Sixnet
a red lion business

USER MANUAL

IP67 Fast Ethernet Industrial Switch

Installation and Wiring Manual

Contents at a Glance:

This manual applies to the following products:

- **ET-8ES-MIL-1** 8-port unmanaged IP67 Ethernet switch with 8 10/100 ports
- **ET-8MS-MIL-1** 8-port managed IP67 Ethernet switch with 8 10/100 ports

Sixnet • 331 Ushers Road • Ballston Lake, NY 12019 • USA • 1.518.877.5173 • support@sixnet.com

SIXNET Protected Technology Policy - Sixnet protects your investment in Sixnet systems with long-term planned technology and our unique Protected Technology Policy. We will continue to support the specified capabilities of standard Sixnet products for at least five years (twenty years for Industrial Managed Switches). We plan each product improvement and new feature to be upward compatible with existing designs and installations. Our goals are to make each new software release bring new power to your Sixnet systems and have every existing feature, applications program and data file continue to work. We protect your investment even further with a liberal five-year trade-in policy. Exchange standard products for upgraded versions of the same product to take advantage of new features and performance improvements at any time for five years. A prorated trade-in allowance will be given for your existing equipment. Sixnet protects your long-term productivity with state-of-the-art planned technology and continued support.

Sixnet Statement of Limited Warranty - Sixnet, manufacturer of Sixnet products, warrants to Buyer that products, except software, manufactured by Sixnet will be free from defects in material and workmanship. Sixnet's obligation under this warranty will be limited to repairing or replacing, at Sixnet's option, the defective parts within one year of the date of installation, or within 60 months of the date of shipment from the point of manufacture, whichever is sooner. Products may be returned by Buyer only after permission has been obtained from Sixnet. Buyer will prepay all freight charges to return any products to the repair facility designated by Sixnet. This limited warranty does not cover losses or damages which occur in shipment to or from Buyer or due to improper installation, maintenance, misuse, neglect or any cause other than ordinary commercial or industrial applications. In particular, Sixnet makes no warranties whatsoever with respect to implied warranties of merchantability or fitness for any particular purpose. All such warranties are hereby expressly disclaimed. No oral or written information or advice given by Sixnet or Sixnet's representative shall create a warranty or in any way increase the scope of this warranty. This limited warranty is in lieu of all other warranties whether oral or written, expressed or implied. Sixnet's liability shall not exceed the price of the individual units, which are the basis of the claim. In no event shall Sixnet be liable for any loss of profits, loss of use of facilities or equipment, or other indirect, incidental or consequential damages.

INSTALLATION AND HAZARDOUS AREA WARNINGS - These products should not be used to replace proper safety interlocking. No software-based device (or any other solid-state device) should ever be designed to be responsible for the maintenance of consequential equipment or personnel safety. In particular, Sixnet disclaims any responsibility for damages, either direct or consequential, that result from the use of this equipment in any application. All power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods and in accordance with the authority having jurisdiction.

FCC Statement - This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures: Reorient or relocate the receiving antenna; Increase the separation between the equipment and receiver; Connect the equipment into an outlet on a circuit different from that to which the receiver is connected; Consult the dealer or an experienced radio/TV technician for help.

Note: All information in this document is subject to change without notice.

Section 1 General Specifications

Overview

This manual will help you install and maintain the IP67 Industrial Ethernet Switch. Installation of these switches will enable the user to 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

The IP67 Industrial Ethernet Switch can support 10BaseT (10 Mbps) or 100BaseT (100 Mbps) on all ports. Each of these ports will independently auto-sense the speed, allowing you to interface to regular(10Mb) or fast Ethernet(100Mb) devices.

Standards and Specs

The IP67 Industrial Ethernet Switch meets the following standards plus others:

General	8 Fast Ethernet ports	
Ethernet switch type	Managed or Unmanaged	
Ethernet protocols supported	All IEEE 802.3	
Ethernet connectors with olive-drab cadmium plating	MIL-DTL-38999 Series III w/ 22D socket (female) contacts (9-35)	
USB/RS232 connector with olive-drab cadmium plating	MIL-DTL-38999 Series III w/ 22D socket (female) contacts (9-35)	
Ethernet speed (10/100BaseTX)	Auto-negotiation (10 or 100 Mbps)	
Ethernet MDI/MDIX	Auto-crossover	
Ethernet TD and RD polarity	Auto-polarity	
Ethernet isolation	1500 VRMS 1 minute	
Latency for 10 Mbps ports	16us	Typical less frame time (Varies on load & settings)
Latency for 100 Mbps ports	5us	
Full or half duplex operation	Yes, automatic on unmanaged, configurable on managed	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	

Power	Automatic power savings when ports are unused
Power input receptacle with olive-drab cadmium plating	MIL-DTL-38999 Series III w/ pin (male) contacts (9-98) size 20
Input voltage (all models)	10-30 VDC (continuous)
Input power (typical – with all ports linked and active)	3 W (unmanaged) 4 W (managed)
Reverse polarity protection	Yes
Extended power protection	Exceeds MIL-STD-1275
Surge protection	100 volts for 1 second
Transient protection	15,000 watts peak
Spike Protection	5,000 watts (10x for 10 uS) or 250 volts (50x for 100 uS)

Environmental	Truly industrial design
Operating temperature range	-40 to +75 °C (cold startup at -40 °C)
Storage temperature range	-40 to +85 °C
Humidity (non-condensing)	5 to 95% RH (Conformal coating avaible by special order)
Vibration, shock and freefall	MIL-STD-810F; IEC68-2-6, -27 and -32
Electrical safety	UL508/CSA C22, EN61010-1
EMC emissions and immunity	MIL-STD-461E; FCC part 15, ICES-003; EN55022, IEC61326-1
Hazardous locations (Class I, Division 2; Zone 2)	ANSI / ISA 12.12.01, CSA C22.2/213; ATEX IEC60079-0, 15

Package protection	IP67 dust, oil and water-tight
Dimensions (L x W x H) (see diagram on next page)	10.5 x 4 x 1.5” (267 x 102 x 38 mm)
Weight (including caps)	2.20 lbs (1 Kg)

Military Standards Compliance

MIL Standard	Specification	Description
MIL-STD-810F; 501.4, I; 501.4, II	+70°C Transport/Storage +65°C operating	High Temperature
MIL-STD-810F; 502.4, I; 501.4, II	-20°C Transport/Storage -10°C operation	Low Temperature
MIL-STD-810F; 507.4	95%	Humidity
MIL-STD-810F; 500.4, II	9000 Feet	Low pressure operating
MIL-STD-810F; 500.4, I	15000 Feet	Low pressure transportation
MIL-STD-810F; 514	5-1000 Hz	Vibration
MIL-STD-810F; 516, I	half sinus 40g 11msec	Mechanical Shock
MIL-STD-810F; 516, V	Drop on table	Handling Shock
MIL-STD-810F; 509	5% salt for 48 hours	Salt
MIL-STD-810F; 510, I	According to specs	Sand and Dust
MIL-STD-810F, Method 514.5	Vibration while in transport	
MIL-STD-810F, Method 512.4	Immersion into water; rain and wind resistance	
MIL-STD-1275B	100V for 1 second 15,000 watts peak 250V (50 times for 100uS)	Surge Protection Transient Voltage Spike Protection
MIL-STD-461E-RE102	2MHz to 18GHz	Radiated emissions (ground)
MIL-STD-461E-RS103	2MHz to 18GHz	Radiated susceptibility

Safety Warnings

Strictly abiding by these warnings will help ensure the safe installation, startup and operation of the switch.

INSTALL THE SWITCH IN ACCORDANCE WITH ALL LOCAL AND NATIONAL ELECTRICAL CODES.

LIGHTNING DANGER: DO NOT WORK ON EQUIPMENT DURING PERIODS OF LIGHTNING ACTIVITY.

WARNING (EXPLOSION HAZARD)

SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2 (ZONE 2).

WARNING (EXPLOSION HAZARD)

WHEN IN HAZARDOUS LOCATIONS, DISCONNECT POWER BEFORE REPLACING OR WIRING UNITS.

WARNING (EXPLOSION HAZARD)

DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.

Section 2 LED Indicators

Overview

The IP67 Industrial Ethernet switches have communication LEDs for each port, an "OK" output LED, a status LED and power LEDs. Refer to the sample pictures below for the location of these LEDs.

LED Locations

Status LED

The Status LED indicates the overall health of the switch. It is normally ON solid indicating that no internal CPU or software problems are detected. It will flash when loading firmware and briefly on power up or reset. Otherwise, if it is OFF or flashing for an extended period of time then a problem is detected. In this case, please contact your switch supplier for support.

Power LEDs

There is a power LED labeled as Power. It will be on solid when power is applied to the switch.

LNK LED

The port LEDs are multifunctional and indicate link confirmation, activity, and speed.

Flashing = Indicates that there is a proper Ethernet connection (Link) between the port and another Ethernet device, and that there is communications activity.

On Solid = Indicates that there <u>is</u> a proper Ethernet connection (Link) between the port and another Ethernet device, but no communications activity is detected.

Off = Indicates that there <u>is not</u> 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.

100 LED

The port LEDs are multifunctional and indicate link confirmation, activity, and speed.

ON = A 100 Mbps (100BaseT) connection is detected.

OFF = A 10 Mbps (10BaseT) connection is detected.

OK LED

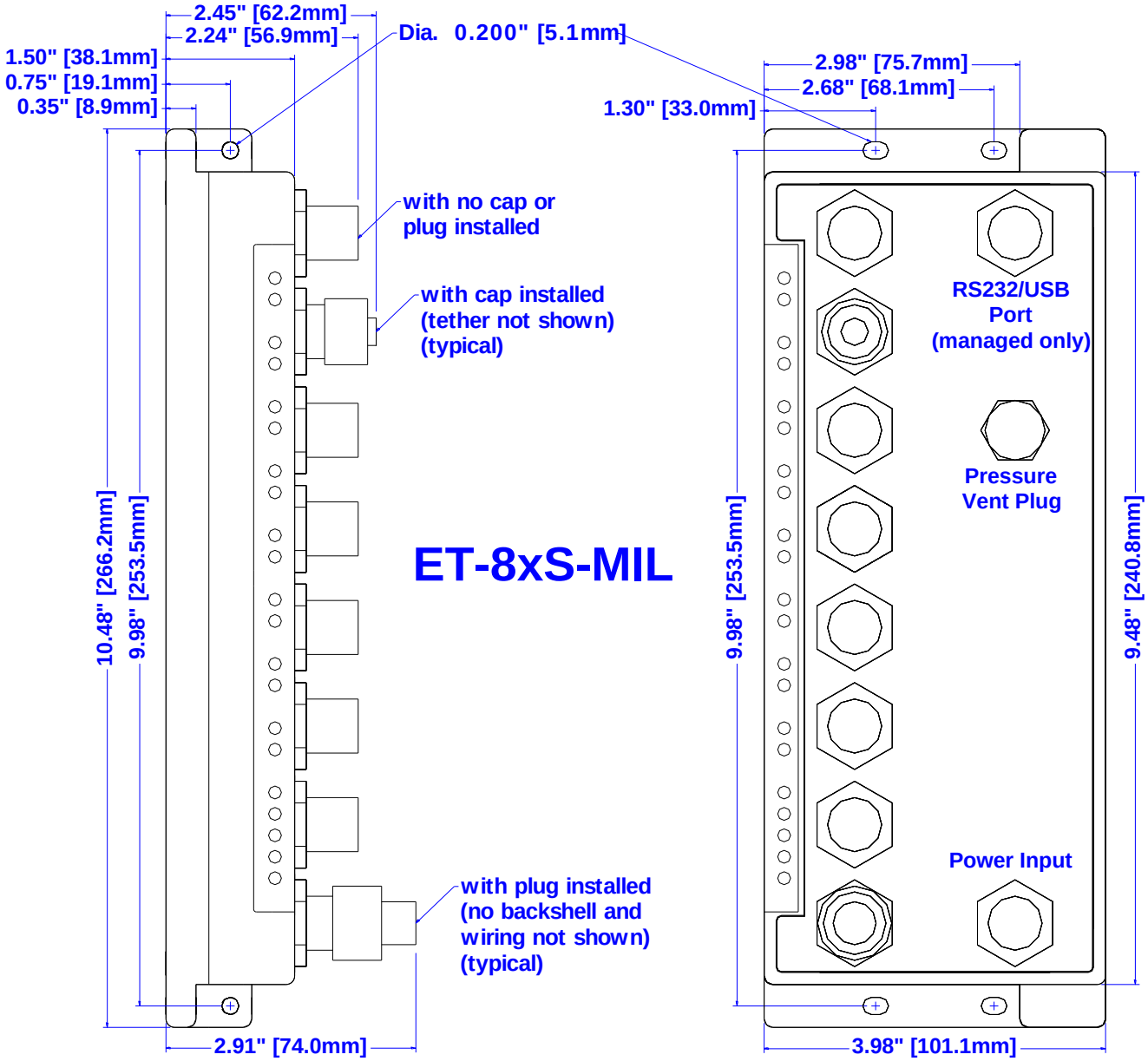
This LED is not used in the standard model and will always be off. On special order units with dual power inputs, the OK LED will be lit when both the P1 and P2 pins have power applied.

Section 3 Mechanical Dimensions and Installation

Overview

The IP67 Industrial Ethernet Switch can be mounted either on its edge or flat, as shown below. All LED's are visible from either mounting position.

NOTE: Mounting holes will accept a #12 size screw or smaller.



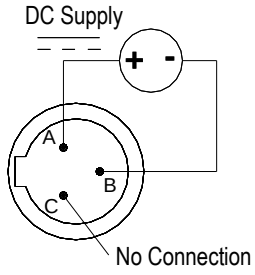
Sixnet • 331 Ushers Road • Ballston Lake, NY 12019 • USA • 1.518.877.5173 • support@sixnet.com

Section 4 Power and Communication Wiring

Overview

The IP67 Industrial Switches can be powered from the same DC source that is used to power your other devices. 10 to 30 VDC needs to be applied between Pin A and Pin B as shown below.

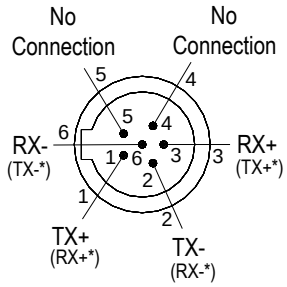
NOTE: Any of the available mounting holes may be used for grounding and electrical bonding of the switch.



Shell=A, Insert=98, Contacts=P, Keying=A

Power Input Wiring All Models (ET-8xS-MIL)

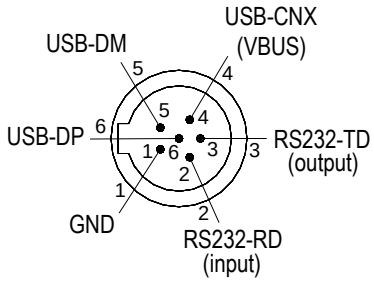
* also allowed due to the auto-mdi/mdix-crossover



Shell=A, Insert=35, Contacts=S, Keying=N

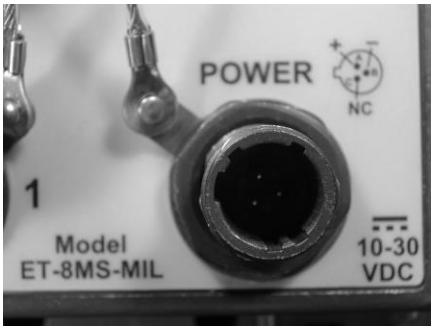
Ethernet Wiring All Models (ET-8xS-MIL)

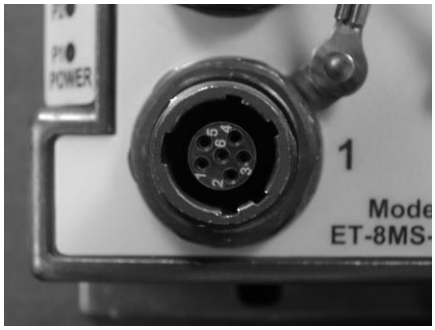
RS232 and USB



Shell=A, Insert=35, Contacts=S, Keying=A

Console Port Wiring Managed Models (ET-8MS-MIL)





Section 5 Mating Connections Wiring

Overview

The IP67 Industrial Switches meet or exceed all MIL-STD-38999 Series III for severe environmental applications. All connectors and their mating couplings have EMI shielding and ESD, moisture and corrosion resistance. All mating connectors will self-lock with one 360 degree turn of the coupling nut.

Mating Connections

The following mating plugs are required to interface with the switch:

Ethernet Plug
D38999/26WA35PN
(w/ pin contacts and Normal keying)

Power Plug
D38999/26WA98SA
(w/ socket contacts and “A" keying)

USB/RS232 Plug
D38999/26WA35PA
(w/ pin contacts and “A” keying)

Typical Plug

Cable Distance

The maximum cable length for 10/100BaseT is typically 100 meters (328 ft.).

Section 6

Service Information

We sincerely hope that you never experience a problem with any **Sixnet** product. If you do need service, call **Sixnet** at (518) 877-5173 and ask for Technical Support. A trained specialist will help you to quickly determine the source of the problem. Many problems are easily resolved with a single phone call. If it is necessary to return a unit to us, an RMA (Return Material Authorization) number will be given to you.

Sixnet tracks the flow of returned material with our RMA system to ensure speedy service. You must include this RMA number on the outside of the box so that your return can be processed immediately.

The applications engineer you are speaking with will fill out an RMA request for you. If the unit has a serial number, we will not need detailed financial information. Otherwise, be sure to have your original purchase order number and date purchased available.

We suggest that you give us a repair purchase order number in case the repair is not covered under our warranty. You will not be billed if the repair is covered under warranty.

Please supply us with as many details about the problem as you can. The information you supply will be written on the RMA form and supplied to the repair department before your unit arrives. This helps us to provide you with the best service, in the fastest manner. Normally, repairs are completed in two days. Sometimes difficult problems take a little longer to solve.

If you need a quicker turnaround, ship the unit to us by air freight. We give priority service to equipment that arrives by overnight delivery. Many repairs received by mid-morning (typical overnight delivery) can be finished the same day and returned immediately.

We apologize for any inconvenience that the need for repair may cause you. We hope that our rapid service meets your needs. If you have any suggestions to help us improve our service, please give us a call. We appreciate your ideas and will respond to them.

For Your Convenience:
Please fill in the following and keep this manual with your **Sixnet** system for future reference:

Serial #:_____ Date Purchased: _____

Purchased From:_____

Product Support

To obtain support for Sixnet products:

Latest product info: http://www.sixnet.com

Phone: 1 (518) 877-5173

Fax: 1 (518) 877-8346

E-mail: support@sixnet.com

Mailing address: Sixnet, 331 Ushers Road, Ballston Lake, NY 12019