eX-S1110-XT Gigabit Ethernet Extenders

10/100/1000 Industrial Temperature Copper Extender

- Extends 10/100/1000Base-T Ethernet up to 10,000 feet (3 KM) over 2-wire 24 AWG twisted pair
- Rugged-designed for harsh industrial -40°C to 75°C temperatures (-40°F to 167°F)
- High-Speed – up to 200+ mbps aggregate line rate
- Transparent operation for all Ethernet protocols including 802.1Q VLAN packets and IP video compression schemes
- One or four 10/100/1000 Ethernet ports
- Advanced features: Link Pass-Through*, Interlink Fault Feedback*, Plug and Plan, Auto-MDIX and Loopback

When you need to extend Ethernet services beyond the general IEEE 802.3 limits of 328ft / 100m in extreme temperatures, and new fiber cabling is cost prohibitive, **Ethernet Extenders** are the perfect solution. Perle Ethernet Extenders **transparently extend** up to four 10/100/1000 **Ethernet connections across copper wiring**. Use **single twisted pair** (CAT5/6/7) **or any existing copper wiring** previously used in alarm circuits, E1/T1 circuits, RS-232, RS-422, RS-485, CCTV and CATV applications.

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 Ethernet Extender. With the ability to operate in **industrial grade temperatures of -40°F to +167°F (-40°C to +75°C)** along with a **rugged steel casing**, these simple and effective point to point Ethernet Copper Extenders are ideal to extend the distance between two industrial Ethernet devices subjected to harsh environments and severe temperatures such as security cameras, wireless access points, alarms, traffic controllers, sensors and tracking devices.

Perle's advanced features such as Link Pass-Through*, Interlink Fault Feedback*, and Loopback allow Network administrators to "see everything" 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 Ethernet Extenders** the smart choice for IT professionals. **eX-S1110 Ethernet Extenders** are also available with support for **Commercial Temperature ranges**, **managed networks with AAA security** and **high density applications**.

eX-S1110-XT Gigabit Ethernet Extender Features

Extend Ethernet over twisted pair
Extend an Ethernet link over category 5e, 6 and 7 cabling up to 10,000 feet (3 km)

Extend Ethernet over Coaxial cable

Extend an Ethernet link over 75 ohm coaxial cable

High-Speed Performance

Utilizes second generation VDSL2 technology (ITU-T Recommendation G.993.) . When operating under “Profile 30a”, Perle Ethernet extenders can provide an aggregate VDSL line rate capability of over 200 mbps.

Actual distance and performance may vary depending on the type / gauge and condition of the wire used.

Plug and Play operation

Perle Ethernet Extenders will automatically configure your VDSL interlink connection. The CO/CPE peer association will be determined automatically by the Ethernet Extender. No need to set CO / CPE VDSL pairing.

Once a connection is made, both ends will automatically adjust relevant VDSL parameters to optimize the level of bandwidth possible across the copper link.

Link Pass-Through*

With Link Pass-Through the state of the 10/100/1000Base-T Ethernet connection is “passed through” the VDSL link to the 10/100/1000Base-T Ethernet connection on its remote peer. A managed switch on the remote end can then report the state (link up or link down) to its network management system so that any errors can be detected and recovered early.

Competitive Ethernet extenders without this feature will never detect or report any error conditions.

Interlink Fault Feedback*

Similar to the Link Pass-Through feature, a loss of VDSL link will drop the 10/100/1000 Ethernet ports on each end until the link recovers.

Auto-Negotiation

The Ethernet Extender supports auto negotiation on the 10/100/1000Base-T interface.

Auto-MDIX

Auto-MDIX (Automatic Medium-Dependent Interface crossover) detects the signaling on the 10/100/1000 Ethernet RJ45 interface and determines the type of cable connected (straight-through or crossover) and automatically adopts a compatible pinout.

Fixed Speed and Duplex

Some Ethernet equipment require a fixed speed and duplex be used or cannot auto-negotiate. By disabling Auto-Negotiation on the Ethernet Extender, a fixed speed of 10, 100 or 1000 mbps as well as Full or half Duplex can be configured through DIP switches.

VLAN

Transparent to tagged VLAN (802.1Q) packets.

Transparent to IP Video compression protocols

Fully transparent to such IP video compression schemes such as MPEG-4, H.264 and MJPEG.

Power Strain Relief strap

A strain relief strap is provided to ensure a solid and secure power connection to the Ethernet Extender. Ideal for areas that may be exposed to vibration.

Loopback

When enabled, will perform a loopback on the copper VDSL Interlink.

*Available on 1 port models.

Specifications

Lifetime limited warranty	Reach, RoHS and WEEE Compliant	HTSUS Number:	UNSPSC Code:	ECCN:
		8517.62.0020	43222608	5A991

Ethernet

Port	eX-1S1110-XT	eX-4S1110-XT
	1 port RJ45 – 10/100/1000Base-T - Shielded	4 port RJ45 – 10/100/1000 Base-T - Shielded

Auto-MDIX	Auto-MDIX enables proper operation with either straight-through or crossover cabling
Distance	Distance up to 100 meters (328 feet) as per IEEE 802.3
Maximum Frame Size	1522 bytes
VDSL – Interlink	
RJ45, BNC, Terminal Block	Ethernet Extenders must be connected in pairs using unconditioned wire. Circuits that run through signal equalization equipment are not permitted. TIP and RING are polarity insensitive. Surge suppression of 400 volts between TIP and RING. Choice of RJ45, BNC or terminal block models for VDSL link connector: • RJ45 – RING pin 4, TIP pin 5 (TIA 568 A/B) • BNC – Coaxial 50 and 75 ohm cable with BNC connector • Terminal Block – 2 position screw connectors for use with twisted pair telephone, alarm or serial cabling between 19 (0.9 mm) and 26 AWG (0.44 mm).

VDSL2 Line Rate/Reach

Actual distance and rates experienced will depend on condition and gauge of wire used. This Rate/Reach table applies to 24 AWG (0.5 MM) twisted pair wiring on RJ45 (RJ) and terminal block (TB) models

High Speed Asymmetric			
Reach (Distance)		VDSL Rate (Mbps)	
feet	meters	Downstream	Upstream
500	152	101	92
1000	305	101	63
1500	457	90	38
2000	610	62	24
2500	762	55	10
3000	914	42	5
3500	1000	35	3
High Speed Symmetric			
Reach (Distance)		VDSL Rate (Mbps)	
feet	meters	Downstream	Upstream
500	152	101	101
1000	305	85	101
1500	457	62	47
2000	610	60	29
2500	762	44	14
3000	914	30	7
3500	1000	29	4
Long Reach Symmetric			

Reach (Distance)		VDSL Rate (Mbps)	
feet	meters	Downstream	Upstream
500	152	53	44
1000	305	53	43
2500	762	39	18
4000	1219	25	4
5500	1676	17	1.9
7000	2134	8	2.3
7500	2286	7	2.2
8000	2438	5	2.2
Long Reach Asymmetric			
Reach (Distance)		VDSL Rate (Mbps)	
feet	meters	Downstream	Upstream
500	152	78	16
1000	305	78	16
2500	762	55	10
4000	1219	31	0.8
5500	1676	20	0.6
7000	2134	11	0.6
7500	2286	10	0.6
8000	2438	8	0.6

Power	
Input Supply Voltage	9 - 30 vDC, unregulated (12 vDC Nominal)

Current	**eX-1S1110-XT** 350 mA	**eX-4S1110-XT** 500 mA
Power Consumption (watts)	**eX-1S1110-XT** 4.2	**eX-4S1110-XT** 6.0
Power Connectors	5.5mm x 9.5mm x 2.1mm barrel socket and 2 pin terminal Block	
	eX-1S1110-XT 	**eX-4S1110-XT** 
Power Adapter		
Universal AC/DC adapter	Optional Industrial Temperature 100-240v AC, regulated 12V DC adapter	
Indicators		
Power / TST	This green LED is turned on when power is applied to the Ethernet Extender. Otherwise it is off. The LED will blink when in Loopback test mode.	
CO - Local	Ethernet Extender is operating in CO VDSL mode	
CPE - remote	Ethernet Extender is operating in CPE VDSL mode	
ILNK	Indicates Link Status and activity on the Interlink (VDSL) port	
ETH	Indicates link status and activity on Ethernet port(s).	
Switches		
Access	All switch settings are accessible through a side opening in the chassis	
		
Rate/Reach	Two switches enable the user to select the right balance between speed and distance for their environment.	

Signal to Noise Ratio	Selectable Signal to Noise Ratio (SNR) of 6dB or 9dB. The higher SNR number provides better impulse noise protection but lowers performance.
Auto-Negotiation (802.3u)	*Enabled (Default)* - The Ethernet Extender uses 802.3u Auto-negotiation on the 10/100/1000Base-T interface. It is set to advertise full duplex. *Disabled* - The Ethernet Extender sets the port according to the position of the speed and duplex switches.
Link Mode	**eX-1S1110-XT** *Standard (Default)* – The 10/100/1000Base-T link remains active independent of the state of the Ethernet link on its remote peer. *Link Pass-Through*- the state of the 10/100/1000Base-T Ethernet connection is 'passed through' or propagated across the VDSL link to the 10/100/1000Base-T Ethernet link on its remote Ethernet Extender peer. This enables a managed switch to report the state of the remote device to its network management system. **eX-4S1110-XT** N/A
Interlink Fault Feedback	**eX-1S1110-XT** *Enabled* - A loss of VDSL link will drop the 10/100/1000 Ethernet port on each end until the link recovers *Disabled (Default)* – The state of the VDSL link is not propagated to the 10/100/1000Base-T port **eX-4S1110-XT** N/A
Loopback	*Enabled* - The VDSL interlink will perform a loopback function, retransmitting all received Ethernet frames back to its peer. *Disabled (Default - Up)*

Set Ethernet Speed (Port 1)	When Auto-Negotiation switch is disabled, fixed speed can be set at 1000 (Default) or 100 or 10	
Set Ethernet Duplex (Port 1)	When Auto-Negotiation switch is disabled, Duplex can be set at Full (Default) or Half	
Environmental Specifications		
Operating Temperature	-40°C to 75°C (-40°F to 167°F)	
Storage Temperature	minimum range of -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)	**eX-1S1110-XT** 14.3	**eX-4S1110-XT** 20.5
MTBF (Hours)*	**eX-1S1110-XT** 466,861 Hours	**eX-4S1110-XT** 365,077 Hours
	**Calculation model based on MIL-HDBK-217-FN2 @ 30°C*	
Mounting		
Din Rail Kit	Optional	
Rack Mount Kit	Optional	
Product Weight and Dimensions		
Weight	**eX-1S1110-XT** 0.33 kg, 0.73 lbs	**eX-4S1110-XT** 0.47 kg, 1.04 lbs
Dimensions	**eX-1S1110-XT** 120 x 80 x 35 mm, 4.7 x 3.1 x 1.4 inches	**eX-4S1110-XT** 130 x 115 x 35 mm, 5.1 x 4.5 x 1.4 inches

Packaging		
Shipping Weight	**eX-1S1110-XT** 0.46 kg, 1.01 lbs	**eX-4S1110-XT** 0.65 kg, 1.43 lbs
Shipping Dimensions	170 x 260 x 70 mm, 6.7 x 10.2 x 2.8 inches	
Regulatory Approvals		
Emissions	• FCC Part 15 Class A, EN55022 Class A • CISPR 32:2015/EN 55032:2015 (Class A) • EN61000-3-2	
Immunity	CISPR 35/EN 55035	
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

eX-1S1110-RJ-XT - Gigabit Industrial Temperature Ethernet Extender - 1 port 10/100/1000Base-T (RJ-45). RJ45 Interlink (VDSL2) connector

Power Cord & Part Number(s)

None

06003650

eX-1S1110-BNC-XT - Gigabit Industrial Temperature Ethernet Extender - 1 port 10/100/1000Base-T (RJ-45). BNC (Coax) Interlink (VDSL2) connector

Power Cord & Part Number(s)

None

06003660

eX-1S1110-TB-XT - Gigabit Industrial Temperature Ethernet Extender - 1 port 10/100/1000Base-T (RJ-45). 2-pin Terminal Block Interlink (VDSL2) connector

Power Cord & Part Number(s)

None

06003670

eX-4S1110-RJ-XT - Gigabit Industrial Temperature Ethernet Extender - 4 port 10/100/1000Base-T (RJ-45). RJ45 Interlink (VDSL2) connector

Power Cord & Part Number(s)

None

06003770

eX-4S1110-BNC-XT - Gigabit Industrial Temperature Ethernet Extender - 4 port 10/100/1000Base-T (RJ-45). BNC (Coax) Interlink (VDSL2) connector

Power Cord & Part Number(s)

None

06003780

eX-4S1110-TB-XT - Gigabit Industrial Temperature Ethernet Extender - 4 port 10/100/1000Base-T (RJ-45). 2-pin Terminal Block Interlink (VDSL2) connector

Power Cord & Part Number(s)

None

06003790

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

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