Applications

What is the primary application for the Model 2158 Multi-Rate CopperLink Ethernet Extender?

LAN Extension

Used in pairs, the Model 2158 establishes a high-speed 12.5 Mbps communication link inter-connecting two geographically separated LANs. Operation is simple: packets destined for the remote LAN are sent transparently, at full line rate, to the peered LAN. The Patton Model 2158 can also be used to reach remote PCs and other equipment and for delivering last mile ISP services.

Back-to-Back Extension Application

Use the Patton Model 2158 units in a back-to-back configuration, using an Ethernet cable between the two pairs, to double the length of your high-speed Ethernet connection!

Other Applications include:

- MTU/MDU Internet Services
- Network Backbones
- Remote Workstations and Equipment
- ISP Last Mile Extension

Product Related Questions

How is the CopperLink connection established?

Four steps are required to establish a communications link between the two Model 2158 Ethernet Extenders (Local and Remote) and the respective network devices.

1) Connect the 10/100Base-TX devices to the Ethernet port of each 2158 unit.
2) Connect each end of the twisted-pair wire to the CopperLink port of each 2158 unit.
3) Plug the 2158 power supplies into a suitable power source.
4) Plug the output jack of each power supply to the rear power jack of each 2158 unit.

Once powered up, a communications link is established between the two 2158 units and the CopperLink LED on each 2158 unit will glow solid green.

NOTE: If line rates are changed from their original settings, both L (Local) and R (Remote) units must be set to the same line rate/dip switch settings.

Does the Model 2158 include any management capabilities or test modes?

No, the Model 2158 does not have any management capabilities or test modes. However, it does feature seven status LED indicators to provide operational status at a glance and assist with troubleshooting.

Why does the Model 2158 QOL light occasionally flash?

When the QOL LED flashes it signifies that error correction is taking place and data integrity is maintained. It is possible for the QOL light to be constantly lit and the link will still function with data intact. However, when the QOL LED is continuously lit, the 2158's are approaching their maximum distance capabilities under the current environment and line rate. When the QOL is constantly lit, we recommend switching the modem to a lower line rate to ensure the most reliable connection.

What are the distance limitations of the Model 2158 using different gauge wires?

Using 24 AWG (0.5 mm) wire, the Model 2158 is capable of providing Ethernet extensions up to 4,656 ft (1.42 km) including the potential 328 ft (100 m) Ethernet connections on both ends of the communications link. Using 26 AWG (0.4 mm) wire, the Model 2158 is capable of providing Ethernet extensions up to 3,856 ft (1.18 km). Actual distance and link performance will vary based on the environment (cross talk/noise) and type/gauge of wire used. The chart below shows an example of how the gauge of wire affects the distance.

Approximate Distances at 12.5 Mbps (Default Setting)	
Wire Gauge: AWG (mm)	Distance: Feet (km)
26 AWG (0.4 mm)	3856' (1.18 km)
24 AWG (0.5 mm)	4656' (1.42 km)
22 AWG (0.64 mm)	5256' (1.60 km)
20 AWG (0.81 mm)	5556' (1.69 km)
18 AWG (1.00 mm)	5756' (1.75 km)
16 AWG (1.29 mm)	5856' (1.78 km)

*NOTE: Distances are based on a minimum to no cross talk environment. This distance table includes the potential 328ft (100 m) Ethernet connections on both ends of the communications link.

Can the line rate be altered on the Model 2158 to achieve lower bandwidths and/or longer distances?

No, the line rate cannot be altered. For a variable rate high speed Ethernet extender Patton recommends the CopperLink 2168 or 2172 which will allow for longer distances.

What is a symmetrical line rate?

With a symmetrical line rate, data travels upstream (to the Internet or data source) and downstream (from the internet or data source) at the same rate. Symmetrical services are commonly used in applications requiring high speeds in both directions, which is ideally suited for business applications. Increasingly, symmetrical applications, which began with enterprise networks, are now also required by both small and medium enterprises and residential customers. Leading the list of symmetrical applications are video conferencing, interactive videos, and telecommuting.

Can the Model 2158 be configured for symmetrical or asymmetrical transmission from the field?

No, the Model 2158 is only symmetrical. Both the Model 2168 and 2172 can be configured for either symmetrical or asymmetrical transmission via dipswitch settings.

Does the Model 2158 operate in pairs?

Yes, the Model 2158 must operate in pairs. For each link, a Local (2158/R or 2158/L) and Remote (2158/R or 2158/L) unit is required.

Which end of the link should the "L" Local unit and "R" Remote unit be located?

The Model 2158/L and 2158/R should be located according to their descriptions. The 2158/L unit should to be placed at the Central Location and the 2158/R should be placed at the Remote Location due to special filtering requirements for each application.

Does the Patton Model 2158 support VLAN?

The Model 2158 will support VLAN (802.1Q) by passing the larger sized packets transparently. The Model 2158 does not have configuration commands to add a VLAN tag to a packet.

Does the Patton Model 2158 pass higher layer protocol such as TCP/IP packets?

Yes, the Model 2158 does pass higher layer protocols such as TCP/IP. The Model 2158 does not read the TCP/IP packets, but will pass the packets on transparently.

Is the Model 2158 capable of bridging?

Yes, the Model 2158 will automatically learn, age, and filter 32 source addresses. Destination addresses of incoming frames are compared with the Source Address in the address table and discarded if an entry exists; otherwise, they are forwarded over the CopperLink link.

Ethernet (10 or 100Base-T) Interface

What devices typically connect to the Ethernet 10/100Base-TX port?

Devices that typically connect to the Ethernet port are Ethernet Hubs/Switches, Remote PC's, and any other network enabled device.

How is the Ethernet port configured to accept 10 or 100Base-TX?

The Ethernet port automatically senses 10 or 100Base-TX Ethernet connections.

Does the Ethernet port require configuration for full or half-duplex connections?

The Model 2158 will automatically sense full or half-duplex Ethernet connections. To fully utilize the 100Base-TX Full-Duplex feature, your network enabled devices must support 802.3x flow control (pause packets). A switch setting is provided on the Model 2158 to transparently lock out the 100Base-TX full duplex communication if your network enabled devices do not support 802.3x flow control (pause packets). This feature will only allow Ethernet connections in 10Base-T full/half duplex or 100Base-TX half duplex and transparently avoid the 802.3x issue without degrading link performance.

Do I use straight-through or crossover cables?

The 2158 is equipped with an MDI-X switch that enables automatic connections to a hub (DCE) or PC (DTE) interface, thereby eliminating confusion over whether a straight-through or crossover cable is needed. The Ethernet port will automatically sense the required connection type.

Power Supply

What are the power supply options for the Model 2158's?

The Model 2158's come standard with an external 120VAC or UI (100-240VAC) power supply. –48, -24, or -12VDC power supplies are optional and ordered separately.