TURCK

Industrial Automation

IP20 Industrial Ethernet
Managed Switch

MANUAL

MA1004
Published 11/21/2013

INDUSTRIAL ETHERNET MANAGED SWITCH - USER MANUAL

Applicable standards and certifications:

Standard Locations

European Directives

SECTION 1 GENERAL INFORMATION

Overview

This manual will help you install and maintain the Managed Switches. Installation of these managed switches will enable the user to wire redundant connections between nodes, manage the network by monitoring/gathering network data, allow for browser or telnet configuration, increase network performance, and more.

Note: This manual only covers the installation and wiring of these switches. Refer to the separate Software User Manual for details on configuring and using any of the management functions such as SNMP, RSTP, IGMP, port mirroring, etc.

Operation

Unlike an Ethernet hub that broadcasts all messages out all ports, the Managed Switches will intelligently route Ethernet messages only out the appropriate port. Most importantly, unlike a regular Ethernet switch, very resilient networks can be implemented because the Managed Switch has the intelligence to detect and allow for ring Ethernet topologies. In other words, implementing this switch will optimize the network for optimal bandwidth conditions, reduce the number of collisions, and allow for redundant data path connections to reduce/eliminate downtime.

To further aid in network reliability and performance, SNMP is available to extract and exchange network statistical information. Through the use of SNMP, various groups of statistical information can be obtained such as TCP, RMON, IP, and more to aid the user's job to extrapolate the "health" of the network.

The Managed Switches can support 10BaseT (10 Mbps) and 100BaseT (100 Mbps) on their M12 ports. Each of these ports will independently auto-sense the speed, allowing you to interface to regular, fast or gigabit Ethernet devices.

Performance Specifications

These general specifications apply to the Managed Switches. Refer to Section 7 for complete technical specifications.

Ethernet ports:	8xRJ45
Ethernet Switch Type:	Managed with SNMP, RSTP, IGMP, VLANs and much more
Ethernet Protocols:	All standard IEEE 802.3
M12 Ports (shielded):	10/100 (with auto-negotiation, auto-crossover and auto-polarity)

Standards and Safety

The Managed Switches meet the following standards plus others:

Electrical safety: UL 508, CSA C22; EN61010-1 (IEC1010)
EMC immunity: IEC61326-1, IEEE C37.90

Install the Managed Switches in accordance with local and national electrical codes.

Lightning Danger: Do not work on equipment during periods ofl ightning activity.

SECTION 2 LED INDICATORS

Overview

The Managed Switches have communication LEDs for each port, an "OK" output LED, a status LED and dual power LEDs. Refer to the sample pictures below for the location of these LEDs.

Activity, link and speed LEDs are integrated into the RJ45 ports.

Power LEDs

There are two Power LEDs on the Managed Switch. Power 1 is used for primary power and Power2 is used for secondary power. Both indicate if there is power applied to the respective terminal.

ACT / LNK / (10/100) LEDs

The two LEDs adjacent to each port indicates activity and link confirmation.

ACT/LNK LED	
Off	This would indicate that there is not a proper Ethernet connection (Link) between the port and another Ethernet device. Make sure the cable has been plugged securely into the ports at both ends.
On Solid (not flashing)	This would indicate that there is a proper Ethernet connection (Link) between the port and another Ethernet device, but no communications activity is detected.
Flashing	This would indicate that there is a proper Ethernet connection (Link) between the port and another Ethernet device, and that there is communications activity.
SPEED 10/100 LED	
Green	A 100 Mbps (100BaseT) connection is detected.
Off	A 10Mbps (10BaseT) connection is detected.

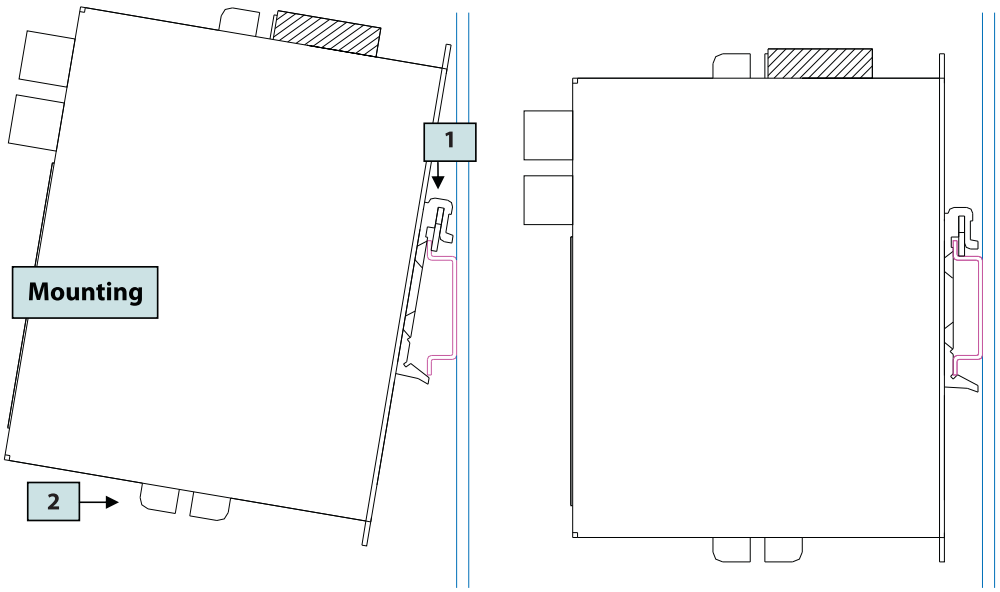
OK Redundant Power LED

This LED indicates the status of the power inputs. The LED will be ON when both the Power 1 and Power 2 have power applied to them. It will be OFF if either input does not have power or the switch software is not running.

SECTION 3 INSTALLATION

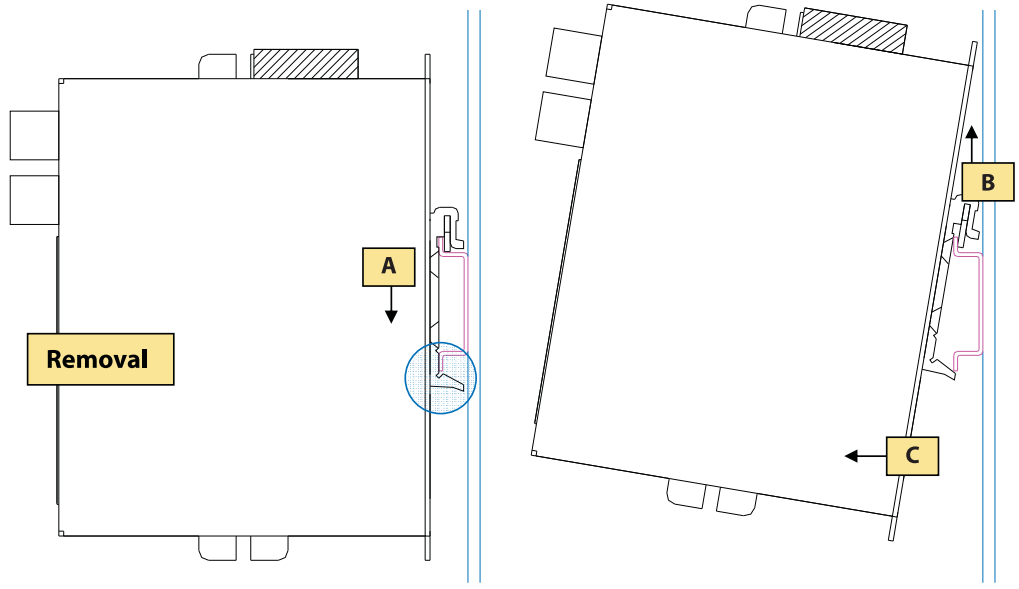
Overview

The Managed Switches can be mounted directly on a DIN rail. Refer to the drawing below.
Note: Make sure to allow enough room to route your Ethernet cables.



Recommended DIN rail mounting steps:

1. Hook the top back of the DIN rail clip on the unit over the din rail.
2. Push the bottom of the unit towards the DIN rail until it snaps into place.



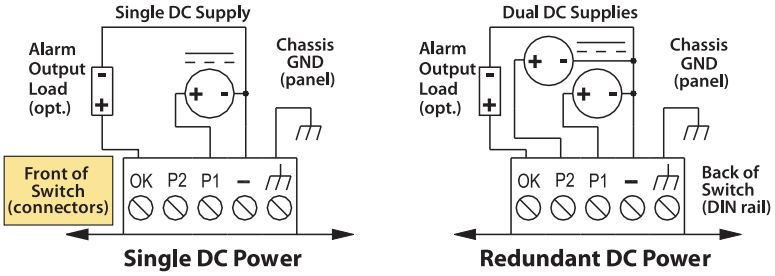
Recommended DIN rail removal steps:

A. Push the whole unit down to free the bottom of the DIN rail clip. See blue circle area.
B. Pull the bottom of the unit away from the DIN rail.
C. Unhook the top of unit and remove it from the DIN rail.

SECTION 4 POWER WIRING

Overview

These industrial Ethernet switches can be powered from the same DC source that is used to power your I/O devices. Voltage ranging from 10 to 30 VDC must be applied between the P1 (plus) terminal and the Minus terminal. The chassis screw terminal should be tied to panel or chassis ground.



To reduce down time resulting from power loss, these industrial Ethernet switches can (optionally) be powered redundantly with a second power supply as shown in the diagram. The "OK" output that can be tied to a PLC input or other device to indicate when there is a power loss (output is ON when both P1 and P2 are properly supplied with 10-30 VDC). This output sources the same voltage applied to the switch power terminals.

SECTION 5 ETHERNET AND SERIAL PORT WIRING

Overview

The Managed Switches provides connections to Ethernet devices on the factory floor, managed devices, and agents. The other Ethernet ports are then connected to Ethernet devices such as PLCs, Ethernet I/O, or industrial computers. Electrical isolation is provided on the Ethernet ports for increased reliability.

M12 Wiring Guidelines

Use data-quality (not voice-quality) twisted pair cable rated category 5 (or better) with standard RJ45 connectors. For best performance use shielded cable. Straight through or crossover RJ45 cables can be used regardless of the device the switch is to be connected to as the Managed Switche is capable of auto-crossover of MDI versus MDIX detection.

The RJ45 Ethernet port connector bodies on these products are metallic and are connected to the Chassis GND terminal. Therefore, shielded cables may be used to provide further protection. To prevent ground loops, the cable shield should be tied to the metal connector body at one end of the cable only.

Duplex Operation

The Ethernet ports will auto-sense for Full or Half duplex operation.

Verifying Connection

After all Ethernet connections are made, check the LED's corresponding to the ports that each of the devices are connected to. Ensure that for each port that is in use, the LED is on or blinking. If a port LED is off, go back and check for connectivity problems between that port and the network device connected to that particular port. In addition, the color of the LED should indicate the speed for which your device is connected at (see prior section on LEDs).

SECTION 6 USB CONFIGURATION PORT

Configuration Ports

These managed switches have a USB port for device configuration. Use a standard USB cable with a mini-USB plug on one end and an A-type-USB plug on the other end. The A-type plug goes into a standard USB port on a computer. The mini-USB plug goes into the USB port on the switch.

Refer to the software user manual for how to interface with the switch using the USB port

SECTION 7 TECHNICAL SPECIFICATIONS

Technical Specs

Here are the technical specifications for the Managed Switches covered by this manual.

Copper RJ45 Ports: (10/100BaseT or 10/100/1000BaseT)	
10/100BaseT ports	Shielded RJ45
Protocols supported	All standard IEEE 802.3
Ethernet compliancy	IEEE 802.3, 802.3u, 802.3x, 802.3z, 802.1p and more
Auto-crossover	Yes, allows you to use straight or cross wired cables
Auto-sensing operation	Full and half duplex
Auto-negotiating	10BaseT and 100BaseT
Auto-polarity	Yes, on the TD and RD pair
Flow control	Automatic
Ethernet isolation	1500 VRMS 1 minute
Plug and play	Yes
Cable requirements	Twisted pair (Cat. 5 or better) (shielded recommended)
Max. cable distance	100 meters

General Specifications:		
Ethernet switch type	Managed with 8 Ethernet ports and USB configuration port	
Latency for 10 Mbps ports	16 us + frame time (typical)	Varies on load and settings
Latency for 100 Mbps ports	5 us + frame time (typical)	
Full or half duplex operation	Configurable	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant Input Terminals	
Input power (typical - all ports active at 100 Mbps) (10 W maximum)	4.3 W (8-port)	
Input voltage (all models)	10-30 VDC (continuous)	
Transient protection	15,000 watts peak	
Spike protection	5,000 watts (10x for 10 uS)	
Extended protection		
Maximum voltage surge	100V for 1 second	
Maximum voltage spike	5,000 watts (10x for 10 uS) or 250 volts (50x for 100 uS)	
Ethernet isolation	1500 VRMS 1 minute	
Operating temperature range	-40 to +75 °C	
Storage temperature range	-40 to +85 °C	
Humidity (non-condensing)	5 to 95% RH	
Vibration	IEC 60068-2-6, -27 and -32	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, IEEE C37.90	
Packaging	IP20	
Dimensions (L x W x H)	See mechanical diagrams for details	