S-1110-SFP Media and Rate Converter

10/100/1000Base-T to 100/1000Base-X Conversion

- 10/100/1000Base-T to 1000Base-X or 100Base-X Fiber SFP Media Converters
- Connect 10/100 devices to Fast Ethernet or Gigabit backbone
- Empty slot for **Cisco** and other industry standard **Gigabit or Fast Ethernet Fiber SFPs**
- Automatically adjusts to speed of Gigabit and Fast Ethernet fiber SFP´s
- **Manage via SNMP, CLI - Telnet/SSH, Internet browser**, or **PerleVIEW Central Management Platform**
- Advanced media converter features - Smart **Smart Link Pass-Through**, Fiber Fault Alert, Auto-MDIX and Loopback

Perle's advanced line of **Managed 10/100/1000 SFP Media Converters**, transparently connects 10/100/1000 copper to SFP-based 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 **10/100/1000 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 10/100/1000 Ethernet Converters the smart choice for IT professionals.

SMI-1110-SFP Managed 10/100/1000 SFP Media Converter Features

QOS (Quality of Service)

- Bandwidth Allocation via rate limiting
- IEEE 802.1P tagged frame priority control
- IEEE 802.1P priority tag remapping
- IP TOS (Type of Service) priority for IPV4 Diffserv or IPV6 traffic class frames
- Congestion Service Policy through WQF (Weighted Fair Queuing) or Strict Priority Queuing (default)

VLAN Tagging

- Default – Transparent to VLAN frames
- Enable discarding of tagged frames
- Enable discarding of untagged frames
- Untag – Removes any existing tag
- Insert Tag – Insert (if original frame is untagged) or replace (if original frame is tagged) the VLAN ID and priority with the configured default VLAN ID and priority tag.
- Insert Double tag (Q in Q) – Append an additional tag using the configured default VLAN ID and priority.

Unknown Multicast Frame filtering

When enabled, Multicast frames with an unknown destination address are not allowed to egress the port

Unknown Unicast Frame filtering

When enabled, Unicast frames with an unknown destination address are not allowed to egress the port

Unidirectional Ethernet

When enabled, provides the ability to restrict port to one-way traffic flow. Used in applications such as unidirectional video broadcasting as well as providing security for ethernet connections in accessible public areas

SFP Speed Sensing

Automatically detects whether a gigabit or Fast Ethernet fiber SFP has been inserted and adjusts accordingly.

Configuration Mode selection

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

Auto-MDIX

Can manually set Auto or MDIX on the copper port via on-board strap or via the management card. Auto-MDIX (automatic medium-dependant interface crossover) detects the signaling on the copper ethernet 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 120ns of delay skew between the 1000Base-T pairs.

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
- Copper Downshift status
- Hardware revision number
- Firmware version number

DIP switch settings

View hardware DIP switch settings

Selectable Max Packet Size

Set max packet size to 1522 / 2048 or 10,240 (default)

10BaseT Extended Distance

Normal/extended – default Normal. By configuring as “extended”, the 10baseT receiver sensitivity is increased providing the possibility of an 10BaseT connection greater than 100m.

Auto Copper downshift

Automatically detects a 2-pair cable environment and downshifts operation of the link to 100 Mb/s. Configure the number of times (0-8) that the PHY will attempt to establish a successful Gigabit link before attempting to “downshift” as an auto-negotiating 10/100 device. Setting # of attempts to 0 (default) disables the feature.

Virtual Cable Test

A test that enables the detection of potential copper cabling issues such as pair polarity pair swaps and excessive pair skew as well as any opens, shorts or any impedance mismatch. Will report the distance in the cable to the open or short.

Port Control

Enable or disable individual fiber or copper port on the module

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)
- Link Status (Up/Down)
- Far End Fault (OK, Failed)
- Fiber Loopback mode (On/Off)

Control

- Reset
- Reset to factory default
- Reset Statistical counters
- Phy specific commands such write/read config, read dip switches
- Update firmware
- Fiber Loopback mode. (On/Off)
- Virtual Cable Test. (On/Off)
- Upload/download configuration

Detailed port statistics

To assist in troubleshooting copper and fiber links, an extensive list of ingress and egress counters for both copper and fiber ports are available. These statistics can be viewed locally via the management module or from a central SNMP NMS on the network

Auto-Negotiation (802.3u)

The media converter supports auto negotiation. The 1000Base-X fiber interface negotiates according to 802.3 clause 37. The 10/100/1000Base-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.

Smart Link Pass-Through

When the Link Mode switch is placed into Smart Link Pass-Through mode, the copper ethernet 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 802.3xy)

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 10/100/1000Base-T connection and 1000Base-X fiber connection.

Duplex

Full and half duplex operation supported.

Jumbo Packets

Transparent to jumbo packets up to 10KB.

Remote Loopback

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

SMI-1110-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. 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.
Copper link on / Receive activity (LKC)	This green LED is operational only when power is applied. The LED is on when the 10/100/1000Base-T link is on and flashes with a 50% duty cycle when data is received.
Fiber Duplex (FDF)	This green LED is operational only when power is applied. The LED is on when the 10/100/1000Base-X link is operational in full duplex mode. The LED is off when in half duplex.
Copper Duplex (FDC)	This green LED is operational only when power is applied. The LED is on when the 10/100/1000Base-T link is operational in full duplex mode. The LED is off when in half duplex.
10/100/1000 Speed	This multi-color LED is operational only when power is applied. The LED is green when the speed of the copper ethernet port is running at 1000 Mbps. The LED is orange when the speed of the copper Ethernet port is running at 100 Mbps. The LED is off when in 10 Mbps.
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	
10/100/1000Base-T	RJ45 connector • 2 pair CAT5, EIA/TIA 568A/B or better cable for 10/100. • 4 pair CAT5 UTP cable for Gigabit. • Magnetic Isolation1.5kv
Small Form Factor Pluggable (SFP) slot	• Empty slot for 1000Base-X or 100Base-X **SFP modules supplied by Perle**, **Cisco** or other manufacturers of MSA compliant SFPs. • DOM (Digital Optical Monitoring) • DMI (Diagnostic Monitoring Interface) as per SFF-8472 • 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
Filtering	
Filtering	1024 MAC Addresses
Frame Specifications	
Buffer	1000 Kbits frame buffer memory
Size	• Maximum frame size of 10,240 bytes -- Gigabit • Maximum frame size of 2048 bytes -- Fast Ethernet
Switches - accessible through a side opening in the chassis	
Auto-Negotiation (802.3u)	• *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.
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)*
Remote Loopback	The media converter can perform a loopback on the 1000Base-X fiber interface. • *Disabled (Default - Up)* • *Enabled* - The 1000Base-X receiver is looped to the 1000Base-X transmitter. The copper transmitter is taken off the interface.

Auto-MDIX (Strap)	If Auto-Negotiation (802.3u) is enabled, the media converter determines the current cable pinout to use on the copper interface. If Auto-Negotiation (802.3u) is disabled the Media converter will use the RX Energy method on the copper interface to set the port MDI or MDIX whichever is appropriate. *Enabled (Default)* - Either a straight-through or crossover type cable can be used to connect the media converter to the device on the other end of the cable. Disabled - If the partner device on the other end of the cable does not have the Auto-MDIX feature a specific cable, either a straight-through or crossover will be required to ensure that the media converter's transmitter and the partner devices transmitter are connected to the others receiver. The Media converter's 100Base-TX port is configured as MDI-X with this switch setting.
Speed Copper	• 100 (Default) • 10
Duplex Copper	• Full (Default) • Half
Duplex Fiber	• Full (Default) • Half
Power	
Input Supply Voltage	(12 vDC Nominal)
Current	0.34amps at 12vdc
Power Consumption	4.1watts
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)	14
MTBF (Hours)	• 256,533 Hours without power adapter • 173,524 Hours with power adapter *Calculation model based on MIL-HDBK-217-FN2 @ 30°C*
Chassis	Metal with an IP20 ingress protection rating
Mounting	
Din Rail Kit	Optional
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-1110-SFP - 10/100/1000 Gigabit Ethernet Standalone IP Managed Media and Rate Converter. 10/100/1000Base-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
05070774	05070771	05070772	05070775	05070776	05070778

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.

04030840

Standalone media converter wall / rack mount bracket

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