

# SRS-1110-F DIN Rail Media Converters

## Industrial Rate Converting Copper to Fiber Converters



- 10/100/1000Base-T to 100Base-X Fiber Media Converters
- Meets IEC 61850-3 & IEEE 1613 electric power substation environmental standards
- Class 1 Division 2 certified for hazardous locations
- Link copper to multimode or single mode fiber
- Dual fiber ST/SC or Single fiber SC connectors
- -40C to +75C (-40F to +167F) extended operating temperature
- Advanced Features: Link Pass-Through, Far-End Fault, Auto-MDIX
- Triple Power Input: Dual Terminal block power connector & T-Bus

Perle **SRS-1110-F DIN Rail Media Converters** transparently connect UTP CAT5/6/7 copper to Fast Ethernet dual or single fiber in electric utility and power substation environments. With an extended operating temperature range of **-40C to +75C** and advanced electrical certifications for IEC 61850-3, IEEE1613 and EN 61000-4-16, these fiber to Ethernet converters meet all requirements necessary to operate safely in the harsh electrical environments associated with power utility and substation deployments.

The SRS Media Converters are also designed to operate in hazardous industrial locations. With numerous certifications, including ATEX Class 1 Zone 2 and ANSI/ISA 12.12.01 Class 1 Division 2, you are ensured safe and reliable operation in locations where flammable gases, liquids or vapors are handled, processed or used.

- Extend the data transmission distance of IP-based devices by connecting their 10/100/1000Base-T copper interface to Fast Ethernet fiber.
- Extend the distance of an existing industrial network by linking CAT5/6/7 cabling to multimode or single mode fiber.
- Extend the distance between two copper-based devices or networks
- Protect Ethernet data from EMI noise and interference by inter-connecting your copper-Ethernet devices over fiber in industrial plants.

SRS-1110 Media Converters are also available with support for **Gigabit fiber** or an **SFP slot**.

Network Administrators can "see-everything" with Perle's advanced features such as Auto-Negotiation, Auto-MDIX, Link Pass-Through, Far End Fault, and Pause which make the end to end link completely transparent. 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 **SRS-1110-F Rate Converting Media Converters** the smart choice for IT professionals.

# SRS-1110-F Fiber Media Converter Features: 10/100/1000Base-T to 100Base-X

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## Fully designed to operate in extreme temperatures

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- Perle SR-1110-F Industrial Media Converters only use components that are fully qualified and rated to operate in -40F to +167F.
  - There are other products on the market that claim to operate at -40°F to +167°F however, they use “commercial-grade” components that have not been qualified by the manufacturer (OEM) to operate at the claimed temperature ranges. When “commercial-grade” parts are exposed to extremely high or low temperatures, product failures are inevitable. For example, integrated circuits on the PCB overheat causing premature failures. Under-rated connectors do not allow for proper contact between the device and the cables. These failures eventually stop all data communications in these high and low temperature environments.
  - By choosing Perle you can be confident you will not be subjected to these failures.
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## DIN Rail Enclosure

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Easily mount on a DIN rail or inside distribution boxes using native DIN Rail enclosure with grounding clip. No need for add-on brackets.

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## Auto-Negotiation

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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.

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## Auto-MDIX

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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.

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## Smart Link Pass-Through

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When Smart Link Pass-Through mode is enable, the Ethernet copper port will reflect the state of the Ethernet fiber media converter port. This feature can be used whether fiber auto-negotiation is enabled or disabled.

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## Fiber Fault Alert

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With Fiber Fault Alert the state of the Ethernet fiber receiver is passed to the Ethernet fiber transmitter. This provides fault notification to the partner device attached to the Ethernet fiber interface of the media converter. If the Ethernet fiber 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 Ethernet fiber 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.

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## Pause (IEEE 802.3xy)

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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 copper connection and 1000Base-X fiber connection.

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## Duplex

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Full and half duplex operation supported.

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## Jumbo Packets

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Transparent to jumbo packets up to 10KB.

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## VLAN

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Transparent to VLAN tagged packets.



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## Remote LoopBack

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

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Specifications	
<b>Lifetime limited warranty</b>	<b>Reach, RoHS and WEEE Compliant</b>
<b>HTSUS Number:</b> 8517.62.0020	<b>UNSPSC Code:</b> 43201553
<b>ECCN:</b> 5A991	
	
Power	
Input Supply Voltage	Triple voltage 12 / 24 / 48 VDC (9.6 – 60 VDC) input supporting: <ul style="list-style-type: none"> <li>• 2 x Terminal Block power input and</li> <li>• 1 x T-Bus power input</li> </ul>
Current	0.09 A (@ 24VDC)
Power Consumption	2.16 watts (@ 24VDC)
Power Connector	Dual input Terminal Block and/or T-Bus
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 fast/slow when in Loopback test mode or hardware error.
Fiber link on / Receive activity (LKF)	<ul style="list-style-type: none"> <li>• On: Fiber link present.</li> <li>• Blinking slowly: Fiber link disabled because of copper link loss.</li> <li>• Blinking quickly: Fiber link present and receiving data.</li> <li>• Off: No fiber link present</li> </ul>
Link Pass-Through (LKP)	<ul style="list-style-type: none"> <li>• On: Copper link is present.</li> <li>• Blinking slowly: Copper link disabled because of fiber link loss</li> <li>• Blinking quickly: Copper link present and receiving data.</li> <li>• Off: No copper link present</li> </ul>

<p>10/100/1000 Copper Speed (SP)</p>	<ul style="list-style-type: none"> <li>• Green: 1000 Mbps</li> <li>• Yellow: 100 Mbps</li> <li>• Off: 10 Mbps</li> </ul>
<p>Copper Link Activity (LK)</p>	<ul style="list-style-type: none"> <li>• On: Copper link is present</li> <li>• Blinking quickly: Copper link receiving data</li> </ul>
<p>Switches - accessible by sliding the chassis open</p>	
	
<p>Auto-Negotiation</p>	<p>Auto (Default-Up): In this mode of operation the media converter will negotiate Ethernet parameters on both the copper and the fiber connection. This will ensure the most optimal connection parameters will be in effect. If connecting to another Perle Gigabit Media Converter, this parameter should be set to Auto.</p> <p>Off: Copper Negotiation should only be turned off, if the copper link partner does not support copper link negotiations.</p>
<p>Smart Link Pass-Through</p>	<p>Standard Mode (Default-Up): In this mode, with Fiber Negotiation set off, the links on the fiber and copper sides can be brought up and down independently of each other. A loss of link on either the fiber link or copper link can take place without affecting the other connection. However, if the Fiber Negotiation is set to Auto, then a loss of link on the copper side will result in a loss of link on the fiber side but not vice versa.</p> <p>Smart Link Pass-Through: In this mode, the link state on one connection is directly reflected through the media converter to the other connection. If link is lost on one of the connections, then the other link will be brought down by the media converter.</p>
<p>Loopback</p>	<p>Disabled (Default-Up): The loopback feature is disabled. This is the normal position for regular operation. The switch must be set to this position for data to pass through the media converter.</p> <p>Enabled: This is a test mode. All data received on the receive (RX) fiber connection is looped back to the transmit (TX) fiber connection. The state of the copper is not relevant and no data or link status is passed through to the copper side.</p>

<b>Fiber Fault Alert (FFA)</b>	<p>Enabled (Default-Up): In this mode, when Fiber negotiation is turned on, if the media converter detects a loss of fiber signal on the fiber receiver it will immediately disable its fiber transmitter signal. This notifies the fiber link partner that an error condition exists on the fiber connection. If the remote media converter is set up for FFA Enabled and the local media converter is set up with Smart Link Pass-Through, a loss of fiber link on either the transmit or receive line will be passed through to the local copper connection to notify the connected device. If the media converter has been set to Smart Link Pass-Through mode, the effect will be the same as FFA since the link loss on the fiber receiver will result in bringing down the copper link, which will in turn cause the transmit fiber link to be brought down.</p> <p>Disabled: In this mode, the media converter will not monitor for fiber fault.</p>
<b>Duplex Mode</b>	<p>Auto (Default-Up): In this mode, when Fiber Negotiation has been turned off, the media converter will use this Duplex setting for its Ethernet parameter negotiation on the copper connection. In the Auto position, the media converter will advertise support for both Full and Half Duplex mode. The resultant negotiation will provide the most optimum connection.</p> <p>Half: In this mode, the media converter will force the negotiation to Half Duplex mode</p>
<b>Copper Speed</b>	<p>100 (Default-Up): In this mode, when Auto Neg (copper) is set to off, the media converter will use this switch setting for its Ethernet copper speed connection. The media converter will force the speed to 100 Mbps.</p> <p>10: The media converter will force the speed to 10 Mbps</p>
<b>Cables and Connectors</b>	
<b>100Base-TX or 1000Base-T or 10/100/1000Base-T</b>	<ul style="list-style-type: none"> <li>• RJ45 connector, 2 pair CAT 5 (UTP or STP) or better cable for 10/100 Mbps</li> <li>• RJ45 connector, 4 pair CAT 5 (UTP or STP) or better cable</li> </ul>
<b>Fixed Fiber or Small Form Factor Pluggable (SFP) slot</b>	<ul style="list-style-type: none"> <li>• Dual multimode or single mode (Duplex) fiber - SC, ST</li> <li>• Single strand fiber (Simplex) – SC</li> <li>• Single strand fiber (Simplex) – SC</li> </ul>
<b>Magnetic Isolation</b>	1.5kv
<b>Fiber Optic Cable</b>	<ul style="list-style-type: none"> <li>• Multimode: 62.5 / 125, 50/125, 85/125, 100/140 micron</li> <li>• Single Mode: 9/125 micron (ITu-T 625)</li> </ul>

<b>Filtering</b>	
Filtering	1025 MAC Addresses
<b>Frame Specifications</b>	
Buffer	1000 Kbits frame buffer memory
Size	<ul style="list-style-type: none"> <li>• Maximum frame size of 10,240 bytes -- Gigabit</li> <li>• Maximum frame size of 2048 bytes -- Fast Ethernet</li> </ul>
<b>Packet Transmission Characteristics</b>	
Bit Error Rate (BER)	$<10^{-12}$
<b>Environmental Specifications</b>	
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)	7.37
MTBF (Hours)*	570,070 Hours <i>Calculation model based on MIL-HDBK-217-FN2 @ 30°C</i>
Chassis	Molded plastic DIN Rail case with an IP20 ingress protection rating
<b>Mounting</b>	
Din Rail Kit	Native
<b>Product Weight and Dimensions</b>	
Weight	0.12 kg, 0.26 lbs
Dimensions	114 x 100 x 22.5mm, 4.5 x 3.9 x 0.88 inches

<b>Packaging</b>	
<b>Shipping Weight</b>	0.17 kg, 0.37 lbs
<b>Shipping Dimensions</b>	145 x 105 x 30 mm, 5.7 x 4.1 x 1.2 inches
<b>Regulatory Approvals</b>	
<b>Substation &amp; Hazloc</b>	<ul style="list-style-type: none"> <li>• IEC 61850-3</li> <li>• IEEE1613</li> <li>• EN 61000-4-16</li> <li>• ATEX Class 1 Zone 2</li> <li>• ANSI/ISA 12.12.01, Class 1 Division 2 Groups A-D</li> </ul>
<b>Emissions</b>	<ul style="list-style-type: none"> <li>• FCC 47 Part 15 Class A</li> <li>• EN55011 (CISPR11)</li> <li>• ICES-003</li> <li>• EN61000-6-4 (Emissions for industrial environments)</li> <li>• CISPR 32 / EN 55032</li> <li>• EN61000-3-2</li> </ul>
<b>Immunity</b>	<ul style="list-style-type: none"> <li>• CISPR 35 / EN 55035</li> <li>• EN55025</li> <li>• EN 61000-4-2 (ESD)</li> <li>• EN 61000-4-3 (RS)</li> <li>• EN 61000-4-4 (EFT)</li> <li>• EN 61000-4-5 (Surge)</li> <li>• EN 61000-4-6 (CS)</li> <li>• EN 61000-4-8 (PFMF)</li> <li>• EN 61000-4-11</li> <li>• IEC/EN 61000-6-2 (General Immunity for Industrial Environments)</li> </ul>
<b>Safety</b>	<ul style="list-style-type: none"> <li>• UL/EN/IEC 62368-1 (previously 60950-1)</li> <li>• CAN/CSA C22.2 No. 62368-1</li> <li>• UL/IEC 61010-1</li> <li>• UL/IEC 61010-2</li> <li>• CE</li> </ul>
<b>Laser Safety</b>	<ul style="list-style-type: none"> <li>• EN 60825-1</li> <li>• 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.</li> </ul>

## Product List

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**SRS-1110-FSC2**- 10/100/1000 Industrial Media and Rate Converter: 10/100/1000BASE-T (RJ-45) [100 m/328 ft] to 100BASE-FX 1310nm multimode (SC) [2 km/1.2 miles]. Ruggedized to IEC 61850-3/IEEE 1613, -40F to +167F (-40C to +75C) extended operating temperature support. DIN Rail case terminal block (Combicon) power connector for external power source

### Power Cord & Part Number(s)

None

**05092000**

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**SRS-1110-FST2**- 10/100/1000 Industrial Media and Rate Converter: 10/100/1000BASE-T (RJ-45) [100 m/328 ft] to 100BASE-FX 1310nm multimode (ST) [2 km/1.2 miles]. Ruggedized to IEC 61850-3/IEEE 1613, -40F to +167F (-40C to +75C) extended operating temperature support. DIN Rail case terminal block (Combicon) power connector for external power source

### Power Cord & Part Number(s)

None

**05092010**

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**SRS-1110-FSC20**- 10/100/1000 Industrial Media and Rate Converter: 10/100/1000BASE-T (RJ-45) [100 m/328 ft] to 100Base-LX 1310nm single mode (SC) [20 km/12.4 miles]. Ruggedized to IEC 61850-3/IEEE 1613, -40F to +167F (-40C to +75C) extended operating temperature support. DIN Rail case, terminal block (Combicon) power connector for external power source

### Power Cord & Part Number(s)

None

**05092020**

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**SRS-1110-FST20-** 10/100/1000 Industrial Media and Rate Converter: 10/100/1000BASE-T (RJ-45) [100 m/328 ft] to 100Base-LX 1310nm single mode (ST) [20 km/12.4 miles]. Ruggedized to IEC 61850-3/IEEE 1613, -40F to +167F (-40C to +75C) extended operating temperature support. DIN Rail case, terminal block (Combicon) power connector for external power source

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

None

05092030



**SRS-1110-FSC40-** 10/100/1000 Industrial Media and Rate Converter: 10/100/1000BASE-T (RJ-45) [100 m/328 ft] to 100Base-LX 1310nm single mode (SC) [40 km/24.9 miles]. Ruggedized to IEC 61850-3/IEEE 1613, -40F to +167F (-40C to +75C) extended operating temperature support. DIN Rail case, terminal block (Combicon) power connector for external power source

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

None

05092040



**SRS-1110-FST40-** 10/100/1000 Industrial Media and Rate Converter: 10/100/1000BASE-T (RJ-45) [100 m/328 ft] to 100Base-LX 1310nm single mode (ST) [40 km/24.9 miles]. Ruggedized to IEC 61850-3/IEEE 1613, -40F to +167F (-40C to +75C) extended operating temperature support. DIN Rail case, terminal block (Combicon) power connector for external power source

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

None

05092050



**SRS-1110-FSC20U-** 10/100/1000 Industrial Media and Rate Converter: 10/100/1000BASE-T (RJ-45) [100 m/328 ft] to 100Base-BX 1310nm TX / 1550nm RX single strand fiber, single mode (SC) [20 km/12.4 miles]. Ruggedized to IEC 61850-3/IEEE 1613, -40F to +167F (-40C to +75C) extended operating temperature support. DIN Rail case, terminal block (Combicon) power connector for external power source

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

None

05092060



**SRS-1110-FSC20D**- 10/100/1000 Industrial Media and Rate Converter: 10/100/1000BASE-T (RJ-45 [100 m/328 ft] to 100Base-BX 1550nm TX / 1310nm RX single strand fiber, single mode (SC) [20 km/12.4 miles]. Ruggedized to IEC 61850-3/IEEE 1613, -40F to +167F (-40C to +75C) extended operating temperature support. DIN Rail case, terminal block (Combicon) power connector for external power source

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

None

05092070

**Related Accessories**

**Accessories**



Transmit power voltage and data across the bus. 4 parallel positions and 1 serial position. UL 8A / cUL 6A, 150 V. Width 22.5cm. Carton of 5. For use with SR and SRS DIN Rail Media Converters.

**22038528**

## Power Supplies



TRIO-PS/1AC/48DC/10 Power Supply - DIN-Rail 48 VDC , 480 Watt power supply with universal 85 to 264 VAC, 30 to 56V DC output range adjustable, -25 to 70°C extended

**28665018**



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**



UNO-PS/1AC/24DC/150W Power Supply - DIN-Rail 24 VDC , 150 Watt power supply with universal 85 to 264 VAC, -25 to 70°C extended operating temperature

**29043768**