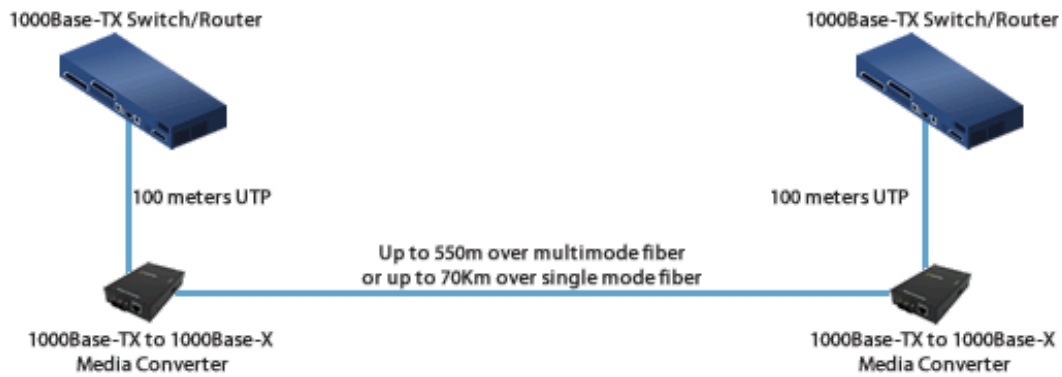
Switch to Gigabit Server

Extend the network distance between a Gigabit Switche and a Gigabit File Server
Two Gigabit Ethernet Media Converters can extend the distance between a 1000Base-T Switch and a Gigabit File Server across a fiber link up to 120km in length.

Gigabit Mode-Conditioning Adapters - More Distance

Extend Gigabit to 550m over 62.5 micron Multimode Fiber

Gigabit across 62.5 micron MMF cable is normally limited to 275 meters. By adding mode-conditioning adapters and 1000baseLX media converters you can extend the distance up to 550 meters on MMF cable plant.
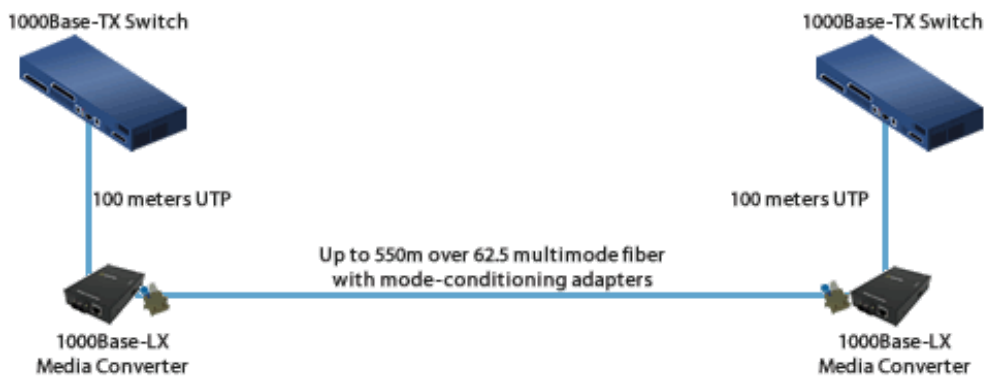
Gigabit Mode-Conditioning Adapters – 1000Base-LX

Installing Gigabit 1000Base-LX routers and switches into existing multimode cable plants

Using mode-conditioning adapters and a 1000Base-LX media converter, connect a copper based Gigabit Switch with a remote 1000base-LX switch/router over existing multimode cable plant.