CopperLink™
Ethernet Extenders
Product Guide

Patton Network Extension Products

Industrial Communication Products Ltd

CopperLink
Ethernet Extenders

Ethernet is the most popular electronic communications medium in the world. Because it offers a versatile, low-cost, standards-based interface, Ethernet has become ubiquitous as the global technology-of-choice in industrial, enterprise, and carrier networks.

For all its benefits, Ethernet does present some limitations:

- **Cabling**—Standard Ethernet, runs over Cat 5 cabling infrastructure, the installation of which may be costly, and require (often more costly) network downtime.

- **Segmentation**—To avoid bottlenecks that cause network congestion, latency or even data loss, Ethernet LANs musts be segmented, which increases network complexity, operational overhead, and cost.

- **Distance**—Perhaps the biggest drawback of Ethernet technology is the standard distance limitation of 328 feet (100 meters). In many applications it is impractical or impossible to install network-enabled devices within 328 feet from the nearest computer, router, or switch.

Despite the above limitations, the number of Ethernet-based installations continues to grow at an astounding rate.

Ethernet extension, which addresses the distance limitation of the Ethernet standard, can be found in these generalized applications:

- **M2M**—Interconnecting Ethernet terminals and devices

- **Ethernet access**—connecting users and devices to a central network

- **Ethernet networking**—interconnecting multiple users and servers

Patton's CopperLink™ Ethernet Extenders—including the CL1200, CL1300, and CL2300—appear in a wide variety of environments, includ-

ing business offices, mining tunnels, oil rigs and drills, manufacturing facilities, vehicular traffic management, security monitoring, maritime vessels, sporting arenas, nuclear power facilities, agriculture, and more!

Patton offers the industry's broadest range of products and solutions for leveraging existing copper or coaxial cabling infrastructure to extend Ethernet connections. CopperLink™ solutions extend Ethernet segments over distances up to and exceeding 5 miles (8 km). The CopperLink™ product line supports line rates ranging from 192 kbps to 168 Mbps, and offers symmetric or asymmetric profiles. While most

models operate over a single twisted pair, new products deliver even greater bandwidth and longer distances by bonding up to four twisted pairs (8 wires) into a single Ethernet connection.

Best of all, CopperLink™ Ethernet Extenders are easy-to-use, plug-and-play devices, so users can avoid complex network configuration requirements. CopperLink™ Ethernet Extenders transparently pass all higher-layer protocols—including 802.1Q VLAN frames (tagged and untagged) and IP video compression schemes such as MPEG-4, H.264 and MJPEG.

Product lending for comprehensive project support, including free consultancy services

Form Factors

Desktop
✔ Typically 0 to 50 °C
✔ New case can be wall mounted
✔ Controlled environment (not in the elements)

Industrial
✔ Temperature range from -10 to 70 °C or -40 to 85 °C
✔ DIN or wall mountable
✔ Controlled environment (not in the elements)

Outdoor
✔ Rated from -40 to 85 °C
✔ Pole or wall mountable
✔ Can be installed outdoors (protected from the elements)

OEM/PCA and Custom Ethernet Extenders
✔ Rated from -40 to 85 °C
✔ Available for assembly locally (to be marketed under your company's branding or to integrate into your systems).

5 things to consider when choosing an

Patton Solution: CopperLink™

Primary decision points

❶ **Topology**—How is my network laid out?

❷ **Rate**—How much bandwidth is required?

❸ **Reach**—How far does my network need to go?

❹ **Environment**—Where are my remote devices located?

❺ **Management**—How much control do I want over this extender?

❶ CopperLink Topologies

Note: In the following topologies, multiple Ethernet devices can be connected to each of the Ethernet Extenders.

Point-to-Point

A point-to-point connection is the most common common topology. In it, two Ethernet Extenders *(local* and *remote)* are connected to each other.

Ring

Connecting multiple Ethernet Extenders together to form a ring provides redundant paths so the extenders can stay interconnected.
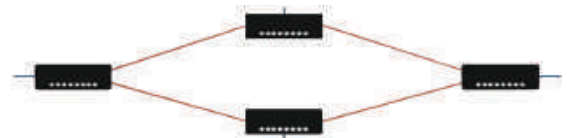
Star

Connecting a centrally located Multi-Port Ethernet Extender to 24 remote Ethernet Extenders (acting as customer-premises equipment or CPE) enables the centrally located extender to aggregate the 24 links from the remote extenders into one or more GigE copper or fiber links. The centrally located extender also manages the remote extenders.
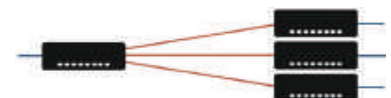
Multi-Drop (Ethernet) or MDE

Connecting multiple Ethernet Extenders in series—from which Ethernet data is "dropped" off at each extender's location—simulates a traditional legacy serial topology. MDE extenders are also able to act as repeaters.

Star + MDE

In a combination star plus MDE topology, a centrally located Multi-Port Ethernet Extender connects up to 24 individual remote Ethernet Extenders (CPE) or MDE extenders. When connected to MDE extenders, the user effectively doubles the potential reach while "dropping" off Ethernet data at each of the locations. The centrally located extender aggregates the 24 links from remote extenders into one or more 100/1000Base-TX links.

Ethernet Extender

❷ CopperLink Rate & ❸ Reach

meters	0	91	152	305	457	510	1,524	3,048	4,572	6,096	7,620	9,144	10,363
feet	0	300	500	1,000	1,500	2,000	5,000	10,000	15,000	20,000	25,000	30,000	34,000
2110P	100 Mbps	100 Mbps	100 Mbps	0	0	0	0	0	0	0	0	0	0
CL1101	100 Mbps	100 Mbps	100 Mbps	10 Mbps	10 Mbps	10 Mbps	0	0	0	0	0	0	0
CL1200	150 Mbps	150 Mbps	150 Mbps	120 Mbps	100 Mbps	60 Mbps	16 Mbps	2.5 Mbps	0	0	0	0	0
CL1300	5.7 Mbps	5.7 Mbps	5.7 Mbps	5.7 Mbps	5.7 Mbps	5.7 Mbps	5.7 Mbps	5.2 Mbps	2.3 Mbps	1.0 Mbps	0	0	0
CL2301	15.3 Mbps	15.3 Mbps	15.3 Mbps	15.3 Mbps	15.3 Mbps	15.3 Mbps	12.2 Mbps	8.2 Mbps	4.8 Mbps	3.9 Mbps	1.8 Mbps	896 kbps	192 kbps
CL2302	30.6 Mbps	30.6 Mbps	30.6 Mbps	30.6 Mbps	30.6 Mbps	30.6 Mbps	24.3 Mbps	16.4 Mbps	9.6 Mbps	7.2 Mbps	3.9 Mbps	1.8 Mbps	384 kbps
CL2304	61.2 Mbps	61.2 Mbps	61.2 Mbps	61.2 Mbps	61.2 Mbps	61.2 Mbps	61.2 Mbps	32.7 Mbps	19.2 Mbps	14.3 Mbps	7.2 Mbps	3.9 Mbps	768 kbps
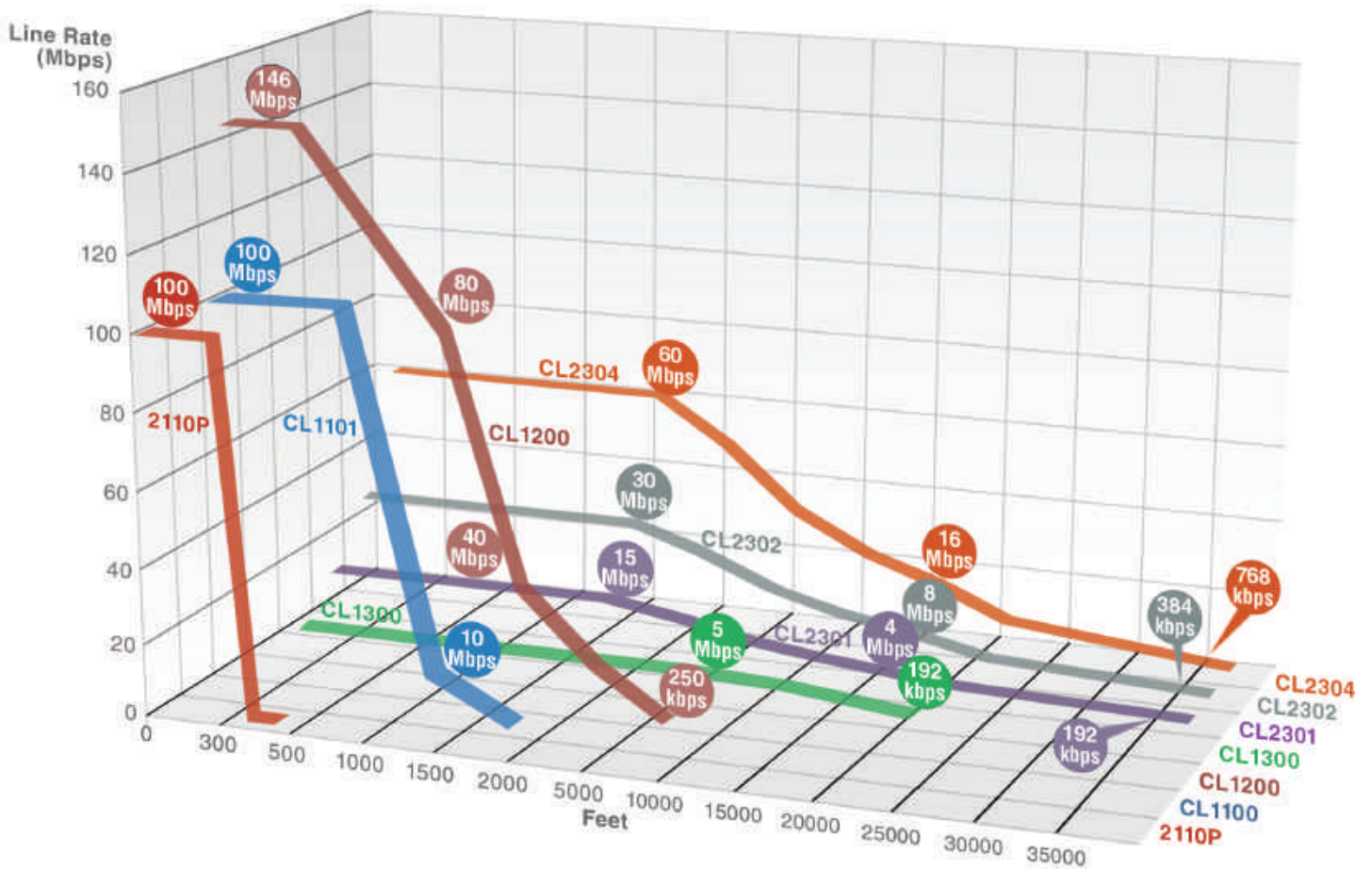
Note: Distances in rate/reach chart do not reflect the use of repeaters or Patton's MDE unit.

④ CopperLink Environments

Indoor **Light Industrial** **Outdoor**

⑤ CopperLink Management

In addition to offering all of Patton's highly regarded CopperLink plug and play features, the managed CopperLink series adds a higher level of network control for the more demanding applications. Patton's proprietary Trinity Operating System includes these advanced management features:

- L2/L3 Managed Switch

- SNMP

- Web GUI

- WAN Balancing & Failover

- Stateful Firewall inspection of traffic, accomplished through the creation of Access Control Lists (ACLs)

- Traffic filtering based on numerous criteria, inculding source and destination IP address, port, connection state and protocol
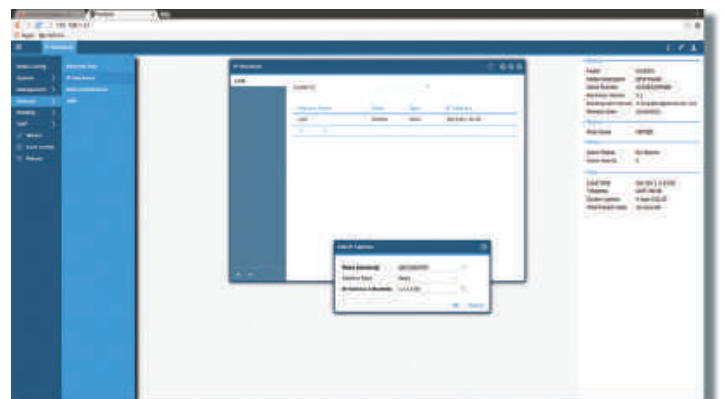
Power Up & Connect
Ethernet & PoE Devices
up to
3300 feet

CopperLink 1101

AC/DC Power

54V. 1.2A   Pwr

Ethernet

10   A   Link

Copper or Coax

CopperLink 1101E

Local   Remote

CopperLink 1101

POE LVL

L   C

Eth

10   A   Link

Line

WAP

IP Camera

Access Control

Telephone

Kiosk

IoT Gateway   PLC   Digital Signage

PUTTING THE SERVICE INTO FINANCIAL SERVICES

Features

- Tranparently pass Ethernet traffic over 1 to 4 twisted pairs or coax
- Support legacy & 803.af PoE modes
- Plug-and-Play…Set-and-Forget
- Options for -10 to 70 °C operation & IP66-level protection

Applications

- IP Telephony
- Security & Surveillance
- SCADA
- Wireless Access & Extension
- Digital Signage
- Subsea Exploration

Made in Maryland **USA**

Applications Overview

Patton Solution: CopperLink™

Ethernet Connectivity (Machine-to-Machine)

Connecting Ethernet terminals/devices

✓ Connectivity is the linking of devices—M2M and IoT

✓ Today, many traditional CCTV, serial, and T1/E1 links are being replaced with Ethernet, enabling the Internet of Things (IoT)

Examples:

• Access Control and Card Reader Devices

• IP Cameras

• Traffic Control Signals

• Railway Communications

Corporate Network

100 Mbps + over Coax

IP Camera Network Connectivity
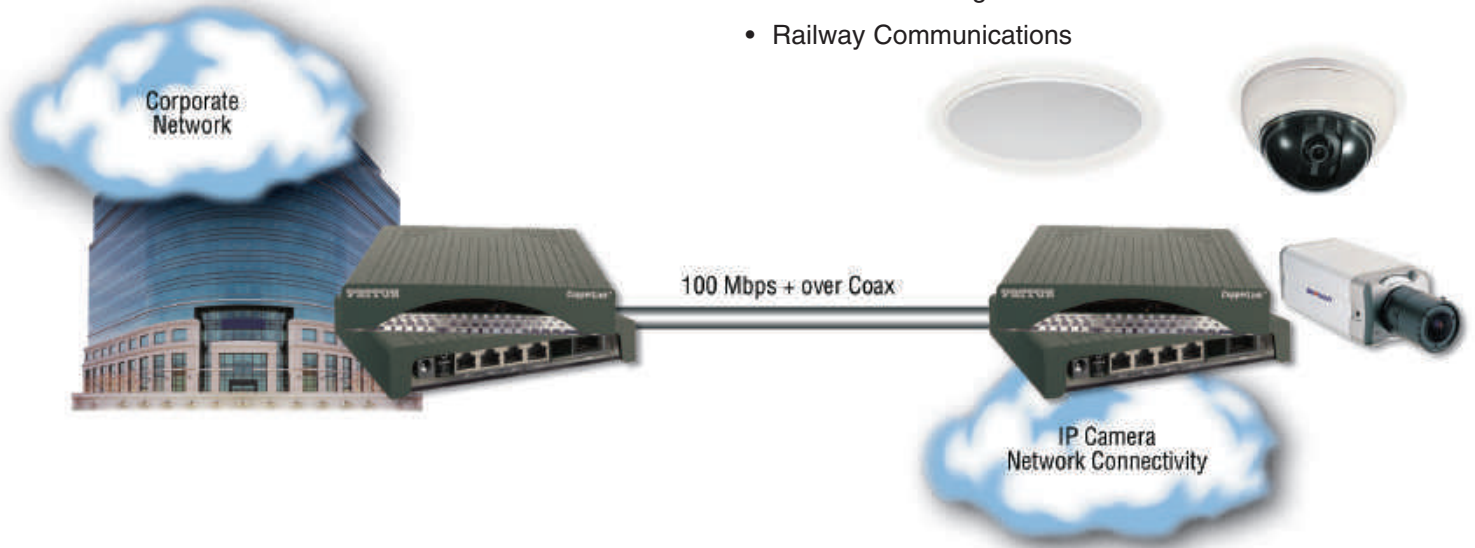
Ethernet Access (Person-to-Person)

Connecting remote users to a central network

✓ Access is connecting remote users and devices to a central network

✓ Usually a few remote devices or users need network access

Examples:

• Remote Utility Room

• Remote Control Room, Receiving Dock

• Caddy shack/Starters house

Corporate Network

168 Mbps + over Cat 5/Coax/UTP

Primary Office (Corporate LAN)

Remote Network Connectivity

IP Video

Remote Location (Guard House)

Card Reader

IP Data

PC
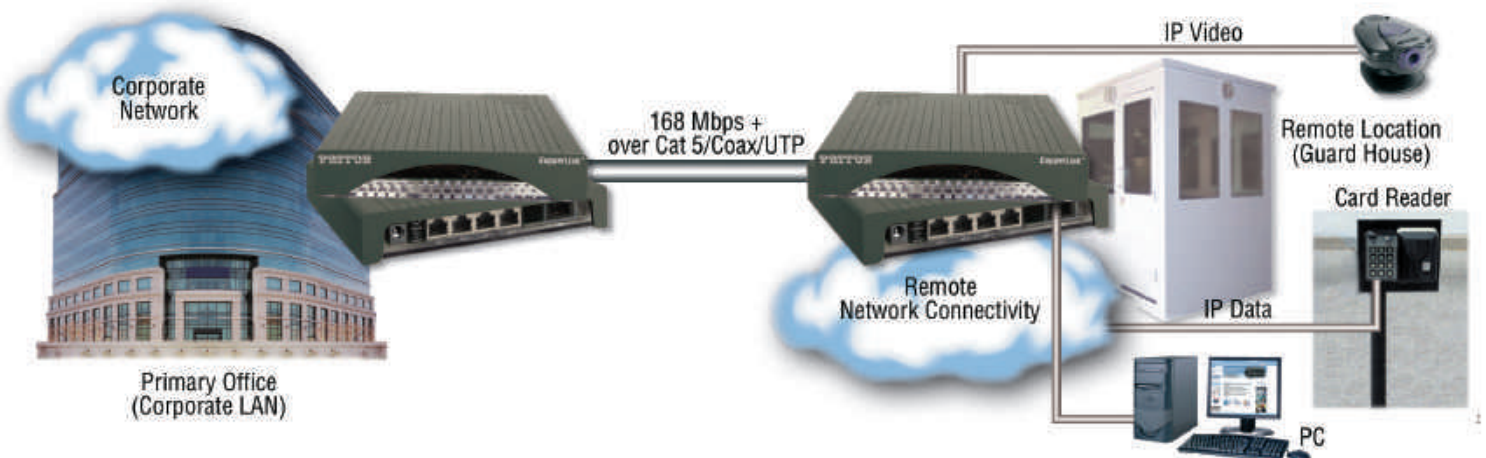
Ethernet Networking (LAN-to-LAN)

Connecting multiple users and servers

✓ Networking is connecting multiple users on each side of the connection to each other.

✓ An alternative to fiber or wireless while maintaining the lowest cost with copper

Examples:

• LAN extension to remote office

• high-speed IP video delivery

• Campus building trunking

What CopperLink has to offer

✓ Devices that extend Ethernet beyond its 100-meter (328-foot) natural limitations

✓ Products sold in pairs (local and remote), so everything you need for installation is in the box. (Boosters don't work in pairs so they're sold individually)

✓ Pass Ethernet over multiple forms of media, not just Cat 5. Using your existing infrastructure decreases downtime and saves money.

✓ Transparent to higher-layer protocols and video schemes

✓ Ethernet bridge

✓ Plug-and-Play. Our Ethernet Extenders are easy to use; require no training; and rarely require technical support.

CopperLink
Ethernet Extender Selection Tool

Copper Ethernet Extenders

Model	Installation	# of Ethernet Ports	# of wire pairs	Max. Distance	Max. Speed	Distance at Max. Speed	Operating Temp.	Page
CL1101	Desktop	1	1–4	3300 ft (1005 m)	100 Mbps	1849 ft (563.6 m)	0 to 50 °C	16
CL1211	Desktop or Rack mount	1	1	1.8 miles (3 km)	200+ Mbps asymmetrical	750 ft (230 m)	0 to 50 °C	19
CL1212	Desktop or Rack mount	2	1	1.8 miles (3 km)	200+ Mbps asymmetrical	750 ft (230 m)	0 to 50 °C	19
CL1214	Desktop or Wall mount	4	1	1.8 miles (3 km)	200+ Mbps asymmetrical	750 ft (230 m)	v0 to 50 °C	13
CL1314	Desktop or Wall mount	4	1	4.3 miles (6.9 km)	5.7 Mbps	16,400 ft (5.0 km)	0 to 50 °C	14
CL2110	Inline	2	Cat 5 or greater	328 ft (100 m)	10/100Base-TX	328 ft (100 m) per Model 2110	0 to 50 °C	20
CL2301	Desktop	4	1	5.2 miles (8.3 km)	15 Mbps	3800 ft (1.16 km)	0 to 50 °C	15
CL2302	Desktop	4	2	5.2 miles (8.3 km)	30 Mbps	3800 ft (1.16 km)	0 to 50 °C	15
CL2304	Desktop	4	4	5.2 miles (8.3 km)	60 Mbps	3800 ft (1.16 km)	0 to 50 °C	15

Ruggedized Copper Ethernet Extenders

Model	Installation	# of Ethernet Ports	# of wire pairs	Max. Distance	Max. Speed	Distance at Max. Speed	Temp. Range	Page
CL1101E	Wall mount or DIN rail	1	1–4	3300 ft (1005 m)	100 Mbps	1849 ft (563.6 m)	-40 to 85°C	26
CL1200E	Wall mount or DIN rail	1, 2, 4	1	1.8 mile (3 km)	200+ Mbps asymmetrical	750 feet (230 m)	-40 to 85°C	28
CL1300R	Wall mount or DIN rail	1, 2	1	4.3 miles (6.9 km)	5.7 Mbps	9,000 feet (2.7 km)	-40 to 85°C	24
CL1314MDE	DIN rail	4	1	4.3 miles (6.9 km)	5.7 Mbps	9,000 feet (2.7 km)	-40 to 85°C	22
CL2300E	DIN rail	4	up to 4	6.4 miles (10.4 km)	61.2 Mbps	3,844 feet (1.2 km)	-40 to 85°C	25

EnviroNET Also Available	Extended Temperature -40 to 85 °C Custom Designs for MIL-SPEC, IP, and NEMA	23

OEM/PCB COTS Ethernet Extenders

Model	Dimensions	# of Ethernet Ports	High-Speed	Long-Range	Corrosion Resistance Available	Extended Temp. Available	Page
CL1101	3.890 W x 3.120 D in. (9.880 W x 7.924 D cm)	1	Yes	—	**Yes**	—	30
CL1212	3.890 W x 3.120 D in. (9.880 W x 7.924 D cm)	1 to 2	—	Yes	Yes	—	30
CL1214	4.9 W x 4.0 D in. (12.446 W x 10.16 D cm)	1 to 4	Yes	Yes	Yes	—	30
CL2110	1.410 W x 3.256 D in. (3.581 W x 8.270 D cm)	1	—	Yes	Yes	—	30
CL2300	7.0 W x 5.74 D in. (17.78 W x 14.580 D cm)	1 to 4	Yes	—	Yes	Yes	30

Serial (RS-232, X.21, V.35) Network Extenders

Model	Type	Max. Distance	Max. Speed	Distance at Max. Speed	Page
1008	RS-232	17 miles (27.4 km)	57.6 kbp	4 miles (6.4 km)	32
1009	X.21	4.3 miles (6.9 km)	5.7 Mbps	1.3 miles (2.1 km)	32
1040A	V.35	4.3 miles (6.9 km)	5.7 Mbps	1.3 miles (2.1 km)	33
1080A SRM	RS-232	17 miles (27.4 km)	57.6 kbp	4 miles (6.4 km)	33
3088A NTU	V.35	4.3 miles (6.9 km)	5.7 Mbps	1.3 miles (2.1 km)	34

T1 & E1 Network Extenders

Model	Signaling Standard	Distance at Max. Speed	Page
CL2113A	E1	2.5 miles (4.0 km)	35
CL2115	T1	3 miles (5.0 km)	35

Analog over IP Leased Line Extender

Model	Signaling Standard	Distance at Max. Speed	Page
SN2292	VoIP	Unlimited	36

Universal Mounting Panels

Model	Number of slots	Dimensions	Page
1001MP11	11	9.2 H x 17.16 W x 5.3 D in. (233.6 H x 435.8 W x 134.8 D mm)	37
1001MP16	16	19L x 1.5W x 3.8H in. (48.3L x 3.8W x 8.9H cm)	37
NS-1001R-19ADJDIN	16	3.5 H x 2U W x 11.25 D in. DIN rail width: 17.18 in. 88.9 H x 2U W x 285.8 D mm DIN rail width: 436.37 mm	38

Rackmount 1001MP11

5.7 Mbps high-speed Ethernet Extender
CopperLink™ 1314

Reach your remote LAN or device with Patton's economical Long-Range Ethernet Extender, and get the best speed/distance combination in the industry using just a single twisted-pair.

Patton's CopperLink Long-Range Ethernet Extender is the perfect fit for simple, cost-effective high-speed Ethernet extension. It enables customers to take advantage of existing copper infrastructure to connect remote LANs across distances and at speeds previously unthought-of. Several configurable line rates enable you to tune in the highest speed and most relliable connection. The auto-sensing full/half duplex 10/100Base-T Ethernet port and the integrated crossover switch makes setup easy. The value of this Ethernet extender can't be beat!

Model CL1314

Model CL1314

Twisted Pair

Twisted Pair

Model CL1314

Model CL1314
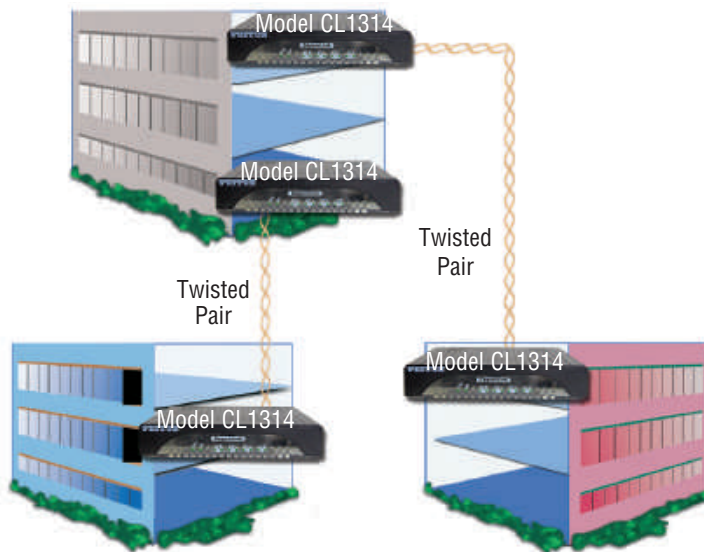
Application Example—Corporate Campus LAN Extension

Distance on 24 AWG (0.5mm)			
Line Rate	K Feet	Miles	km
192	22.5	4.26	6.9
256	22.5	4.26	6.9
512	22.1	4.18	6.7
768	19.5	3.69	5.5
1024	18.5	3.50	5.6
1280	18.5	3.50	5.6
1536	18.6	3.50	5.6
2048	16.5	3.13	5.03
2304	16.5	3.13	5.03
4608	11	2.08	3.35
5696	9	1.70	2.74

Compatible Patton CopperLink™ Models

Desktop 2 Wire
CL2300

Multi-Port Switch (24 Ports)
CL4324

Ruggedized
CL1314R & MDE

Extended Temperature
CL2300E

ORDERING INFORMATION

Obtain ordering info for this product by using the QR code at right or by contacting:

• email: **sales@patton.com**

• tel: **+1 301.975.1000**

• web: **http://www.patton.com/products/product_detail.asp?id=464&tab=Ordering**

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Managed Ethernet Extenders
CopperLink™ 2300

The CL2300 offers the best bandwidth and distance combination in the CopperLink product line. Speeds in excess of 22.8 Mbps symmetrical at distances of 2 miles are possible due to Patton's pair bonding which supports up to 4 individual twisted-pairs (8-wire) or just a single Cat 5 or higher rated cable.

Patton's CopperLink™ Model 2300 is a cost effective Ethernet Extender capable of achieving bandwidth rates of over 60 Mbps. The CL2300 is the ideal choice for providing internet access to bandwidth hungry small to medium size offices, wireless backhaul, Metro Ethernet, even LAN to LAN extensions.

The Model CL2300 is cable of bonding from 1 to 4 pairs to increase overall bandwidth. Each pair is capable of up to 5.7 Mbps to 15.3 Mbps pending your distance requirements. The ability to configure pair bonding and various line rate modes allows service providers, integrators and business' to choose the best available rate vs. reach combination for the application.

The CL2300 supports defaults to plug and play mode enables the CopperLink Extenders to pair up automatically at the best rate achievable. Should a pair be faulty the CL2300 will automatically adjust the line rate to ensure the network connection remains stable.

In addition to offering all Patton's highly regarded CopperLink plug and play features, the managed CopperLink series adds a higher level of network control for the more demanding applications.

QoS configurations ease the bandwidth management of ports and applications through the creation of QoS classes and profiles. Traffic can be shaped and policed to provide full QoS control over both the egress and ingress directions.

Stateful Firewall inspection of traffic is accomplished through the creation of Access Control Lists (ACLs) that enable the filtering of traffic based on numerous criteria including source and destination IP address, port, connection state and protocol.

Logical and physical ports are selectable for bridging. Features such VLANs are configurable on a per-port basis. Bridged traffic can be tagged and prioritized according to user defined parameters.

ORDERING INFORMATION

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- email: **sales@patton.com**
- tel: **+1 301.975.1000**
- web: **http://www.patton.com/products/product_detail.asp?id=493&tab=Ordering**

FEATURES & BENEFITS

✓ **Bandwidth Rich** —Bond up to 4 twisted pairs to achieve the desired rate and reach.

  1 Pair: 5.7 to 15.3 Mbps
  2 Pair: 11.4 to 30.6 Mbps
  3 Pair: 17.1 to 45.9 Mbps
  4 Pair: 22.8 to 61.2 Mbps

✓ **Operates Over Twisted Pair or Cat 5+**—Near fiber speeds without the cost of new cable or fiber installations or the hassles of wireless line of site.

✓ **Connects Point to Point or to CL4324**—The CL2300 can be used either back-to-back or with the Patton CopperLink Extended Reach Ethernet Switch.

✓ **Auto-Rate Adaptation Supported**— Automatically selects the best rate vs. reach combination available on a per-wire basis.
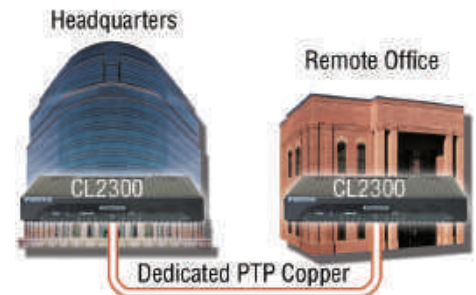
Typical Application

Patton's CopperLink long range Ethernet Extender is the ideal solution for simple, cost-effective, high-speed campus LAN extension. Plug n' play operation gets your network up and running in seconds. Providing four auto-sensing full/half duplex 10/100Base-T Ethernet ports—plus an integrated crossover switch for hassle-free system setup—the value of this Ethernet extender is unsurpassed.

Based on 24 AWG (0.5mm) one cable pair			
Line Rate	K Feet	Miles	km
192K	33972	6.4	10.4
512K	33188	6.3	10.1
1024K	29453	5.6	9.0
2048K	23332	4.4	7.1
4096K	16093	3.0	4.9
5696K	12098	2.3	3.7
8192K	9710	1.8	3.0
15296K	3844	0.7	1.2

As a rule of thumb, when using the CL2302 (2 pair/4 wire) extender a user can expect 30.6 Mbps at 3,844 feet. The CL2304 (4 pair/8 wire) extender can reach 61.2 Mbps at 3,844 feet.

Compatible Patton CopperLink™ Models

Desktop 2 Wire CL1314
Ruggedized CL1314R & MDE
Extended Temperature CL2300E
Multi-Port Switch (24 Ports) CL4324 & FF3310

Power over Ethernet (PoE) Ethernet Extender
CopperLink™ 1101

Energize your cable—*Extend Ethernet & Power over Ethernet (PoE) using existing twisted pair(s) or coax. Benefit instantly from the power and flexibility of IP without downtime or infrastructure and installation expenses!*

With global expansion of the Internet of Things (IoT), demand for IP/Ethernet-connected devices is soaring. Billions of devices are already capable of connecting to the Internet. Ethernet—and power-over-Ethernet (PoE) in particular—has grown in popularity because it strikes the perfect blend of speed, cost, and ease of use.

Ethernet, however, presents a few drawbacks that may overshadow the benefits by creating escalating infrastructure costs and system downtime. The Ethernet standard specifies a distance limitation of 328 ft (100 m), which restricts location options for device installation.

Standard Ethernet also requires Cat 5 cabling or better, which often leads to installing new cabling infrastructure—involving tearing into walls, ceilings, pavement, and worse.

The CopperLink 1101 kit from Patton enables Ethernet connectivity over previously installed copper infrastructure. The solution breathes new life into circuits previously deployed for such traditional non-IP applications as RS232/485 controls, alarms, CCTV, analog phones, intercom speakers, and others.

Instantaneously install PoE-compliant devices such as wireless access points (WAPs), IP cameras, IP telephones, IP door stations, HVAC controls, and more—with no additional overhead cost. With the extended reach the CL1101 kit provides, you can install your IP terminal equipment exactly where you want it! Flexibility of device location is paramount in such applications as building security, where increased perimeter dimension and expanded spot coverage area are critical.

FEATURES & BENEFITS

✓ **Ethernet Extension**—Extends 10/100Base-TX Ethernet over 3300 feet using 2-wire, 24-AWG twisted-pair, Cat 3, Cat 5e/6/7, or coaxial cable.

✓ **Delivers PoE**—PowerPlus technology powers up both the remote CopperLink extender and the PoE enabled device connected to it. No power is required at the remote location.

✓ **Transparent LAN Bridging**—Passes higher layer protocols, including 802.1Q VLAN tagged and untagged packets. Fully transparent to various video compression schemes such as WMV, MPEG-4 and MJPEG.

✓ **Plug and Play**—Modems need no configuration to operate, Ethernet ports are auto-sensing 10/100, full or half-duplex.

Extend **Power** and **Ethernet** to compliant or legacy PoE devices using already installed twisted-pair cable or coax

Commercial Grade Power over Ethernet Extenders

CopperLink port
• Coax
• RJ45
• Terminal Block

Individual Pair Link Status (LED)
Supports up to 4 pair

PoE Port (10/100BaseTX)
Ethernet (10/100BaseTX)

PoE Level Meter (LED)

CL1101 (LOCAL)
Network Side
PoE Ethernet Extender

Power Input
(AC/DC Power Included)

Switch Selectable
• Forced 10 or 100 Line Rate
• Legacy or 802.3af power mode
• # Pairs used

CL1101 (REMOTE)
Device Side
PoE Ethernet Extender

Power & data performance over twisted-pair wires

	10 Mbps		100 Mbps		
	2 wire	4 wire	2 wire	4 wire	8 wire
Min. distance feet (meters)	6 (1.83)	131 (39.9)	6 (1.83)	6 (1.83)	6 (1.83)
Max. distance feet (meters)	2500 (762)	3300 (1005)	915 (278.9)	1065 (324.6)	1849 (563.6)
Link time Min. distance	5 sec	157 sec	5 sec	5 sec	5 sec
Link time Max. distance	5–10 sec	8–265 sec	5 sec	6 sec	6 sec
PoE class at Max. distance	Class 1	Class 2	Class 2/3	Class 4	Class 3/4

Power & data performance over RG59 coaxial cable

	10 Mbps	100 Mbps
Min. distance feet (meters)	6 (1.83)	6 (1.83)
Max. distance feet (meters)	4925 (1501)	1225 (323)
Link time Min. distance	5 sec	5 sec
Link time Max. distance	5–10 sec	5 sec
PoE class at Max. distance	Class 2/3	Class 4

Industrial Grade Power over Ethernet Extenders

CL1101E-SKD
PCA/OEM Board

CL1101E
DIN Mount

CL1101E
Outdoor (IP66)

CALL FOR DETAILS

SPECIFICATIONS

Line Interfaces (Data)
• 1 x RJ45 (Optional: Terminal Block, Coax)
• Supports 1-4 pairs

Ethernet Interfaces
• 1 x RJ45 Auto-Sensing 10/100Base-TX with full or half-duplex operation

LEDs
• Power, Line, (10 or 100 operation), Eth, and PoE

Protocol
• Transparent to high layer protocol
• Supports 802.1Q VLAN tagged frames
• Transparent to IP video schemes
• Fully transparent to compression schemes such as WMV, MPEG-4, and MJPEG

Power Injection (PSE only)
• DC voltage on Ethernet port

• 54 VDC

Power Consumption
• 1.5 W

Power Supply
• External AC Adapter 100–240 VAC to 54 VDC
• Input: 30–57 VDC (Recommended 54 VDC)

MTBF
• 83,043 hours

Environment
• Temperature: 0 to 50°C

(standard)
• Humidity: 10 to 95% (non-condensing)

Physical
• 0.71 H x 1.1 W x 2.56 D in. (18 H x 28 W x 65 D mm)
• 0.78 oz (22 g)

Compliance
• FCC Part 15A, Class B
• CE Mark
EMC Directive 89/336/EEC
LVD Directive 73/23/EEC

ORDERING INFORMATION

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See 页 37
Rackmount 1001MP11

168 Mbps Symmetrical Over Twisted-pair, Cat 5e/6/7 or Coaxial Cable Ethernet Extender

CopperLink™ 1214

Achieving symmetrical line rates greater than 168 Mbps over single twisted-pair, Cat 5e/6/7 or coaxial cable, Patton's CopperLink™ 1214 Ethernet Extender is the fastest CopperLink ever.
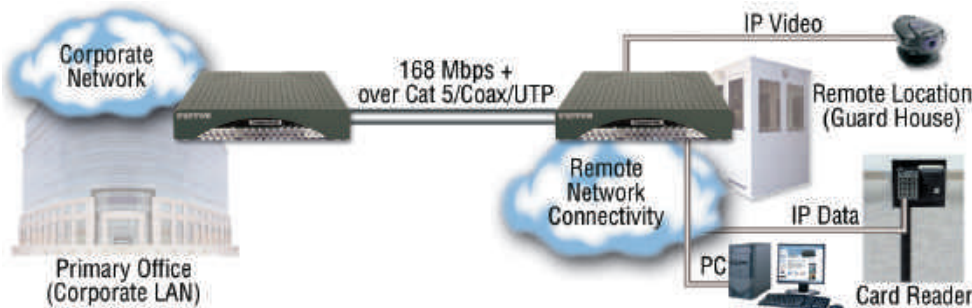
Combining data flows from up to four network-enabled devices onto a single twisted pair or coax cable, the Model 1214 can deliver IP traffic up to 1.8 miles (3 km) away—well beyond the standard 328-foot (100-meter) Ethernet distance limitation.

With achievable line rates up to 168 Mbps, the CopperLink 1214 eliminates the bandwidth constraints commonly experienced with other copper-based transmission technologies. The Model 1214 is engineered to re-use existing infrastructure pre-viously employed in legacy applications including alarm circuits, E1/T1 circuits, RS-232, RS-422, RS-485, CCTV and CATV. Many newer cabling standards are also supported, including Cat 5e, Cat 6 and Cat 7.

A built-in 4-port Ethernet switch makes the CopperLink Model 1214 ideal for delivering multiple IP information streams over a single cable. For example, at a guardhouse or security kiosk, you could aggregate IP data from a laptop, a motion sensor, and two high resolution IP video cameras for simultaneous transmission over a single Ethernet connection.

FEATURES & BENEFITS

✓ **Ethernet Extension**—Extend 10/100Base-TX Ethernet well beyond its 328-foot (100-meter) limitation over a single unshielded twisted pair (UTP), Cat 5e/6/7, or even coaxial cable.

✓ **Operates Over Twisted Pair**—Realize fiber-optic speeds without the expense—and hassle—of installing new cables or line-of-site wireless circuits.

✓ **Plug and Play**—Set these units up straight out of the box. No configuration is required. Auto-sensing 10/100 Ethernet ports support full or half duplex operation.

✓ **Multiple Line Rates Supported**—Switch-selectable rate mode options optimize rate and reach for the noise environment, wire gauge/type and length.

✓ **Transparent LAN Bridging**—Bypass network configuration requirements by transparently passing all higher layer protocols—including 802.1Q VLAN frames (tagged and untagged).

Typical Application

IP Video
168 Mbps +
over Cat 5/Coax/UTP
Corporate Network
Remote Location (Guard House)
Remote Network Connectivity
IP Data
Primary Office (Corporate LAN)
PC
Card Reader

CL1214/S

Also available with POTS splitter for simultaneous voice and data or POTS lifeline applications

Compatible Patton CopperLink™ Models

Desktop 2 Wire 2174
Extended Temperature CL1214E
Desktop 2 Wire CL1212 & CL1211
Extended Temperature CL1212E & CL1211E

Rate and Reach

Length feet (m/km)	Long Range Symmetrical Mbps	
	Downstream	Upstream
250 (76 m)	68	50
1,000 (305 m)	62	44
2,000 (610 m)	50	16
3,000 (914 m)	33	4
5,000 (1.5 km)	16	2
10,000 (3 km)	2.5	1

Length feet (m/km)	High Speed Symmetrical Mbps	
	Downstream	Upstream
250 (76 m)	121	144
1,000 (305 m)	73	103
2,000 (610 m)	45	37
3,000 (914 m)	30	10
3,500 (1 km)	16	4

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CopperLink™ Ultra-High-Speed Copper Ethernet Extenders
Models 1211 & 1212

Achieving symmetrical line rates greater than 168 Mbps over a single twisted-pair or Cat 5e/6/7 cable, Patton's CopperLink™ 1211 and 1212 Ethernet Extenders are the fastest CopperLink™ devices ever.

Combining data flows from up to 2 network-enabled devices onto a single twisted pair or coax cable, the Model 1212 can deliver IP traffic up to 1.8 miles (3 km) away—well beyond the standard 328-foot (100-meter) Ethernet distance limitation.
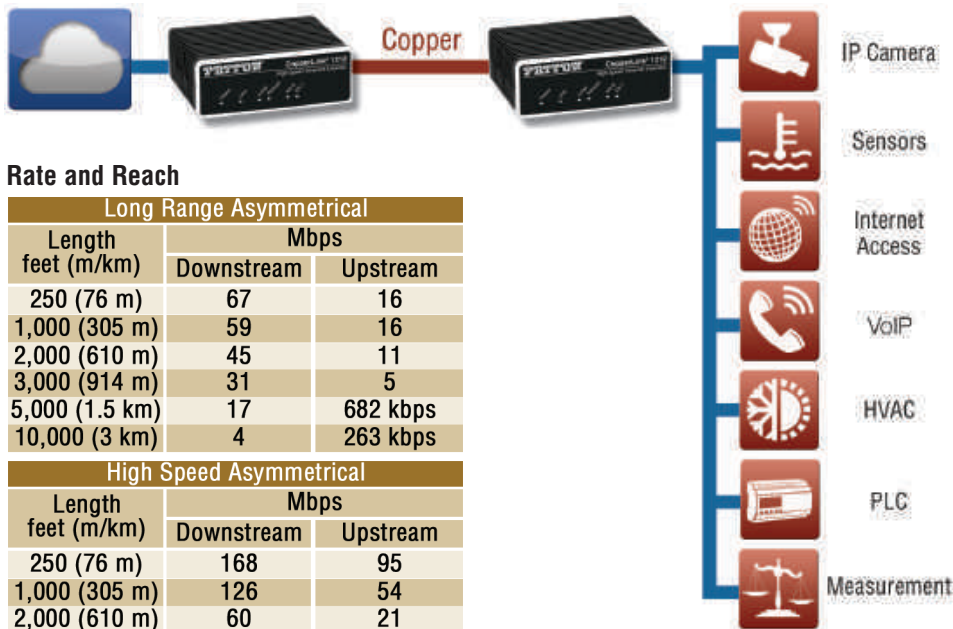
With achievable line rates up to 168 Mbps, the CopperLink 1212 eliminates the bandwidth constraints commonly experienced with other copper-based transmission technologies. The Model 1212 is engineered to re-use existing infrastructure previously employed in legacy applications including alarm circuits, E1/T1 circuits, RS-232, RS-422, RS-485, CCTV and CATV. Many newer cabling standards are also supported, including Cat 5e, Cat 6 and Cat 7.

A built-in 2-port Ethernet switch makes the CopperLink Model 1212 ideal for delivering multiple IP information streams over a single cable. For example, at a guardhouse or security kiosk, you could aggregate IP data from a laptop, a motion sensor, and two high resolution IP video cameras for simultaneous transmission over a single Ethernet connection.

FEATURES & BENEFITS

✓ **Ethernet Extension**—Extend 10/100Base-TX Ethernet well beyond its 328-foot (100-meter) limitation over a single unshielded twisted pair (UTP), Cat 5e/6/7 cable.

✓ **Operates Over Twisted Pair**—Realize fiber-optic speeds without the expense—and hassle—of installing new cables or line-of-sight wireless circuits.

✓ **Plug and Play**—Set these units up straight out of the box. No configuration is required. Auto-sensing 10/100 Ethernet ports support full or half duplex operation.

✓ Multiple Line Rates Supported—Switch-selectable rate mode options optimize rate and reach for the noise environment, wire gauge/type and length.

✓ Transparent LAN Bridging—Bypass network configuration requirements by transparently passing all higher layer protocols—including 802.1Q VLAN frames (tagged and untagged).

Typical Application: Extending Ethernet over Cat 5+ or UTP

Rate and Reach

Long Range Asymmetrical		
Length feet (m/km)	Mbps	
	Downstream	Upstream
250 (76 m)	67	16
1,000 (305 m)	59	16
2,000 (610 m)	45	11
3,000 (914 m)	31	5
5,000 (1.5 km)	17	682 kbps
10,000 (3 km)	4	263 kbps

High Speed Asymmetrical		
Length feet (m/km)	Mbps	
	Downstream	Upstream
250 (76 m)	168	95
1,000 (305 m)	126	54
2,000 (610 m)	60	21
3,000 (914 m)	42	6
3,500 (1 km)	35	1

High Speed Symmetrical		
Length feet (m/km)	Mbps	
	Downstream	Upstream
250 (76 m)	121	144
1,000 (305 m)	73	103
2,000 (610 m)	45	37
3,000 (914 m)	30	10
3,500 (1 km)	16	4

IP Camera
Sensors
Internet Access
VoIP
HVAC
PLC
Measurement

ORDERING INFORMATION

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All-Media Ethernet Extension

Twisted Pair
Cat 5

Compatible Patton CopperLink™ Models

CL1212
CL1214

Desktop Models (2–4 Ethernet Ports)

CL1214E

Light Industrial DIN Rail (4 Ethernet Ports)

CL1212
CL1214

SKD PCB Modules (2–4 Ethernet Ports)

Rackmount 1001MP16

Ethernet Booster
CopperLink™ 2110

The CopperLink™ 2110 solution more than doubles Ethernet and PoE distances over already existing network infrastructure cabling.
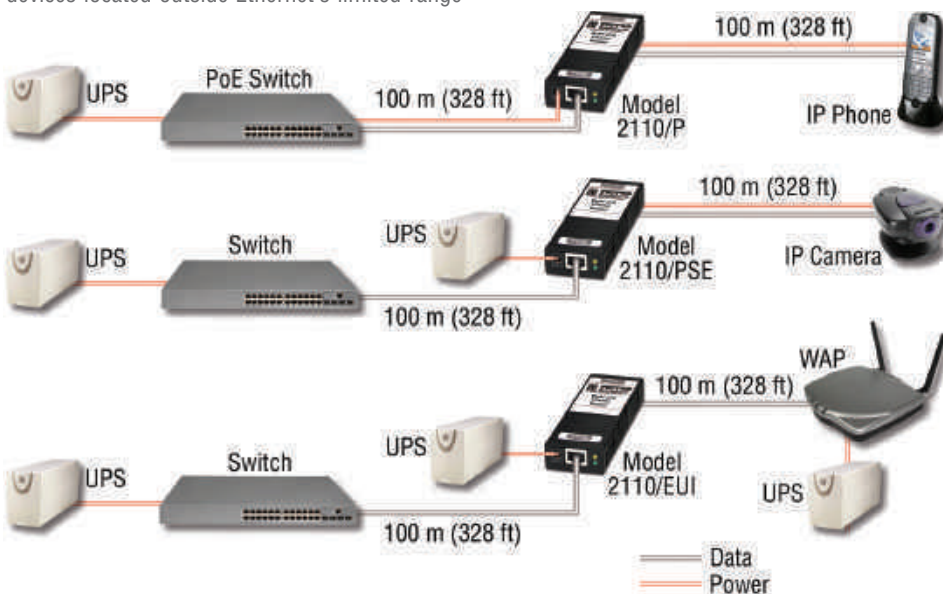
The CopperLink™ Model 2110 doubles Ethernet distance limitations of 328 feet (100 meters). Multiple Model 2110 Ethernet Boosters can be placed in-line to further extend both Ethernet and PoE up to 1,640 ft (500 m), eliminating the need for additional switches, hubs, wireless access points, and expensive fiber installations. The Model 2110 is completely transparent to protocol making them true plug-and-play

devices, completely interoperable with any network enabled device. The Model 2110 will not cause latency or degradation on your network connections, ensuring the maximum 100-Mbps full-duplex line rate. The Model 2110/P and 2110/PSE not only transparently pass on Ethernet data, but also feed on and forward PoE power to devices such as wireless access points, IP cameras, and VoIP phones.

FEATURES & BENEFITS

✓ **Ethernet & PoE Extension**—Doubles 10/100Base-TX Ethernet and PoE to 200 meters (656 feet). Multiple units can be used in series for even longer extensions.

✓ **Operates over Cat 5**—Reduces the cost and hassles of adding switches, hubs, and wireless access points.

✓ **Plug and Play**—No configuration or cable hassles during installation with auto-sensing 10/100, full or half duplex, and automatic MDI-X.

✓ **Transparent LAN Operation**—Transparent operation ensures the highest rate possible for each extension distance.

✓ **No External Power Required**—Power over Ethernet (PoE) capability enables extenders and peripheral devices to be powered over standard twisted-pair Ethernet cable.

Typical Applications

The CopperLInk Ethernet Booster is ideal for delivering Ethernet to remote network enabled devices located outside Ethernet's limited range

of 328 feet (100 meters). Several configurations are possible based on individual requirements.

ORDERING INFORMATION

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802.3af Power and Distance Chart					
	Power Delivered **Class of PoE Device**	**13W** **Class 3/0**	**6.5W** **Class 2**	**3.84W** **Class 1**	**0W** **No PoE Load**
Model	**PoE Source**	**Maximum Distance (Quantity of Units)**			
2110/P	3rd Party PoE switch	N/A	300 m / 984 ft (2 x 2110/P)	400 m / 1,310 ft (3 x 2110/P)	500 m / 1,640 ft (4 x 2110/P)
2110/PSE + 2110/P	PoE Injector 2110/PSE/EUI-48	300 m / 984 ft (1 x 2110/P)	400 m / 1,310 ft (2 x 2110/P)	500 m / 1,640 ft (3 x 2110/P)	600 m / 1,969 ft (4 x 2110/P)

Extend your Ethernet Farther and *Faster*

CopperLink Model	Max Speed (Mbps)	Distance at Max Speed
1200	200	230 m
2300	60	1.16 km
1300	6	2.74 km

Utilize existing copper lines to extend your LAN up to 8 km with CopperLink™

Extend analog extensions beyond normal distance with combinations of SmartNode and CopperLink
Use analog and IP camers for vigilant monitoring without the barrier of distance

Try a Patton CopperLink & SmartNode solution for extending analog extentions to remote locations**

HQ — SmartNode — FXS — FXO — Ethernet — Legacy PBX — CopperLink — Twisted Copper Pair* — CopperLink — M-ATA — FXS — FXO — Ethernet — Branch Office
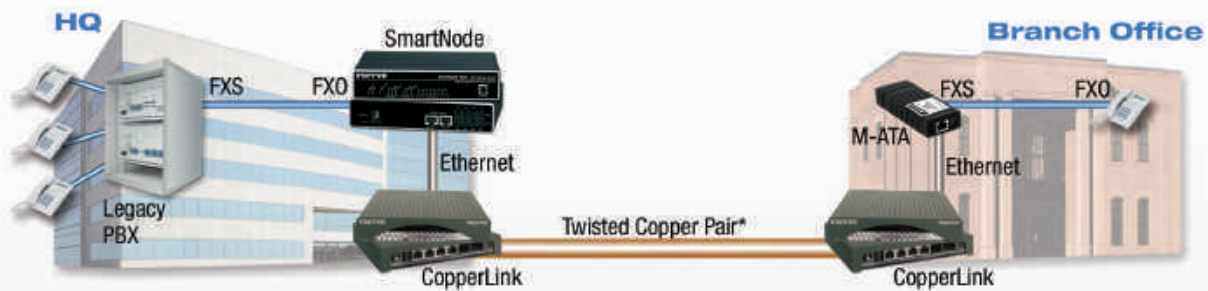
Try a Patton CopperLink for extending IP voice**

HQ — IP-PBX — LAN — Ethernet — CopperLink — Twisted Copper Pair* — CopperLink — M-ATA — FXS — FXO — Ethernet — Branch Office
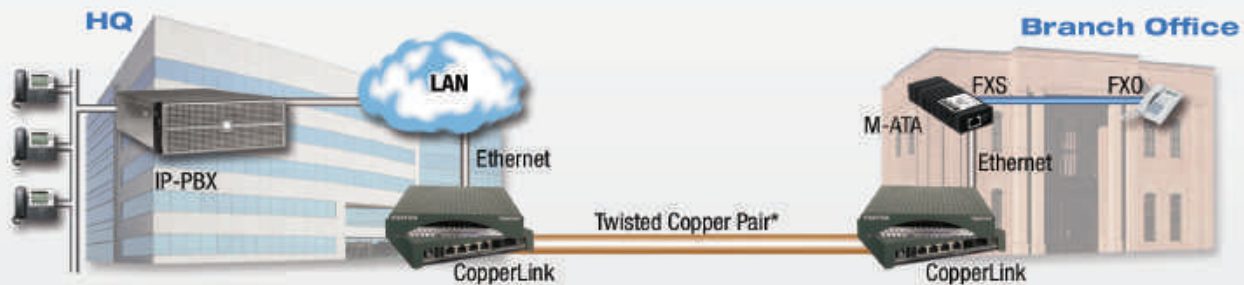
** Shown using CopperLink and SmartNode devices

* Up to 8 km on 0.5 mm wire (or beyond using thicker copper wire)

Adjustable DIN-rail Rack

Ruggedized Wall Mountable Multi-Drop Ethernet Extender & Repeater
CopperLink™ 1314MDE

Use the CopperLink 1314MDE Multi-Drop Ethernet Extender to interconnect and daisy chain multiple remote networks and network enabled devices up to 3.4 miles or more apart using single-twisted-pair cabling.

The CL1314MDE Multi-Drop Ethernet (MDE) Extender, used along with the CL1314R, makes Ethernet extension a breeze.

The MDE series of Ethernet Extenders enables users to replace their legacy serial coms with cost-effective Ethernet (IP) that is easy and inexpensive to set up.

Featuring plug-and-play installation, the CL1314MDE leverages existing copper twisted-pair infrastructure to interconnect Ethernet devices and networks at moderate speeds over long distances. The MDE Extender not only allows multi-drop functionality but also serves a repeater function doubling your maximum distance at every hop.

Operating over standard 0.5 mm (24 AWG) voice-grade wiring, the CL1314 MDE delivers speeds up to 5.7 Mbps and extends Ethernet connections across distances ranging from 3.4 to 5.4 km (2.0 to 3.4 miles) per hop. Whether you need connect to a remote offices, kiosks, guard stations, train stations, digital sensors or IP cameras—Patton Ethernet Extenders offer the industry's optimum combination of speed and distance.

The CL1314 MDE comes with a built-in four-port, auto-sensing, 10/100Base-TX Ethernet switch that provides automatic medium-dependent interface crossover capability (auto-MDIX). That means you can use cross-over or straight through cables to connect up to four Ethernet Absolutely no user-configuration is required.

Set-up is easy! Plug in the twisted pair into each Copperlink port, then plug in up to four LAN devices with Cat5 or greater cabling, and apply power!
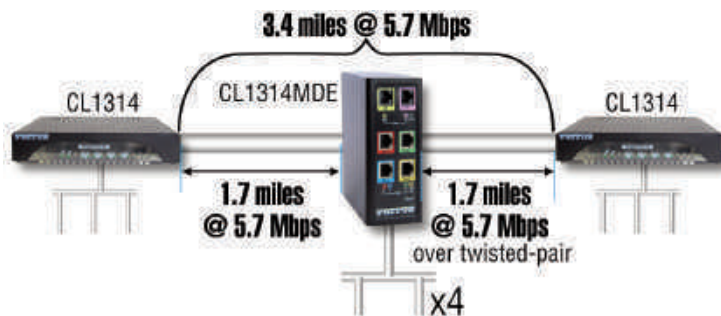
FEATURES & BENEFITS

✓ **high-speed Extension**—Achieve speeds up to 5.7 Mbps.

✓ **Flexible Uses**—Use as a long-distance Ethernet extender (repeater) and/or in Multi-Drop Ethernet applications.

✓ **Multi-rate Selection**—Just plug the units in and select the ideal user-configurable rate for your application.

✓ **CopperLink 2-Wire Connection**—Easy 2-wire CopperLink connections via built-in RJ-45 ports.

✓ **Ruggedized**—Operating temperature of -40 to 85°C and optional conformal coating to protect against condensing humidity and corrosion

✓ **Transparent LAN Bridging**—Transparently pass higher-layer protocols with support for 802.1Q VLAN tagging.

✓ **Automatic Learning, Aging, and Filtering**—Keeps local traffic local, ensuring efficient utilization of the long-range link.

Compatible Patton CopperLink™ Models

Distance per hop on 24AWG (0.5mm)			
Line Rate	K Feet	Miles	km
192	22.5	4.26	6.9
256	22.5	4.26	6.9
512	22.1	4.18	6.7
768	19.5	3.69	5.5
1024	18.5	3.50	5.6
1280	18.5	3.50	5.6
1536	18.6	3.50	5.6
2048	16.5	3.13	5.03
2304	16.5	3.13	5.03
4608	11	2.08	3.35
5696	9	1.70	2.74

ORDERING INFORMATION

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Transit Application

Command Center
x24

1.7 miles @5.7 Mbps

3.4 miles @5.7 Mbps

1.7 miles @5.7 Mbps

Ethernet over single twisted pair

1 WWW — Network — Command Center — CL4324 — x24 twisted pairs to traffic signal enclosures

2/3 Traffic signal & traffic camera — Twisted pair to Command Center — CL1314MDE — Traffic signal cabinet

4 Traffic signal & traffic camera — Twisted pair to Command Center — CL1314R — Traffic signal cabinet

Perimeter Security Application

CL1314 — Headquarters — Ethernet switch

CL1314MDE — Keypad — Camera

1.7 miles @ 5.7 Mbps

CL1314MDE — Camera

CL1314R — Camera

CL1314MDE Ethernet extenders are ideal for delivering drop add Ethernet links to multiple remote locations that are beyond the 328-foot (100-meter) distance limit of Ethernet.

The 5.7 Mbps throughput eliminates bandwidth concerns previously experienced with other legacy copper wired transmission technologies.

The CL1314MDE includes several user configurable line rates so that a user will get a consistent link, even in noisiest environments.

Adjustable DIN-rail Rack

See pg 36

Ruggedized Wall Mountable Ethernet Extender

CopperLink™ 1314R

Use the CopperLink 1314R Ruggedized Ethernet Extender to interconnect remote LANs or network enabled device up to 3.4 miles apart using single-twisted-pair cabling—and realize the best-possible speed/distance combination in the industry!

Featuring plug-and-play installation, the CL1314R CopperLink Ethernet Extenders leverage existing copper twisted-pair infrastructure to interconnect Ethernet devices and networks at high-speeds over long distances.

Operating over standard 0.5 mm (24 AWG) voice-grade wiring, the CL1314R delivers speeds up to 5.7 Mbps and extends Ethernet connections across distances ranging from 2.7 to 6.9 km (1.7 to 4.3 miles).

Patton's CopperLink Ethernet Extenders ensure hassle-free set-up and operation, while achieving the highest possible line rate for the required distance and electro-magnetic environment. Users "hard-set" the desired line rate via DIP switches or console Telnet.

The CL1314R comes with a built-in two-port, auto-sensing, 10/100Base-TX Ethernet switch that provides automatic medium-dependent interface crossover capability (auto-MDIX). That means you can use cross-over or straight-through cables (whichever is handy) to connect up to four Ethernet devices. The auto-MDIX feature detects the polarity of the cabling on each port, and automatically configures the signaling to match. Absolutely no user-configuration is required.

Operating at layer 2 of the OSI model (data link layer), the CL1314R transparently passes all higher-layer protocols—including VLAN tagging, multicast addressing, VPN pass-through for IPsec, and all IP-video compression schemes. All common industrial protocols are also transparently supported, including MODBUS/TCP and PROFINET IO.

Set-up is easy! Simply connect up to four LAN devices to the Ethernet switch, plug the copper twisted-pair into each extender, and apply power! For simple, cost-effective and efficient Ethernet extension, Patton's CopperLink Ethernet Extenders are the ideal solution!

FEATURES & BENEFITS

✓ **high-speed Extension**—Achieve speeds up to 5.7 Mbps.

✓ **Multi-rate Selection**—Just plug the units in and select the ideal user-configurable rate for your application.

✓ **CopperLink 2-Wire Connection**—Easy 2-wire CopperLink connection via built-in RJ-45 port.

✓ **Ruggedized**—Operating temperature of -40 to 85°C and optional conformal coating to protect against condensing humidity and corrosion.

✓ **Hardened**—Aluminum enclosure designed to meet IP40 specifications; DIN rail mount included.

✓ **Extended Temperature**— -40 to 85°C operation.

✓ **Transparent LAN Bridging**—Transparently pass higher-layer protocols with support for 802.1Q VLAN tagging.

✓ **Automatic Learning, Aging, and Filtering**— Keeps local traffic local, ensuring efficient utilization of the long-range link.
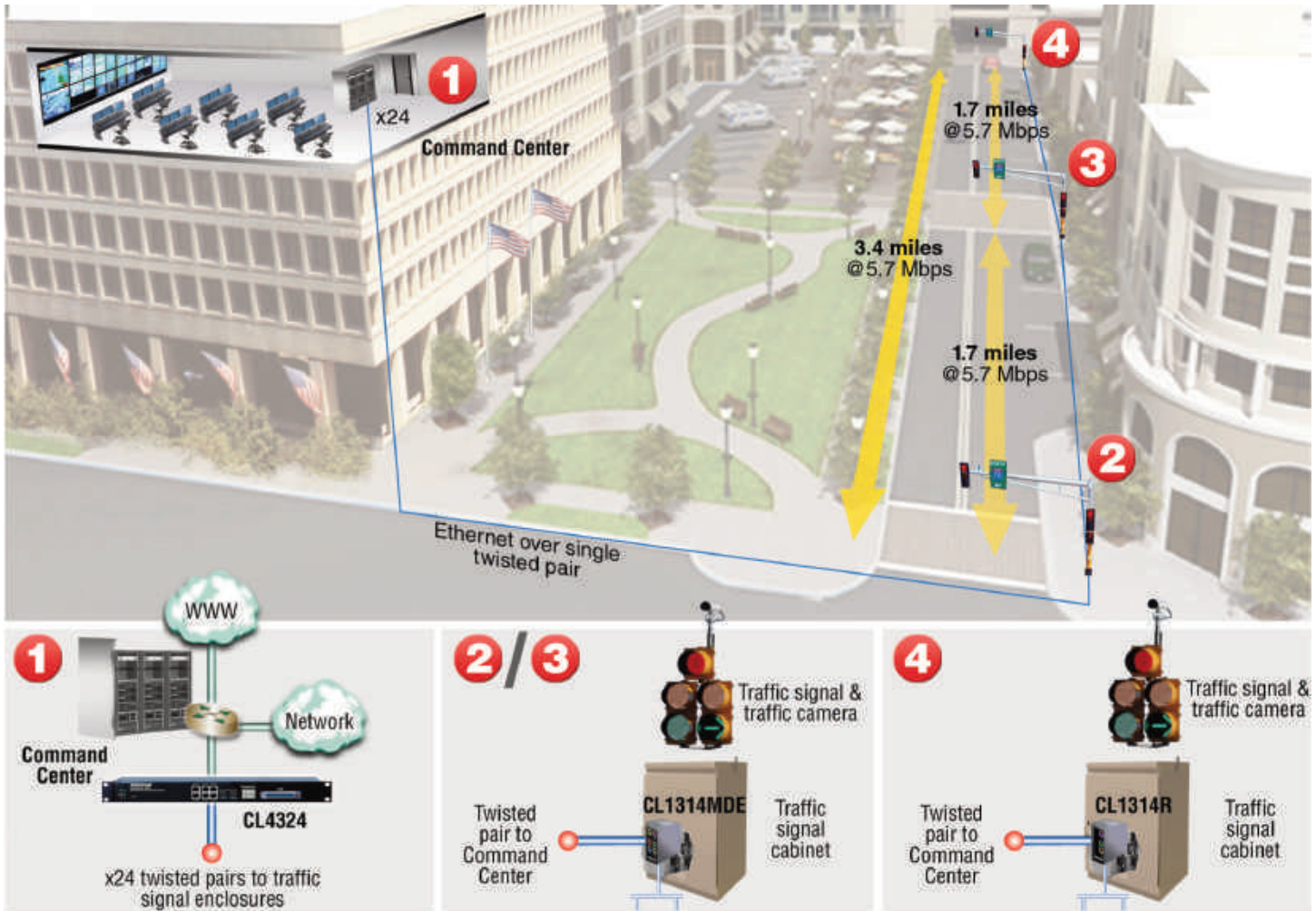
ORDERING INFORMATION

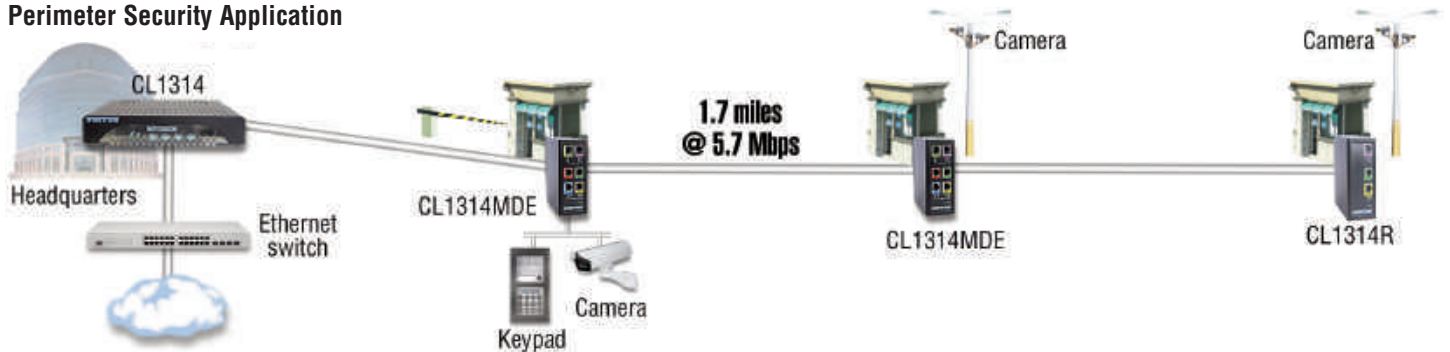Obtain ordering info for this product by using the QR code at right or by contacting:

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Typical Application

Extend 10/100Base-TX Ethernet to reach beyond its natural limitations

CL1314R

CL1314

Office

Pick & place machine

Up to 1.5 miles (2.5 km) at close to 6 Mbps over pre-existing twisted-pair

Model CL1314R ruggedized Ethernet Extenders are ideal for delivering Ethernet links to remote buildings that are beyond the 328-foot (100-meter) distance limit of Ethernet. The 5.7 Mbps throughput eliminates bandwidth concerns previously experienced with other copper wired transmission technologies.

The CL1314R includes several user configurable line rates so that a user will get a consistent link, even in noisy environments. By utilizing existing voice-grade copper pairs or legacy serial circuits the expense and hassle of installing low capacitance or fiber cable is no longer required.

• **Plug-and-Play**—Just unpack a pair of extenders and plug in the cables. Apply power and your connection is up and running. It just doesn't get any easier!

• **high-speed/Long Reach**—The CL1314R Ethernet extender provides the industry's ultimate combination of speed and distance!

Distance on 24 AWG (0.5mm)			
Line Rate	K Feet	Miles	km
192	22.5	4.26	6.9
256	22.5	4.26	6.9
512	22.1	4.18	6.7
768	19.5	3.69	5.5
1024	18.5	3.50	5.6
1280	18.5	3.50	5.6
1536	18.6	3.50	5.6
2048	16.5	3.13	5.03
2304	16.5	3.13	5.03
4608	11	2.08	3.35
5696	9	1.70	2.74

See pg 36

Adjustable DIN-rail Rack

Light Industrial Long-Range Ethernet Extender
CopperLink™ 2300E

The CL2300E offers sturdy industrial design with superior Ethernet performance over existing copper infrastructure. Pair bonding technology extends connections up to 2 miles (3.2 km)—without repeaters—at symmetrical rates surpassing 22 Mbps.

The robust and reliable CopperLink 2300E Light Industrial Ethernet Extender delivers bandwidth greater than 60 Mbps in point to-point topologies. Extend Ethernet segments to IP-enabled devices or remote LANs using existing copper infrastructure. Often used for LRE (Long Range Ethernet), the CL2300 is also an excellent solution for point-to-point connectivity for noisy environments or questionable cable quality.

The CL2300E employs wire-bonding technology to combine up to 4 wire pairs into a single Ethernet connection with superior speed and

distance performance. Each pair provides bandwidth ranging from 5.7 Mbps to 15.3 Mbps depending on segment length. CopperLink devices are engineered for reliability and ease of use. In the default plug-and-play mode, installers need only connect the cables and power up. Patton's auto-rate adaptation feature negotiates the best-possible rate and reach for each wire pair.

The six user-selectable line-rate modes and all pair-bonding settings are configurable, so users can control the rate/reach combination for specialized applications. Should one wire-pair fail, the CL2300E will automatically adjust the line rate to ensure a stable connection.

For business-critical networking, Patton's managed CopperLink series offers optimum versatility and reliability at an affordable price.

FEATURES & BENEFITS

✓ **Bandwidth Rich** —Bond up to 4 twisted pairs to achieve the desired rate and reach.

  1 Pair: 5.7 to 15.3 Mbps
  2 Pair: 11.4 to 30.6 Mbps
  3 Pair: 17.1 to 45.9 Mbps
  4 Pair: 22.8 to 61.2 Mbps

✓ **Robust Network Connectivity**—When a micro disruption would otherwise force link renegotiation with mission-critical data loss, Patton's emergency freeze feature maintains the link.

  In the event of a faulty or damaged wire pair, the CL2300E automatically adjusts the line rate to ensure stable network connectivity.

✓ **Rugged**—Wall-mountable IP40 aluminum enclosure; operating temperature of -40 to 85°C; conformal coated PCB assembly protects against humidity, condensation, and corrosion.

✓ **Operates Over Twisted Pair or Cat 5+**—Near-fiber speeds without costly installation of new fiber or copper cable, or the hassles of wireless line-of-sight.

✓ **Flexible and Secure Management**—Configuration options include CLI via RS232 Console, Telnet, SSH, HTTP web management, and SNMPv1/v2c/v3. Stateful FirewallI and ACL filters securely protect the management port.

✓ **Auto-Rate Adaptation Supported**—Automatically selects the best possible speed/distance combination for each wire pair.

✓ **VLAN Options**—Logical and physical ports are selectable for bridging, while VLANs are configurable per port. Bridged traffic can be tagged and prioritized according to user-defined parameters.

Typical Application

Even in hot, cold, or humid conditions, the CL2300E interconnects your IP-enabled devices over any existing copper infrastructure.

Copper
1–4 Twisted Pair

IP Camera
Sensors
Internet Access
VoIP
HVAC
PLC
Measurement

Chart based on 24 AWG (.5mm) one cable pair			
Line Rate	K Feet	Miles	km
192K	33972	6.4	10.4
512K	33188	6.3	10.1
1024K	29453	5.6	9.0
2048K	23332	4.4	7.1
4096K	16093	3.0	4.9
5696K	12098	2.3	3.7
8192K	9710	1.8	3.0
15296K	3844	0.7	1.2

As a rule of thumb, when using the CL2302 (2 pair/4 wire) extender a user can expect 30.6 Mbps at 3,844 feet. The CL2304 (4 pair/8 wire) extender can reach 61.2 Mbps at 3,844 feet.

ORDERING INFORMATION

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Adjustable DIN-rail Rack

Industrial Grade, Power over Ethernet (PoE) Ethernet Extender
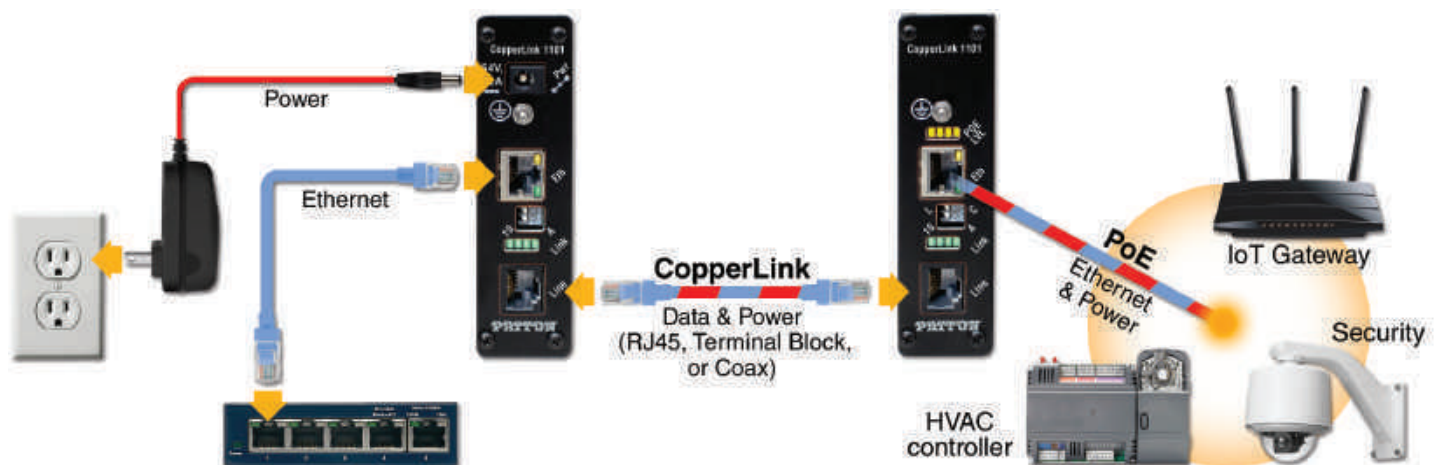### CopperLink™ 1101E

Energize your cable—Extend Ethernet & Power over Ethernet (PoE) using existing twisted pair(s) or coax. Benefit instantly from the power and flexibility of IP without downtime or infrastructure and installation expenses!

With global expansion of the Internet of Things (IoT), demand for IP/Ethernet-connected devices is soaring. Billions of devices are already capable of connecting to the Internet. Ethernet—and power-over-Ethernet (PoE) in particular—has grown in popularity because it strikes the perfect blend of speed, cost, and ease of use.

Ethernet, however, presents a few drawbacks that may overshadow the benefits by creating escalating infrastructure costs and system downtime. The Ethernet standard specifies a distance limitation of 328 ft (100 m), which restricts location options for device installation. Standard Ethernet also requires Cat 5 cabling or better, which often leads to installing new cabling infrastructure—involving tearing into walls, ceilings, pavement, and worse.

The CopperLink 1101E kit from Patton enables Ethernet connectivity over previously installed copper infrastructure. The solution breathes new life into circuits previously deployed for such traditional non-IP applications as RS232/485 HVAC and building automation controls, alarms, CCTV, analog phones, intercom speakers, and others.
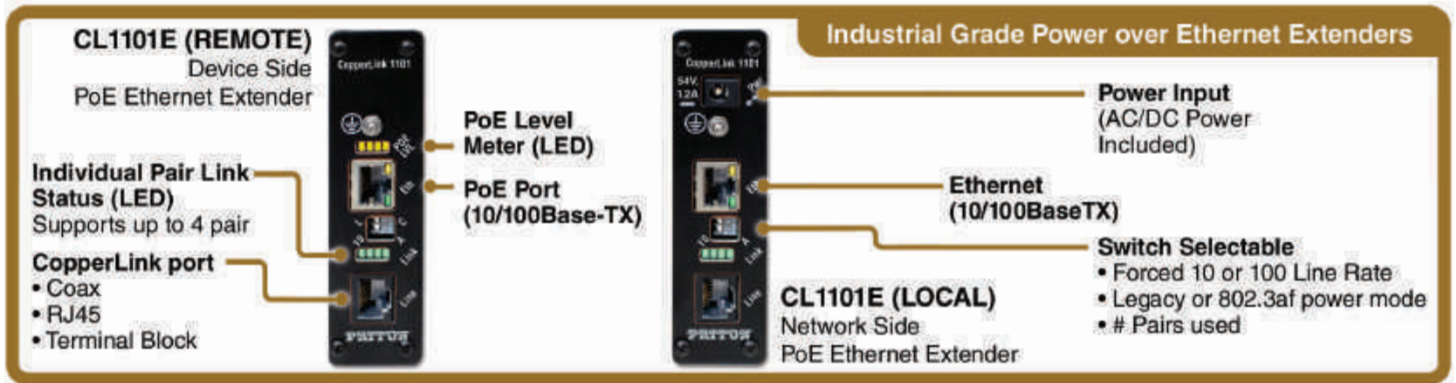
Instantaneously install PoE-capable devices such as wireless access points (WAPs), IP cameras, IP telephones, IP door stations, HVAC controls, LED lighting and more—with no additional overhead cost. With the extended reach the CL1101E kit provides, you can install your IP terminal equipment exactly where you want it! Flexibility of device location is paramount in such applications as building security, where increased perimeter dimension and expanded spot coverage area are critical.

FEATURES & BENEFITS

✓ **Ethernet Extension**—Extends 10/100Base-TX Ethernet over 3300 feet using 2-wire, 24-AWG twisted-pair, Cat 3, Cat 5e/6/7, or coaxial cable.

✓ **Delivers PoE**—PowerPlus technology powers up both the remote CopperLink extender and the PoE enabled device connected to it. No power is required at the remote location.

✓ **Transparent LAN Bridging**—Will pass higher layer industrial Ethernet protocols such as BACnetIP, EtherCAT and Modbus TCP.

✓ **Plug and Play**—Modems need no configuration to operate, Ethernet ports are auto-sensing 10/100, full or half-duplex.

✓ **Overvoltage Protection**—Overvoltage protection on Line and Ethernet ports prevents damage from ESD (electrostatic discharge), CDE (cable discharge events), and lightning.

Extend **Power** and **Ethernet** to compliant or legacy PoE devices using already installed twisted-pair cable or coax

CL1101E (REMOTE)
Device Side
PoE Ethernet Extender

Industrial Grade Power over Ethernet Extenders

Individual Pair Link Status (LED)
Supports up to 4 pair

CopperLink port
• Coax
• RJ45
• Terminal Block

PoE Level Meter (LED)

PoE Port (10/100Base-TX)

Power Input (AC/DC Power Included)

Ethernet (10/100BaseTX)

CL1101E (LOCAL)
Network Side
PoE Ethernet Extender

Switch Selectable
• Forced 10 or 100 Line Rate
• Legacy or 802.3af power mode
• # Pairs used

Power & data performance over twisted-pair wires					
	10 Mbps		100 Mbps		
	2 wire	4 wire	2 wire	4 wire	8 wire
Min. distance feet (meters)	6 (1.83)	131 (39.9)	6 (1.83)	6 (1.83)	6 (1.83)
Max. distance feet (meters)	2500 (762)	3300 (1005)	915 (278.9)	1065 (324.6)	1849 (563.6)
Link time Min. distance	5 sec	157 sec	5 sec	5 sec	5 sec
Link time Max. distance	5–10 sec	8–265 sec	5 sec	6 sec	6 sec
PoE class at Max. distance	Class 1	Class 2	Class 2/3	Class 4	Class 3/4

Power & data performance over RG59 coaxial cable		
	10 Mbps	100 Mbps
Min. distance feet (meters)	6 (1.83)	6 (1.83)
Max. distance feet (meters)	4925 (1501)	1225 (323)
Link time Min. distance	5 sec	5 sec
Link time Max. distance	5–10 sec	5 sec
PoE class at Max. distance	Class 2/3	Class 4

Industrial Grade Power over Ethernet Extenders

CL1101E-SKD PCA/OEM Board

CL1101E DIN Mount

CL1101E Outdoor (IP66)

CALL FOR DETAILS

ORDERING INFORMATION

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• email: **sales@patton.com**

• tel: **+1 301.975.1000**

• web: **http://www.patton.com/products/ product_detail.asp?id=536&tab=Ordering**

SPECIFICATIONS

Line Interfaces (Data)
• 1 x RJ45 (Optional: Terminal Block, Coax)
• Supports 1-4 pairs

Ethernet Interfaces
• 1 x RJ45 Auto-Sensing 10/100Base-TX with full or half-duplex operation

LEDs
• Power, Line, (10 or 100 opera-tion), Eth, and PoE

Protocol
• Transparent to high layer Industrial Ethernet protocols such as EtherCAT, Modbus-TCP, PROFINET and more.
• Supports 802.1Q VLAN tagged frames
• Transparent to IP video schemes

• Fully transparent to compres-sion schemes such as WMV, MPEG-4, and MJPEG

Overvoltage Protection (Line and Ethernet)
• IEC 61000-4-2 (ESD) 25kV (air), 15kV (contact)
• IEC 61000-4-4 (EFT) 40A (5/50ns)
• IEC 61000-4-5 (lightning) 25A

(8/20µs)

Power Injection (PSE only)
• DC voltage on Ethernet port
• 54 VDC

Power Consumption
• 1.5 W

Power Supply
• External AC Adapter 100–240 VAC to 54 VDC

• Input: 30–57 VDC (Recommended 54 VDC)

MTBF
• 83,043 hours

Environment
• Temperature: -10 to 70°C
• Humidity: 10 to 95% (non-condensing)

Physical
• 0.71 H x 1.1 W x 2.56 D in. (18 H x 28 W x 65 D mm)
• 0.78 oz (22 g)

Compliance
• FCC Part 15A, Class B
• CE Mark EMC Directive 89/336/EEC LVD Directive 73/23/EEC

Adjustable DIN-rail Rack
See pg 36

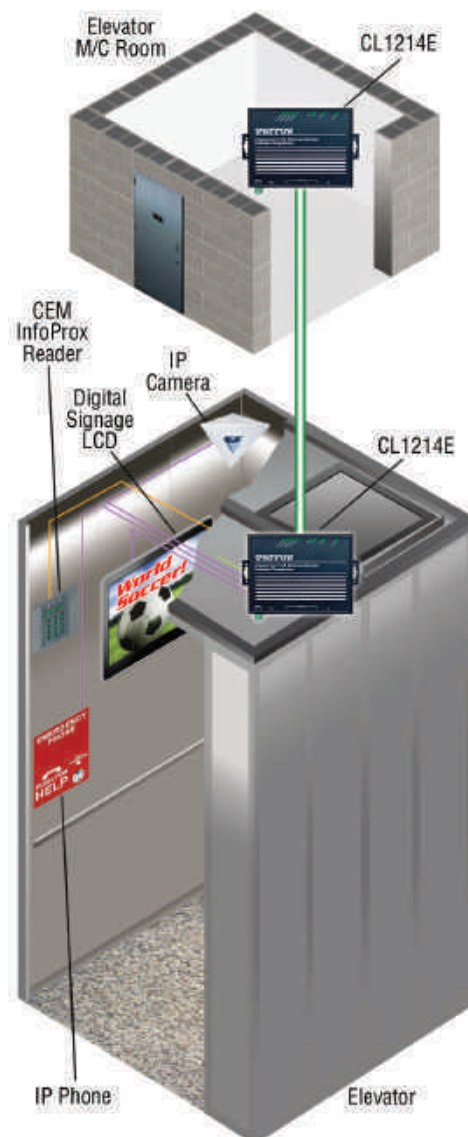### Wall Mountable Ethernet Extender
CopperLink™ 1214E

Achieving symmetrical line rates greater than 168 Mbps over single twisted-pair, Cat 5e/6/7 or coaxial cable, Patton's CopperLink 1214E Ethernet Extender is the fastest CopperLink ever.

IP Convergence is finding itself everywhere, including elevator cabs…and why not? IP/Ethernet enabled equipment offers unparalleled flexibility, security, and simplicity. The use of these Ethernet devices does however come with its own costs and drawbacks:

• Ethernet requires CAT5 twisted pair (2 to 4 wire pairs). The CL1214E operates over the same twisted pair that already exists in a typical elevator cable bundle. These twisted pairs could have been used for POTS, RS-232/422/485 circuits, alarm circuits, etc.

• Ethernet specification only ensures a 328-foot reach. The CL1214E is able to transport Ethernet communications up to 10,000 feet.

• Ethernet devices, because of the numerous applications and controls, can consume more bandwidth than their legacy serial counterparts. Bandwidth varies according to distance and cable type. On typical cable runs of less than 1,000 feet it can be as high as 100 Mbps.

The CL1214E helps customers take full advantage of delivering the IP experience and benefits in the elevator cab without the expense and hassles associated with it.

Typical IP Elevator Application

FEATURES & BENEFITS

✓ **Ethernet Extension**— Extend 10/100Base-TX Ethernet well beyond its 328-foot (100-meter) limitation over a single unshielded twisted pair (UTP) or Cat 5e/6/7 cable.

✓ **Ruggedized**—Operating temperature of -40 to 85°C and optional conformal coating to protect against condensing humidity.

✓ **Plug and Play**—Set these units up straight out of the box. No configuration is required. Auto-sensing 10/100 Ethernet ports support full or half duplex operation.

✓ **Transparent LAN Bridging**—Bypass network configuration requirements by transparently passing all higher layer protocols—including 802.1Q VLAN frames (tagged and untagged). Data-transmission mechanism is fully transparent to such IP video compression schemes as MPEG-4, H.264 and MJPEG.

✓ **Flexible Installation**—Wall-mount ready and an optional DIN rail mounting kit is available.

✓ **Multiple Line Rates Supported**—Switch-selectable rate mode options optimize rate and reach for the noise environment, wire gauge/type and length.

✓ **Made in the USA**—This Patton equipment is designed by Patton engineers and built in our Gaithersburg, Maryland facility. Patton's American-made manufacturing process delivers high-quality networking solutions with reliability you can trust.

Rate and Reach

Long Range Asymmetrical		
Length feet (m/km)	Mbps	
	Downstream	Upstream
250 (76 m)	67	16
1,000 (305 m)	59	16
2,000 (610 m)	45	11
3,000 (914 m)	31	5
5,000 (1.5 km)	17	682 kbps
10,000 (3 km)	4	263 kbps

High Speed Asymmetrical		
Length feet (m/km)	Mbps	
	Downstream	Upstream
250 (76 m)	168	95
1,000 (305 m)	126	54
2,000 (610 m)	60	21
3,000 (914 m)	42	6
3,500 (1 km)	35	1

ORDERING INFORMATION

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Adjustable DIN-rail Rack
See pg 36

Wall Mountable Ultra-High-Speed Copper Ethernet Extenders
CopperLink™ Models 1211E & 1212E

Achieving symmetrical line rates greater than 168 Mbps over a single twisted-pair or Cat 5e/6/7 cable, the CL1211E and CL1212E Ethernet Extender are the fastest CopperLink™ devices ever..
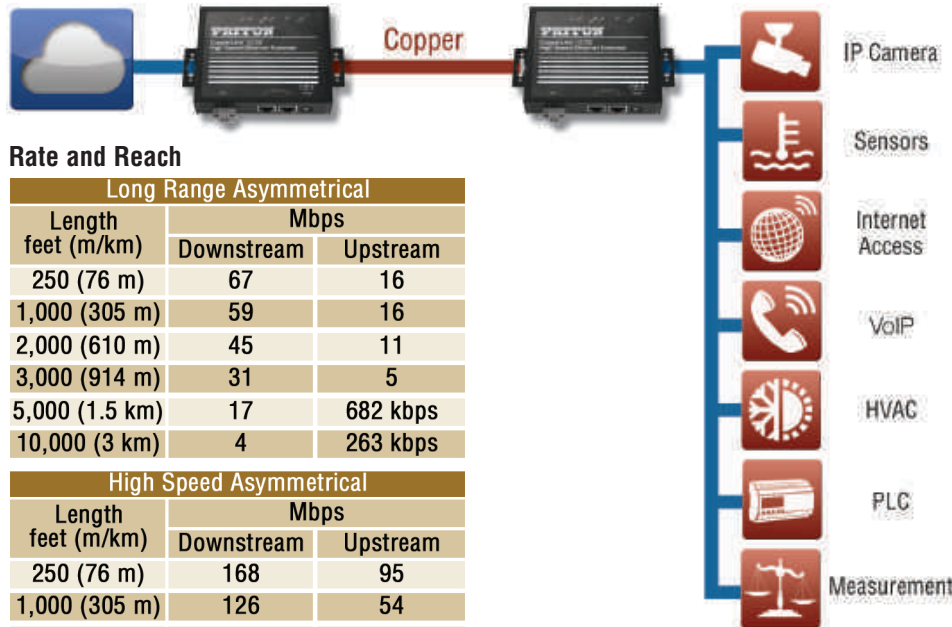
Combining data flows from up to four network-enabled devices onto a single twisted pair or coax cable, the Model 1212E can deliver IP traffic up to 1.8 miles (3 km) away—well beyond the standard 328-foot (100-meter) Ethernet distance limitation.

With achievable line rates up to 168 Mbps, the CopperLink 1212E eliminates the bandwidth constraints commonly experienced with other copper-based transmission technologies. The Model 1212E is engineered to re-use existing infrastructure previously employed in legacy applications including alarm circuits, E1/T1 circuits, RS-232, RS-422, RS-485, CCTV and CATV. Many newer cabling standards are also supported, including Cat 5e, Cat 6 and Cat 7.

A built-in 2-port Ethernet switch makes the CopperLink Model 1212E ideal for delivering simultaneous connectivity to more than one IP enabled device such as a laptop, a motion sensor, or even a few high resolution IP video cameras—all over a single twisted-pair!

FEATURES & BENEFITS

✓ **Ethernet Extension**—Extend 10/100Base-TX Ethernet well beyond its 328-foot (100-meter) limitation over a single unshielded twisted pair (UTP), Cat 5e/6/7 cable.

✓ **Operates Over Twisted Pair**—Realize fiber-optic speeds without the expense—and hassle—of installing new cables or line-of-sight wireless circuits.

✓ **Plug and Play**—Set these units up straight out of the box. No configuration is required. Auto-sensing 10/100 Ethernet ports support full or half duplex operation.

✓ **Multiple Line Rates Supported**—Switch-selectable rate mode options optimize rate and reach for the noise environment, wire gauge/type and length.

✓ **Transparent LAN Bridging**—Bypass network configuration requirements by transparently passing all higher layer protocols—including 802.1Q VLAN frames (tagged and untagged).

Typical Application

Rate and Reach

Length feet (m/km)	Long Range Asymmetrical Mbps	
	Downstream	Upstream
250 (76 m)	67	16
1,000 (305 m)	59	16
2,000 (610 m)	45	11
3,000 (914 m)	31	5
5,000 (1.5 km)	17	682 kbps
10,000 (3 km)	4	263 kbps

Length feet (m/km)	High Speed Asymmetrical Mbps	
	Downstream	Upstream
250 (76 m)	168	95
1,000 (305 m)	126	54
2,000 (610 m)	60	21
3,000 (914 m)	42	6
3,500 (1 km)	35	1

Length feet (m/km)	High Speed Symmetrical Mbps	
	Downstream	Upstream
250 (76 m)	121	144
1,000 (305 m)	73	103
2,000 (610 m)	45	37
3,000 (914 m)	30	10
3,500 (1 km)	16	4

ORDERING INFORMATION

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• web: **http://www.patton.com/products/product_detail.asp?id=517&tab=Ordering**

All-Media Ethernet Extension

Twisted Pair   Cat 5

Compatible Patton CopperLink™ Models

CL1214
Desktop Model (2–4 Ethernet Ports)

CL1214E   CL1212E
Light Industrial DIN Rail (4 Ethernet Ports)

CL1212   CL1214
**SKD PCB Modules (2–4 Ethernet Ports)**

OEM/PCA and Custom Ethernet Extenders

IP convergence, M2M, Cloud computing, and the growing need for security are driving today's need for IP Connectivity. There are literally millions of uses for Patton Ethernet extenders. It stands to reason that not all these needs are met with our standard Ethernet extenders. Different PCB sizes, connectors, power options and environmental specs are just a few examples of requirements that can be very device or industry specific.

Since 1984 Patton Electronics has been designing and manufacturing our own and custom Ethernet extenders and datacom products in our Maryland, USA corporate headquarters. For more specialized requirements, Patton has set up a Special Projects Group (SPG) that is located in North Carolina.

Let Patton help you connect.
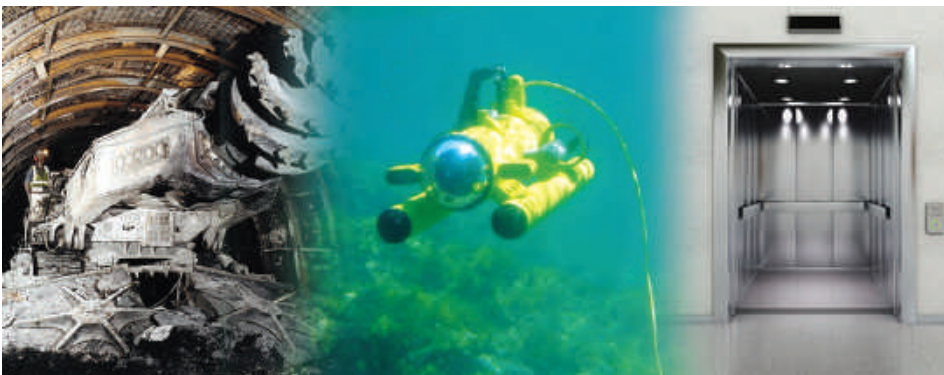
Below is a sampling of standard PCBs we offer that can either be incorporated into systems or resold under your brand in either our enclosures or yours.

FEATURES & BENEFITS

✓ **Long Range (Best over 5,000 feet or 1,524 m)**—Line rates vary from 192 kbps to 15.3 Mbps per wire pair. Maximum distance at 192 kbps is approximately 30,000 feet (9,144 m).

✓ **High-speed (Best under 5,000 feet or 1,524 m)**—For the higher bandwidth requirements where reach is of less concern. Downstream data rates of 100 Mbps are possible over distances of 250 feet (76 m). The maximum distance is 10,000 feet (3,048 m).

✓ **Corrosion Resistant**—Patton offers a special protective coating on the Ethernet Extender PCB and components giving the Ethernet Extenders protection from condensing humidity, greatly reducing the chance of damaging the extender and preventing failures due to corrosion.

✓ **Extended Temperature**—Patton's typical extended temperature products are rated -40 to 185 °F (-40 to 85 °C). Standard operating temperature unless stated otherwise is 32 to 122 °F (0 to 50 °C)

Model	Dimensions	# of Ethernet Ports	High Speed	Long Range	Corrosion Resistance Available	Extended Temp Available
CL2110E-SKD	1.410 W x 3.256 D in. (3.581 W x 8.270 D cm)	1	✓	—	✓	—
CL1101E-SKD	3.890 W x 3.120 D in. (9.880 W x 7.924 D cm)	1	✓	—	✓	✓
CL1212E-SKD	3.890 W x 3.120 D in. (9.880 W x 7.924 D cm)	1 to 2	✓	—	✓	✓
CL1214E-SKD	4.9 W x 4.0 D in. (12.446 W x 10.16 D cm)	4	✓	—	✓	✓
CL2300E-SKD	7.0 W x 5.74 D in. (17.78 W x 14.580 D cm)	4	✓	—	✓	✓

PATTON® *Let's Connect!*™

FAST Delivery From Your AUTHORIZED DISTRIBUTOR!

CopperLink™ EnviroNET™ Custom Ethernet Extender Solutions

- Each EnviroNET product is customized to your requirements
- Various NEMA, IP (ingress protection), and MIL-SPEC options are available

Contact: **sales@patton.com** for details.

Sample solutions

EnviroNET™ Ethernet Extenders provide transparent extension of your 10/100 Ethernet LANs at distances up to 8 km over a single twisted pair or line rates over 100 Mbps!

EnviroNET™ Ethernet Extenders are housed in protective enclosures and operate in extreme temperatures, ranging from -40 to 85°C. Each EnviroNET extender is customized to your requirements. So whether you are looking for protection from vandalism or extending Ethernet to locations where harsh environmental elements such as heating, cooling, dust, and moisture cannot be controlled, there is an EnviroNET solution that is right for you.

EnviroNET™ Ethernet Extender applications include closets, ceilings, industrial automation, roadside cabinets, and various outdoor installations such as security and transportation access/control/surveillance.

Self-Powered Asynchronous DB-9 Short-Range Modem
Model 1009

Basic point-to-point async SRM.

The Model 1009 async short range modem plugs directly into a DB-9 RS-232 port. A pair of Model 1009s supports distances up to 17 mi (27.4 km) at 1200 bps over two 19 AWG (0.9 mm) unconditioned twisted pairs.

Operating at data rates up to 19.2 kbps, this cost saving device does not require AC power or batteries to operate.

The Model 1009 is DCE/DTE switchable, and incorporates 600 watts per wire of built-in silicon avalanche diode surge protection.

FEATURES & BENEFITS

✓ Range to 17 miles (27.4 km) on 19 AWG at 1,200 bps

✓ Data rates to 19,200 bps

✓ External DCE/DTE switch

✓ FCC Approved—Part 15 Class A

ORDERING INFORMATION

Obtain ordering info for this product by using the QR code at right or by contacting:

- email: **sales@patton.com**
- tel: **+1 301.975.1000**
- web: **http://www.patton.com/products/product_detail.asp?id=78&tab=Ordering**

SPECIFICATIONS

Transmission Format: Async
Data Rate: 0 to 19,200 bps (no strapping)
Control Signal: CTS (Pin 5) turns ON immediately after the terminal raises RTS (Pin 4);

DSR (Pin 6) and DCD (Pin 8) turn ON immediately after the terminal raises DTR (Pin 20)
Transmit Line: 4 wire, unconditioned line (2 twisted pair)
Transmit Mode: Full

duplex, 4-wire
Transmit Level: 0 dBm
Line Connection: RJ-11 or RJ-45 jack or 5 screw terminal posts and a strain relief
Surge Protection: 600W power dissipation at up to 1

msec
Power: None required, uses ultra low power from EIA data and control signals
Dimensions: 2.20 x 1.75 x 0.75 in. (5.59 x 4.45 x 1.91 cm)

High-Speed, Multipoint Short-haul Modem
Model 1008

Still the best choice for high speed multidrop applications.

The Model 1008 wire short range modem (with DB-9, EIA-574, connector) gives you up to 50 terminal drops over one (half duplex) twisted pair, and supports async data rates up to 115.2 kbps. Great

for same-building applications, the Model 1008 has high/low impedance settings, selectable RTS/CTS delay and a DTE/DCE switch.

Plus, 600 watts of surge protection is standard.

Plug them directly into closely-spaced serial ports.

FEATURES & BENEFITS

✓ Point-to-point full-duplex operation over 4 wires

✓ Multipoint (half-duplex) operation over 2 or 4 wires

✓ Multidrop up to 50 terminals

✓ Async. data rates to 115.2 kbps

✓ Range to 9 mi (14.5 km) on 19 AWG (0.9mm) at 1.2 kbps

✓ No AC power or batteries required

SPECIFICATIONS

Transmission Format: Asynchronous
Data Rate: Up to 115,200 bps
Transmit Line: 2, 4 wire unconditioned twisted pair
Transmit Mode: Full or half duplex

Transmit Level: 0 dbm
Range: Over 9 miles (14.5 km)
Dimensions: 2.66 X 2.10 X 0.73 in. (6.8 X 5.3 X 1.9 cm)
Surge Protection: 600W power dissipation for up to 1

msec
Control Signals: DSR turns "ON" immediately after the terminal raised DTR; DCD turns on after recognizing the receive signal from the line; CTS turns on 8 mSec after the terminal raises RTS

Power: None required, uses ultra low power from EIA data and control signals
Carrier: The carrier is a strap selected for continuous operation or controlled by RTS

ORDERING INFORMATION

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Synchronous/Asynchronous Short-Range Modem
Model 1040

Sync/async in a compact SRM that you can use in just about any RS-232 UTP or STP application.

The Model 1040 self-powered miniature short range modem packs the features of Patton's Model 1080 into a package that requires no AC power. Operating asynchronously or synchronously, the Model 1040 supports data rates to 38.4 Kbps and distances to 12 miles (19.3 km). The Model 1040 will operate over 2 or 4 wires, in point-to-point or multipoint environments. In synchronous mode, the Model 1040 supports internal, external or receive loopback clocking.

The Model 1040 incorporates two V.54 and two V.52 BER test modes, which can be activated via the RS-232 interface. Built-in LEDs let you monitor test mode operation. Additional peace of mind comes from knowing that the Model 1040 has both transformer isolation and surge protection to guard against data loss. The Model 1040 is designed to plug directly into the RS-232 interface. Twisted pair wire is connected using RJ-11, RJ-45 or terminal blocks.

FEATURES & BENEFITS

✔ Async or sync operation

✔ RS-232 data rates to 38.4 kbps

✔ Distances to 12 mi (19.3 km)

✔ Point-to-point or multipoint

✔ 2-wire half duplex, 4-wire full duplex

✔ V.54 and V.52 test modes

✔ Internal, external or receive recover clocking (sync. mode)

✔ Transformer isolation and surge protection

ORDERING INFORMATION

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• email: **sales@patton.com**

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• web: **http://www.patton.com/products/product_detail.asp?id=78&tab=Ordering**

See pg 37

Rackmount 1001MP11

AC Powered, Universal Short-Range Modem
Connect-IT™ 1080A

TYou can use Patton's Model 1080A in just about any RS-232 UTP or STP application! Made in USA, the Model 1080A AC-Powered, Universal Short Range Modem is the bread and butter of Patton's line of RS-232 short-haul modems.

The Model 1080A AC Powered, Universal Short Range Modem is the bread and butter of our RS-232 short haul line, and it's now tastier than ever! Recent improvements in the Model 1080A include better distances (up to 17 miles [27.4Km] on one or two unconditioned twisted pair), support for higher data rates (up to 57.6 kbps), and the addition of a built-in V.52 BER test pattern generator. Of course, the Model 1080A retains all the features that you have already come to expect: asynchronous or synchronous RS-232 operation, half duplex communication over two wires or a choice of half or full duplex communication over four wires, support for point-to-point or multipoint applications, and fully compliant V.54 test modes (local analog loop and remote digital loop).

Automatic features include equalization, gain control and noise filtering (a separate filter for each data rate is built into a custom VLSI chip). To combat the many nemeses of clear data transmission, the Model 1080A includes surge protection (guards against transients), transformer isolation (eliminates ground looping) and a new anti-streaming timer (stops data streaming).

The Model 1080A packs a lot of convenience into a little box: Front panel LEDs give a clear picture of link status, V.54 tests can be activated remotely or via the front panel, and the unit can be externally configured (no need to open the case).

FEATURES & BENEFITS

✔ Async or Sync Operation

✔ 4-Wire Half or Full Duplex/2-Wire Half Duplex Only

✔ RS-232 Data Rates to 57.6 kbps

✔ Distances over 17 Miles (27.4 Km)

✔ Point-to-Point or Multipoint

✔ V.54 and V.52 Test Modes

✔ Automatic Equalization/Gain Control

ORDERING INFORMATION

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• tel: **+1 301.975.1000**

• web: **http://www.patton.com/products/product_detail.asp?id=78&tab=Ordering**

G.SHDSL CPE
OnSite™ 3088A

The Model 3088A is a low cost, manageable and software upgradeable G.SHDSL.bis CPE designed for service providers needing transparent last-mile telecom and data service delivery.


Patton's Model 3088A G.SHDSL.bis OnSite CPE is the perfect choice for users or service providers who need high-speed dedicated network connections. Based on the ITU and ETSI G.Shdsl G.991.2 standard, the 3088A enables providers to extend their reach-and-range by delivering rate-adaptive nx64 symmetrical speeds up to 5.7 Mbps—all over a single pair of wires.

The OnSite 3088A uses Patton's Plug 'n' Play features to remove any CPE configuration issues when used with any Patton CO concentration solution, even another 3088A CPE. Just set the units to their default mode and plug them in. The remote modem configures automatically and the link is up and running in seconds.

The Model 3088A is available with V.35 and X.21. The V.35 interface is presented on a female DB-25 connector. The X.21 is presented on a female DB-15 and is DTE/DCE selectable.

Typical Extension and Conversion Application
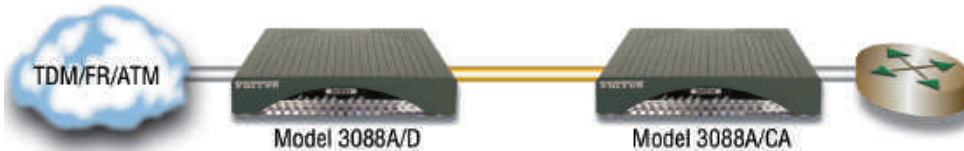
FEATURES & BENEFITS

✓ **nx64 Rates to 5.7 Mbps**—With multiple full-duplex symmetric rates available, users select the bandwidth option they need.

✓ **Low Cost Fixed Interfaces**—Multiple interface options to choose from: E1 (G.703/G.704), X.21, and V.35

✓ **Local and Remote Loopbacks**—Loopbacks add a powerful troubleshooting tool for determining line quality

✓ **Software Upgradeable**—Software upgrades make it easy to keep the OnSite CPE in service for years

✓ **Plug 'n' Play**—Just plug them in and the link comes up in seconds. Set the unit to use G.Handshaking and the selection of optimal link speeds can also be done automatically.

ORDERING INFORMATION

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- email: **sales@patton.com**
- tel: **+1 301.975.1000**
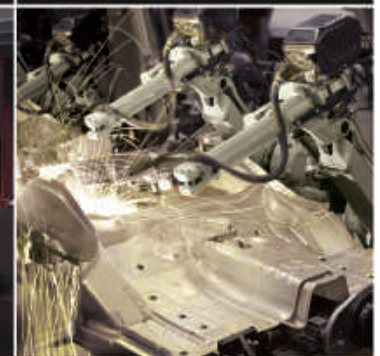- web: **http://www.patton.com/products/product_detail.asp?id=456&tab=Ordering**

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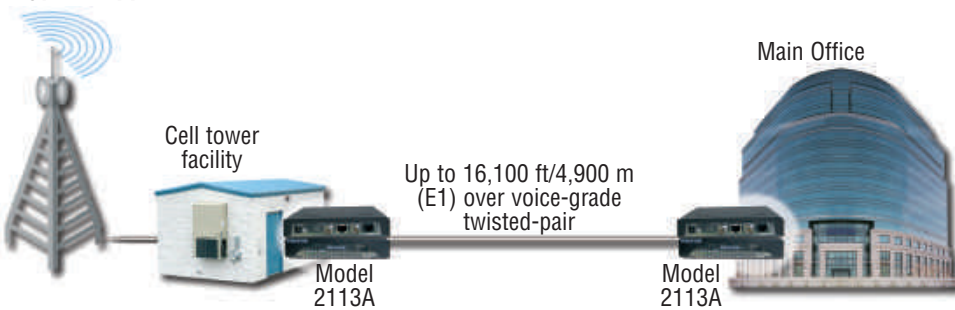**www.patton.com**

E1 Extender
CopperLink™ 2113A

The CopperLink™ 2113A is a transparent, plug-and-play E1 Extender that solves the distance and wire limitations of TDM technology by tripling the reach and halving the number of required wire pairs.

With the CopperLink™ 2113A extender, zero configuration is required. They operate in clear-channel mode, thereby facilitating the transparent extension of data and voice bearing circuits. The two active pins on the RJ connector are polarity insensitive, so you don't even need to worry about which wire you connect on the line interface. Simply take them out of the box, put them on either side of the dry copper pair, connect your E1 device and the circuit will light up immediately!

The Model 2113A extends E1 circuits to 16,100 feet (4,900 meters, nearly 5 km). The 2113A requires only two wires (one pair) to extend the TDM circuits, thereby conserving and minimizing the copper plant resources used.

Typical Application

Cell tower facility

Main Office

Up to 16,100 ft/4,900 m (E1) over voice-grade twisted-pair

Model 2113A

Model 2113A

FEATURES & BENEFITS

✓ Triple the Distance—Extend E1s to nearly 5 km over one pair of wires.

✓ Half the Wires—The E1 extender only needs one pair of wires to operate.

✓ Voice and Data Extension—The E1 Extender operates in clear channel mode allowing the transparent passing of voice and data.

✓ Plug and Play—Plug the 2113A in and the link comes up in seconds. The line interface is even polarity insensitive, making it easier to get running.

✓ Line Tests—V.52 511/511E Pattern Generator with Remote Digital Loopback (RDL); Local Analog Loopback (LAL).

ORDERING INFORMATION

Obtain ordering info for this product by using the QR code at right or by contacting:

• email: **sales@patton.com**

• tel: **+1 301.975.1000**

• web: **http://www.patton.com/products/product_detail.asp?id=455&tab=Ordering**

T1 Extender
CopperLink-T 2115

This transparent, plug-and-play T1 Extender solves the distance and wire limitations of TDM technology by tripling the reach and halving the number of required wire pairs.

The Model 2115 T1 Extender is the perfect choice for enterprises, integrators, and service providers needing to extend T1 circuits beyond their typical reach while conserving the number of wire pairs used.

With the CopperLink™-T extenders, zero configuration is required. They operate in clear-channel mode, thereby facilitating the transparent extension of data and voice bearing circuits—including the F-bit on T1 circuits. The two active pins on the RJ connector are polarity insensitive, so you don't even need to worry about which wire you connect on the line interface. Simply take them out of the box, put them on either side of the dry copper pair, connect your T1 device and the circuit will light up immediately! The Model 2115 extends T1 circuits to more than 3.5 miles (18,500 feet or 5,600 while using only two wires (one pair) to extend the TDM circuits, thereby conserving and minimizing the copper plant resources used.

For these reasons, the CopperLink™-T extender is the ideal solution for most popular applications such as T1 backhaul from a remote site, T1 relocation, T1 extension across a campus or between buildings, and last-mile TDM delivery.plant resources used.

FEATURES & BENEFITS

✓ Triple the Distance—Extend E1s to nearly 5 km over one pair of wires.

✓ Half the Wires—The E1 extender only needs one pair of wires to operate.

✓ Voice and Data Extension—The E1 Extender operates in clear channel mode allowing the transparent passing of voice and data.

✓ Plug and Play—Plug the 2113A in and the link comes up in seconds. The line interface is even polarity insensitive, making it easier to get running.

ORDERING INFORMATION

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Analog over IP Leased-Line Extender
SmartNode™ 2290 Series

The Leased Line Extender converts up to four analog circuits to secure IP transport with QoS routing, VPNs, IPsec encryption and IKE. Replace such twisted-pair-based analog circuits as leased-line, alarm, intercom, audio, and off-premise extension. Eliminate leased-line costs by extending audio lines between two locations using best effort networks—including the Internet.

The SmartNode™ 2290 Series Leased Line Extender enables end users to deploy such leased-line applications an "always-on" connections over the Internet or other IP networks. Install only one Extender on each side to transport up to four audio leased-lines over a packet-based network. This means you can establish up to four leased-line circuits between two Internet access locations anywhere in the world!

Many service providers are discontinuing their TDM backbone networks and analog leased-line offerings. The 2290 series offers service providers a chance to offer the same always-on

services as analog leased lines over their new, coverged-IP networks.

For enterprises, the SN2290 offers a chance to migrate to best effort networks like the Internet and enjoy the same benefits of using analog leased lines with the existing local area network they have already deployed. In addition, it allows them to use LANs to provide intraoOffice always-on lines instead of a dedicated web of telephone wires.

After installation, the connection between two 2290 extenders establishes immediately, and re-establishes itself after any network disruption. The connection can also be secured with hardware-accelerated 3DES or AES encryption end-to-end. Such security technology prevents wiretapping, making Patton the ideal choice for security-conscious enterprises.

Typical Application

Patton SmartNode Models 2292 and 2294 are equipped with two Ethernet ports and provide gateway and Voice-over-IP line extension services.

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www.patton.com

Universal Mounting Panels
Models 1001MP11 & 1001MP16

The Model 1001MP11 Universal Mounting Panel offers the ability to rack up to 11 Patton products side by side. Products that are compatible with the 1001MP11 include Ethernet Extenders, xDSL modems, short range modems, NTUs, and much more!

The Model 1001MP11's sturdy 5U design easily installs into any standard 19-inch rack. A combination of a unique groove system and an easily installed panels enables the 1001MP11 to securely lock the individual Patton devices into place.

1001MP11
Mounting Panel

1001MP16
Universal Mounting Panel

Compatible Patton CopperLink™ Models

1001MP16

2110   460   3/11 Data Tap   552   570-PoE

Rack mount any of Patton's MicroPak Products

1001MP11

High Speed Extenders
CL1214 & CL1214/S

Long Range Extender
CL1314

E1 Extender
2113A

WAN Serial Extenders
3088A/CA (V.35) & 3088A/D (X.21)

FEATURES & BENEFITS

1001MP11

✓ **Multi-Functionality**—Supports NTUs, xDSL Modems, Short Range Modems, and Ethernet Extenders

✓ **Independent Slots**—Up to 11 independently operating slots to completely do away with any single point of failures.

✓ **Rackmount**—Universal Mounting Panel fits into any 19-in. rack. The 11-slot panel is 9 in./233.6 mm high.

✓ **Cost Effective**—Rack-mount products you have already purchased

1001MP16

✓ **Mount any MicroPak**—Supports Media Converters, Interface Converters, Short Haul Modems, Surge Protectors, and PoE Injectors and Extenders.

✓ **Low Profile-2U High**—Universal Mounting Panel is only 2U (3.5 in. or 8.9 cm) high and holds up to 16 MicroPaks; Installs quickly into any standard 19-inch rack.

✓ **Front & Rear Access Panels**—Design provides for easy front or rear access to your Patton MicroPak.

ORDERING INFORMATION

Obtain ordering info for this product by using the QR code at right or by contacting:

- email: **sales@patton.com**
- tel: **+1 301.975.1000**
- web: **http://www.patton.com/products/ product_detail.asp?id=29&tab=Ordering**

SPECIFICATIONS

1001MP11
Front panel: 11 Operationally independent slots
Dimensions: 9.2 H x 17.16 W (18.93 with rack ears) x 5.3 D in. 233.6 H x 435.8 W (480.8 with rack ears) x 134.8 D mm
Power: None required. Some units may require individual power supplies

1001MP16
Front panel: 16 Operationally independent slots
Dimensions: 19L x 1.5W x 3.8H in. (48.3L x 3.8W x 8.9H cm)
Weight: 1.1 lbs (0.5 kg)
Latching: 16 individual steel clips with hardware (Included with unit)
Power: None required. Some units may require individual power supplies

Adjustable DIN-rail Rack
NS-1001R-19ADJDIN

The Model NS-1001R-19ADJDIN Universal Mounting Panel offers the ability to rack 16 Patton products side by side.

The NS-1001R-19ADJDIN offers a clean, simple and secure solution to installing any third party or Patton DIN rail devices inside a standard 19-inch rack. The user-friendly design easily adjusts to accommodate DIN rail devices of any size.

SPECIFICATIONS

Dimensions: 3.5 H x 2U W x 11.25 D in. DIN rail width: 17.18 in.
88.9 H x 2U W x 285.8 D mm DIN rail width: 436.37 mm
Power: None required. Some units may require individual power supplies

FEATURES & BENEFITS

✓ Brackets mount on standard 19-inch-wide rack rails.

✓ Slots allow front/back adjustments of DIN rail.

✓ Unit uses 3.5 inches (2U) of panel space.

✓ Made of 14 gauge steel.

✓ Finished in rugged textured black powder paint.

✓ Knockdown design ships unassembled for easy handling and shipping protection.

✓ RoHS Compliant.

✓ Manufactured in North America.

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