



S-1110-XT 10/100/1000 Industrial Temperature Media Converters Standalone, Unmanaged



- 10/100/1000Base-T to 1000Base-X Fiber Media Converters
- Connect 10/100 devices to Gigabit backbone
- Extend network distances up to 10km for industrial Ethernet equipment
- Advanced features - Smart Link Pass-Through, Fiber Fault Alert, Auto-MDIX and Loopback
- -40F to +167F (-40C to +75C) extended temperature support
- Terminal block power connector

The **S-1110-XT Industrial Temperature Media Converters** address the need for transparently connecting 10/100/1000 Ethernet equipment that operate in extreme temperatures to fiber optic cable. The S-1110-XT Media Converters will operate in industrial grade temperatures of **-40F to +167F (-40C to +75C)**. Equipment found in **traffic management, oil and gas pipelines, weather tracking, industrial and outdoor applications** must function in temperatures that cannot be supported by a commercial based media converter. Boasting this extended temperature feature along with a rugged steel casing, the S-1110-XT Media Converter provides an economical path to extend the distance between two industrial devices subjected to harsh environments and severe temperatures such as security cameras, wireless access points, alarms, traffic controllers, sensors and tracking 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 **S-1110-XT Industrial Temperature 10/100/1000 Media Converters** the smart choice for IT professionals.

S-1110-XT 10/100/1000 to Fiber Industrial Temperature Media Converter Features

Auto-Negotiation (802.3u)	<p>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.</p> <p>The media converter supports auto-negotiation of full duplex, half duplex, remote fault, full duplex pause, asymmetric pause and Auto MDI-X.</p>
Auto-MDIX	<p>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.</p> <p>The media converter will adjust for up to 120ns of delay skew between the 1000Base-T pairs.</p>
Smart Link Pass-Through	<p>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.</p>
Fiber Fault Alert	<p>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.</p>
Pause (IEEE 802.3xy)	<p>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.</p>
Duplex	<p>Full and half duplex operation supported.</p>
Jumbo Packets	<p>Transparent to jumbo packets up to 10KB.</p>
VLAN	<p>Transparent to VLAN tagged packets.</p>
Remote Loopback	<p>Capable of performing a loopback on the 1000Base-X fiber interface.</p>

Power	
Input Supply Voltage	6 - 16 vDC, unregulated (12 vDC Nominal)
Current	216 mA @ 12 vDC
Power Consumption	2.6 watts
Power Connector	2-pin pluggable terminal block
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.
Switches - accessible through a side opening in the chassis	
Auto-Negotiation (802.3u)	<p><i>Enabled (Default)</i> - 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.</p> <p><i>Disabled</i> - The media converter sets the port according to the position of the speed and duplex switches.</p>
Link Mode	<p>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.</p> <p><i>Normal (Default – Up)</i> 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).</p> <p>With Fiber Auto Negotiation disabled the state of the copper link has no effect on the 1000Base-X link.</p> <p><i>Smart Link Pass Through (Down)</i> 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.</p> <p>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.</p>
Fiber Fault Alert	<p>The Fiber Fault Alert switch has meaning when Auto-Negotiation is disabled</p> <p><i>Enabled (Default - Up)</i> 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.</p> <p><i>Disabled (Down)</i></p>
Remote Loopback	<p>The media converter can perform a loopback on the 1000Base-X fiber interface.</p> <p><i>Disabled (Default - Up)</i></p> <p><i>Enabled</i> - The 1000Base-X receiver is looped to the 1000Base-X transmitter. The copper transmitter is taken off the interface.</p>

Auto-MDIX (Internal Strap)	<p>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.</p> <p><i>Enabled (Default)</i> - 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.</p> <p><i>Disabled</i> - 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.</p>
Speed Copper	100 (Default) 10
Duplex Copper	Full (Default) Half
Duplex Fiber	Full (Default) Half
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 Isolation	1.5kv
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
Environmental Specifications	
Operating Temperature	-40 C to 75 C (-40 F to 167 F)
Storage Temperature	-40 C to 85 C (-40 F to 185 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)	8.9 BTU
MTBF (Hours)	489,616
Mounting	
Din Rail Kit	Optional
Rack Mount Kit	Optional
Product Weight and Dimensions	
Weight	0.5 kg, 1.1 lbs
Dimensions	150 x 95 x 26 mm, 5.9 x 3.7 x 1.0 inches
Packaging	
Shipping Weight	0.55 kg, 1.2 lbs
Shipping Dimensions	150 x 210 x 40 mm, 5.9 x 8.3 x 1.6 inches
Regulatory Approvals	
Emissions	FCC Part 15 Class A, EN55022 Class A
	CISPR 22 Class A
	EN61000-3-2
Immunity	EN55024
Electrical Safety	UL 60950-1

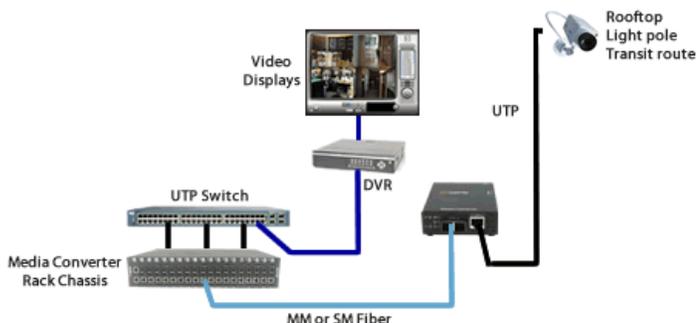
Electrical Safety	EN60950
	CE
Laser Safety	EN 60825-1:2007
	Fiber optic transmitters on this device meet Class 1 Laser safety requirements per IEC-60825 FDA/CDRH standards and comply with 21CFR1040.10 and 21CFR1040.11.
Environmental	Reach, RoHS and WEEE Compliant
Other	ECCN: 5A991A
	HTSUS Number: 8517.62.0050
	Perle Lifetime warranty

Fast Ethernet to IP Cameras

Connect 10/100/1000 IP Cameras to Fast Ethernet Backbone

Extend the reach to IP cameras using industrial fiber media converters. Security cameras are typically installed in remote locations where extremely high or low temperatures are a concern -- ceilings, rooftops, light poles, along fences, pipelines and transit routes.

Stand-alone Extended Temperature Media Converters are placed at the remote end connecting cameras with copper interfaces to fiber optic cabling. The fiber can extend the distance up to 20 kilometers using single mode or multimode fiber back to a control center. A media converter chassis located in the data closet at the control center accepts the fiber signal, converts it, and connects to the copper equipment at the main site.

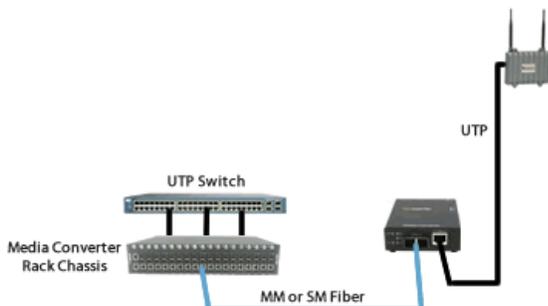


Fast Ethernet Fiber to Wireless Access Points

Connect 10/100/1000 Wireless Access Points to Fast Ethernet Backbone

Extend the reach to wireless access points (AP) using fiber media converters. When a company deploys a wireless network in their office or large warehouse, APs need to be set up throughout the facility to ensure complete coverage for reliability. The network manager will likely need to extend further than the 100 meters allowed by copper cable to reach many of the APs.

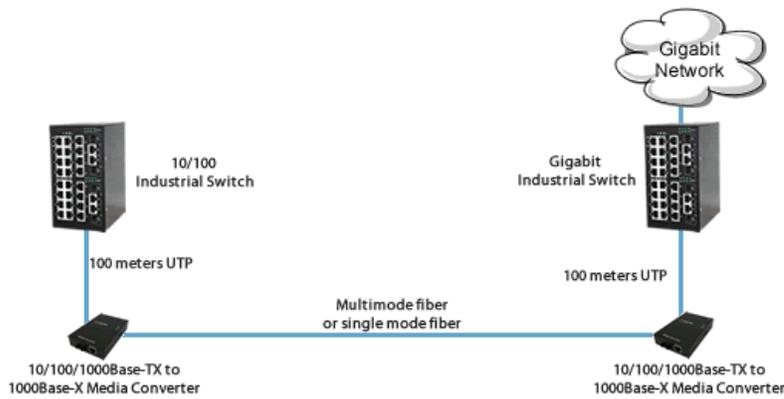
When AP's are used in industrial environments where extremely high or low temperatures are a concern, Stand-alone Extended Temperature Media Converters are placed at the remote end connecting APs with copper interfaces to fiber optic cabling. The fiber can extend the distance up to 20 kilometers using single mode or multimode fiber back to a control center. A media converter chassis located in the data closet at the control center accepts the fiber signal, converts it, and connects to the copper equipment at the main site.



Bridge 10/100 Devices to gigabit Backbone

Connect 10/100 devices to Gigabit Backbone

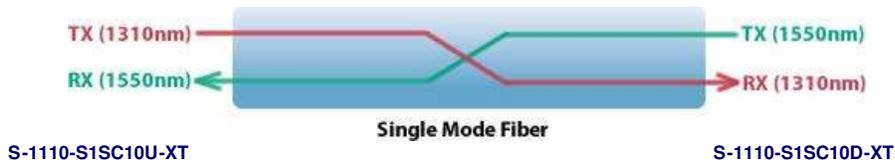
Industrial switches are often used in environments where extremely high or low temperatures are a concern. Devices in an industrial environment can be connected to a Gigabit backbone through the use of rate converting Industrial Temperature Media Converters.



Single Mode / Single Fiber

Connect copper ports over a single fiber strand (also referred to as “Bi-Directional” BiDi)

When Single Strand fiber is used, a pair of Single Fiber Media Converters is needed for the copper to fiber conversion. Perle Single Fiber Media Converters are also referred to as “Up/Down” models. For example the S-1110-S1SC10U-XT (“Up”) and S-1110-S1SC10D-XT (“Down”), shown below, must be used in pairs. An “Up” must be matched with a “Down” peer to deal with transmit and receive frequencies separately.



The majority of installations for single mode fiber media converters are of the “dual connector” or “dual fiber” type where one fiber connection is used for transmit, the other for receive. These are physically “crossed” to match up the Transmit/Receive links.

However, to reduce costs, or where there are limits on available fiber, WDM technology may be utilized. WDM uses separate transmit and receive frequencies to communicate on a single fiber strand. WDM technology relies on the fact that optical fibers can carry many wavelengths of light simultaneously without interaction between each wavelength. Thus, a single fiber can carry many separate wavelength signals or channels simultaneously.

So remember, if Single Strand fiber is used, you will need an “Up” Media Converter on one side and a “Down” Media Converter on the other for copper to fiber conversion.

Perle offers a wide variety of Single Fiber (“Up/Down”) Media Converters to connect 10BaseT, Fast Ethernet and Gigabit to single fiber. Whether you need Managed or Unmanaged, Standalone or Modular Chassis Based, 20km or 120km, Perle has the right model to meet your fiber conversion requirement.

Select a Model to obtain a Part Number - S-1110-XT Industrial Temperature Media Converter

Model	Connector	Type	Transmit (dBm)		Receive (dBm)		Power Budget (dBm)	Wavelength (nm)	Fiber Type	Core Size (um)	Modal Bandwidth (MHz* Km)	Operating Distance
			Min	Max	Min	Max						
S-1110-M2SC05-XT	Dual SC	1000Base-SX	-9.5	-4.0	-17.0	-3.0	7.5	850	MMF	62.5	160	220 m (722 ft)
										62.5	200	275 m (902 ft)
										50	400	500 m (1,640 ft)
										50	500	550 m (1,804 ft)
										50	2000	1000 m (3281 ft)
S-1110-M2ST05-XT	Dual ST	1000Base-SX	-9.5	-3.0	-20.0	-3.0	10.5	850	MMF	62.5	160	220 m (722 ft)
										62.5	200	275 m (902 ft)
										50	400	500 m (1,640 ft)
										50	500	550 m (1,804 ft)
										50	2000	1000 m (3281 ft)
S-1110-S2SC10-XT	Dual SC	1000Base-LX/LH	-9.5	-3.0	-20.0	-3.0	10.5	1310	MMF*	62.5	500	550 m (1,804 ft)
										50	400	550 m (1,804 ft)
										50	400	550 m (1,804 ft)
									SMF	**	-	10 km (6.2 mi)
S-1110-S2ST10-XT	Dual ST	1000Base-LX/LH	-9.5	-3.0	-20.0	-3.0	10.5	1310	MMF*	62.5	500	550 m (1,804 ft)
										50	400	550 m (1,804 ft)
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									SMF	**	-	10 km (6.2 mi)

Single Fiber Models ([Recommended use in pairs](#))

Model	Connector	Type	Transmit (dBm)		Receive (dBm)		Power Budget (dBm)	Wavelength (nm)	Fiber Type	Core Size (um)	Modal Bandwidth (MHz* Km)	Operating Distance
			Min	Max	Min	Max						
S-1110-S1SC10U-XT	Single SC	1000Base-BX-U	-9.0	-3.0	-20.0	-3.0	11.0	1310 / 1490	SMF	**	-	10 km (6.2 mi)
S-1110-S1SC10D-XT	Single SC	1000Base-BX-D	-9.0	-3.0	-20.0	-3.0	11.0	1490 / 1310	SMF	**	-	10 km (6.2 mi)

The minimum fiber cable distance for all converters listed is 2 meters.

*A mode-conditioning adapter as specified by the IEEE standard, is required regardless of the span length. Note how the mode conditioning adapter for 62.5-um fibers has a different specification from the mode-conditioning adapter for 50-um fibers.

**ITU-T G.652 SMF as specified by the IEEE 802.3z standard.

Media Converter Accessories	
4 DIN Rail Mount Bkt	DIN Rail Mounting Kit
MCA1000-50SC	Mode Conditioning Adapter - Gigabit. IEEE 802.3z-compliant, consisting of a single-mode fiber permanently coupled off-center to a 50-micron multimode optical fiber with duplex SC connectors at both ends.
MCA1000-62SC	Mode Conditioning Adapter - Gigabit. IEEE 802.3z-compliant, consisting of a single-mode fiber permanently coupled off-center to a 62.5-micron multimode optical fiber with duplex SC connectors at both ends.
MCSM	Standalone media converter wall mount bracket
04030674	Extended Temperature USA power adapter for 12 Volt Industrial Temperature Media Converter

04030671	Extended Temperature UK power adapter for 12 Volt Industrial Temperature Media Converter
04030672	Extended Temperature EU power adapter for 12 Volt Industrial Temperature Media Converter
04030675	Extended Temperature SA power adapter for 12 Volt Industrial Temperature Media Converter
04030676	Extended Temperature AUS power adapter for 12 Volt Industrial Temperature Media Converter