# S-1110-XT Industrial Media and Rate Converters

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

- 10/100/1000 Copper to 1G Fiber Media Converters
- Connect 10/100 devices to Gigabit backbone
- Dual fiber ST/SC/LC or Single fiber SC Connectors
- Extend network distances up to 10km for industrial Ethernet equipment
- Advanced features - Smart Link Pass-Through, Fiber Fault Alert, Auto-MDIX and Loopback
- -40°F to +167°F (-40°C to +75°C) 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 **-40°F to +167°F (-40°C to +75°C)**. 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)

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.

## Auto-MDIX

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.

## 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.

## 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 |



| Power | |
|---|---|
| Input Supply Voltage | 6 - 30 vDC, unregulated (12 vDC Nominal) |
| Current | 175 mA @ 12 vDC |
| Power Consumption | 2.1 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) | • *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.<br>• *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.<br>*Normal (Default — Up)*<br>• 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).<br>• With Fiber Auto Negotiation disabled the state of the copper 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 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.<br>• 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<br>• *Enabled (Default - Up)*<br>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)* |
| 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 copper transmitter is taken off the interface. |

| | |
|---|---|
| Auto-MDIX (Internal 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.<br>• *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.<br>• 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)<br>• 10 |
| Duplex Copper | • Full (Default)<br>• Half |
| Duplex Fiber | • Full (Default)<br>• Half |
| Connectors | |
| 10/100/1000Base-T | RJ45 connector<br>• 2 pair CAT5, EIA/TIA 568A/B or better cable for 10/100.<br>• 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<br>• 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 75°C (-40°F to 167°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) | • 7.2 BTU |
| MTBF (Hours)* | 475,616 Hours<br>*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 | 0.3 kg, 0.7 lbs |
| Dimensions | 120 x 80 x 26 mm, 4.7 x 3.1 x 1.0 inches |
| Packaging | |
| Shipping Weight | 0.43 kg, 1.0 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<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

**S-1110-M2SC05-XT - 10/100/1000 Gigabit Ethernet Stand-Alone Industrial Temperature Media Rate Converter.** 10/100/1000Base-T (RJ-45) to 1000Base-SX 850nm multimode (SC) [550 m/1804 ft.]. Extended Temperature, terminal block power connector for external power source.

**Power Cord & Part Number(s)**

**None**

**05090670**

**S-1110-M2ST05-XT - 10/100/1000 Gigabit Ethernet Stand-Alone Industrial Temperature Media Rate Converter.** 10/100/1000Base-T (RJ-45) to 1000Base-SX 850nm multimode (ST) [550 m/1804 ft.]. Extended Temperature, terminal block power connector for external power source.

**Power Cord & Part Number(s)**

**None**

**05090680**

**S-1110-S2SC10-XT - 10/100/1000 Gigabit Ethernet Stand-Alone Industrial Temperature Media Rate Converter.** 10/100/1000Base-T (RJ-45) [] 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 adapter. Extended Temperature, terminal block power connector for external power source.

**Power Cord & Part Number(s)**

**None**

**05090700**

**S-1110-S2ST10-XT - 10/100/1000 Gigabit Ethernet Stand-Alone Industrial Temperature Media Rate Converter.** 10/100/1000Base-T (RJ-45) [] to 1000Base-LX/LH 1310 nm single mode (ST) [10 km/6.2 miles]. Extended Temperature, terminal block power connector for external power source.

**Power Cord & Part Number(s)**

**None**

**05090710**

**S-1110-S1SC10U-XT - 10/100/1000 Gigabit Ethernet Stand-Alone Industrial Temperature Media Rate Converter.** 10/100/1000Base-T (RJ-45) [] to 1000Base-BX 1310nm TX / 1490nm RX single strand fiber, single mode (SC) [10 km/6.2 miles]. Extended Temperature, terminal block power connector for external power source.

**Power Cord & Part Number(s)**

**None**

**05090730**

**S-1110-S1SC10D-XT - 10/100/1000 Gigabit Ethernet Stand-Alone Industrial Temperature Media Rate Converter.** 10/100/1000Base-T (RJ-45) [] to 1000Base-BX 1490nm TX / 1310nm RX single strand fiber, single mode (SC) [10 km/6.2 miles]. Extended Temperature, terminal block power connector for external power source.

**Power Cord & Part Number(s)**

**None**

**05090740**

**S-1110-M2LC05-XT - 10/100/1000 Gigabit Ethernet Stand-Alone Industrial Temperature Media Rate Converter.** 10/100/1000Base-T (RJ-45) [] to 1000Base-SX 850nm multimode (LC) [550 m/1804 ft.]. Extended Temperature, terminal block power connector for external power source.

**Power Cord & Part Number(s)**

**None**

**05090690**

**S-1110-S2LC10-XT - 10/100/1000 Gigabit Ethernet Stand-Alone Industrial Temperature Media Rate Converter.** 10/100/1000Base-T (RJ-45) [] to 1000Base-LX/LH 1310 nm single mode (LC) [10 km/6.2 miles] or multimode (SC) [550 m/1804 ft.] using a mode conditioning adapter. Extended Temperature, terminal block power connector for external power source.

**Power Cord & Part Number(s)**

**None**

**05090720**

## Related Accessories

## Power Supplies

UK Extended Temperature 12VDC / 24W power adapter for Perle Device Servers, Media

**04030671**

EU Extended Temperature 12VDC / 24W power adapter for Perle Device Servers, Media

**04030672**

USA Extended Temperature 12VDC / 24W power adapter for Perle Device Servers, Media

**04030674**

South Africa Extended Temperature 12VDC / 24W power adapter for Perle Device

**04030675**

Australia Extended Temperature 12VDC / 24W power adapter for Perle Device Servers, Media

**04030676**

UNO-PS/1AC/24DC/60W DIN-Rail Power Supply: 24 VDC, 60 Watt with universal 85 to 264 VAC, -25 to 70°C extended operating temperature.

**29029928**

## 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**