eX-S110-XT Fast Ethernet Extenders

perle.com/products/10-100-industrial-ethernet-extender.shtml

10/100 Industrial Temperature Copper Extender

- Extends 10/100Base-TX Ethernet up to 10,000 feet (3 KM) over 2-wire 24 AWG twisted pair.
- Rugged-designed for harsh industrial -40 to 75C temperatures (-40 to 167F)
- 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 Ethernet ports
- Advanced features: Link Pass-Through*, Interlink Fault Feedback*, 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 **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 -40F to +167F (-40C to +75C)** 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-S110 Ethernet Extenders** are also available with support for Commercial Temperature ranges, managed networks with AAA security and high-density applications.

eX-S110-XT Fast 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 10/100Base-TX Ethernet connection is “passed through” the VDSL link to the 10/100Base-TX 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 ethernet ports on each end until the link recovers.
Auto-Negotiation	The Ethernet Extender supports auto negotiation on the 10/100Base-TX interface.
Auto-MDIX	Auto-MDIX (Automatic Medium-Dependent Interface crossover) detects the signaling on the 10/100 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 or 100 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.

Ethernet	**eX-1S110-XT**	**eX-4S110-XT**
Port	1 port RJ45 – 10/100 Base-TX - Shielded	4 port RJ45 – 10/100 Base-TX - 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	**eX-1S110-XT**	**eX-4S110-XT**
Input Supply Voltage	9 - 30 vDC, unregulated (12 vDC Nominal)	
Current	320 mA	370 mA
Power Consumption	3.8 watts	4.4 watts
Power Connectors	5.5mm x 9.5mm x 2.1mm barrel socket and 2 pin terminal Block	

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	**eX-1S110-XT**	**eX-4S110-XT**
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 10/100Base-TX 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	*Standard (Default)* – The 10/100Base-TX link remains active independent of the state of the Ethernet link on its remote peer. *Link Pass-Through*- state of the 10/100Base-TX Ethernet connection is “passed through” or propagated across the VDSL link to the 10/100Base-TX 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.	N/A
Interlink Fault Feedback	*Enabled* - A loss of VDSL link will drop the 10/100 Ethernet port on each end until the link recovers *Disabled (Default)* – The state of the VDSL link is not propagated to the 10/100Base-TX port	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 to 100 (Default) or 10
Set Ethernet Duplex (Port 1)	When Auto-Negotiation switch is disabled, Duplex can be set to Full (Default) or Half

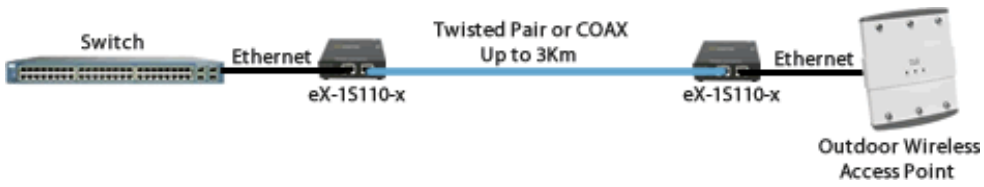
Environmental Specifications	**eX-1S110-XT**	**eX-4S110-XT**
Operating Temperature	-40°C to 75°C (-40°F to 167°F)	
Storage Temperature	minimum range of -40°C to 85°C (-40°F to 185°F)	
Operating Humidity	5% to 90% non-condensing	
Storage Humidity	5% to 95% non-condensing	
Operating Altitude	Up to 3,048 meters (10,000 feet)	
Heat Output (BTU/HR)	13.1	15.2
MTBF (Hours)**	466,387	365,077
Mounting		
Din Rail Kit	Optional	
Rack Mount Kit	Optional	
Product Weight and Dimensions		
Weight	0.33 kg, 0.73 lbs	0.47 kg, 1.04 lbs
Dimensions	120 x 80 x 35 mm, 4.7 x 3.1 x 1.4 inches	130 x 115 x 35 mm, 5.1 x 4.5 x 1.4 inches
Packaging		
Shipping Weight	0.46 kg, 1.01 lbs	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 24:2010/EN 55024:2010
Electrical Safety	IEC 62368-1 (ed 2) EN 62368-1:2014
	UL 60950-1
	IEC 60950-1(ed 2); am1, am2
	EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013
	CE
Environmental	Reach, RoHS and WEEE Compliant
Other	ECCN: 5A991
	HTSUS Number: 8517.62.0020
	Perle Lifetime warranty

*Available on 1 port models.
**Calculation model based on MIL-HDBK-217-FN2 @ 30 °C

Extend 10/100 Ethernet across Twisted Pair or Coaxial Wire in Harsh Temperature Areas

Extend an Ethernet link beyond the 100 meter (328 feet) limit using Ethernet Extenders. Distances of up to 3 km (10,000 feet) can be achieved over twisted pair Cat 5,6 or 7 cable.



Extend four 10/100 Ethernet ports across Twisted Pair or Coaxial Wire

Extend four Ethernet ports up to 3 km (10,000 feet) over twisted pair Cat 5,6 or 7 cable.