eX-C1110 Gigabit Ethernet Extender Modules

10/100/1000 Ethernet Copper Extenders

- Extends 10/100/1000Base-T Ethernet up to 10,000 feet (3 KM) over 2-wire 24 AWG twisted pair
- High-Speed – up to 200+ mbps aggregate line rate
- For use in high-density applications with **Perle Media Converter Chassis**
- Transparent operation for all Ethernet protocols including 802.1Q VLAN packets and IP video compression schemes.
- 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, and new fiber cabling is cost prohibitive, **Ethernet Extenders** are the perfect solution. Installed in a high density **Perle Media Converter Chassis**, Perle Ethernet Extenders **transparently extend** 10/100/1000 **Ethernet connections across copper wiring**. Use **single twisted pair** (CAT5/6/7), **coax or any existing copper wiring** previously used in alarm circuits, E1/T1 circuits, RS-232, RS-422, RS-485, CCTV and CATV applications.

These simple and effective point to point Ethernet Copper Extenders are perfect for commercial buildings, residential units, hospitality environments, connecting a remote office or private-network backbone to a corporate LAN … anywhere you need Ethernet communication links between separated LANs or LAN devices (i.e. PCs, digital sensors, VoIP phones, WiFi APs, IP cameras and more).

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 ex-C1110 Ethernet Extenders** the smart choice for IT professionals. **eX-C1110 Ethernet Extenders** are also available for **managed networks with AAA security** and as standalone models with support for **Commercial Temperature ranges** and **Extended Temperature ranges**.

eX-C1110 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.

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

Ethernet	
Port	1 port RJ45 – 10/100/1000Base-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
Long Reach Asymmetric			
Reach (Distance)		VDSL Rate (Mbps)	

feet	meters	Downstream	Upstream
250	76	78	16
1000	305	76	16
2500	762	52	10
4000	1219	28	2
5500	1676	15	1.5
7000	2134	8	1.4
8500	2591	5	1.3
10000	3000	2	0.9

Chassis Module	
Compatible chassis	Module occupies a single slot in MCR1900 and MCR200 chassis
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.
Switches – On-board PCB	
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	• *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.
Interlink Fault Feedback	• *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
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	When Auto-Negotiation switch is disabled, fixed speed can be set at 100 (Default) or 10
Set Ethernet Duplex	When Auto-Negotiation switch is disabled, Duplex can be set at Full (Default) or Half
Environmental Specifications	
Operating Temperature	0°C to 50°C (32°F to 122°F)
Storage Temperature	minimum range of -25°C to 70°C (-13°F to 158°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)	14.3
Power Consumption (Watts)	4.2
MTBF (Hours)*	446,387 Hours *Calculation model based on MIL-HDBK-217-FN2 @ 30°C*
Packaging	
Shipping Weight	0.25 kg, 0.55 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 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-1C1110-RJ - Gigabit Ethernet Extender Module - 1 port 10/100/1000Base-T (RJ-45). RJ45 Interlink (VDSL2) connector

Part Number(s)
06003590

eX-1C1110-BNC - Gigabit Ethernet Extender Module - 1 port 10/100/1000Base-T (RJ-45). BNC (Coax) Interlink (VDSL2) connector

Part Number(s)
06003600

eX-1C1110-TB - Gigabit Ethernet Extender Module - 1 port 10/100/1000Base-T (RJ-45). 2-pin Terminal Block Interlink (VDSL2) connector

Part Number(s)
06003610