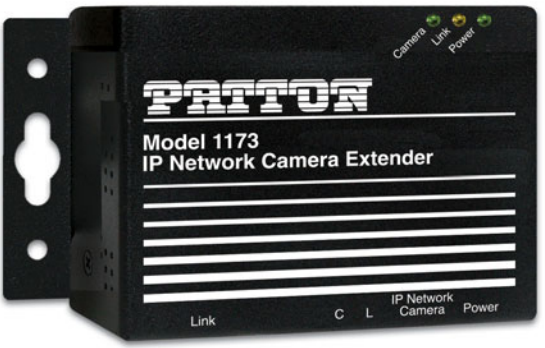
USER MANUAL

MODEL 1173R

IP Network Camera Extender



PATTON Electronics Co.

Part# 07M1173-UM
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Rev. A
Revised 5/21/08

SALES OFFICE
(301) 975-1000
TECHNICAL SUPPORT
(301) 975-1007

ISO 9001 CERTIFIED

An ISO-9001Certified Company

CONTENTS

1.0 WARRANTY INFORMATION

Patton Electronics warrants all Model 1173R components to be free from defects, and will—at our option—repair or replace the product should it fail within one year from the first date of the shipment.

This warranty is limited to defects in workmanship or materials, and does not cover customer damage, abuse or unauthorized modification. If this product fails or does not performs as warranted, your sole recourse shall be repair or replacement as described above. Under no condition shall **Patton Electronics** be liable for any damages incurred by the use of this product. These damages include, but are not limited to, the following: lost profits, lost savings and incidental or consequential damages arising from the use of or inability to use this product. **Patton Electronics** specifically disclaims all other warranties, expressed or implied, and the installation or use of this product shall be deemed an acceptance of these terms by the user.

Note Conformity documents of all Patton products can be viewed online at www.patton.com under the appropriate product page.

1.1 COMPLIANCE

EMC Compliance:

- FCC Part 15, Class A
- EN55022, Class A
- EN55024

Safety Compliance:

- IEC/EN 60950-1
- AS/NZS 60950-1

PSTN Compliance:

Note This device is not intended nor approved for connection to the PSTN.

1.2 RADIO AND TV INTERFERENCE (FCC PART 15)

This equipment generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. This equipment has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the equipment causes interference to radio or television reception, which can be determined by disconnecting the cables, try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, reorienting the receiving antenna, and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

1.3 CE DECLARATION OF CONFORMITY

We certify that the apparatus described above conforms to the requirements of Council Directive 2004/108/EC on the approximation of the laws of the member states relating to electromagnetic compatibility; and Council Directive 2006/95/EC on the approximation of the laws of the member states relating to electrical equipment designed for use within certain voltage limits.

The safety advice in the documentation accompanying this product shall be obeyed. The conformity to the above directive is indicated by the CE sign on the device.

1.4 SERVICE

All warranty and non-warranty repairs must be returned freight prepaid and insured to Patton Electronics. All returns must have a Return Materials Authorization number on the outside of the shipping container. This number may be obtained from Patton Electronics Technical Services at:

- Tel: **+1 (301) 975-1007**
- Email: **support@patton.com**
- URL: **http://www.patton.com**

Note Packages received without an RMA number will not be accepted.

1.5 SAFETY WHEN WORKING WITH ELECTRICITY

• This device contains no user serviceable parts. The equipment shall be returned to Patton Electronics for repairs, or repaired by qualified service personnel.

• Mains Voltage: Ensure that the external power adapter is a listed Limited Power Source. The mains outlet that is utilized to power the devise shall be within 10 feet (3 meters) of the device, shall be easily accessible, and protected by a circuit breaker. Ensure that the power cable used meets all applicable standards for the country in which it is to be installed, and that it is connected to a wall outlet which has earth ground.

• Hazardous network voltages are present in WAN ports regardless of whether power to the unit is ON or OFF. To avoid electric shock, use caution when near WAN ports. When detaching the cables, detach the end away from the device first.

• Do not work on the system or connect or disconnect cables during periods of lightning activity.

In accordance with the requirements of council directive 2002/96/EC on Waste of Electrical and Electronic Equipment (WEEE), ensure that at end-of-life you separate this product from other waste and scrap and deliver to the WEEE collection system in your country for recycling.

This device is NOT intended nor approved for connection to the PSTN. It is intended only for connection to customer premise equipment.

When the 1173R is mounted, it shall be secured in such a way as to withstand a vertical shear force of 50N or 14 pounds.

2.0 GENERAL INFORMATION

Thank you for your purchase of this Patton Electronics product. This product has been thoroughly inspected and tested and is warranted for one year for parts and labor. If any questions or problems arise during installation or use of this product, contact Patton Electronics Technical Support at +1 (301) 975-1007.

2.1 FEATURES

- IP Network Camera Extender - Easy to configure
- Auto-MDIX Ethernet
- Configurable 10/100, Full/Half, and Auto-Negotiating Ethernet
- Extends network connections up to 6,000 ft (1.8 km) over 2-wire 24-AWG unconditioned lines
- Switch selectable line rates up to 50 Mbps via DIP Switch
- Transparent operation
- LED indicators for Power, Link, and Camera's Ethernet Link & Activity
- Surge suppression up to 20 kA (8/20 μs)
- Made in the USA

2.2 DESCRIPTION

The Patton Electronics Model 1173R IP Network Camera Extender provides high-speed Ethernet connections between an Ethernet LAN or remote PC to a 10/100Base-T IP camera.

Operating in pairs, one Model 1173R is configured as the (L) LAN unit located at one end of the LAN extension and the other Model 1173R is configured as the (C) Camera unit at the other end. The Model 1173R is configured as a L or C via the switch on the rear panel. These units can automatically forward LAN broadcasts, multicasts, and frames across a 2-wire voice-grade twisted-pair link. The data is passed transparently (unmodified) through the 1173Rs. The 1173Rs automatically add and delete MAC addresses, only passing packets across the link that are meant for the remote peered LAN.

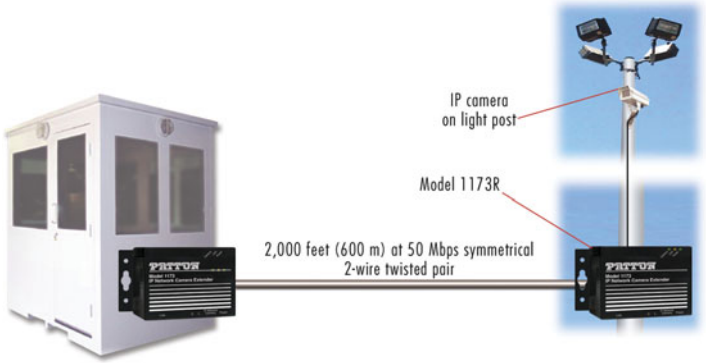

Figure 1. Typical application

The pair of 1173Rs work together to create a transparent extension between an IP camera and Ethernet LANs. Figure 1 shows a typical point-to-point application.

3.0 INSTALLATION

CAUTION

The Interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.

To install the 1173R Camera Extender, do the following:

1. Connect the line interface between the units (refer to section 3.1, “Connecting the Twisted-Pair Line Interface” on page 9)

   Note See Figure 2 for the standalone unit’s rear panel arrangements.

2. Connect the Ethernet interface (refer to section 3.2, “Connecting the 10/100Base-T Ethernet Interface” on page 11).

3. Connect the power plug (refer to section 3.3, “Connecting Power” on page 11).

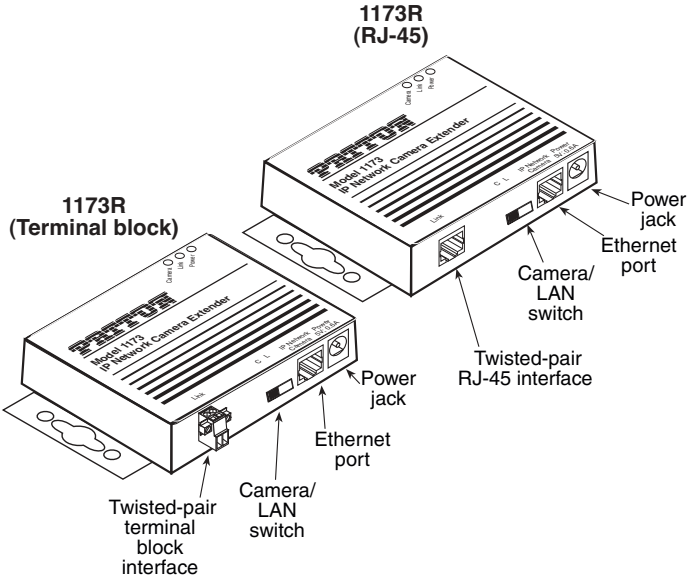

Figure 2. Model 1173R standalone rear panel

3.1 CONNECTING THE TWISTED-PAIR LINE INTERFACE

CAUTION

The Interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.

The Model 1173R supports communication betweena network-enabled camera and a LAN over a distance of up to 6,000 ft (1.8 km) over 24 AWG (0.5 mm) twisted-pair wire.

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

Follow the steps below to connect the Model 1173R interfaces.

Note The Model 1173R units work in pairs. One of the units must be configured as a (L) LAN unit, and the other unit must be configured as a (C) Camera unit. The link is always initiated by the C unit. As long as the L unit is powered on, the C unit can establish a link by being powered on or by having its power reset.

1. To function properly, the two Model 1173Rs must be connected together using twisted-pair, unconditioned, dry, metal wire, between

19 (0.9mm) and 26 AWG (0.4mm). Leased circuits that run through signal equalization equipment are not acceptable.

2. The Model 1173R is equipped with either an RJ-45 or a terminal block interface jack that can be used on the interface. These interfaces are a two-wire interface. Observe the signal/pin relationships on the Model 1173R's interface jacks.

The RJ-45 connector on the Model 1173R's twisted pair interfa ce is polarity insensitive and is wired for a two-wire interface. The signal/pin relationship is shown in Figure 3.

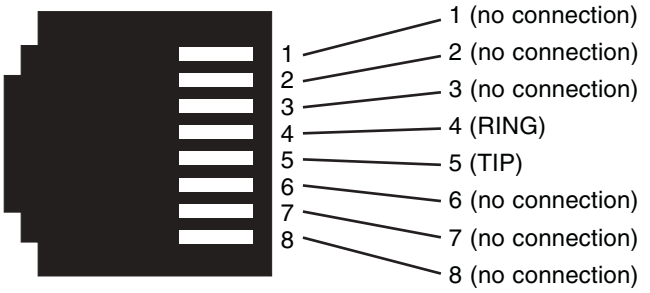

Figure 3. Model 1173R (RJ-45) twisted pair line interface.

The terminal block connector on the Model 1173R's twisted pair interface is polarity insensitive and is wired for a two-wire interface. The signal/pin relationships is shown in Figure 4.

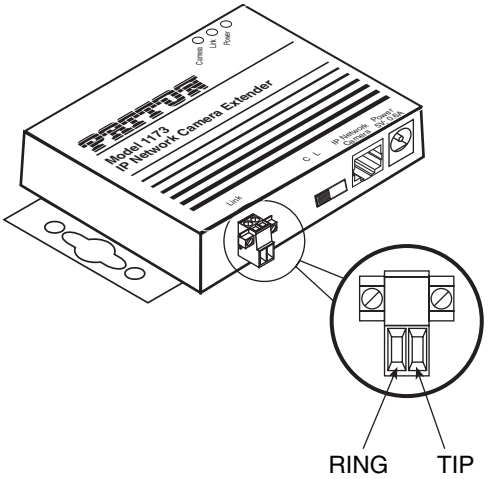

Figure 4. Model 1173R (Terminal Block) twisted pair line interface.

3.2 CONNECTING THE 10/100BASE-T ETHERNET INTERFACE

CAUTION

The Interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.

The shielded RJ-45 port labeled *Ethernet* is the Auto-MDIX10/100Base-T interface. This port is designed to connect directly to a 10/100Base-T network. Figure 5 shows the signal/pin relationships on this interface. You may connect this port to a hub or PC using a straight through or crossover cable that is up to 328 ft long.

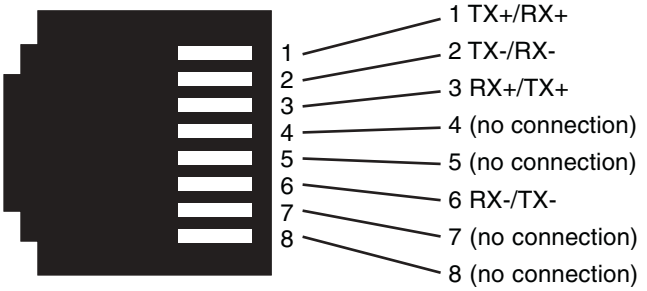

Figure 5. Model 1173R 10/100Base-T RJ-45 Connector Pinout.

3.3 CONNECTING POWER

CAUTION

The Interconnecting cables shall be acceptable for external use and shall be rated for the proper application with respect to voltage, current, anticipated temperature, flammability, and mechanical serviceability.

The Model 1173R does not have a power switch, so it powers up as soon as it is plugged in.

An external AC or DC power supply is available separately. This connection is made via the barrel jack on the rear panel of the Model 1173R. No configuration is necessary for the power supply (See Appendix B for domestic and international power supply and cord options). DC power (supplied via the power supply jack to the 1173R) must meet the following requirements; DC power supplied must be regulated +5VDC ±5%, 1.0A minimum. Center pin is +5V. The barrel type plug has a 2.5/5.5/10mm I.D./O.D./Shaft Length dimensions.

4.0 CONFIGURATION

The Model 1173R has eight DIP switches for configuring the unit for a wide variety of applications. This section describes switch locations and explains the different configurations.

4.1 CONFIGURING THE HARDWARE DIP SWITCHES

Using a small flat-tip screwdriver, remove the protective cover located on the underside of the Model 1173R (see Figure 6).

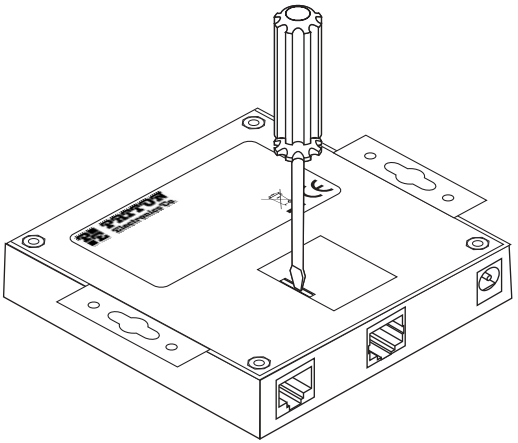

Figure 6. Removing protective cover

Figure 7 on page 13 shows the orientation of the DIP switches in the On and Off positions.

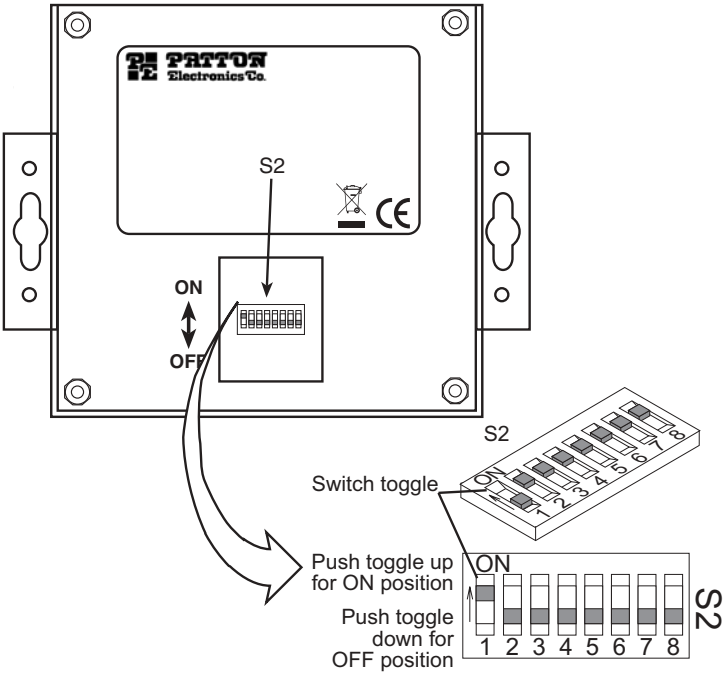

Figure 7. DIP switch orientation

4.2 CONFIGURING DIP SWITCH S2

DIP switch S2 is where you configure the line rate, Ethernet, and Ethernet Shutdown. Table 1 summarizes default positions of DIP switches S2-1 through S2-8. Detailed descriptions of each switch follow the table.

Table 1: S2 Summary

Position	Description
S2-1	Reserved
S2-2	Line Rate
S2-3	Line Rate
S2-4	Ethernet configuration
S2-5	Ethernet configuration
S2-6	Ethernet configuration
S2-7	Ethernet Shutdown
S2-8	Remote Configuration

Switch S2-1: Reserved

Switch S2-1 should always be in the OFF position.

Table 2: Ethernet Auto Sense Selection Chart

S2-1	Setting
ON	Reserved
OFF	Reserved

Switches S2-2 and S2-3: Data Rate

Use switches S2-1, S2-2 and S2-3 to configure the line rates.

Table 3: Rates Selection Chart

S2-2	S2-3	Line Rates DS/US
ON	ON	50 Mbps/2 Mbps
ON	OFF	16 Mbps/2 Mbps
OFF	OFF	4 Mbps/1 Mbps

Switches S2-4, S2-5 and S2-6: Ethernet Configuration

Use switches S2-4, S2-5 and S2-6 to configure Ethernet settings.

Table 4: Ethernet configurations

S2-4	S2-5	S2-6	Ethernet Configurations
ON	ON	ON	Auto-Negotiate
ON	ON	OFF	100Mb Full Duplex
ON	OFF	ON	100Mb Half Duplex
ON	OFF	OFF	10Mb Full Duplex
OFF	ON	ON	10Mb Half Duplex

Switch S2-7: Ethernet Shutdown

Use switch S2-7 to enable or disable Ethernet Shutdown. When Ethernet Shutdown is enabled, the 1173R will disable the Ethernet interface when there is no link detected. When Ethernet Shutdown is disabled, the Ethernet interface will always be enabled.

Table 5: Ethernet Shutdown

S2-7	Description
ON	Ethernet Shutdown Enabled
OFF	Ethernet Shutdown Disabled

Switch S2-8: Remote Configuration

Use switch S2-8 to enable or disable Remote Configuration.

Table 6: Ethernet Shutdown

S2-8	Description
ON	Remote Configuration Enabled
OFF	Remote Configuration Disabled

Note The S2-8 switch applies to the R unit only. If enabled, the R will follow the dip switch configuration of the L unit. If disabled, the R unit will use its own dip switch setting to determine its Ethernet operating mode and Ethernet Shutdown mode configuration. The S2-8 switch does not affect the data rate. The data rate will always follow the L configuration.

5.0 OPERATION

Once the Model 1173Rs are properly installed, they should operate transparently. No user settings required. This section describes reading the LED status monitors.

5.1 POWER UP

Before applying power to the Model 1173R, please review section 3.3, “Connecting Power” on page 11 to verify that the unit is connected to the appropriate power source.

5.2 FRONT PANEL LED STATUS MONITORS

The Model 1173R features three front panel LEDs that monitor power, the Ethernet signals, and the connection. Figure 8 shows the front panel location of each LED. Table 7 on page 16 describes the LED functions.

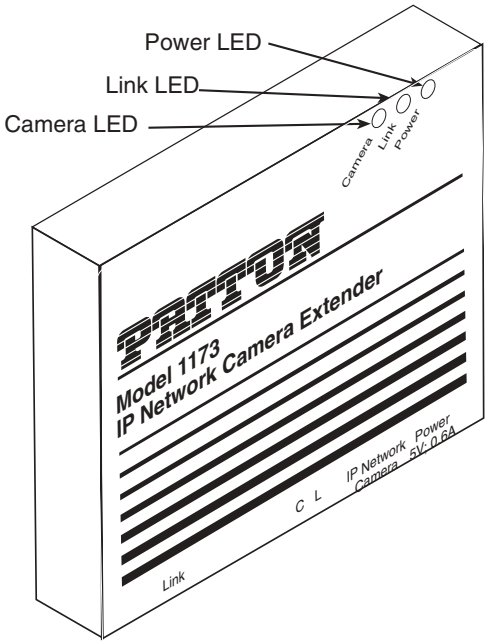

Figure 8. Model 1173R standalone unit front panel

Table 7: Front panel LED description

LED	Description
Power	Solid GREEN to indicate the unit is powered on.
Link	Solid GREEN (ON) to indicate that the end-to-end link between the Model 1173Rs is established. The Link LED is OFF when the link is down.
Camera	Solid GREEN indicates that 10/100Base-T Ethernet link has been established. Flashes to indicate activity.

APPENDIX A
SPECIFICATIONS

A.1 LAN CONNECTION

- Shielded RJ-45, 10/100Base-T, IEEE 802.3 Ethernet
- Line Connection: RJ-45 or Terminal Block

A.2 TRANSMISSION LINE

Two-wire unconditioned twisted pair.

A.3 LINE RATE AND DISTANCE

- Distance: 6,000 ft (1.8 km) at 1 Mbps upstream/4 Mbps downstream

Note Distances depend on selected line rate and line conditions. See Appendix D on page 20 for details.

A.4 SURGE SUPPRESSOR

SIDACTOR with maximum current surge: 20 kA (8/20 μs).

A.5 LED STATUS INDICATORS

- Power (Green)
- Link (Green)
- Camera: Link (Green) & Activity (Flashing Green)

A.6 POWER SUPPLY

External AC and DC options:

- AC: 120 VAC, 220 VAC, and UI (120–240 VAC)
- DC: 12 VDC, 24 VDC and 48 VDC
- Power consumption: 450 mA at 5 VDC

A.7 TEMPERATURE RANGE

-10 to 70°C

A.8 HUMIDITY

Standard:Up to 90% non-condensing

Conformal Coated: 85% condensing humidity from -10 to 35°C

A.9 DIMENSIONS

1.5H x 4.13W x 3.75D in.(3.81H x 10.5W x 9.53D cm)

APPENDIX B

MODEL 1173R SERIES FACTORY
REPLACEMENT PARTS AND ACCESSORIES

Patton Model #	Description
Base Models	
1173R/EUI	IP Network Camera Extender; -10 to 70°C; UI
1173R/C/EUI	IP Network Camera Extender; -10 to 70°C; conformal coated (humidity 85% condensing from -10 to +35°C); UI
1173R/EUI-2PK	IP Network Camera Extender Kit; -10to70°C; UI
1173R/CC/EUI-2PK	IP Network Camera Extender Kit; -10 to 70°C ,conformal coated (humidity 85% condensing from -10 to +35°C); UI
07M1173-UM	User Manual
Power Supplies	
08055DCUI 08055-120-5-1	100-240VAC (+5V reg. DC/2A) Universal Input Adapter. 120 VAC (+5V reg. DC/1A) Input Adapter
12V-PSM	12 VDC Input Adapter
24V-PSM	24 VDC Input Adapter
48V-PSM	48 VDC Input Adapter
Power Cords*	
0805US	American Power Cord
0805EUR	European Power Cord CEE 7
0805UK	United Kingdom Power Cord
0805AUS	Australian Power Cord
0805DEN	Denmark Power Cord
0805FR	France/Belgium Power Cord
0805IN	India Power Cord
0805IS	Israel Power Cord
0805JAP	Japan Power Cord
0805SW	Switzerland Power Cord

*Only required with optional UI power supply (08055DCUI)

APPENDIX C

MODEL 1173R SERIES INTERFACE PIN ASSIGNMENT

C.1 10/100BASE-T INTERFACE

RJ-45

- Pin 1: TX+
- Pin 2: TX-
- Pin 3: RX+
- Pin 6: RX-
- Pins 4, 5, 7, 8: no connection

C.2 LINE INTERFACE

RJ-45

- Pin 4: RING
- Pin 5: TIP
- Pins 1, 2, 3, 6, 7, 8: no connection

Terminal Block

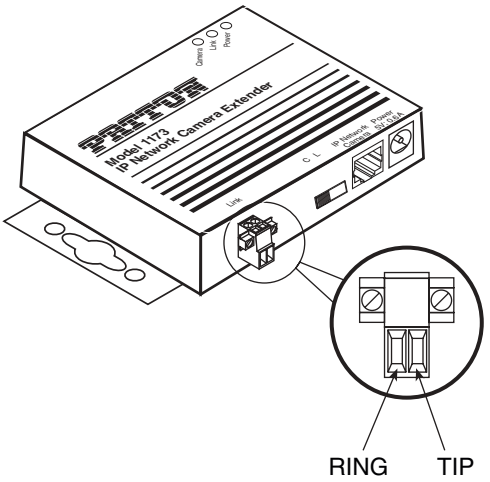

Figure 1. Model 1173R (Terminal Block) twisted pair line interface..

APPENDIX D

DISTANCE CHART, BASED ON 24 AWG (0.5 MM)

Line Rate (DS/US)	Distance in feet (km)	Throughput at Max Distance (DS/US)
50 Mbps/2 Mbps	2,000 (0.61 km)	48/2
16 Mbps/2 Mbps	4,000 (1.22 km)	15/2
4 Mbps/1 Mbps	6,000 (1.82 km)	3.75/1

Note The actual distance and link performance may vary depending on the environment and type/gauge of wire used.

Note DS = downstream, US = upstream