ELPRO
Technologies

1050E-T
Ethernet
Switch

10/100TX

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COOPER Bussmann

Cooper Bussmann

1050E-T

Unmanaged Ethernet Switch

User Manual

Version 1.1.5

COOPER Bussmann

Interference Issues

This Equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a commercial or industrial installation. This equipment generates, uses, and can radiate radio frequency energy. It may cause harmful interference to radio communications if the equipment is not installed and used in accordance with the instructions.

UL Listed Models

When operating at elevated temperature extremes, the surface may exceed +75 Celsius. For user safety, the 1050E-T should be installed in a restricted access location. The openings on the enclosure are for air convection. Protect the equipment from overheating. DO NOT COVER THE OPENINGS.

UL Notice

The Equipment shall be powered using an external Listed Power Supply with LPS outputs or a Class 2 Power Supply. The 1050E-T must be properly grounded for surge protection before use.

Hazardous Location Notices

This equipment is suitable for use in Class I, Division 2, Groups A, B, C, and D or non-hazardous locations only.

For Hazardous Locations operating temperature is strictly -40°C to +60°C only.

WARNING: EXPLOSION HAZARD
Do not disconnect equipment unless power has been removed or the area is known to be non-hazardous.

WARNING: EXPLOSION HAZARD
Substitution of any components may impair suitability for Class I, Division 2.

WARNING: EXPLOSION HAZARD
The area must be known to be non-hazardous before servicing/replacing the unit and before installing.

WARNING
Exposure to some chemicals may degrade the sealing properties of materials used in the Sealed Relay Device.

Recommendations

It is recommended to inspect the sealed relay device periodically and to check for any degradation of the materials and to replace the complete product, not the sealed device, if any degradation is found.

Important Notice

Cooper Bussmann reserves the right to modify the equipment, its specification or this manual without prior notice, in the interest of improving performance, reliability, or servicing. At the time of publication all data is correct for the operation of the equipment at the voltage and/or temperature referred to. Performance data indicates typical values related to the particular product.

No part of this documentation or information supplied may be divulged to any third party without the express written consent of Cooper Bussmann. Products offered may contain software which is proprietary to Cooper Bussmann. The offer or supply of these products and services does not include or infer any transfer of ownership.

Release Notice

This is the May 2013 release of the 1050E-T Unmanaged Ethernet Switch User Manual version 1.1.5.

Follow Instructions

Read this entire manual and all other publications pertaining to the work to be performed before installing, operating, or servicing this equipment. Practice all plant and safety instructions and precautions. Failure to follow the instructions can cause personal injury and/or property damage.

Proper Use

Any unauthorized modifications to or use of this equipment outside its specified mechanical, electrical, or other operating limits may cause personal injury and/or property damage, including damage to the equipment. Any such unauthorized modifications: (1) constitute "misuse" and/or "negligence" within the meaning of the product warranty, thereby excluding warranty coverage for any resulting damage; and (2) invalidate product certifications or listings.

CONTENTS

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CHAPTER 1 - INTRODUCTION

The 1050E-T Ethernet Switch from Cooper Bussmann is a cost-effective solution that meets the high reliability requirements demanded by industrial applications. The 1050E-T is a 5-port 10/100TX Slim Type Industrial Unmanaged Switch that includes the following features.

High-Speed Transmissions

The Industrial Switch includes a switch controller that can automatically sense transmission speeds (10/100Mbps). The RJ-45 interface can also be auto-detected, so MDI or MDIX is automatically selected and a crossover cable is not required. All Ethernet ports have memory buffers that support the store-and-forward mechanism. This assures that data is properly transmitted.

Dual Power Input

To reduce the risk of power failure, the Industrial Switch provides +12 Vdc to +48 Vdc dual power inputs. If there is power failure, Industrial Switch will automatically switch to the secondary power input.

Flexible Mounting

The Industrial Switch is extremely compact and can be mounted on a DIN-rail or a wall so it is suitable for any space-constrained environment.

Advanced Protection

The power line of the 1050E-T supports up to 3,000 Vdc EFT (Electrical Fast Transient) protection, which secures equipment against unregulated voltage and makes systems safer and more reliable. Its 6,000 V ESD protection for Ethernet ports makes the 1050E-T suitable for harsh environments.

Wide Operating Temperature

The operating temperature of the 1050E-T is between -40°C and 75°C. Given this wide range, you can use the Industrial Switch in some of the harshest industrial environments.

Easy Troubleshooting

LED indicators make troubleshooting quick and easy. Each 10/100 Base-TX port has 2 LEDs that display the link status, transmission speed and collision status. Also the three power indicators P1, P2 and Fault help you diagnose problems immediately.

1.1 Module Identification

The module identification label can be found on the bottom of your 1050E-T device. This label contains the model number, temperature range, power range, serial number, and all certifications.
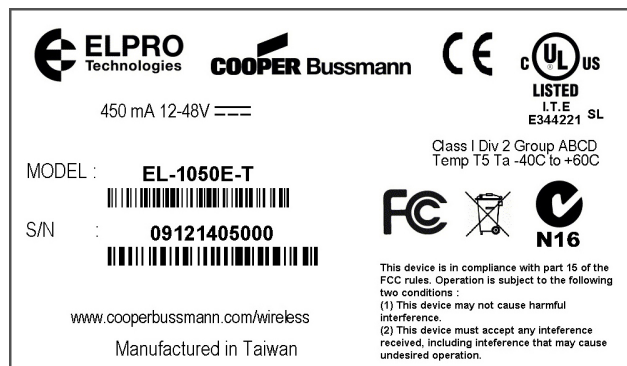
1.2 Features and Benefits

- IEEE 802.3 10Base-T, 802.3u 100Base-TX

- Flow control on full duplex

- RJ-45 connectors with auto MDI/MDIX functionality

- Store-and-forward switching architecture

- Relay alarm contact for system events

- UL Class I Division II for Group A,B,C, and D hazardous locations

- Supports surge protection 3,000 Vdc for power line

- Supports 6,000 Vdc Ethernet ESD protection

- Supports redundant +12 Vdc to +48 Vdc power input

- Provides flexible mounting: DIN-rail, Wall Mounting

- Supports operating temperatures from -40°C to 75°C

1.3 General Specifications

Product specifications are subject to change without notice.

Ethernet Standards/Transfer Rate	Standards	10Base-T Ethernet (IEEE 802.3)
		100Base-TX Ethernet (IEEE 802.3u)
		Flow Control and Backpressure (IEEE 802.3x)
	Transfer Rate	10 Mbps (IEEE 802.3)
		100 Mbps with Auto-Negotiation (IEEE 802.3u)
Fault Alarm	Fault Alarm Contact	Alarm for System Events
		1 Relay Output, 1A MAX @ 24 Vdc or 24 Vac
Ethernet Port	Connectors	RJ-45
	Network Cabling	10Base-T: 2-pair UTP/STP Cat. 3,4,5,6 cable EIA/TIA-568 100-ohm (100m/328)
		100Base-TX: 2 pair UTP/STP Cat. 5,6 cable EIA/TIA-568 100-ohm (100m/328)
Protocols/Configuration	Protocols Supported	Multiple Access Protocol – Carrier sense multiple access with collision detection (CSMA/CD)
	User Configuration	N/A
LED Indication/Diagnostics	LED Indication	Power OK; Fault Condition Exists
	Port LED Indication	Link Active, Full Duplex/Collision
	Network Management	N/A
Compliance	EMI and EMC	FCC Part 15 – Class A; CE EN61000-4-2 (ESD),
		CE EN61000-4-3 (RS), CE EN61000-4-4 (EFT),
		CE EN61000-4-5 (Surge), CE EN61000-4-6 (CS),
		CE EN61000-4-8, CE EN61000-4-11,
		CE EN61000-4-12, CE EN61000-6-2, CE EN61000-6-4
	Hazardous Area	UL Class I, Division 2
		Maximum Ambient Temperature +60°C
	Safety	CE/EN60950-1
	UL	UL Listed

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General	Size	30 mm x 95 mm x 140 mm (1.18" x 3.74" x 5.51")
	Housing	Painted Metal Case; IP30
	Mounting	DIN Rail or Wall-mount
	Terminal Blocks	Removable; Max conductor 12 AWG (2.5 sqmm)
	Temperature Rating	-40°C to +75°C (-40°F to 167°F)
	Humidity Rating	5% - 95% RH Non-condensing
	Weight	0.43 kg (0.95 lb)
Power Supply	Nominal Supply	12 Vdc to 48 Vdc; Under/Over Voltage Protection and Reverse Polarity
	Maximum Current Draw	450 mA

1.4 Mechanical Specifications

The following diagram shows the exterior dimensions of the 1050E-T Ethernet switch.
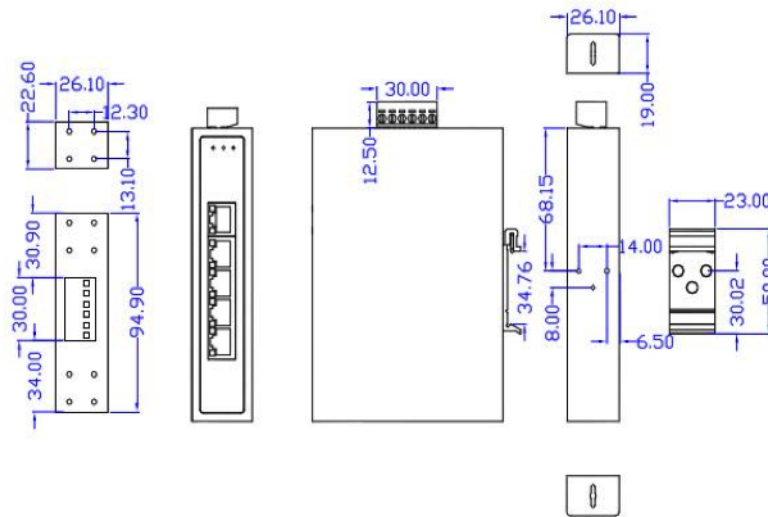
1.5 Order Information

Item	Product Code	Description
Ethernet Switch	1050E-T	Basic Ethernet Switch
Power Supply	PS-DINAC-24DC-OK	AC/DC Adapter, 24 Vdc, 2.5 A, 60 W, -20 to +70°C

CHAPTER 2 - GETTING STARTED
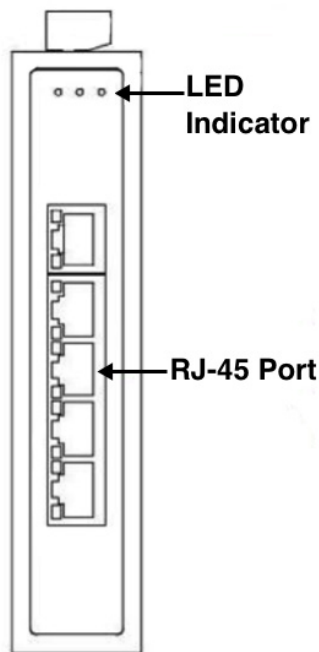
2.1 Package Contents

- 1050E-T Ethernet Switch x 1

- Pluggable Terminal Block x 1

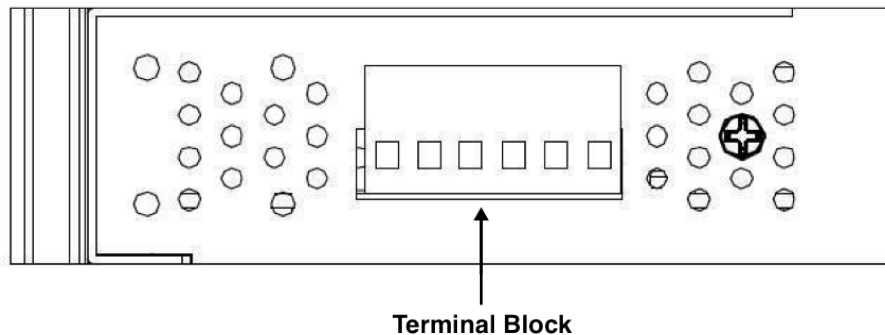- Wall Mounting Plate x 2

2.2 Hardware Description

Front Panel

The front panel of the 5-port 10/100BaseTX Industrial Switch is shown below.

Top View

The top panel of the 5-port 10/100BaseTX Industrial Switch is equipped with one terminal block connector of two power inputs.

Terminal Block

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2.3 Wiring

Wiring the Power Inputs

Follow these steps to insert the power wire.

1. Insert the positive and negative wires into the V+ and V- contacts on the terminal block connector.

2. When using a single power supply to power the device, connect the power supply to both power inputs to ensure that the fault alarm is not set. (Connect V+ to both pins 2 and 6, and then connect V- to both pins 1 and 5.)
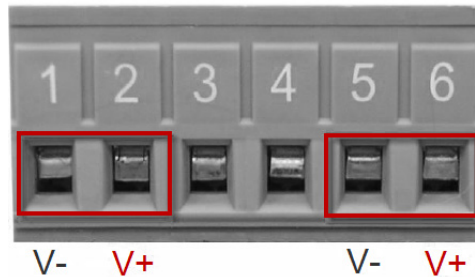

3. Tighten the wire-clamp screws to prevent the wires from coming loose.
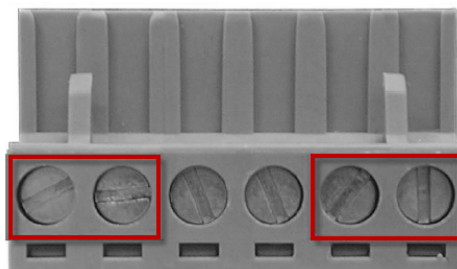
Wiring the Fault Alarm Contact

The fault alarm contact is in the middle of terminal block connector, as shown below. The contact will be closed for normal operation, and will open in the case of a power failure from either of the two power inputs.

1. Insert the wires into the fault alarm contact (number 3 and 4).
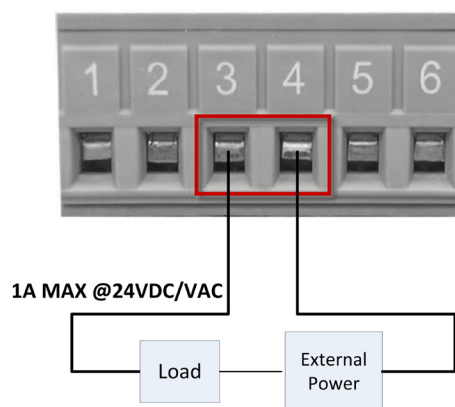
Power Fail Alarm Example

⚠ NOTE The wire gauge for the terminal block should be in the range between 12 and 24 AWG.

Grounding

To provide maximum surge and lightning protection, the 1050E-T should be effectively grounded via a GND screw located on the top of the unit next to the terminal connector block. All ground (earth) wiring should be minimum 14 AWG.
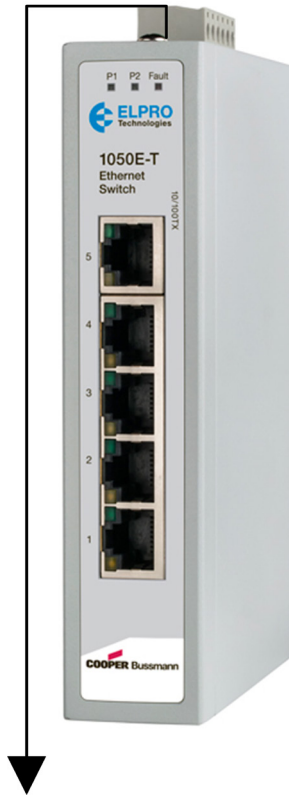
## 2.4 LED Indications, Ports, and Cabling

LED Indicators

Three LEDs display the power status, and an additional ten LEDs display the network status. These LEDs are located on the front panel of the switch and are described in the following table.

LED	Color	Description	
P1	Green	On	Power input 1 is active
		Off	Power input 1 is inactive
P2	Green	On	Power input 2 is active
		Off	Power input 2 is inactive
Fault	Red	On	Power input 1 or 2 is inactive
		Off	Power input 1 and 2 are both functional, or no power inputs
Link/Active (1~5)	Green	On	Connected to network
		Flashing	Networking is active
		Off	Not connected to network
Duplex/Collision (1~5)	Orange	On	Ethernet port full duplex
		Flashing	Collision of packets occurs
		Off	Ethernet port half duplex or not connect to network

Ports

The RJ-45 ports (Auto MDI/MDIX) are auto-sensing for 10Base-T or 100Base-TX devices connections. Auto MDI/MDIX means that you can connect to another switch or workstation without changing straight through or crossover cabling (see the following schematics).

Straight Through Cable Schematic   **Crossover Cable Schematic**
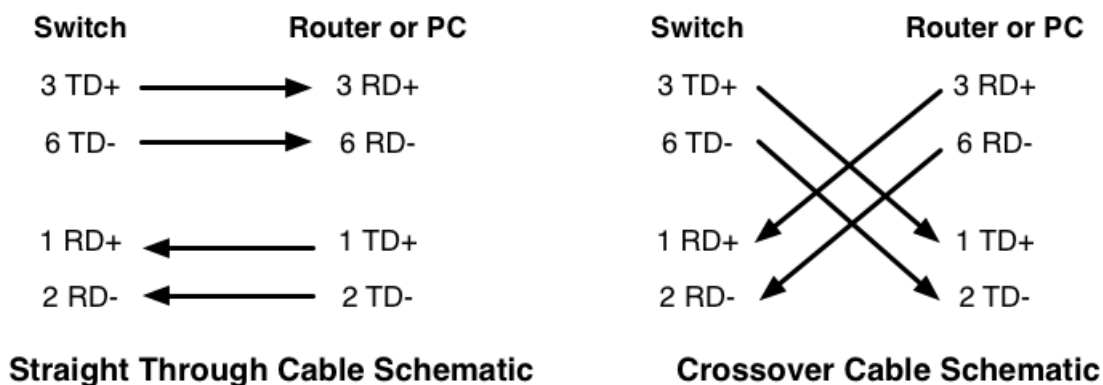
Cabling

Use the four twisted-pair Category 5 cabling for RJ-45 port connection. The cable length between the switch and the link partner (switch, hub, or workstation) must be less than 100m (328 ft).

2.5 Mounting Installation

DIN-rail Mounting

The 1050E-T ships from the factory with the DIN-rail mount kit installed. Follow these steps to mount the 1050E-T.

1. Insert the top of DIN-rail into the track.

2. Lightly push the button of DIN-rail into the track.

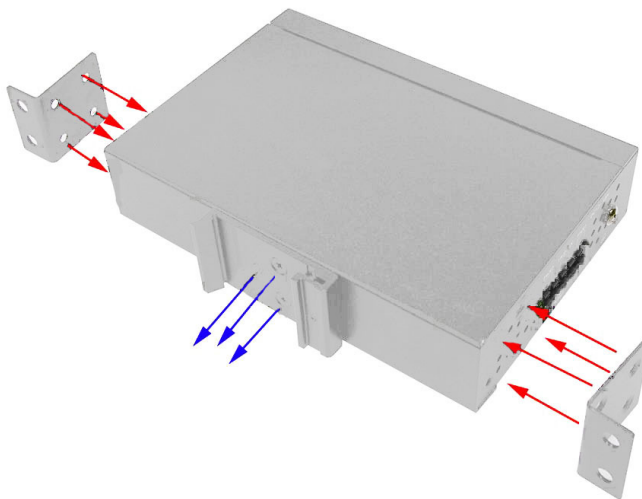3. Check the module is firmly secured to the DIN-rail track.

To remove the Industrial Switch from the track, reverse steps above.

Wall Mount Plate Mounting

Follow these steps to mount the switch using the wall mount plate. Unscrew the screws to remove the DIN-rail mount from the switch.

1. Fit the wall mount plates to the top and bottom ends of the switch.

2. Use the mounting screws to secure the wall mount plate to the switch.

3. Mount using the wall mount holes provided.

To remove the wall mount plate, reverse the steps above.

APPENDIX A - GLOSSARY

Term	Definition
100Base-TX	100Base-TX is a Fast Ethernet cabling standard. 100Base-TX devices can transfer data at a rate of up to 100 Mbps, and use two wire-pairs of wires inside a category 5 or above cable.
10Base-T	10Base-T is an Ethernet cabling standard. 10Base-T devices can transfer data at a rate of up to 10 Mbps, and use twisted pairs of wires in their Ethernet cabling.
AWG	American wire gauge (AWG), also known as the Brown & Sharpe wire gauge, is a standard-ized wire gauge system used predominantly in the United States and Canada for the diameters of round, solid, nonferrous, electrically conducting wire.
CSMA/CD	Carrier Sense Multiple Access/Collision Detection is the access method used on an Ethernet network. A network device transmits data after detecting that a channel is available. However, if two devices transmit data simultaneously, the sending devices detect a collision and retransmit after a random time delay.
DIN rail	A DIN rail is a metal rail of a standard type widely used for mounting circuit breakers and industrial control equipment inside equipment racks.
ESD	Electrostatic discharge (ESD) is discharge of static electricity from a outside source, such as human hands, into an integrated circuit, often resulting in damage to the circuit.
FCC	The Federal Communications Commission (FCC) is the US agency that regulates interstate and international wire, radio, and other broadcast trasmissions, including telephone, telegraph, and telecommunications.
Full Duplex	A full-duplex (or double-duplex) system allows communication in both directions and, unlike half-duplex, allows this to happen simultaneously. Land-line telephone networks are exam-ples of full-duplex, since they allow both callers to speak and be heard at the same time.
IEEE	Institute of Electrical and Electronics Engineers, New York, www.ieee.org. A membership organization that includes engineers, scientists and students in electronics and allied fields. It has more than 300,000 members and is involved with setting standards for computers and communications.
MDI/MDIX	Medium Dependent Interface (MDI) describes the interface (both physical and electrical) in a computer network from a physical layer implementation to the physical medium used to carry the transmission. Ethernet over twisted pair also defines a medium dependent interface crossover (MDIX) interface. Auto-MDIX ports on newer network interfaces detect if the con-nection would require a crossover, and automatically chooses the MDI or MDIX configuration to properly match the other end of the link.
RJ-45	Standard connectors used in Ethernet networks. RJ-45 connectors are similar to standard RJ-11 telephone connectors, except that RJ-45 connectors can have up to eight wires, whereas telephone connectors have four wires.
Switch	A type of hub that efficiently controls the way multiple devices use the same network so that each can operate at optimal performance. A switch acts as a networks traffic cop. Rather than transmitting all the packets it receives to all ports as a hub does, a switch transmits packets to only the receiving port.
UL	Underwriter Laboratories (UL) is one of several companies approved to perform safety testing by the US federal agency Occupational Safety and Health Administration (OSHA).

Notes:

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Online Resources
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for the following resources and more:
• User Manuals
• Installation Guides
• Configuration Software
• Datasheets
• Dimensional Drawings

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