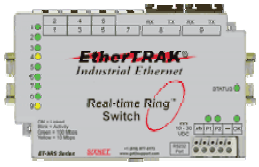
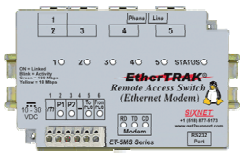
Unmanaged Industrial Ethernet Switches		5-port 9-port Fiber Converter
Unmanaged Industrial Ethernet Switches **eWON**		4+1 5-port 10/100 Mbps TX Full/Half duplex
Ring Industrial Ethernet Switches		5-port 9-port 16-port Gigabit - 9 port Gigabit -10 port Gigabit- 18 port
Managed Industrial Ethernet Switches		5-port 9-port Gigabit – 9 port
Managed Industrial Ethernet Modem		Kombineret modem og 5 port managed Ethernet Switch
EtherBus		Industrial Power over Ethernet (PoE) Switch
IP67 Industrial Ethernet Switches		5-port 8-port
Slim Line Remote Access Switches		

GreenMatic I Lundeager 24 I 2791 Dragør I Tel. 7020 4840 I Fax 7020 4847 I www.greenmatic.dk

Comparison Chart

Networking Features	Unmanaged	Ring	Managed	IP67
10/100BaseTx RJ45 ports	✓	✓	✓	✓
10/100/1000BaseTx RJ45 ports	-	✓ (9RG)	✓(9MG)	-
Auto-polarity on TXD & RXD signals	✓	✓	✓	✓
Auto-mdi/mdix-crossover (use any cable)	✓	✓	✓	✓
Auto-sense speed & duplex	✓	✓	✓	✓
100BaseFx fiber ports up to 40km+	✓	✓	✓	-
Gigabit fiber ports up to 70km+	-	✓(9RG)	✓(9MG)	-
1024 MAC addresses	✓(5ES)	✓	✓	✓
2048 MAC addresses	✓(9ES)	✓	✓	-
8192 MAC addresses	-	✓(9RG)	✓(9MG)	-
Optimized for real-time performance	✓	✓	✓	✓
Plug and play - right out of the box!	✓	✓	-	✓
Real-time Ring™ for super fast rings	-	✓	-	-
Simple rings, dual rings, & coupled rings	-	✓	✓	-
Configurable port settings	-	✓	✓	-
Traffic prioritization (QoS, CoS, etc.)	-	✓	✓	-
Port Mirroring for diagnostics	-	✓	✓	-
Modbus over Ethernet (UDP) monitoring	-	✓	-	-
Message filtering (broadcast protection)	-	✓	✓	-
Rapid Spanning Tree Protocol	-	-	✓	-
Complex rings and mesh topologies	-	-	✓	-
SNMP v1, v2 and v3; plus SNMP traps	-	-	✓	-
IGMP multicast filtering (v1 and v2)	-	-	✓	-
VLAN for network segregation	-	-	✓	-
Network Time Protocol (NTP)	-	-	✓	-
Set IP per port	-	-	✓	-
Linux open-source programming	-	-	✓	-
Web, telnet & terminal configurable	-	-	✓	-
Advanced security - HTTPS, SSL, SSH...	-	-	✓	-
Windows utility configurable	-	✓	-	-

Industrial Ethernet Gigabit Switches

Super speed your network backbone or take advantage of the Gigabit capability of your newest plant floor equipment. These Gigabit-enabled industrial Ethernet switches are ten times faster, and like all SIXNET switches are designed to survive in the toughest industrial environments. Now you can insure the deterministic performance of your fault-tolerant rings with the ultra-fast Gigabit fiber optic or RJ45 copper ports on these powerful products. Plus only SIXNET industrial Ethernet switches deliver ultra-reliability and a unique 20-year service life promise!



Advanced Hardware Features

Ethernet Ports are fully IEEE 802.3 compliant
6-16 10/100 RJ45 ports that are auto-detecting, auto-crossover and auto-polarity
Up to three 10/100/1000 RJ45 ports that are auto-detecting, auto-crossover and auto-polarity
Up to two 1000 Mbps fiber optic ports for distances up to 80 km
Self-test / alarm output for reporting errors
Dual redundant power inputs with industrial surge and spike protection
DIN rail or direct panel mounting (no extra kits required)

Real-time Performance

Real-time Ring™ for ultra-fast fault-tolerant loops
Link loss recovery of 30 mS + 5 mS per hop!
Priority Queuing (QoS/CoS) for real-time operation
Modbus over Ethernet monitoring - use Modbus to monitor power and ring status
Free and easy to use Windows configuration utility (Optional: only needed for advanced operation; the switch and rings are plug & play and work right out of the box!)
Message filtering to prevent broadcast storms
Store and forward wire speed switching - no delays!

True Industrial Design for Long-term Reliability

Ultra-reliable with 1,000,000+ service-free hours (MTBF)
Free field-installable upgrades forever
Unique 20-year support and service policy
Industrial -40 to +85°C operating range
UL, CSA (CUL), & CE certified
DNV marine & offshore rated
Hazardous locations rated for Class I, Div. 2 (Zone 2) areas

Specifications:

General
Operation Store and forward wire speed switching, non-blocking
Modes Full or half duplex operation with flow control supported on all ports
MAC Addresses 8192
Memory Bandwidth 32 Gbps
Latency (typical) 5 us for 100 Mbps and 16 us for 10 Mbps (plus frame time)
Ethernet Isolation 1500 Vrms 1 minute

RJ45 Copper Ports
RJ45 Ports Up to nine RJ45 ports that are fully IEEE 802.3 compliant
RJ45 Speed & Duplex Configurable or auto-detecting for speed & duplex (full or half), ports 1-6 are 10/100, port 7 and optionally 8 & 9 are 10/100/1000
RJ45 MDI/MDIX Auto-mdi/mdix-crossover automatically supports either straight or crossed cables
RJ45 Polarity Auto-polarity for automatic correction of crossed TXD and RXD pairs

Fiber Optic Ports
Fiber Optic Ports Up to two 1000 Mbps fiber optic ports for distances up to 80 km
Transceivers SFP (mini-gbic pluggable) with LC style connectors
Multimode Links up to 550 m typical; 850 nm; use with 50-62.5/125 um fiber
Standard “M” option Transmitter power (dB): -9 min, -3 max
Receiver sensitivity (dB): -18 max

Multimode Long Haul Links up to 2 km typical; 1310 nm; use with 50-62.5/125 um fiber
Special Order Transmitter power (dB): -9 min, -3 max
Receiver sensitivity (dB): -18 max

Singlemode Links up to 10 km typical; 1310 nm; use with 9/125 um fiber
Standard “S” option Transmitter power (dB): -9 min, -3 max
Receiver sensitivity (dB): -20 max

Singlemode LongHaul Links up to 30 km typical; 1310 nm; use with 9/125 um fiber
Special Order Transmitter power (dB): -4 min, -2 max
Receiver sensitivity (dB): -23 max

Singlemode LongHaul Links up to 50 km typical; 1550 nm; use with 9/125 um fiber
Special Order Transmitter power (dB): -4 min, -2 max
Receiver sensitivity (dB): -23 max

Singlemode LongHaul Links up to 80 km typical; 1550 nm; use with 9/125 um fiber
Special Order Transmitter power (dB): 0 min, +5 max
Receiver sensitivity (dB): -23 max

Other transceivers Contact SIXNET for special application transceivers
Eye safety IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11

Networking Features
Devices Supported All IEEE 802.3 compliant devices are supported
Protocols & Features All IEEE 803.2, Real-time Ring™, QoS/CoS/ToS/DS, port mirroring, broadcast storm protection, Modbus monitoring

Real-time Ring™ Maximum recommended switches in a ring: <50 for best performance but more is possible (Contact SIXNET for more details)
Dual ring support: Yes
Link loss recovery time: 30 mS plus 5 mS per hop
Industrial Protocols Supported Modbus/TCP, EtherNet/IP, PROFInet, Foundation Fieldbus HSE and others
Standards IEEE 802.3, 802.3u, 802.3x, 802.1p, 802.3z
Management Interfaces Free Windows configuration utility (only needed to configure advanced capabilities such as QoS, port mirrioring, Modbus monitoring ...)

Power and Alarm Output
Power Input Dual redundant power inputs for redundant power supplies
Input Voltage Range 10 to 30 VDC
Power Consumption 8.0 W - Typical with all ports linked and active
Industrial surge and spike protection 15 kW peak, 5 kW (10 times for 10 us)
Self-test / Alarm Output Same voltage as power input; 0.5 Amps max.

Environmental
Operating Temperature -40 to 85°C (cold startup at -40°C)
Storage Temperature -40 to 85°C
Humidity 5 to 95% RH (non-condensing)
Vibration IEC68-2-6
Shock IEC68-2-27
Freefall IEC68-2-32

Standards and Certifications
Electrical Safety UL508 & CSA C22.2/14 per CUL, EN61010-1
EMC FCC part 15, ICES-003, EN55022, IEC61326-1
Hazardous Locations UL1604, CSA22.2/213 per CUL (Class I, Div. 2, Groups A, B, C, D); EN50021/EN60079-15 (Zone 2), ATEX Group II, Cat 3 (Zone 2), EEx nA II T4 X
Marine and Off-shore DNV (Det Norske Veritas) No. 2.4
MTBF Mean Time Between Failure: >1,000,000 hours
RoHS and WEEE RoHS (Pb free) and WEEE compliant
ISO9001:2000 Certified “Total Quality” company
Industrial Warranty 3 years with product registration

Mechanical
Case Low profile, ideal for shallow enclosures and tight spaces
Material Rust-proof Lexan and aluminum with clear protective coating
Protection IP30 protection from dust and debris
Mounting DIN rail or direct to panel (no optional kits or accessories required)
Dimensions 3.8” x 6.25” x 2.3” (9.6 cm x 15.9 cm x 5.8 cm)
Weight 12 oz. (0.34 kg)

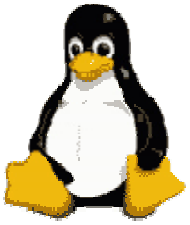
20-Year Product Support & Service Promise

Twenty years is a long time. During this time, technology will most certainly advance in amazing ways. Components used inside SIXNET Ethernet Switches will be upgraded to take advantage of new technology that offers higher performance and lower cost. Through all these changes, many systems that incorporate SIXNET Ethernet switches will continue to function reliably with no desire to “fix what isn't broken”. SIXNET customers want to know that they will be able to maintain their existing systems for a very long-time, with product support and replacement parts remaining available. In response, SIXNET has established a twenty-year product support policy for our Ethernet Switch products. This page substantiates our ability to see this policy through.



Control and Ownership of Essential Technology
The key to maintaining long-term product support is to have control over the technologies incorporated into the product with the ability to adapt as changes are needed. SIXNET owns all of the tooling and engineering documentation utilized in our products. A modular design approach insures that any element of a SIXNET product may be upgraded in the future with full compatibility with the remaining elements of the design. Also, the use of SIXNET controlled and maintained software and the durable IPm platform insure the longevity of product support.

Linux Durability
SIXNET IPm-based Switches run on a truly open Linux platform. This open-source version of Unix has been growing and strengthening for more than 30 years. Its maturity and robustness have made it the most popular operating system for embedded products. Its open source nature insures that it will survive and thrive for decades to come. More over, the upward functionality of SIXNET Managed Switches will grow as our customers and OEM partners develop add-on applications – in the true spirit of this open source platform.



A History of Exceeding the Twenty Year Mark
Long-term product support has been the cornerstone policy at SIXNET for more than a quarter century. Our first generation of programmable products was the IOMUX RTU, first delivered in 1987. Today, 17 years later we are still delivering more than 700 of these durable products to OEM customers annually. Our rolling commitment to provide a minimum of five years of product support has now brought the life of these products to its 23rd year – and beyond. In 2005 an IPm-based replacement for the IOMUX RTU will be presented to these OEM customers, providing them with a “form, fit, and function” replacement with huge upgrade potential. These upgrades will be drop in replacements for the first generation IOMUX controllers (with some software porting by the OEMs.) This remarkable commitment by SIXNET will extend the life of the IOMUX and support for the more than 20,000 installed units well past the thirty-year mark!

For local support contact:

GreenMatic
Lundeager 24
2791 Dragor
Denmark

Tel: +45 7020 4840
Fax: +45 7020 4847

Industrial Ethernet Real-Time Switch with 5 Ports

For Real-time Deterministic Performance and Ultra-Reliability

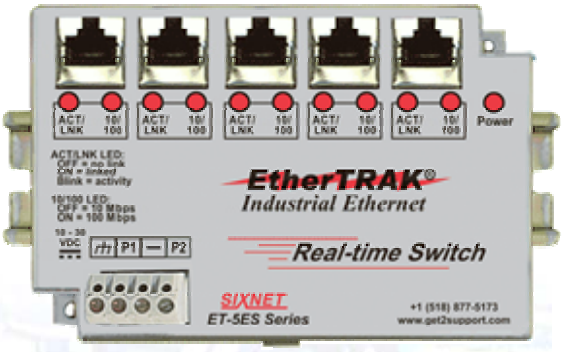
SIXNET Real-time Ethernet Switches have enhanced performance that allows you to achieve real-time deterministic operation. These ruggedized switches are truly industrial hardened to provide superior reliability and are offered with a unique 20-year support promise. They require no user setup and immediately start operating as soon as you power them up. SIXNET switches will make your job easier.

- **Real-time operation**
  - Intelligent routing - No collisions!
  - Ideal for deterministic systems and PLCs
- **SIXNET reliability and long-term support**
  - Ultra-reliable 1,000,000+ hours MTBF
  - Unique 20-year support policy
- **Plug and play simplicity**
  - Auto-sensing for speed and duplex
  - Auto-mdi/mdix-crossover and auto-polarity
- **Rated for harsh industrial environments**
  - -40 to +85 °C operating range
  - Dual power inputs with superior spike protection
  - Certified to perform – see below

Ideal for:

- Real-time control
- Distributed systems
- Outdoor / marine use

All Copper Model: ET-5ES-1



Dual Fiber Model: ET-5ES-4ST



Certified to Perform:

ISO9001 Certified	Class 1, Div II & Cenelec Zone 2	Marine & Offshore	European Community	UL508 for Safety

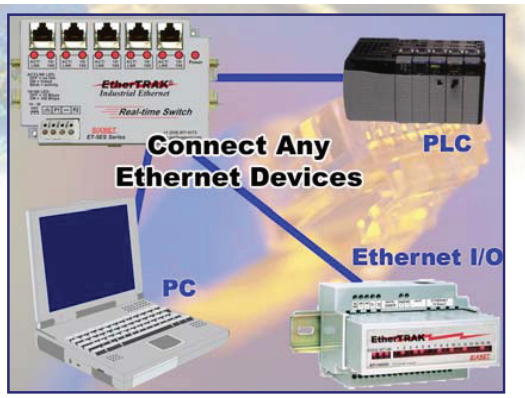
SIXNET knows industrial –
We have been designing industrial hardware such as Remote Terminal Units for over 20 years and have used this expertise to design the toughest Ethernet switches on the market. Don't trust your critical communications to so-called industrial hardware from commercial switch manufacturers. Many of them just screen their products for wide temperature operation. SIXNET switches are specifically design to operate from -40 to 85 °C, and they have over one **billion** running hours without a single temperature related failure to prove it. SIXNET switches give you proven assurance that your system will keep running for years to come.

Industrial Ethernet Real-Time Switch with 5 Ports

SIXNET Industrial Ethernet Switches

Ensure that your critical automation and control communications stays running. These ruggedized switches connect to any Ethernet device and provide the important features you need:

- **Simplify Installation**
- **Increase Reliability**
- **Improve Network Bandwidth**
- **Ensure Real-time Operation**
- **Supports Deterministic Control**



Why a SIXNET Industrial Ethernet Switch?

SIXNET Real-time Switches are truly industrial. SIXNET has over 20 years experience designing Remote Terminal Units for the toughest applications and has applied this expertise to design the most rugged and reliable Ethernet switches. Their tough packaging and protected circuitry keep them working under conditions that may cause other so-called industrial switches to quickly fail. Industrial applications are demanding - it gets hot, it gets cold - the power browns out or spikes wildly - and you need a reliable industrial switch that can keep on going.

Real-time deterministic performance

SIXNET Real-time Switches are one of the best and easiest ways to ensure the real-time operation of your automation and control system. They provide high throughput (3.2 Gbps, non-blocking) to ensure no delays and special handling for the many repeated short messages found in real-time polled systems. With plug and play ease, simply install these active switches and you'll immediately reap the benefits of increased performance. By providing enhanced message routing and eliminating message collision, these switches allow for true network determinism.

SIXNET Switches deliver ultra-reliability

SIXNET Real-time Switches have field-proven reliability of more than 1,000,000 hours MTBF. These SIXNET industrially hardened switches are rated to survive in your harsh environment – even outdoors in marine and military applications. You can count on SIXNET, who has been making industrial hardware for over 20 years!

Industrial switches survive heat & cold

SIXNET industrial switches work reliably through the dead of winter and those hot summer days. Unlike some industrial switches that are only screened commercial switches (this means they are not truly designed for extended temperature operation), SIXNET industrial switches are designed for those places that you don't want to be - over an industry-best temperature range of -40 to 85 °C. Over one billion running hours without a temperature related failure prove that SIXNET industrial switches survive!

Lose those bulky power transformers

SIXNET Real-time switches run directly on the DC power that you already have in your control cabinet. Get rid of those cumbersome AC outlet transformers. No AC power means fewer safety issues. If you ship your equipment internationally, you can forget about the headaches caused by different line voltages and incompatible power plugs.

Forget the Velcro and makeshift brackets

SIXNET industrial switches can be DIN rail or direct panel mounted - right out of the box. Their compact footprint fits easily into equipment-filled enclosures. No extra mounting accessories are need!

SIXNET Industrial Switches Make Your Job Easier

Just snap these switches onto the rail, plug in your network cables, and sit back and watch the data flow, year after year. These switches have been specifically designed to make your job easier.

Industrial Ethernet Real-Time Switch with 5 Ports

Performance Specifications

General	5 Ethernet ports	
Ethernet switch type	Intelligent store & forward	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX and TD/RD	Auto-crossover and auto-polarity	
Fiber optic port speed	100BaseFX (100 Mbps)	
Fiber optic port wavelength	1300 nm center	
Fiber multimode (mm) optimal	62.5/125 um (SC or ST connector)	
Fiber singlemode (sm) optimal	9/125 um (SC or ST connector)	
Fiber max. distance (full duplex) (see web for details)	4 km (mm), 20 or 40 km (sm) or more (contact SIXNET)	
Typ. latency for 100 Mbps ports	5 us + frame time	Varies on load
Full or half duplex operation	Yes and settable on the fiber port(s)	
MAC addresses supported	1024	
Memory bandwidth	3.2 Gbps	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (typical - all ports active at 100 Mbps) (Max. 6 W)	2.0 W (model -1 without fiber) 3.0 W (model -2 & -3 w/ 1 fiber) 4.0 W (models -4 & -5 w/ 2 fiber)	
Power Input	10-30 VDC	
Transient protection	15,000 watts peak	
Spike Protection	5,000 watts (10 times for 10 uS)	
Ethernet isolation	1500 VRMS 1 minute	
Operating temperature range	-40 to +85 °C	
Storage temperature range	-40 to +85 °C	
Humidity (non-condensing)	5 to 95% RH	
Vibration	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, IEEE C37.90	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Marine and off-shore	DNV (Det Norske Veritas)	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging (high temp. Lexan & rust-free aluminum case)	IP20 protection; UL 94V-0	
Dimensions (L x W x H)	See next page	

Specifications are subject to change. Consult factory for latest information.

Ordering Guide

ET-5ES-4SC

- **SC** style fiber connector(s)
- **ST** style fiber connector(s)
- **SCL** for long haul fiber (40 km)
- **STL** on singlemode models
- **1** – 5 RJ45 ports & no fiber
- **2** – 4 RJ45 & 1 multimode fiber
- **3** – 4 RJ45 & 1 singlemode fiber
- **4** – 3 RJ45 & 2 multimode fiber
- **5** – 3 RJ45 & 2 singlemode fiber
- **5ES** – 5 port switch

Accessories:	
RM-PS-024-01F	Power supply – AC to 24VDC, 1A
SP-ETH-2	Dual port surge & lightning protector

Hardware Highlights:

- 5 port truly industrial Ethernet switch with up to two fiber optic ports (multimode or singlemode)
- Redundant power inputs and surge protection
- Industrial rated -40 to +85 °C operation (without fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

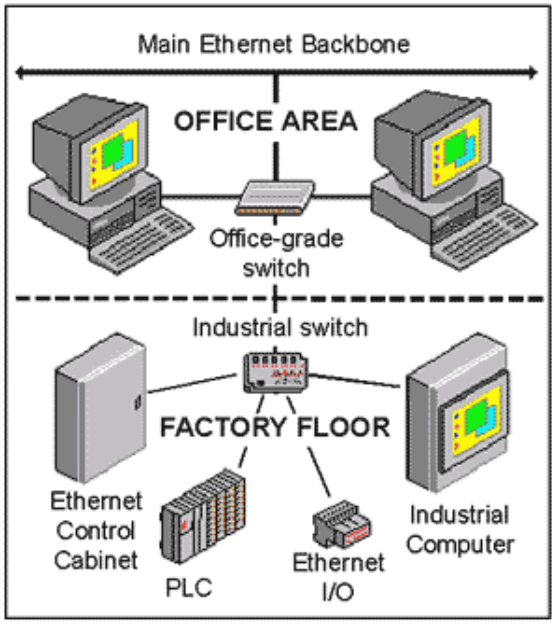
Networking Features:

- Store and forward wire speed switching – no delays
- Support for up to 1024 MAC addresses
- Automatic address learning, aging and migration
- Full-Duplex operation with flow control (no collisions!)
- Auto crossover (MDI/MDIX) and auto polarity

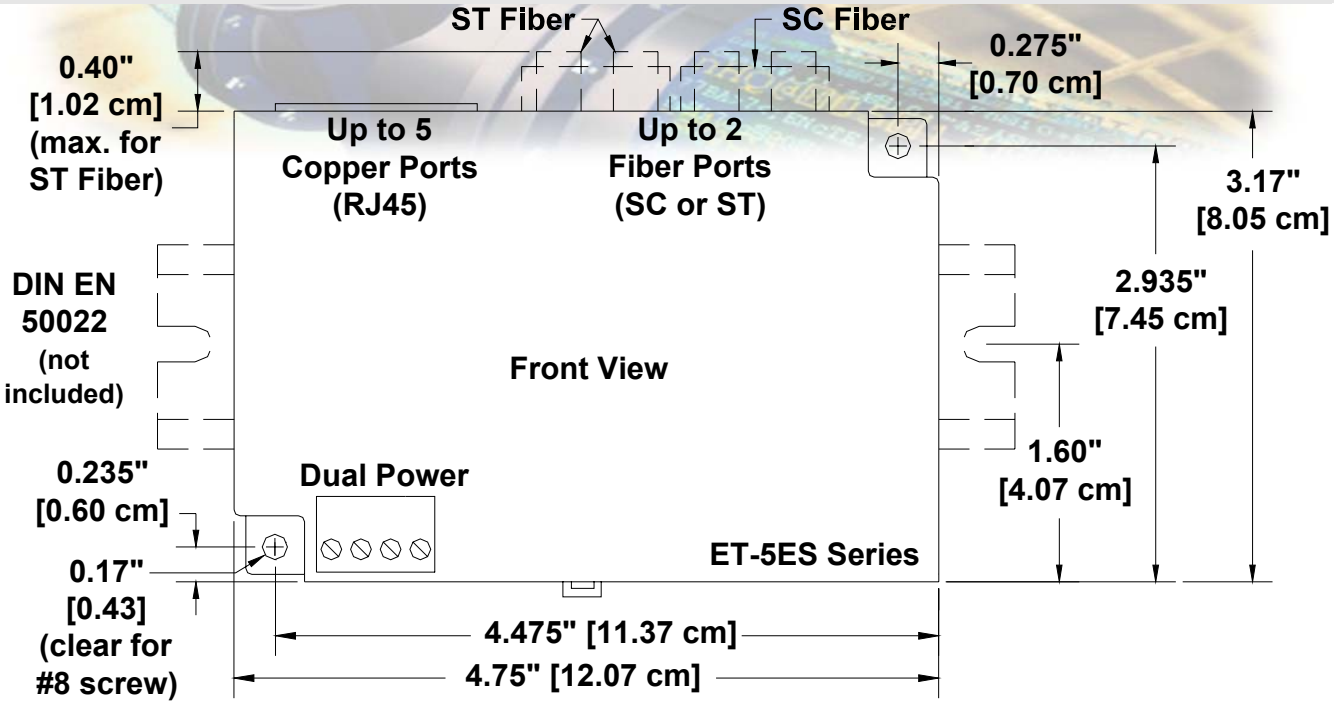
Ethernet Compliance:

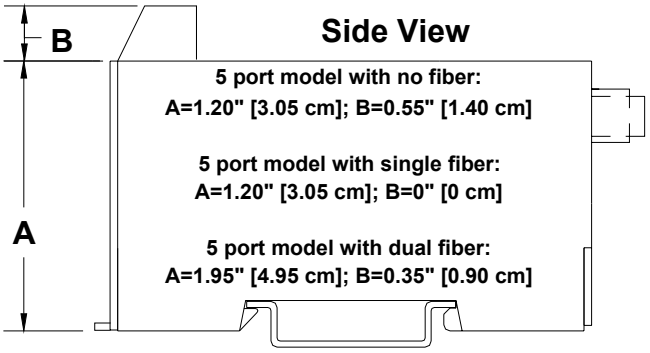
- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)

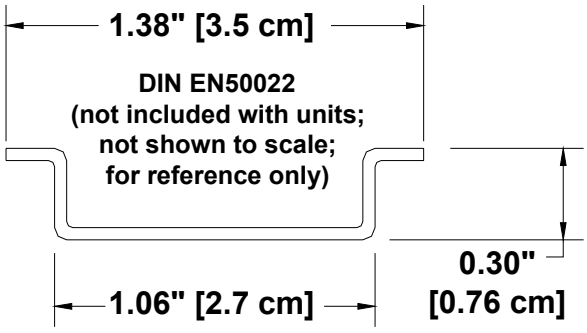
Typical Switch Application:



ET-5ES Mechanical Dimensions

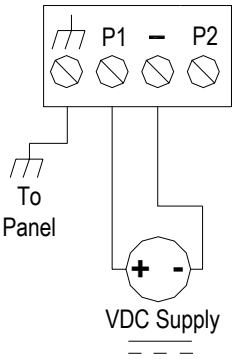




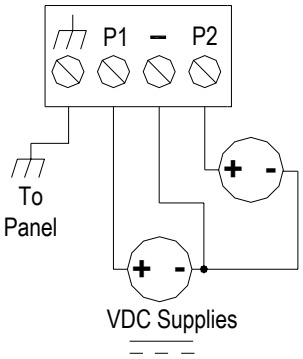


ET-5ES Power and Alarm Connections

Single DC Power



Redundant DC Power



Industrial Ethernet Real-Time Switch with 9 Ports

For Real-time Deterministic Performance and Ultra-Reliability

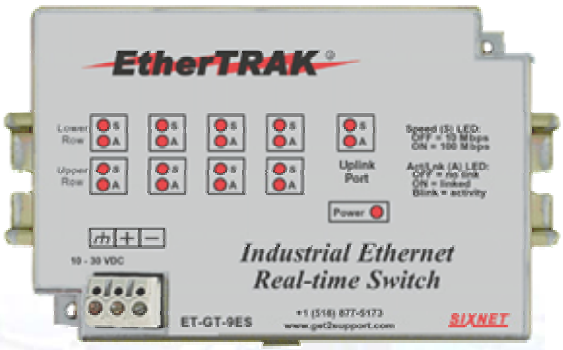
SIXNET Real-time Ethernet Switches have enhanced performance that allows you to achieve real-time deterministic operation. These ruggedized switches are truly industrial hardened to provide superior reliability and are offered with a unique 20-year support promise. They require no user setup and immediately start operating as soon as you power them up. SIXNET switches will make your job easier.

- **Real-time operation**
  - Intelligent routing - No collisions!
  - Ideal for deterministic systems and PLCs
- **SIXNET reliability and long-term support**
  - Ultra-reliable 1,000,000+ hours MTBF
  - Unique 20-year support policy
- **Plug and play simplicity**
  - Auto-sensing for speed and duplex
  - Auto-mdi/mdix-crossover and auto-polarity
- **Rated for harsh industrial environments**
  - -40 to +85 °C operating range
  - Industrial surge protection
  - Certified to perform – see below

Ideal for:

- Real-time control
- Distributed systems
- Outdoor / marine use

All Copper Model: ET-GT-9ES-1



Single Fiber Model: ET-GT-9ES-2ST



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We have been designing industrial hardware such as Remote Terminal Units for over 20 years and have used this expertise to design the toughest Ethernet switches on the market. Don't trust your critical communications to so-called industrial hardware from commercial switch manufacturers. Many of them just screen their products for wide temperature operation. SIXNET switches are specifically design to operate from -40 to 85 °C, and they have over one **billion** running hours without a single temperature related failure to prove it. SIXNET switches give you proven assurance that your system will keep running for years to come.

Certified to Perform:

ISO9001 Certified	Class 1, Div II & Cenelec Zone 2	Marine & Offshore	European Community	UL508 for Safety

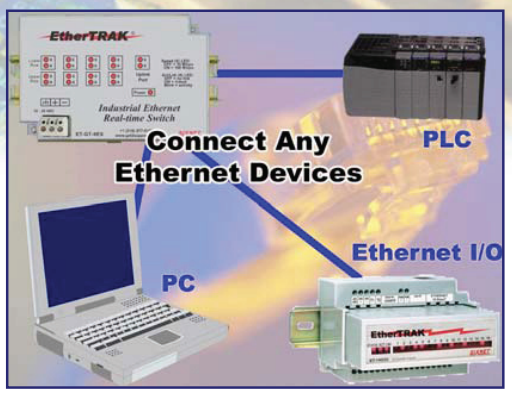
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Industrial Ethernet Real-Time Switch with 9 Ports

SIXNET Industrial Ethernet Switches

Ensure that your critical automation and control communications stays running. These ruggedized switches connect to any Ethernet device and provide the important features you need:

- **Simplify Installation**
- **Increase Reliability**
- **Improve Network Bandwidth**
- **Ensure Real-time Operation**
- **Supports Deterministic Control**



Why a SIXNET Industrial Ethernet Switch?

SIXNET Real-time Switches are truly industrial. SIXNET has over 20 years experience designing Remote Terminal Units for the toughest applications and has applied this expertise to design the most rugged and reliable Ethernet switches. Their tough packaging and protected circuitry keep them working under conditions that may cause other so-called industrial switches to quickly fail. Industrial applications are demanding - it gets hot, it gets cold - the power browns out or spikes wildly - and you need a reliable industrial switch that can keep on going.

Real-time deterministic performance

SIXNET Real-time Switches are one of the best and easiest ways to ensure the real-time operation of your automation and control system. They provide high throughput (3.2 Gbps, non-blocking) to ensure no delays and special handling for the many repeated short messages found in real-time polled systems. With plug and play ease, simply install these active switches and you'll immediately reap the benefits of increased performance. By providing enhanced message routing and eliminating message collision, these switches allow for true network determinism.

SIXNET Switches deliver ultra-reliability

SIXNET Real-time Switches have field-proven reliability of more than 1,000,000 hours MTBF. These SIXNET industrially hardened switches are rated to survive in your harsh environment – even outdoors in marine and military applications. You can count on SIXNET, who has been making industrial hardware for over 20 years!

Industrial switches survive heat & cold

SIXNET industrial switches work reliably through the dead of winter and those hot summer days. Unlike some industrial switches that are only screened commercial switches (this means they are not truly designed for extended temperature operation), SIXNET industrial switches are designed for those places that you don't want to be - over an industry-best temperature range of -40 to 85 °C. Over one billion running hours without a temperature related failure prove that SIXNET industrial switches survive!

Lose those bulky power transformers

SIXNET Real-time switches run directly on the DC power that you already have in your control cabinet. Get rid of those cumbersome AC outlet transformers. No AC power means fewer safety issues. If you ship your equipment internationally, you can forget about the headaches caused by different line voltages and incompatible power plugs.

Forget the Velcro and makeshift brackets

SIXNET industrial switches can be DIN rail or direct panel mounted - right out of the box. Their compact footprint fits easily into equipment-filled enclosures. No extra mounting accessories are need!

SIXNET Industrial Switches Make Your Job Easier

Just snap these switches onto the rail, plug in your network cables, and sit back and watch the data flow, year after year. These switches have been specifically designed to make your job easier.

Industrial Ethernet Real-Time Switch with 9 Ports

Performance Specifications		
General	9 Ethernet ports	
Ethernet switch type	Intelligent store & forward	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX and TD/RD	Auto-crossover and auto-polarity	
Note: Port 9 is an uplink port and requires full duplex and the correct polarity.		
Fiber optic port speed	100BaseFX (100 Mbps)	
Fiber optic port wavelength	1300 nm center	
Fiber multimode (mm) optimal	62.5/125 um (SC or ST connector)	
Fiber singlemode (sm) optimal	9/125 um (SC or ST connector)	
Fiber max. distance (full duplex) (see web for details)	4 km (mm), 20 or 40 km (sm) or more (contact SIXNET)	
Typ. latency for 100 Mbps ports	5 us + frame time	Varies on load
Full or half duplex operation	Yes and settable on the fiber port(s)	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	
Environmental	DIN rail or direct panel mounting	
Input power (typical - all ports active at 100 Mbps) (Max. 8 W)	4.0 W (model -1 without fiber) 6.0 W (model -2 & -3 w/ 1 fiber)	
Power Input	10-30 VDC	
Transient protection	15,000 watts peak	
Spike Protection	5,000 watts (10 times for 10 uS)	
Ethernet isolation	1500 VRMS 1 minute	
Operating temperature range	-40 to +85 °C	
Storage temperature range	-40 to +85 °C	
Humidity (non-condensing)	5 to 95% RH	
Vibration	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, IEEE C37.90	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Marine and off-shore	DNV (Det Norske Veritas)	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging (high temp. Lexan & rust-free aluminum case)	IP20 protection; UL 94V-0	
Dimensions (L x W x H)	See next page	

Specifications are subject to change. Consult factory for latest information.

Ordering Guide

ET-GT-9ES-2SC

SC style fiber connector(s)
ST style fiber connector(s)
SCL for long haul fiber (40 km)
STL on singlemode models

1 – 9 RJ45 ports & no fiber
2 – 8 RJ45 & 1 multimode fiber
3 – 8 RJ45 & 1 singlemode fiber

9ES – 9 port switch

Accessories:	
RM-PS-024-01F	Power supply – AC to 24VDC, 1A
SP-ETH-2	Dual port surge & lightning protector

Hardware Highlights:

- 9 port truly industrial Ethernet switch with an optional fiber optic port (multimode or singlemode)
- Industrial surge and spike protection
- Industrial rated -40 to +85 °C operation (without fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

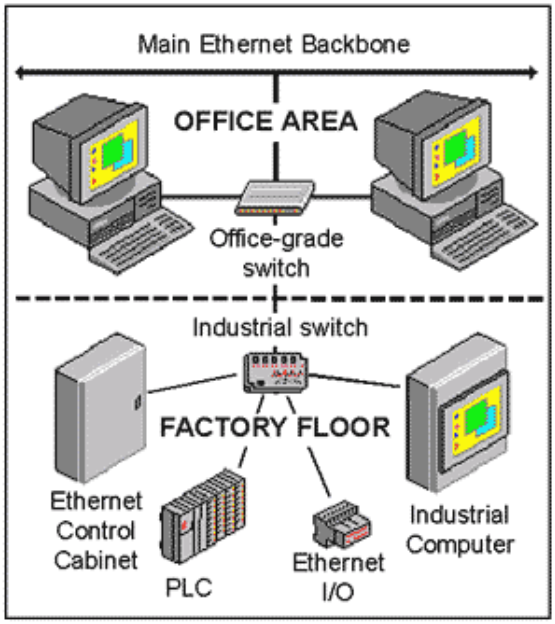
Networking Features:

- Store and forward wire speed switching – no delays
- Support for up to 2048 MAC addresses
- Automatic address learning, aging and migration
- Full-Duplex operation with flow control (no collisions!)
- Auto crossover (MDI/MDIX) and auto polarity

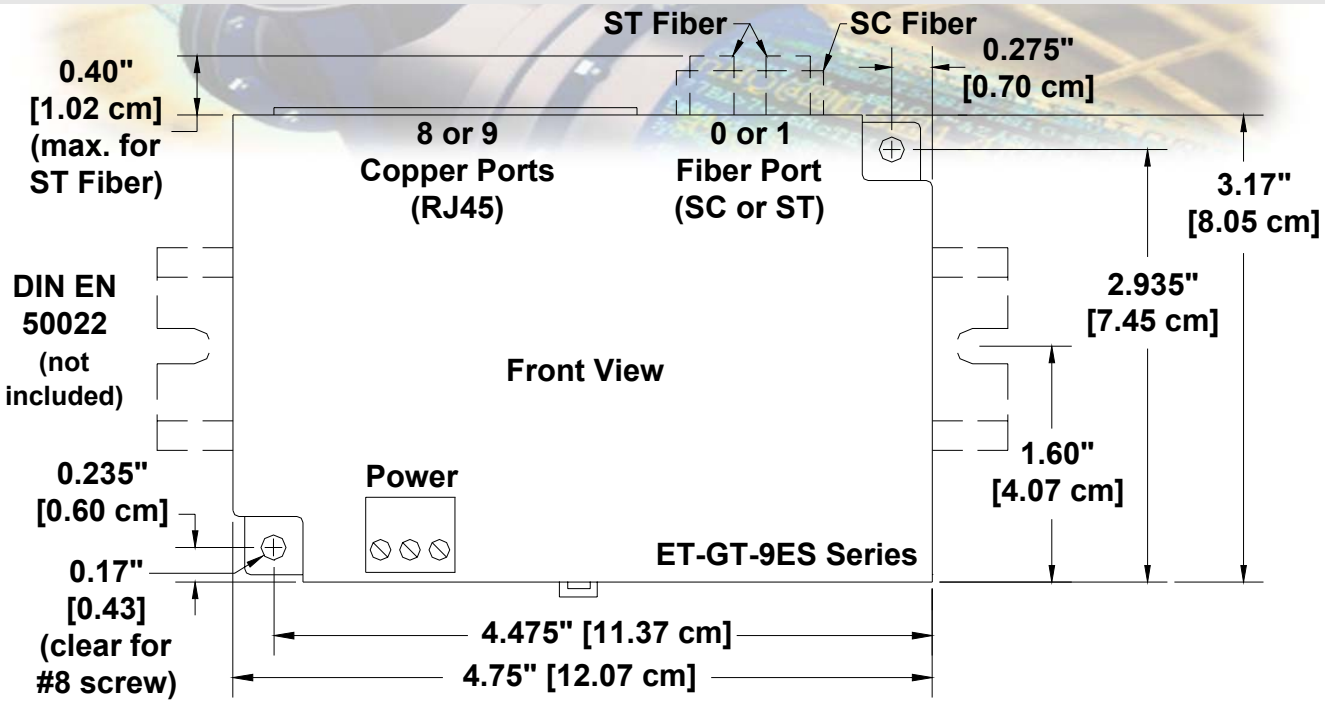
Ethernet Compliance:

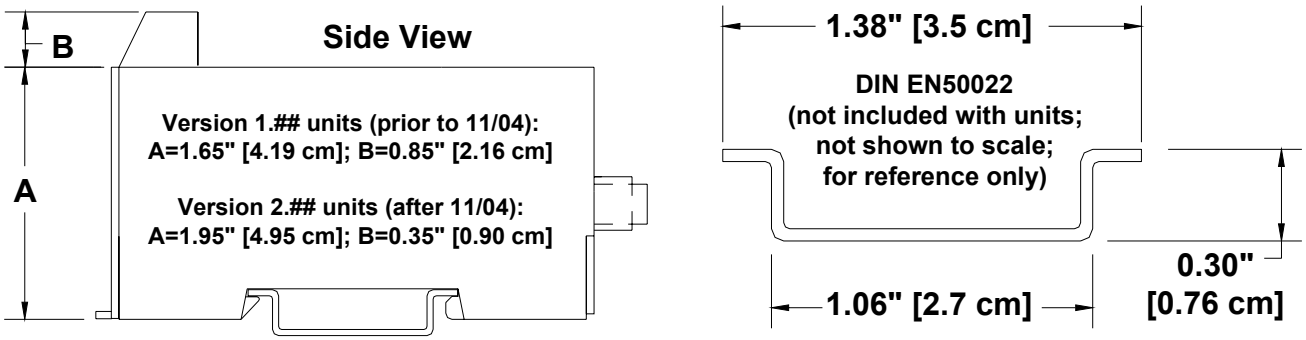
- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)

Typical Switch Application:



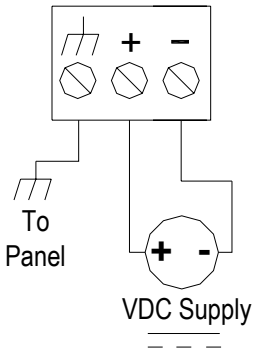
ET-GT-9ES Mechanical Dimensions





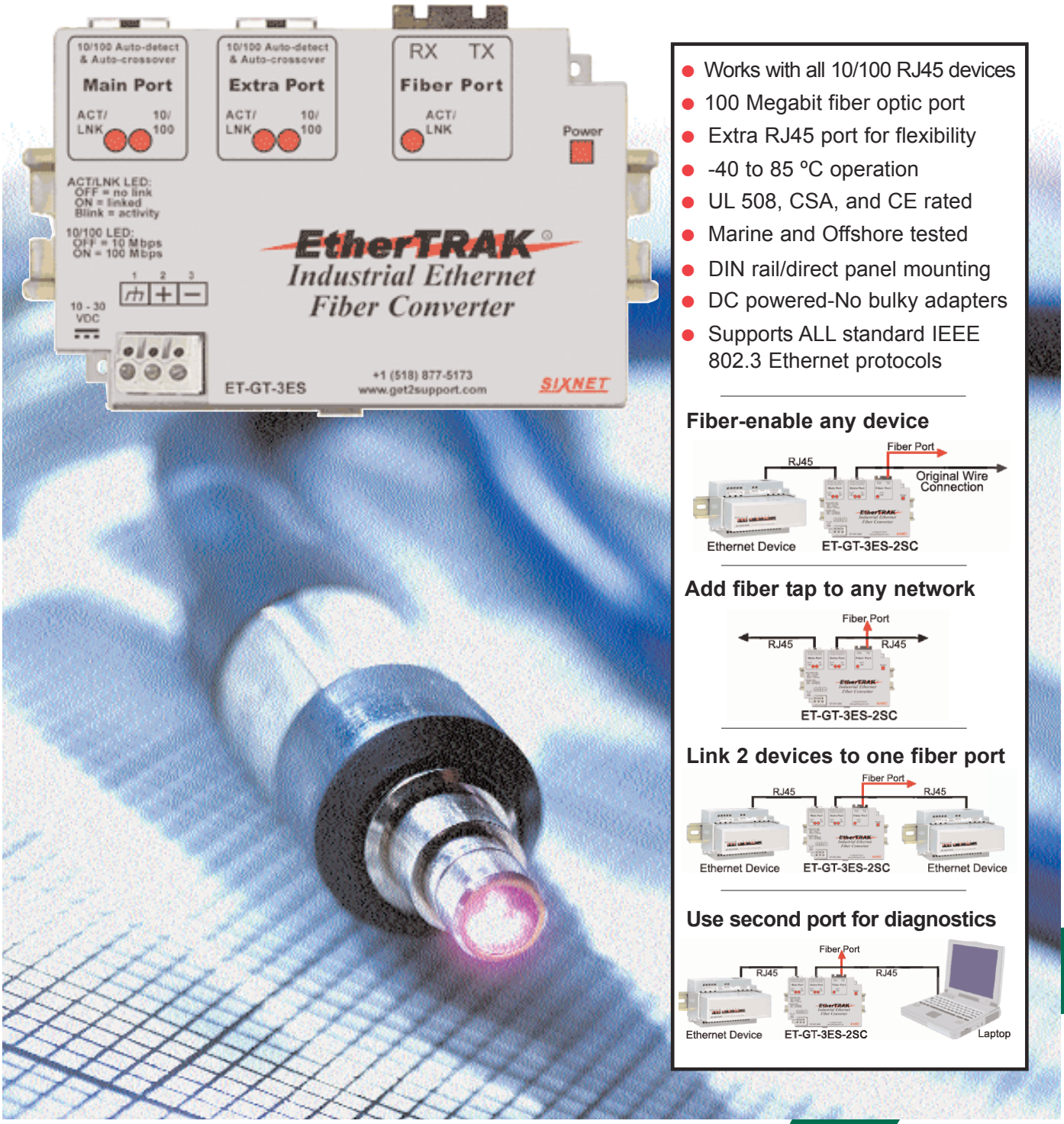
ET-GT-9ES Power and Alarm Connections

DC Power



Industrial Ethernet Fiber Converter

Add a fiber optic port to any industrial Ethernet device.



- Works with all 10/100 RJ45 devices
- 100 Megabit fiber optic port
- Extra RJ45 port for flexibility
- -40 to 85 ºC operation
- UL 508, CSA, and CE rated
- Marine and Offshore tested
- DIN rail/direct panel mounting
- DC powered-No bulky adapters
- Supports ALL standard IEEE 802.3 Ethernet protocols

Fiber-enable any device

Add fiber tap to any network

Link 2 devices to one fiber port

Use second port for diagnostics

Make any Ethernet Device “Fiber Optic Ready”



SIXNET Industrial Fiber Converter

Now, any industrial Ethernet device can connect to a high reliability fiber optic network. This ultra-rugged RJ45 converter is rated for your tough industrial environments. Run the fiber cable right to the place you need it most - the electrical cabinet right on the plant floor.

Upgrade Older Equipment

Speed up 10BaseT (10 Megabit) Ethernet devices with a 100 Megabit upgrade. This intelligent converter automatically senses speed and provides both a 100BaseTx and 100BaseFx uplink. Be ready for the future with both copper and fiber fast Ethernet ports.

Why an Industrial Ethernet Converter?

SIXNET industrial converters are designed for industrial environments. Their rugged packaging and protected circuitry keep them working under conditions that may cause cheap office-grade units to fail. Industrial applications are demanding - it gets hot, it gets cold - the power browns out or spikes wildly - and you need a reliable industrial switch that can keep on going.

Real-time deterministic performance

This converter is built upon industrial Ethernet switch technology. Intelligent message routing avoids collisions and reduces network loading. Increase the throughput of real-time systems and achieve deterministic results.

Fiber optics increase distance and reliability.

Fiber optic cables are absolutely immune to electrical and magnetic interference. Fiber optics cannot be damaged by voltage transients. You will never spend time tracking down a ground loop in a fiber optic network. This is because an optical cable is not an electrical device. Fiber optic cabling not only enhances reliability, it saves all the time you might have spent tracking down those nasty communications problems. In addition, fiber cables increase the allowable direct cable lengths to 40km or more.

Industrial converter survives heat & cold

SIXNET industrial converters work reliably through the dead of winter and those hot summer days. Unlike office-grade devices that are intended only for use in air conditioned offices, SIXNET industria converters are designed for those places that you don’t want to be - over a temperature range of -40 to 85 ^{o}C.

Minimize your wiring headaches

Eliminate unwieldy bundles of ethernet cables by placing these efficient wiring concentrators right on the plant floor. Simpler and shorter cabling means higher reliability, too!

Forget the Velcro and makeshift brackets

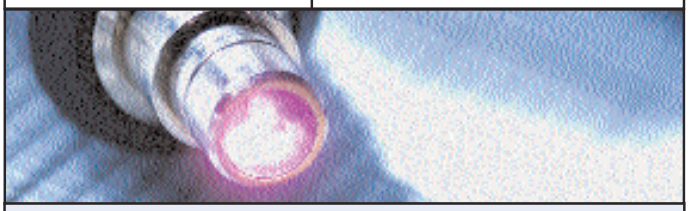
SIXNET industrial converters can be DIN rail or direct panel mounted. Their compact footprint fits easily into equipment-filled enclosures.

Lose those bulky power transformers

SIXNET industrial convertes run directly on the DC power that you already have in your control cabinet. Get rid of those cumbersome AC outlet transformers. No AC power means fewer safety issues. If you ship your equipment internationally, you can forget about the headaches caused by different line voltages and incompatible power plugs.

Performance Specifications

Basic operation	Unmanaged, store & forward
RJ45 ports (shielded)	10/100BaseT(x)
RJ45 speed (auto-negotiating)	10 Mbps or 100 Mbps
Fiber optic port (dual SC or ST)	Multimode or singlemode
Fiber optic port speed	100 Mbps (100BaseFX)
Fiber port wavelength	1300 nm center
Optimal fiber multimode (mm)	50/125 um, 62.5/125 um
Optimal fiber singlemode (sm)	9/125 um, 10/125 um
Fiber maximum distance	4 km (mm), 20 km (sm) or 40+ km
Ethernet protocols supported	All standard IEEE 802.3
Memory bandwidth	3.2 Gbps
Completely compliant	IEEE 802.3 & IEEE 802.3u
Full or half duplex operation	Auto-sensing on RJ45 ports; Switchable on fiber port
MAC addresses supported	1K (automatic learning, aging, and migration)
Ethernet isolation	1500 VRMS 1 minute
Required supply voltage	10-30 VDC
Power consumption (typical)	2 W
Operating and storage temp.	-40 to +85 °C
Humidity (non-condensing)	5 to 95% RH
Flammability	UL 94V-0 materials
Electrical safety	UL 508, CSA C22/14; EN61010-1 (IEC1010) CE
EMI emissions	FCC part 15, ICES 003, EN55022, Class B CE
EMC immunity	EN61326-1 (EN61000-4-2, 3, 4, and 6) CE
Surge withstand	IEEE-472 (ANSI C37.90)
Vibration	IEC68-2-6
Hazardous locations	UL 1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11



Ordering Information

Part Number	Description
ET-GT-3ES-2SC	Fiber converter with 2 RJ45 and 1 SC style fiber port (multimode)
ET-GT-3ES-3SC	Fiber converter with 2 RJ45 and 1 SC style fiber port (singlemode)
Ethernet Switches	Refer to Ethernet Switch Datasheet

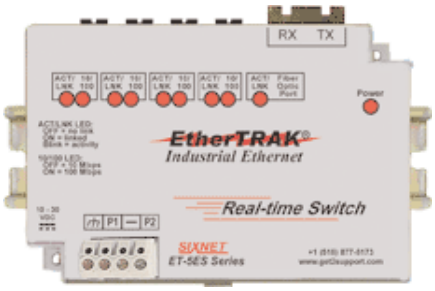
NOTE1: For ST style connectors just substitute "ST" for "SC" in the part numbers above.

NOTE2: Contact SIXNET for singlemode long haul fiber ports for 40 km or more.

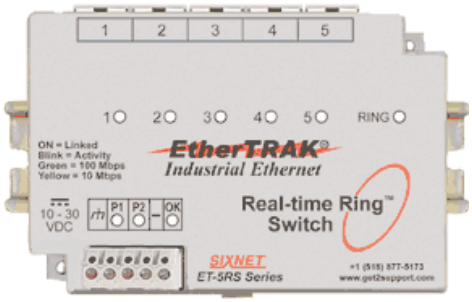
Accessories	
RM-PS-024-01F	Universal AC/DC power supply (24 VDC, 1 AMP)
SP-ETH-2	Ethernet surge & lightning protector (protects 2 RJ45 ports)

NOTE: Each SP-ETH-2 includes a grounding kit and two Ethernet patch cables.

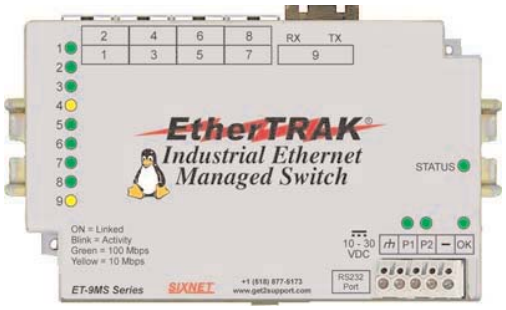
Other SIXNET Industrial Switches



Five & nine port switches for small automation cells



Real-time Ring™ Switches for fault-tolerant rings



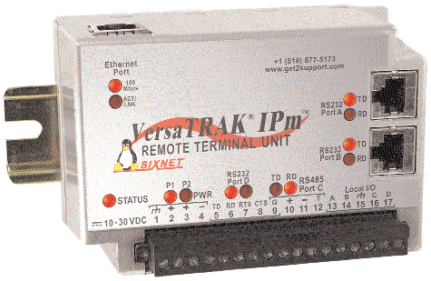
Managed Switches with SNMP, VLAN, IGMP, and much more

A Complete Family of I/O Solutions

Ethernet I/O



Remote Terminal Unit



Industrial Phone Modems



Ethernet and RS485 I/O

SIXNET can provide you the building blocks for the open systems you are looking for. Three complementary families of modular DIN rail mounted I/O provide local, remote, enterprise level, or Internet I/O solutions.

Ethernet-Ready RTU

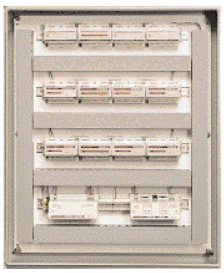
SIXNET IPm is a combination of installation-ready industrial controllers & RTUs and a wealth of powerful software solutions. IPm offers the reliability of a PLC, the familiarity of powerful Windows programming and configuration utilities, all combined with powerful open-source Linux flexibility.

Industrial Modems

SIXNET rugged industrial modems eliminate the hassles of mounting a telephone modem in an industrial enclosure. These robust modems are rated for -30 to +70 °C industrial operation.

TrakPAK Packaged Systems

SIXNET delivers complete I/O cabinets that come to you designed; built; tested; and ready for installation.



Unmanaged Industrial Ethernet Switch 5 Ports

eSWITCH is a low cost, powerfull, industrial and highly integrated device with five ports 10/100 Mbps TX Full/Half duplex.

eSWITCH is the ideal companion of the eWON Product family.



Features

- DIN Rail Mounting
- 24VDC power supply
- Five RJ45 ports supporting
  - 100 Base-Tx (100 Mbits/s with RJ45 connector)
  - 10 Base-T (10 Mbits/s with RJ45 connector)
  - Full Duplex Mode
  - Half Duplex Mode
  - Straight Connection
  - Crossed Connection
- IEEE 802.3u auto-negociation with as priority:
  - 100 Base-Tx full duplex
  - 100 Base-Tx half duplex
  - 10 Base-T full duplex
  - 10 Base-T half duplex
- Automatic Mode Switching
- Up to 2048 MAC addresses in Internal Table
- Hash algorithm learning method
- Broadcasts only if destination address not in table

Typical Applications

- Remote eWON local Ethernet network
- Industrial small Ethernet network connectivity

Unmanaged Industrial Ethernet Switch 5 Ports

Power Supply

Specification	Value
Pinout	❶ = Ground ❷ = Positive
Connector Manufacturer	Phoenix
Connector Type	GMSTB 2,5/2-STF-7,62
Voltage	12 to 24 VDC +/-20%
Security	SELV-compliant
Max Current	300 mA max.
Current Protection	300 mA by auto fuse (**)
Voltage Protection	30V by varistor
EMI filter	Common mode filter (*)
Power absorbed (typical)	3 Watts



(*) Grounding properly the unit with the earth screw located at the rear side is a must to ensure the security and the electromagnetic compatibility (EMC) of the device.

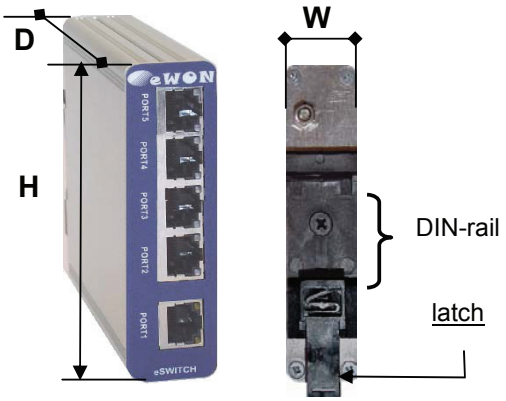


(**) An auto fuse is located just after the power input in order to protect the eSWITCH against short circuit. The auto fuse returns by itself to normal state when short circuit has disappeared and after that the t° of the eSWITCH comes back to normal.

Mechanical Design

Like all of the eWON family members,
the eSWITCH has a robust Aluminium Housing.

Height	**H** = 105 mm
Width	**W** = 26mm
Depth	**D** = 120mm
Weight	300 g
Temp.	0 - 55°C
Humidity	0 - 80% (non condensed)



LED Conventions

Event	Upper LED	Lower LED
Power ON	1s Red – 1s Green – OFF	1s Red – 1s Red – OFF
100 Mbits/s	OFF	Permanent RED
Activity 100 Mbits/s	Blinking Green	Permanent RED
10 Mbits/s	OFF	OFF
Activity 100 Mbits/s	Blinking Red	OFF



Product Reference

Reference	Description
ES10205	eSWITCH 4TX + 1TX 24 VDC

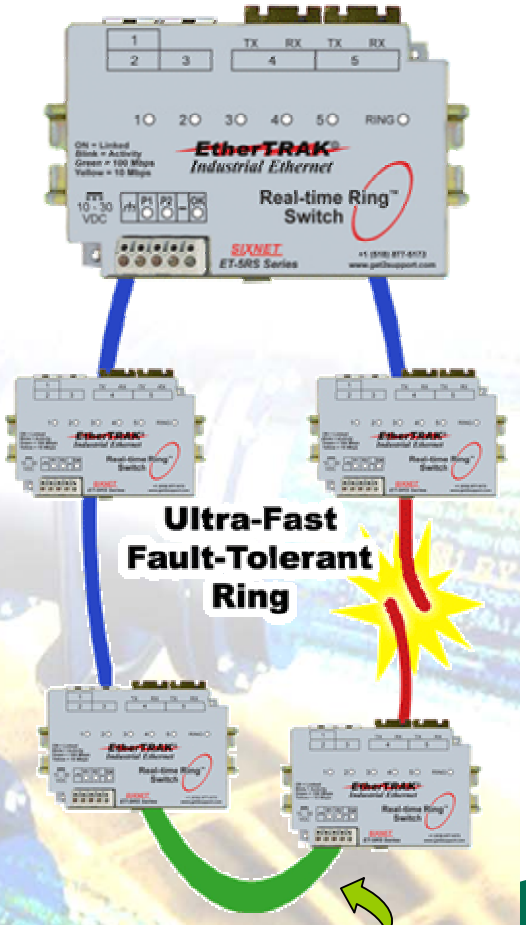
Fault-tolerant Ethernet Switches for Deterministic Systems

SIXNET Real-time Ring™ switches provide very fast, fault-tolerant network redundancy and prioritized message delivery needed in critical real-time systems. Real-time Rings self-configure and just run, without t complex configuration steps required by alternative solutions. This break-through product delivers reliabilit and performance, saves you money, and makes your job easier.

- **Real-time fault-tolerant rings**
  - Recovery time of 30 mS plus 5 mS per hop!
  - Ideal for deterministic systems and PLCs
  - Real-time Modbus over Ethernet monitoring
- **Real-time traffic prioritization**
  - Assure delivery of real-time data
  - Improve network utilization (see page 2)
  - User settable priority assignments
- **Managed Switch features – at a lower cost**
  - User configurable port settings
  - Port mirroring for traffic diagnostics
  - Pre-configurable for plug and play simplicity
- **SIXNET reliability and long-term support**
  - Ultra-reliable 1,000,000 hours MTBF
  - Unique 20-year support policy
  - Firmware upgrades are FREE forever
- **Certified for harsh industrial environments**
  - -40 to +85 °C operating range
  - Dual power inputs – protected to 250 volts
  - UL, CSA, CE, DNV and CENELEC rated

Ideal for:

- Real-time control
- Distributed systems
- Outdoor / marine use



Ensure the reliability of your network with ultra-fast automatic switchover on a segment failure.

Certified to Perform:

ISO9001 Certified	Class 1, Div II & Cenelec Zone 2	Marine & Offshore	European Community	UL508 for Safety

Real-Time Ring™ Switch with 5 Ports

Performance Specifications

General	5 Ethernet ports	
Ethernet switch type	Intelligent store & forward	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Fiber optic port speed	100BaseFX (100 Mbps)	
Fiber optic port wavelength	1300 nm center	
Fiber multimode (mm) optimal	62.5/125 um (SC or ST connector)	
Fiber singlemode (sm) optimal	9/125 um (SC or ST connector)	
Fiber max. distance (full duplex) (see web for details)	4 km (mm), 20 or 40 km (sm) or more (contact SIXNET)	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	
Status Reporting	Power & operational status	
Modbus status registers	Modbus Ethernet over UDP	
"OK" contact output	Sourcing power @ 0.5 Amp	
Real-Time Ring™ Features	SIXNET Exclusive	
Maximum switches in ring	50+	
Dual ring support	Yes	
Link loss recovery time	30 mS plus 5 mS per hop	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (typical - all ports active at 100 Mbps) (Max. 8 W)	4.0 W (model -1 without fiber) 5.0 W (model -2 & -3 w/ 1 fiber) 6.0 W (models -4 & -5 w/ 2 fiber)	



Power Input	10-50 VDC (Derate 1.8°C / V above 30V)	
Extended power protection	Standard with all models	
Military surge protection	Exceeds MIL-STD-1275; 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)	
Ethernet isolation	1500 VRMS 1 minute	
Operating temperature range	-40 to +85 °C	
Storage temperature range	-40 to +85 °C	
Humidity (non-condensing)	5 to 95% RH	
Vibration	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, IEEE C37.90	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Marine and off-shore	DNV (Det Norske Veritas)	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging (high temp. Lexan & rust-free aluminum case)	IP30 protection; UL 94V-0	
Dimensions (L x W x H)	See next page	

Specifications are subject to change. Consult factory for latest information.

Hardware Highlights:

- 5 port truly industrial Ethernet switch with up to two fiber optic ports (multimode or singlemode)
- Output for reporting power and operational status
- Redundant power inputs and enhanced surge/spike protection (meets MIL-STD-1275 on all models)
- Industrial rated -40 to +85 °C operation (without fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Store and forward wire speed switching – no delays
- Support for up to 2048 MAC addresses
- Automatic address learning and aging
- Full-Duplex operation with flow control (no collisions!)
- Auto crossover (MDI/MDIX) and auto polarity
- Real-Time Ring™ for ultra-fast fault-tolerant loops
- Priority queuing for real-time network performance
- Message filtering to prevent broadcast storms
- Port mirroring for advanced diagnostics
- Easy to use Windows configuration utility

Ethernet Compliance:

- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1p (QoS / CoS – Quality & Class of Service)

Pre-configured To Make Your Job Easier!

Ordering Guide

ET-5RS-4SC-E1

0 Pre-set for 0 rings (special order)
1 Pre-set for 1 ring (standard)
2 Pre-set for 2 rings (special order)
C Custom configured for you

E extended power is standard

SC style fiber connector(s)
ST style fiber connector(s)
SCL for long haul fiber (40 km)
STL on singlemode models

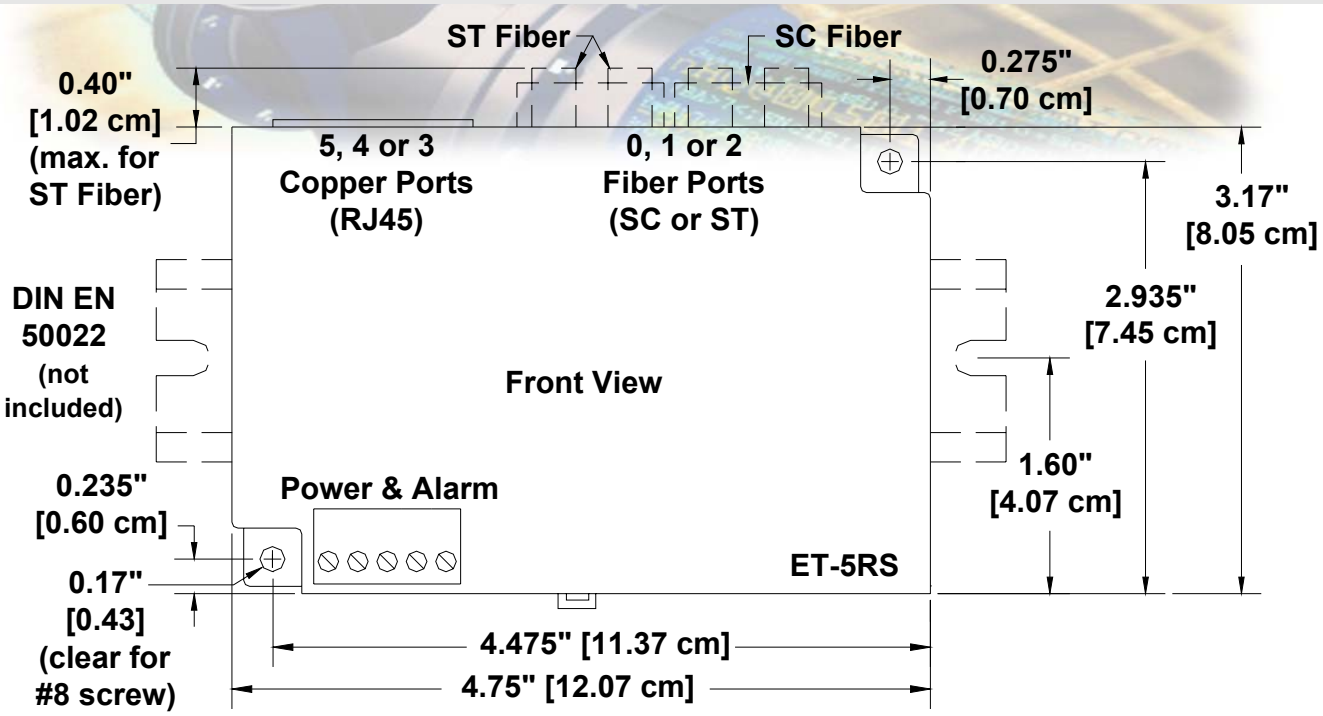
1 (5 RJ45 ports & no fiber)
2 (4 RJ45 & 1 multimode fiber)
3 (4 RJ45 & 1 singlemode fiber)
4 (3 RJ45 & 2 multimode fiber)
5 (3 RJ45 & 2 singlemode fiber)

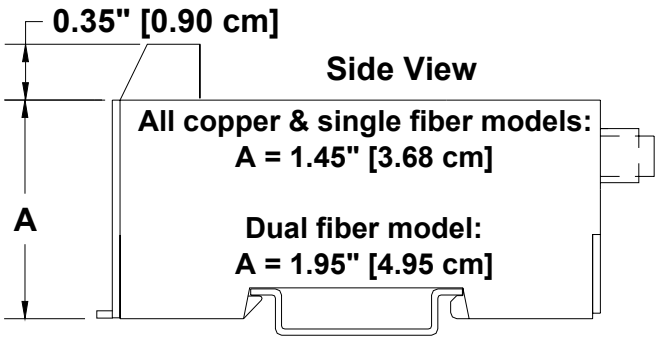
Part # Example: ET-5RS-4SC-E1 has 3 RJ45 & 2 SC multimode fiber w/ ports 4 & 5 pre-set for a ring.

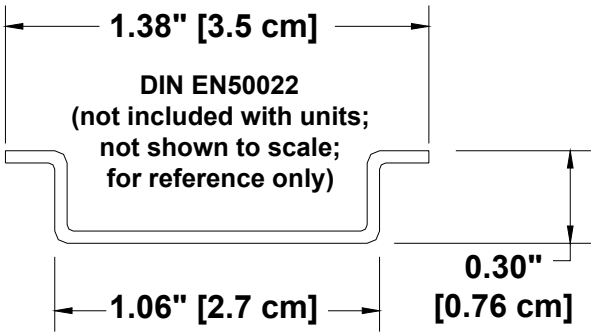
Accessories:	
Setup Wizard	**Free** Windows configuration tool
RM-PS-024-01F	Power supply – AC to 24VDC, 1A
SP-ETH-2	Dual port Ethernet surge and lightning protector

0907

ET-5RS Mechanical Dimensions

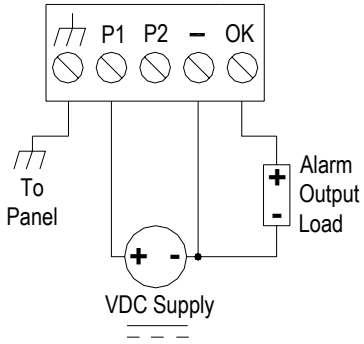




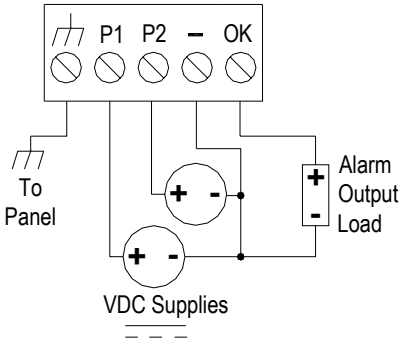


ET-5RS Power and Alarm Connections

Single DC Power



Redundant DC Power



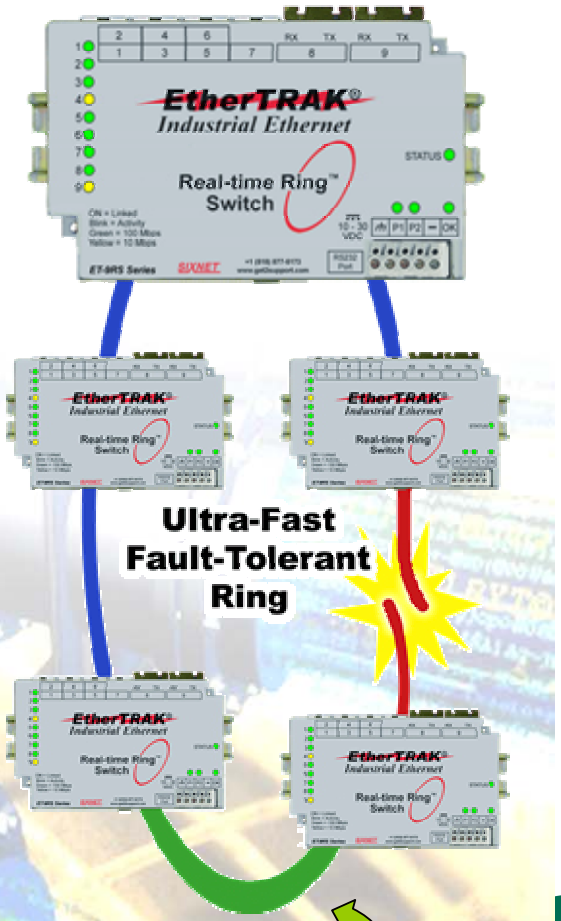
Fault-tolerant Ethernet Switches for Deterministic Systems

SIXNET Real-time Ring™ switches provide very fast, fault-tolerant network redundancy and prioritized message delivery needed in critical real-time systems. Real-time Rings self-configure and just run, without the complex configuration steps required by alternative solutions. This break-through product delivers reliability and performance, saves you money, and makes your job easier.

- **Real-time fault-tolerant rings**
  - Recovery time of 30 mS plus 5 mS per hop!
  - Ideal for deterministic systems and PLCs
  - Real-time Modbus over Ethernet monitoring
- **Real-time traffic prioritization**
  - Assure delivery of real-time data
  - Improve network utilization (see page 2)
  - User settable priority assignments
- **Managed Switch features – at a lower cost**
  - User configurable port settings
  - Port mirroring for traffic diagnostics
  - Pre-configurable for plug and play simplicity
- **SIXNET reliability and long-term support**
  - Ultra-reliable 1,000,000 hours MTBF
  - Unique 20-year support policy
  - Firmware upgrades are FREE forever
- **Certified for harsh industrial environments**
  - -40 to +85 °C operating range
  - Dual power inputs – protected to 250 volts
  - UL, CSA, CE, DNV and CENELEC rated

Ideal for:

- Real-time control
- Distributed systems
- Outdoor / marine use



Ensure the reliability of your network with ultra-fast automatic switchover on a segment failure.

Backup path quickly restores communications

Certified to Perform:

ISO9001 Certified

Class 1, Div II & Cenelec Zone 2

Marine & Offshore

European Community

UL508 for Safety

Real-Time Ring™ Switches Deliver Ultra-Dependable Results

Fault-tolerant Systems Survive Network Breaks

Real-time Rings have an alternative network path in constant readiness. When a network node or cable segment fails, the Real-time Ring instantly redirects the traffic through the alternative path of the ring.

Achieve Deterministic Performance

Rings are simple by design. The alternative path is unique and well known and the action to take when a failure occurs is predetermined. Ring Switches use this knowledge to deliver deterministic performance, with recovery times of 5 mS per hop plus some overhead. (The link loss recovery is 30 mS plus 5 mS times the number of Real-time Ring Switches in the ring. For example, 10 ring switches will recover in less than 80 mS.)

Avoid the High Cost and Complexity of Managed Switches

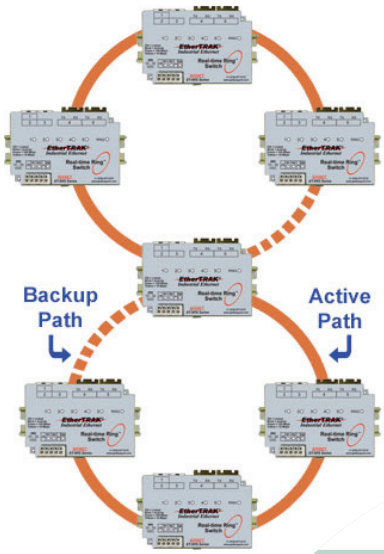
Real-time Ring Switches are the ideal way to achieve fault tolerance without the higher cost and complexity of Managed Switches. In most situations, Real-time Ring Switches will do what you need with just the factory pre-configuration. A simple Windows wizard (supplied at no cost) allows you to fine tune the performance if you like. These auto-configuring switches eliminate the learning curve associated with more complex network devices. Now you can get the job done without needing help from the "IT" department.

Priority Queuing For Real-time Performance

Customers tell us that the new security cameras added to their networks are slowing down their real-time data delivery. Real-time Ring Switches can tag the camera ports as lower priority (or you can set the critical data as a higher priority). In any event, the data will travel from switch to switch using priority queuing best suited for your situation. Real-time Ring switches will cure your data overload headaches – without significant effort or expense!

Connect Independent Rings Together

Real-time Ring Switches may be members of more than one ring. This capability permits you to design fast, work-cell oriented rings that are joined to each other to exchange information.
(Smaller rings recover faster and are inherently more reliable.)



Mix Real-Time Rings and Managed Switches

SIXNET Industrial Managed Switches also support the Real-time Ring technology. Finally, there is a way to mix low cost Real-time Switches and Managed Switches in the same network. Achieve the optimum mix of performance and cost that is ideal for you.

Alarm Output and Modbus Avoid Future Problems

An “OK” contact assures that the redundant power inputs and the ring (or rings) are complete. Modbus registers report the readiness of individual ports to your SCADA or control system.
This is a SIXNET exclusive feature.

Real-time Switches Deliver Ultra-Reliability

Real-time Ring Switches have field-proven reliability of more than 1,000,000 hours MTBF. These SIXNET industrially hardened switches are certified to survive in your harsh environment – Even outdoors in marine and military applications.

SIXNET Industrial Switches Make Your Job Easier

In most applications, the factory pre-configuration will just work for you. Snap these switches onto the rail, plug in your network cables, and sit back and watch the data flow, year after year. These switches have been specifically designed to make your job easier.

Real-Time Ring™ Switch with 9 Ports

Performance Specifications

General	9 Ethernet ports	
Ethernet switch type	Intelligent store & forward	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Fiber optic port speed	100BaseFX (100 Mbps)	
Fiber optic port wavelength	1300 nm center	
Fiber multimode (mm) optimal	62.5/125 um (SC or ST connector)	
Fiber singlemode (sm) optimal	9/125 um (SC or ST connector)	
Fiber max. distance (full duplex) (see web for details)	4 km (mm), 20 or 40 km (sm) or more (contact SIXNET)	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	
Status Reporting	Power & operational status	
Modbus status registers	Modbus Ethernet over UDP	
"OK" contact output	Sourcing power @ 0.5 Amp	
Real-Time Ring™ Features	SIXNET Exclusive	
Maximum switches in ring	50+	
Dual ring support	Yes	
Link loss recovery time	30 mS plus 5 mS per hop	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (typical - all ports active at 100 Mbps) (Max. 9 W)	6.0 W (model -1 without fiber) 7.0 W (model -2 & -3 w/ 1 fiber) 8.0 W (models -4 & -5 w/ 2 fiber)	



Power Input	10-50 VDC (Derate 1.8°C / V above 30V)	
Extended power protection	Standard with all models	
Military surge protection	Exceeds MIL-STD-1275; 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)	
Ethernet isolation	1500 VRMS 1 minute	
Operating temperature range	-40 to +85 °C	
Storage temperature range	-40 to +85 °C	
Humidity (non-condensing)	5 to 95% RH	
Vibration	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, IEEE C37.90	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Marine and off-shore	DNV (Det Norske Veritas)	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging (high temp. Lexan & rust-free aluminum case)	IP30 protection; UL 94V-0	
Dimensions (L x W x H)	See next page	

Specifications are subject to change. Consult factory for latest information.

Hardware Highlights:

- 9 port truly industrial Ethernet switch with up to two fiber optic ports (multimode or singlemode)
- Output for reporting power and operational status
- Redundant power inputs and enhanced surge/spike protection (meets MIL-STD-1275 on all models)
- Industrial rated -40 to +85 °C operation (without fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Store and forward wire speed switching – no delays
- Support for up to 2048 MAC addresses
- Automatic address learning and aging
- Full-Duplex operation with flow control (no collisions!)
- Auto crossover (MDI/MDIX) and auto polarity
- Real-Time Ring™ for ultra-fast fault-tolerant loops
- Priority queuing for real-time network performance
- Message filtering to prevent broadcast storms
- Port mirroring for advanced diagnostics
- Easy to use Windows configuration utility

Ethernet Compliance:

- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1p (QoS / CoS – Quality & Class of Service)

Pre-configured To Make Your Job Easier!

Ordering Guide

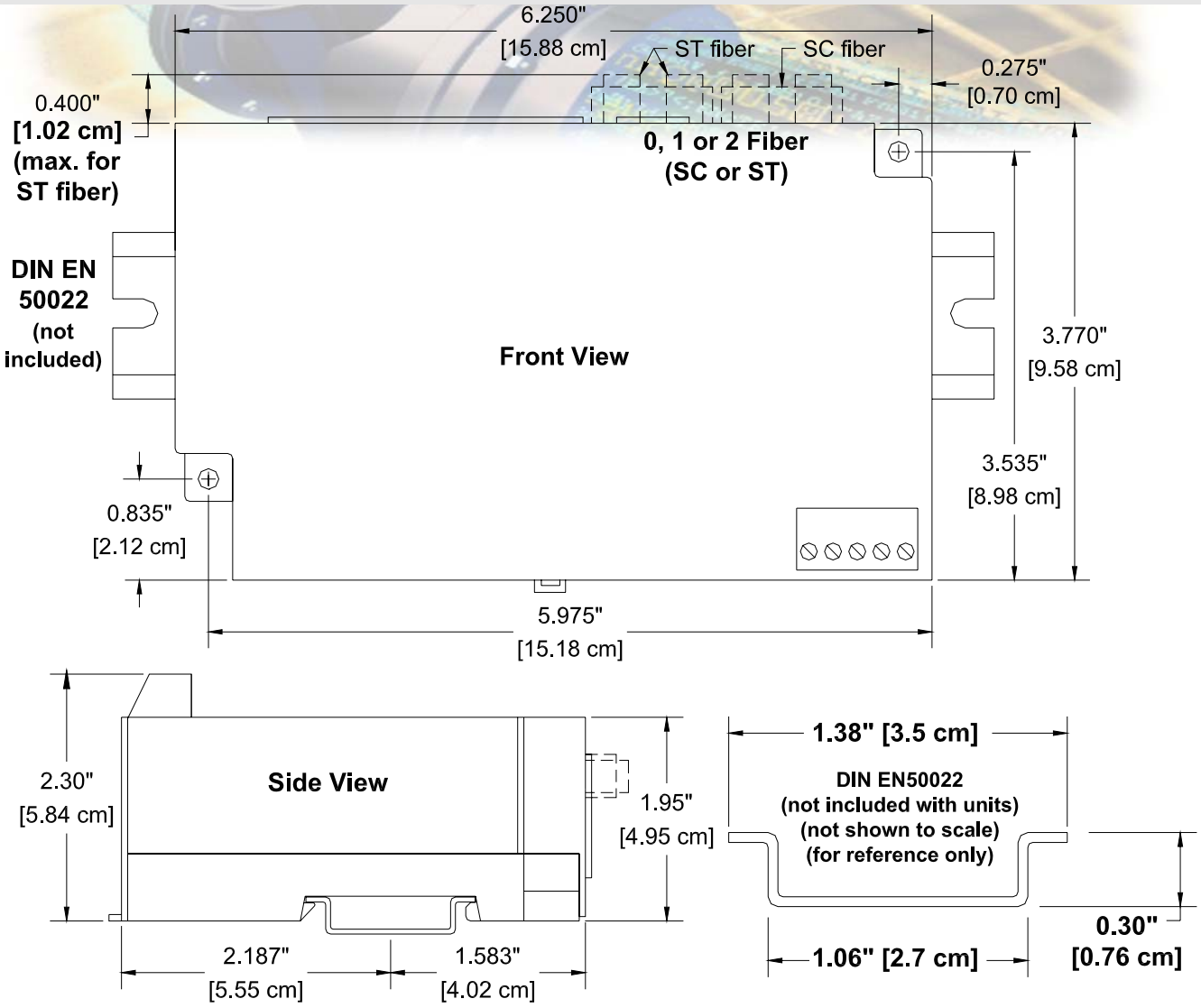
ET-9RS-4SC-E1

- **0** Pre-set for 0 rings (special order)
- **1 Pre-set for 1 ring (standard)**
- **2** Pre-set for 2 rings (special order)
- **C** Custom configured for you
- **E** extended power is standard
- **SC** style fiber connector(s)
- **ST** style fiber connector(s)
- **SCL** for long haul fiber (40 km)
- **STL** on singlemode models
- **1** (9 RJ45 ports & no fiber)
- **2** (8 RJ45 & 1 multimode fiber)
- **3** (8 RJ45 & 1 singlemode fiber)
- **4** (7 RJ45 & 2 multimode fiber)
- **5** (7 RJ45 & 2 singlemode fiber)

Part # Example: ET-9RS-4SC-E1 has 7 RJ45 & 2 SC multimode fiber w/ ports 8 & 9 pre-set for a ring.

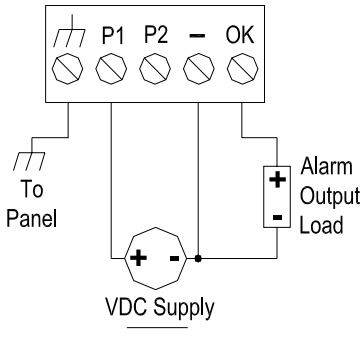
Accessories:	
Setup Wizard	**Free** Windows configuration tool
RM-PS-024-01F	Power supply – AC to 24VDC, 1A
SP-ETH-2	Dual port Ethernet surge and lightning protector

ET-9RS Mechanical Dimensions

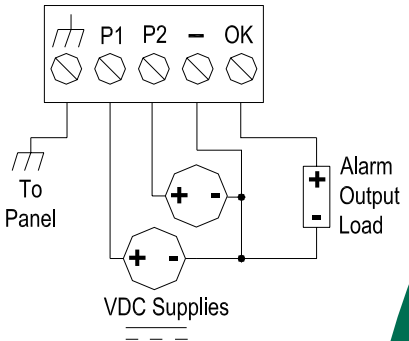


ET-9RS Power and Alarm Connections

Single DC Power



Redundant DC Power

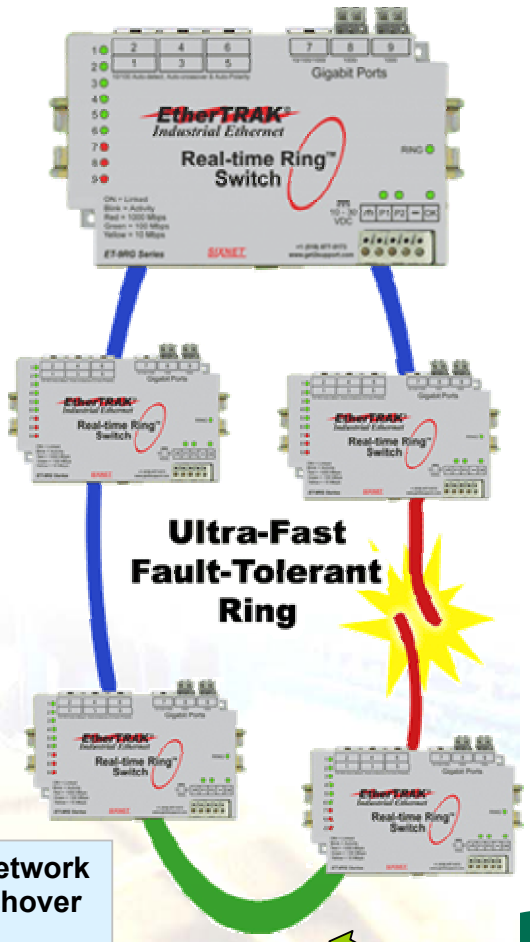


Fault-tolerant Ethernet Switches for Deterministic Systems

SIXNET Real-time Ring™ switches provide very fast, fault-tolerant network redundancy and prioritized message delivery needed in critical real-time systems. Real-time Rings self-configure and just run, without the complex configuration steps required by alternative solutions. This break-through product delivers reliability and performance, saves you money, and makes your job easier.

Ideal for:
- Real-time control
- Distributed systems
- Outdoor / marine use

- **3 Gigabit ports for super fast connections**
  - One auto-detecting 10/100/1000 RJ45 port
  - Two flexible Gigabit ports for fiber or copper
  - Gigabit fiber connections up to 70+ km
- **Real-time fault-tolerant rings**
  - Recovery time of 30 mS plus 5 mS per hop!
  - Ideal for deterministic systems and PLCs
  - Real-time Modbus over Ethernet monitoring
- **Real-time traffic prioritization**
  - Assure delivery of real-time data
  - Improve network utilization (see page 2)
  - User settable priority assignments
- **Managed Switch features – at a lower cost**
  - User configurable port settings
  - Port mirroring for traffic diagnostics
  - Pre-configurable for plug and play simplicity
- **SIXNET reliability and long-term support**
  - Ultra-reliable 1,000,000 hours MTBF
  - Unique 20-year support policy
  - Firmware upgrades are FREE forever
- **Certified for harsh industrial environments**
  - -40 to +85 °C operating range
  - Dual power inputs with superior spike protection
  - UL, CSA, CE, DNV and CENELEC rated



Ensure the reliability of your network with ultra-fast automatic switchover on a segment failure.

Backup path quickly restores communications

Certified to Perform:

ISO9001 Certified

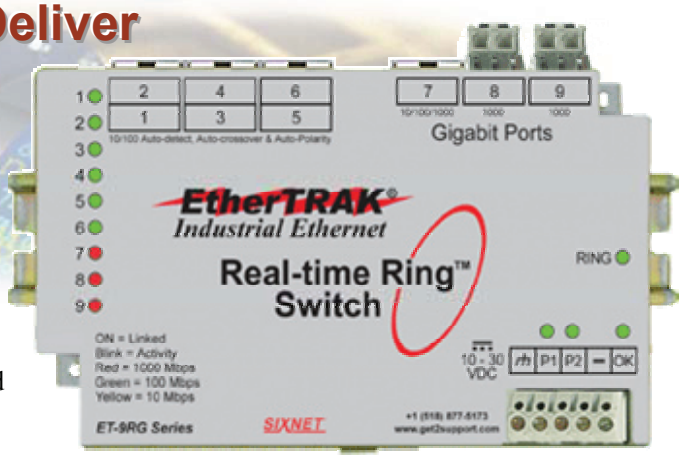
Class 1, Div II & Cenelec Zone 2

Marine & Offshore

European Community

UL508 for Safety

Real-Time Ring™ Switches Deliver Ultra-Dependable Results



Fault-tolerant Systems Survive Breaks

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Achieve Deterministic Performance

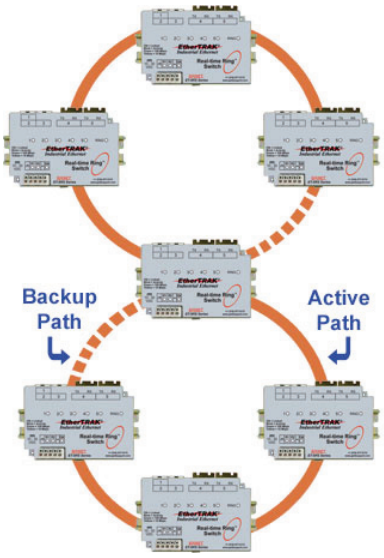
Rings are simple by design. The alternative path is unique and well known and the action to take when a failure occurs is predetermined. Ring Switches use this knowledge to deliver deterministic performance, with recovery times of 5 mS plus some overhead. (The link loss recovery is 30 mS plus 5 mS times the number of Real-time Ring Switches in the ring. For example, 10 ring switches will recover in less than 80 mS.)

Avoid the High Cost and Complexity of Managed Switches

Real-time Ring Switches are the ideal way to achieve fault tolerance without the higher cost and complexity of Managed Switches. In most situations, Real-time Ring Switches will do what you need with just the factory pre-configuration. A simple Windows wizard (supplied at no cost) allows you to fine tune the performance if you like. These auto-configuring switches eliminate the learning curve associated with more complex network devices. Now you can get the job done without needing help from the "IT" department.

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Connect Independent Rings Together

Real-time Ring Switches may be members of more than one ring. This capability permits you to design fast, work-cell oriented rings that are joined to each other to exchange information. (Smaller rings recover faster and are more reliable.)

Mix Fast Ethernet and Gigabit Ring Switches

Combine fast and gigabit ring switches to optimize for speed versus cost. The Real-time Ring™ capability is 100% compatible between these switches.

Alarm Output and Modbus Avoid Future Problems

An "OK" contact assures that the redundant power inputs and the ring (or rings) are complete. Modbus registers report the readiness of individual ports to your SCADA or control system. **This is a SIXNET exclusive feature.**

Real-time Switches Deliver Ultra Reliability

Real-time Ring Switches have field-proven reliability of more than 1,000,000 hours MTBF. These SIXNET industrially hardened switches are certified to survive in your harsh environment – even outdoors in marine and military applications.

SIXNET Industrial Switches Make Your Job Easier

In most applications, the factory pre-configuration will just work for you. Snap these switches onto the rail, plug in your network cables, and sit back and watch the data flow, year after year. These switches have been specifically designed to make your job easier.

Real-Time Ring™ Switch with Gigabit

Performance Specifications

General	9 Ethernet ports including Gigabit	
Ethernet switch type	Intelligent store & forward	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports 1 – 6 (shielded)	10/100BaseTX	
RJ45 port 7 (shielded)	10/100/1000BaseTX	
RJ45 ports 8 and 9 (shielded)	10/100/1000BaseTX (-1 model)	
RJ45 port speed	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
SFP ports 8 and 9 (pluggable)	Fiber or RJ45 depending on module	
Fiber optic port speed	100 Mbps or 1000 Mbps	
Fiber optic port wavelength	850, 1310 or 1550 nm center	
Fiber multimode (mm) optimal	62.5/125 um (LC connector)	
Fiber singlemode (sm) optimal	9/125 um (LC connector)	
Fiber max. distance (full duplex)	0.5 km (mm), 10 km (sm) or more	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	8192	
Memory bandwidth	32 Gbps	
Status Reporting	Power & operational status	
Modbus status registers	Modbus Ethernet over UDP	
"OK" contact output	Sourcing power @ 0.5 Amp	
Real-Time Ring™ Features	SIXNET Exclusive	
Maximum switches in ring	50+	
Dual ring support	Yes	
Link loss recovery time	30 mS plus 5 mS per hop	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power @ 24 VDC	8.0 W (typical with all ports active)	
Power input voltage	10-30 VDC	
Transient protection	15,000 watts peak	
Spike Protection	5,000 watts (10x for 10 uS)	
Ethernet isolation	1500 VRMS 1 minute	
Operating temperature range	-40 to +85 °C	
Storage temperature range	-40 to +85 °C	
Humidity (non-condensing)	5 to 95% RH	
Vibration	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, IEEE C37.90	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Marine and off-shore	DNV (Det Norske Veritas)	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging (high temp. Lexan & rust-free aluminum case)	IP30 protection; UL 94V-0 flame resistent packaging	
Dimensions (L x W x H)	See next page	

Specifications are subject to change. Consult factory for latest information.

Ethernet Compliance:

- IEEE 802.3z (Gigabit 1000 Mbps Ethernet connections)
- IEEE 802.3u (Fast Ethernet 100 Mbps for newer devices)
- IEEE 802.3 (10 Mbps Ethernet supports legacy devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1p (QoS / CoS – Quality & Class of Service)

Hardware Highlights:

- 9 port truly industrial Ethernet switch with up to three Gigabit ports (RJ45 copper, fiber optic or mixed)
- Up to two Gigabit fiber optic ports (multimode or singlemode for distances up to 70 km or more)
- Output for reporting power and operational status
- Redundant power inputs and enhanced surge/spike protection
- Industrial rated -40 to +85 °C operation (without fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Store and forward wire speed switching – no delays
- 32 Gbps high throughput for max speed on all ports
- Support for up to 8192 MAC addresses
- Automatic address learning, aging and migration
- Full-Duplex operation with flow control (no collisions!)
- Auto crossover (MDI/MDIX) and auto polarity
- Real-Time Ring™ for ultra-fast fault-tolerant loops
- Modbus over Ethernet status monitoring
- Priority queuing for real-time network performance
- Message filtering to prevent broadcast storms
- Port mirroring for advanced diagnostics
- Easy to use Windows configuration utility

Pre-configured To Make Your Job Easier!

Ordering Guide

ET-9RG-MM-D1

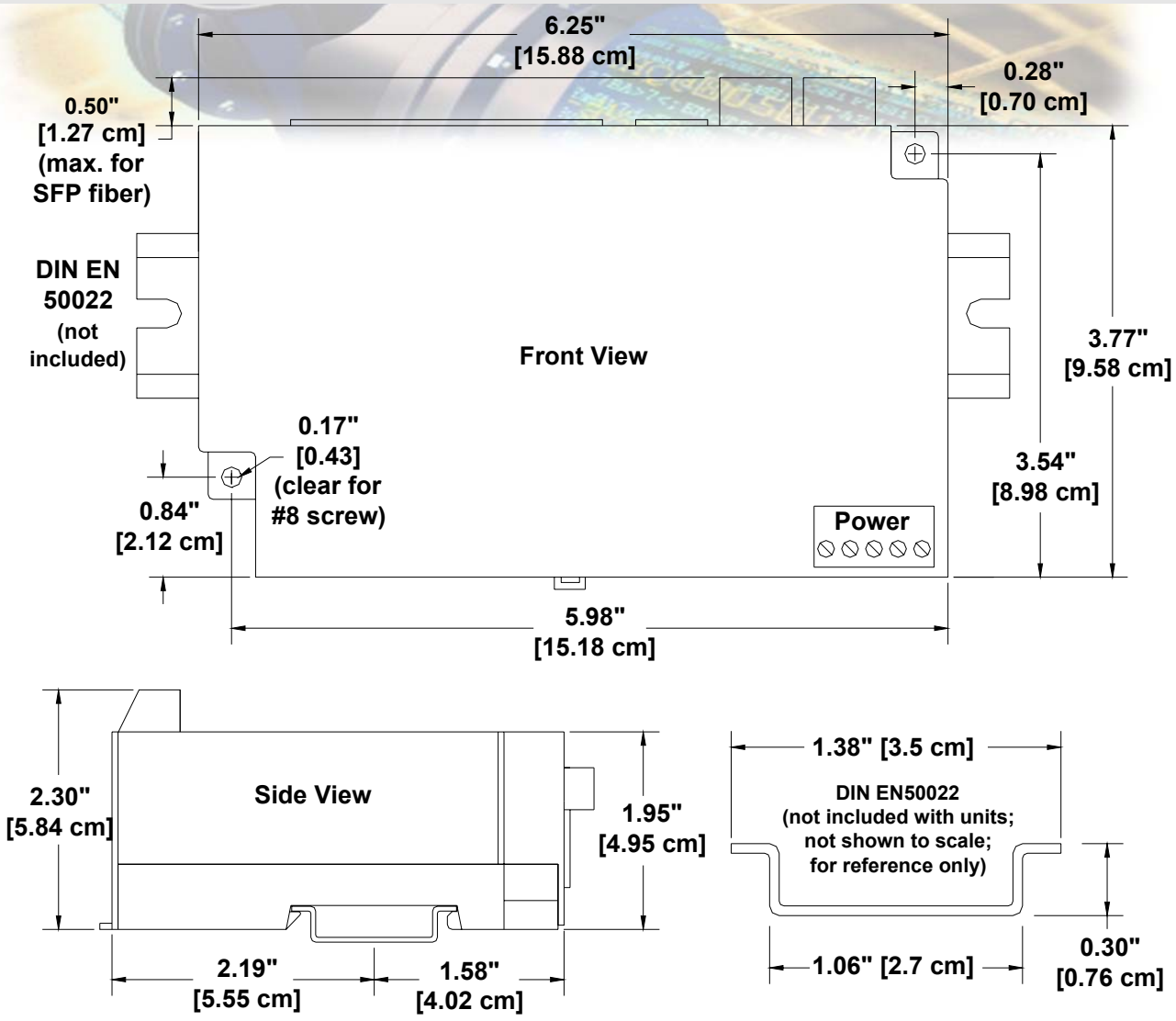
- **0** Pre-set for 0 rings (special order)
- **1 Pre-set for 1 ring (standard)**
- **2** Pre-set for 2 rings (special order)
- **C** Custom configured for you
- **D** dual power is standard
- **1** all RJ45 copper ports
- **MM** two multimode fiber ports
- **SS** two singlemode fiber ports

Many other combinations are available. Contact GreenMatic for details.

Part # Example: ET-9RG-MM-D1 has six 10/100 RJ45, one 10/100/1000 RJ45 and two Gigabit multimode fiber with ports 8 & 9 pre-set for a ring.

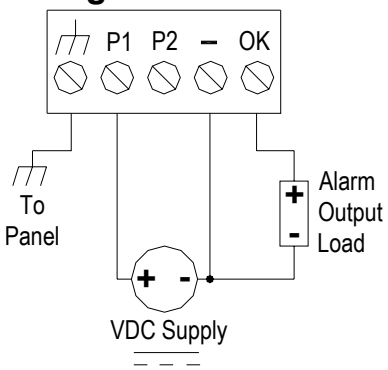
Accessories:	
Setup Wizard	**Free** Windows configuration tool
RM-PS-024-01F	Power supply – AC to 24VDC, 1A
SP-ETH-2	Dual port Ethernet surge & lightning protector for 10/100 ports

ET-9RG Mechanical Dimensions

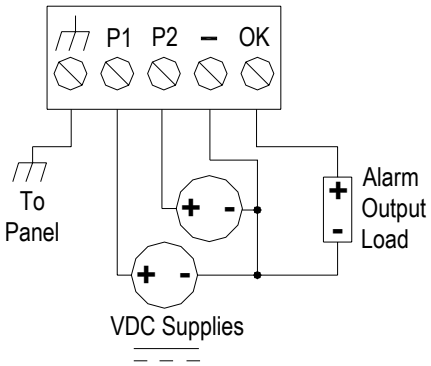


ET-9RG Power and Alarm Connections

Single DC Power



Redundant DC Power

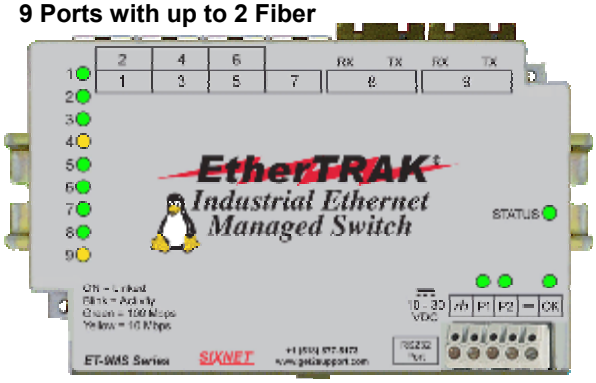


Ultra-Reliability Enhanced with Open-source Capabilities

Real-time Secure Performance

- Rapid Spanning Tree (RSTP) for fast redundant rings
- SNMPv1 and v2 network management
- SNMPv3 authentication & encryption for security
- SNMP notifications (traps) for report on event
- Priority Queuing (QoS/CoS) for real-time operation
- IGMP for Multicast filtering (snooping & querying)
- VLAN for convenient traffic segregation
- Open-source programming for ultimate flexibility
- Broadcast & multicast storm protection
- RMON & port mirroring for advanced diagnostics
- Security with HTTPS, SSL, SSH, SNMPv3 & more

9 Ports with up to 2 Fiber





The Power of Linux IPm Inside

Trouble Free Operation

- Over 1,000,000 hours Mean Time Between Failures
- Twenty year support and service policy
- Free field-installable upgrades forever
- -40 to +75 °C operation – no fans or moving parts!
- UL, CSA (CUL), and CE certified
- Marine, offshore and hazardous locations rated
- MIL-STD-1275 surge and spike protection
- Dual (redundant) power inputs
- Self-test/alarm output contact



Ensure the reliability of your network with fast automatic switchover on a segment failure.

Certified to Perform:

ISO9001 Certified

Class 1, Div II & Cenelec Zone 2

Marine & Offshore

European Community

UL508 for Safety

0907

SIXNET Industrial Switches Make Your Job Easier

Why an Industrial Ethernet Switch

SIXNET switches are designed for industrial environments. Their rugged packaging and protected circuitry keep them working under conditions that will likely cause other switches to fail. Industrial applications are demanding – it gets hot, it gets cold – the power browns out or spikes wildly. You need a reliable industrial switch that can keep on going.

Enhanced Network Reliability and Performance

SIXNET managed switches detect and report network irregularities before serious problems can occur. These switches support SNMP (Simple Network Management Protocol) that allows you to monitor Ethernet and RMON statistics, and SNMP Notifications (traps) to report possible problems as they occur. Then the detailed information from these reliability-enhancing switches can point you to the source of the errors and eliminate hours of frustration while hunting down problems. These ultra-reliable switches will improve the overall performance of your network.

SIXNET managed switches ensure that your system stays running even after a break in a communications pathway. This is possible due to the Rapid Spanning Tree Protocol (RSTP) which lets you wire fault-tolerant loops or redundant rings within your Ethernet network. When a communications path is lost, the switches will automatically and quickly re-route messages through backup or alternate pathways.

Real-time Performance Ensures Deterministic Results

SIXNET managed switches intelligently route messages to eliminate collisions, and use priority queuing (QoS & CoS) to ensure that higher priority messages are delivered first and in real-time. This automatic capability maximizes your network performance by making sure that priority traffic such as I/O control messages are delivered without delay, giving your deterministic software the open communication channels it needs. These switches also support IGMP for IP Multicast filtering for use with industrial protocols like Ethernet/IP. Plus they support VLANs for convenient network segregation, and they automatically limit the number of broadcast and multicast messages to protect you from undesirable "broadcast storms" that can cripple your network.

Ultra-Reliability and Unmatched Environmental Performance

SIXNET managed switches are likely to provide maintenance free service for the life of your equipment. Reliability data reported from field installed units proves the amazing track record of these rugged industrial switches. On average, you will enjoy over 1,000,000 hours of trouble free operation before service is required on even one unit!



SIXNET managed switches work reliably through the dead of winter and those hot summer days. Unlike office-grade switches that are intended only for use in air-conditioned offices, SIXNET managed switches are designed for those places that you don't want to be – over a wide temperature range. They are also rated for hazardous locations (Zone 2) and tested by DNV for offshore and marine use. SIXNET switches are even tough enough for the military and therefore tough enough for your application. They have been used in military Light Armored Vehicles (LAVs), ships and aircrafts.

Advanced Security without Holes or Back Doors

The reality is that security is measured by its weaknesses, not its strengths. If there is a single hole in your system's security, the bad guys can find it and take advantage of it. Unless your Ethernet switches have every aspect of security adequately protected, access to your network management is not secure. SIXNET managed switches make sure that you

are completely secure, with no holes or “back doors” for hackers to sneak into. The first way they do this is with SSH (Secure Shell) which gives you secure and encrypted terminal access to your managed switch.

Plus the SIXNET managed switches include the secure Apache Web Server (the same server that is used to manage many e-commerce sites). Authenticated communications (user name and password) and support for encrypted communications through an HTTPS are provided. Or you can turn off the web server completely for the ultimate security.

SIXNET managed switches also support SNMP v3 which provides authenticated and encrypted SNMP messaging. (Many of the other so-called "industrial" switches do not provide this important security feature. Without this protection anyone that gains access to the network can shut down or reroute your network traffic!)

The LINUX Advantage - Free Industrial Computer with each SIXNET Managed Switch

The powerful IPm embedded-Linux engine is inside each SIXNET managed switch. The IPm engine provides a Linux computer with plenty of horsepower to run your own application programs. Save the expense of a separate computer and enhance the reliability of your systems through this cost-saving combination.

20-Year Support and Service Promise

SIXNET will continue to supply drop-in replacement parts and service for your SIXNET managed switches for twenty years. Only SIXNET can make this promise because we own the technology inside our products. (We still manufacture and service our IOMUX RTUs that were first developed in the 1980's.) The LINUX open-source software is a big part of the full story.

SIXNET is an established industrial system supplier that provides world-class applications assistance. Real people answer the telephones at SIXNET and provide instant and thoughtful answers to your questions. We know that when you need help, you don't need to listen to a recording that tells you "Your call is important to us, so please don't hang up."

EtherTRAK® Industrial Ethernet Managed Switch

Performance Specifications

General	9 Ethernet ports	
Ethernet switch type	Managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Fiber optic port speed	100BaseFX (100 Mbps)	
Fiber optic port wavelength	1300 nm center	
Fiber multimode (mm) optimal	62.5/125 um (SC or ST connector)	
Fiber singlemode (sm) optimal	9/125 um (SC or ST connector)	
Fiber max. distance (full duplex) (see web for details)	4 km (mm), 20 or 40 km (sm) or more (contact SIXNET)	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	
"OK" Output	Power & operational status	
Voltage	Same as switch input voltage	
Maximum current output	0.5 Amp	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (typical - all ports active at 100 Mbps) (Max. 10 W)	7.0 W (model -1 without fiber) 8.0 W (models -2 & -3 w/ 1 fiber) 9.0 W (models -4 & -5 w/ 2 fiber)	
Input voltage (all models)	10-30 VDC (continuous)	
Transient protection	15,000 watts peak	
Spike protection	5,000 watts (10 times for 10 uS)	



Extended protection	Standard with models -4 & -5	
Military surge protection	Exceeds MIL-STD-1275; 100V for 1 second	
Transient protection	15,000 watts peak	
Spike Protection	5,000 watts (10 times for 10 uS) or 250 volts (50 times 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	IEC68-2-6	
Electrical safety	CE	UL508/CSA C22, EN61010-1
EMI emissions		FCC part 15, ICES-003, EN55022
EMC immunity		IEC61326-1, IEEE C37.90
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Marine and off-shore	DNV (Det Norske Veritas)	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging (Lexan & alum. case)	IP30 protection	
Dimensions (L x W x H)	6.25 x 3.77 x 1.65 inches (159 x 96 x 42 mm)	

Specifications are subject to change. Consult factory for latest information.

Hardware Highlights:

- 9 port industrial Ethernet managed switch with up to two fiber optic ports (multimode or singlemode)
- Output for reporting power and operational status
- Redundant power inputs and enhanced surge/spike protection (meets MIL-STD-1275 on -4/5 models)
- Industrial rated for -40 to +75 °C operation (no fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- Support for up to 2048 MAC addresses
- Full-Duplex operation with flow control (no collisions!)
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- SNMP notifications (traps) for report on event
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telnet / SSH (network), terminal (RS232) or SNMP (v1, v2, v3)

Ethernet Compliance:

- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1D/w (Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability)
- IEEE 802.1p (Priority Queuing – QoS, CoS, ToS/DS)
- IEEE 802.1Q (VLAN for traffic segregation)

Additional features are in the works and are provided through FREE Firmware Upgrades.

Ordering Guide

ET-9MS-2SC

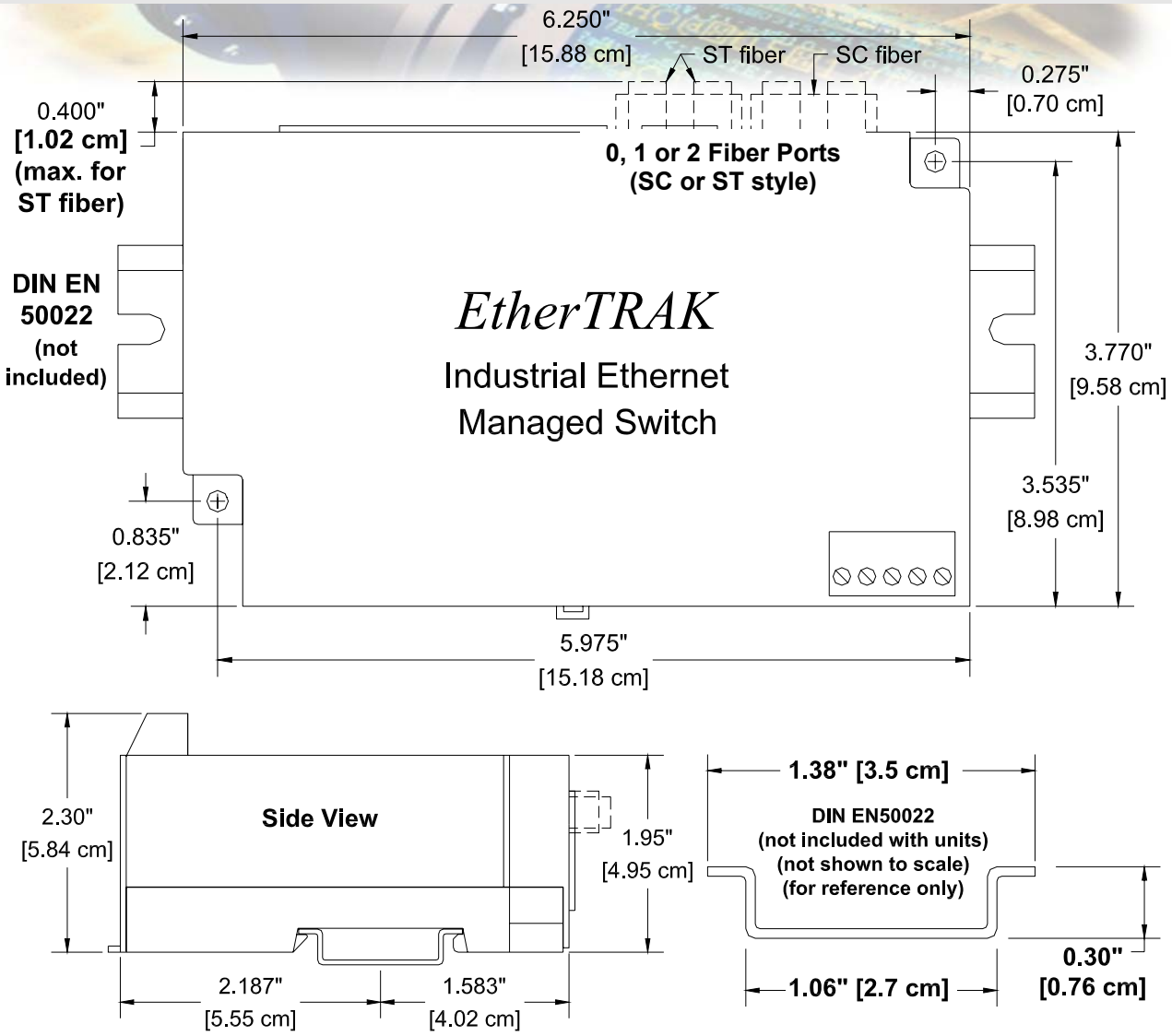
SC style fiber connector(s)
ST style fiber connector(s)
SxL for long haul fiber (40 km)

1 (9 RJ45 ports & no fiber)
2 (8 RJ45 & 1 multimode fiber)
3 (8 RJ45 & 1 singlemode fiber)
4 (7 RJ45 & 2 multimode fiber)
5 (7 RJ45 & 2 singlemode fiber)

Note: The -4 & -5 models have extended surge & spike power protection that exceeds MIL-STD-1275.

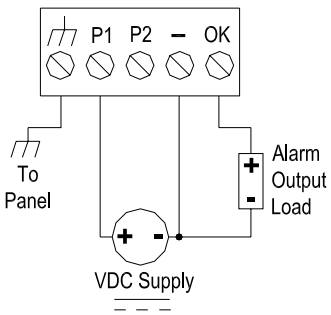
Accessories:	
RM-PS-024-01F	Power supply – AC to 24VDC, 1A
SP-ETH-2	2 port Ethernet surge protector

ET-9MS Mechanical Dimensions

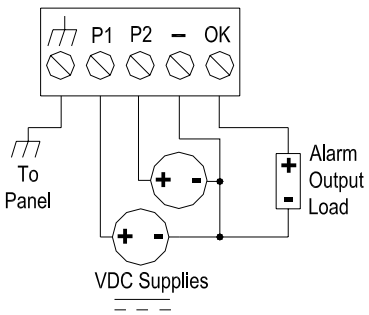


ET-9MS Power and Alarm Connections

Single DC Power



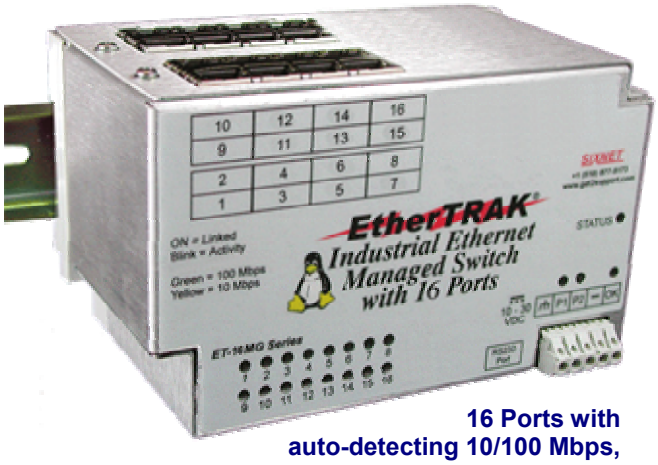
Redundant DC Power



Ultra-Reliable and Rugged with Compact DIN Rail Mounting

Real-time Secure Performance

- Rapid Spanning Tree (RSTP) for fast redundant rings
- SNMPv1 and v2 network management
- SNMPv3 authentication & encryption for security
- SNMP notifications (traps) for report on event
- Priority Queuing (QoS/CoS) for real-time operation
- IGMP for Multicast filtering (snooping & querying)
- VLAN for convenient traffic segregation
- Open-source programming for ultimate flexibility
- Broadcast & multicast storm protection
- RMON & port mirroring for advanced diagnostics
- Security with HTTPS, SSL, SSH, SNMPv3 & more



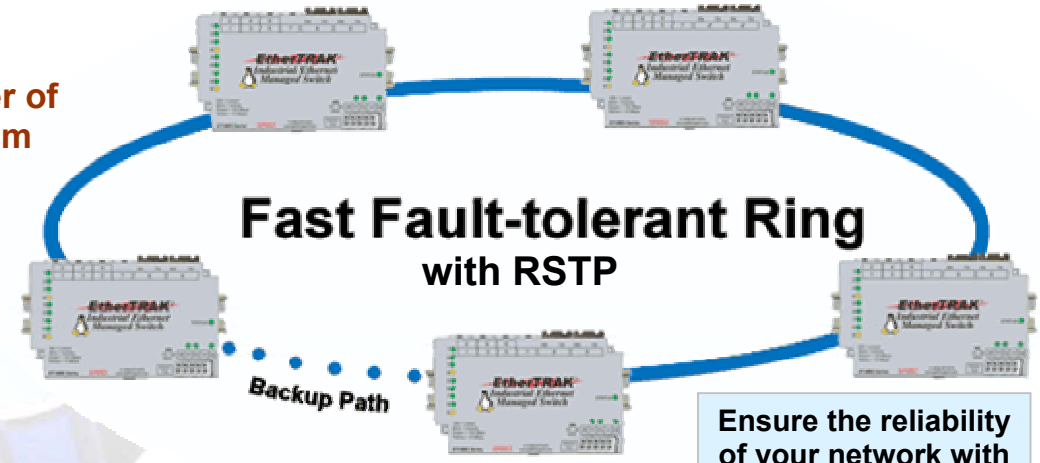
16 Ports with auto-detecting 10/100 Mbps, auto-polarity protection and auto-crossover for quick and easy plug & play connections

Trouble Free Operation

- Over 1,000,000 hours Mean Time Between Failures
- Twenty year support and service policy
- Free field-installable upgrades forever
- -40 to +75 °C operation – no fans or moving parts!
- UL, CSA (CUL), and CE certified
- Marine, offshore and hazardous locations rated
- Enhanced surge and spike protection
- Dual (redundant) power inputs
- Self-test/alarm output contact



The Power of Linux IPm Inside



Ensure the reliability of your network with fast automatic switchover on a segment failure.

Certified to Perform:

- ISO9001 Certified
- Class 1, Div II & Cenelec Zone 2
- Marine & Offshore
- European Community
- UL508 for Safety
- USA/Canada Emissions
- Lead & Hazardous Substance Free

0907

16 Port Industrial Ethernet Managed Switch

Performance Specifications		
General	16 Ethernet ports	
Ethernet switch type	Managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	8192	
Memory bandwidth	32 Gbps	
"OK" Output	Power & operational status	
Voltage	Same as switch input voltage	
Maximum current output	0.5 Amp	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (all ports active)	14 W typical	
Input voltage (all models)	10-30 VDC (continuous)	
Transient protection	15,000 watts peak	
Spike protection	5,000 watts (10 times for 10 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	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, IEEE C37.90	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Marine and off-shore	DNV (Det Norske Veritas)	
Packaging (Lexan & alum. case)	IP30 protection	
Dimensions (L x W x H)	See following page	

Specifications are subject to change. Consult factory for latest information.

Related Products:



The ET-18MG has all the same great features as the ET-16MS plus it includes two Gigabit combo ports. These ports can be either copper RJ45 or fiber optic by just plugging in a fiber transceiver. This allows for noise immune links up to 70 km or more.

Hardware Highlights:

- 16 port industrial Ethernet managed switch
- Output for reporting power and operational status
- Redundant power inputs with industrial surge and spike protection
- Industrial rated for -40 to +75 °C operation (no fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV rated for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- Support for up to 8192 MAC addresses
- Full-Duplex operation with flow control (no collisions!)
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- SNMP notifications (traps) for report on event
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telnet / SSH (network), terminal (RS232) or SNMP (v1, v2, v3)

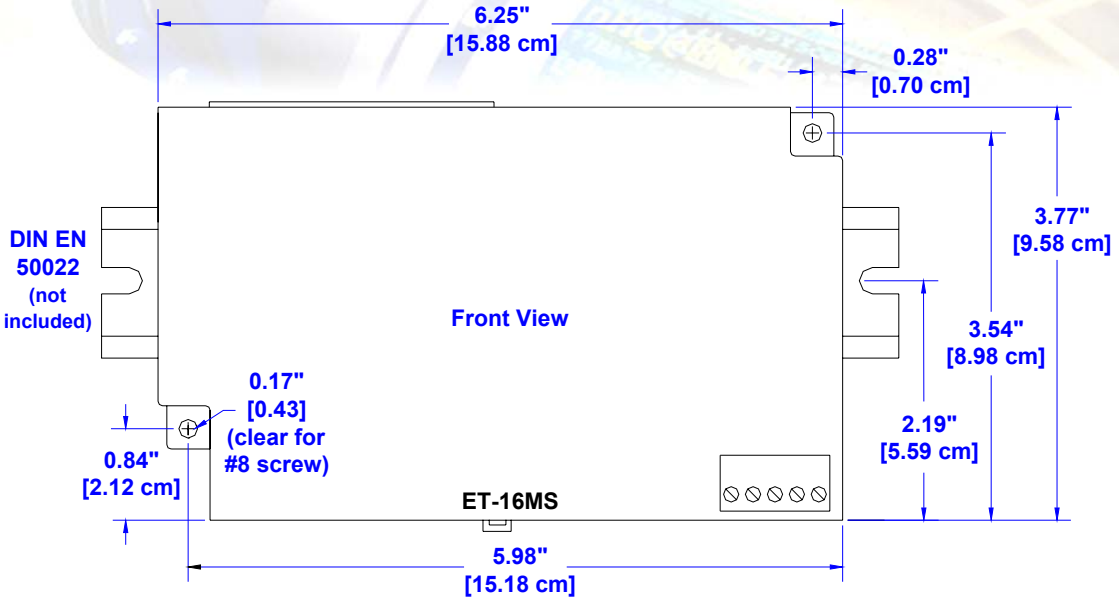
Ethernet Compliance:

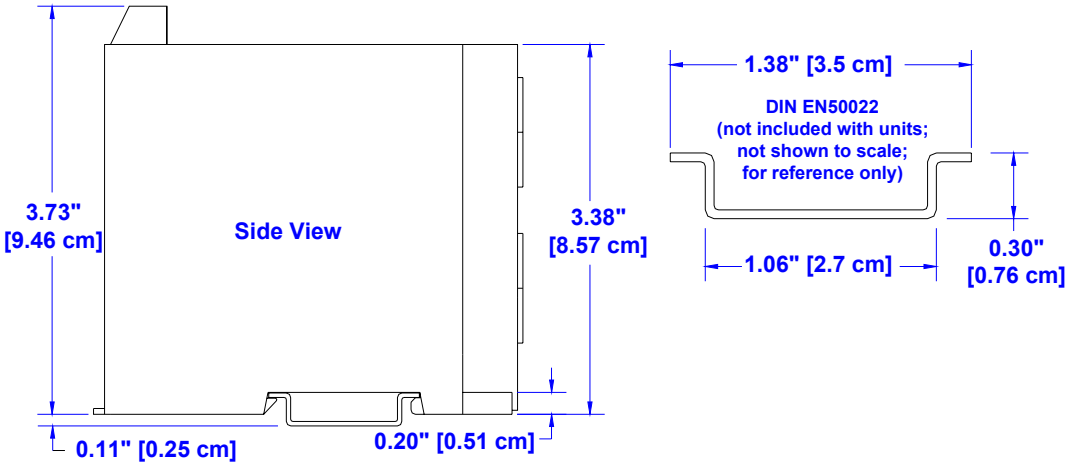
- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
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- IEEE 802.1Q (VLAN for traffic segregation)

Additional features are in the works and are provided through FREE Firmware Upgrades. Contact GreenMatic for the latest information.

Ordering Guide	
ET-16MS-1	16 port industrial managed switch
Note: If you need fiber optic ports please use the ET-18MG which supports both 100 and 1000 Mbps fiber up to 70 km or more.	
Accessories:	
ET-PS-024-02	Power supply – AC to 24VDC, 2A
SP-ETH-2	2 port Ethernet surge protector

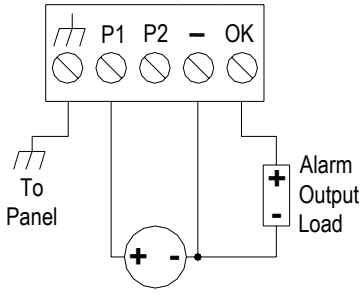
Mechanical Dimensions





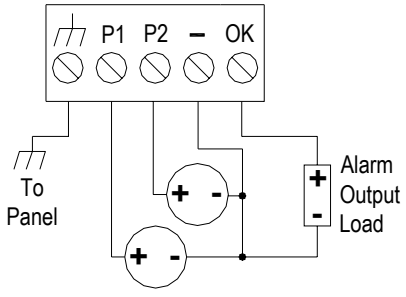
Power and Alarm Connections

Single DC Power



One DC Supply

Redundant DC Power



Dual DC Supplies

Ultra-Reliability Enhanced with Open-source Capabilities

3 Gigabit Ports for Super Fast Connections

- One auto-detecting 10/100/1000 RJ45 port
- Two flexible Gigabit ports for fiber or copper
- Gigabit fiber connections up to 70+ km

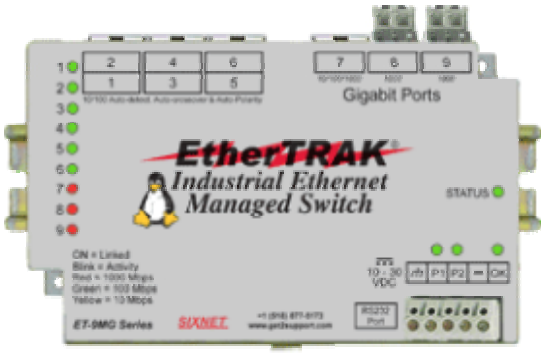
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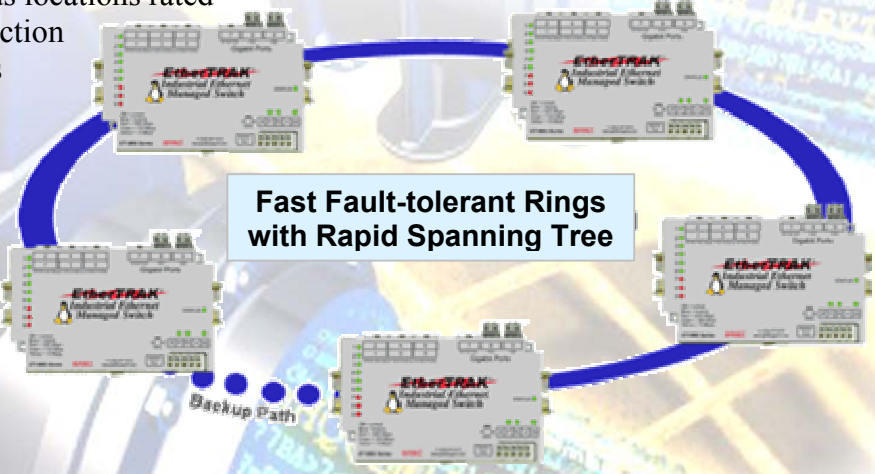
- Over 1,000,000 hours Mean Time Between Failures
- Twenty year support and service policy
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- Marine, offshore and hazardous locations rated
- Superior surge and spike protection
- Dual (redundant) power inputs
- Self-test/alarm output contact

9 Ports with up to 3 Gigabit RJ45 or Fiber



The Power of Linux IPm Inside





Fast Fault-tolerant Rings with Rapid Spanning Tree

Certified to Perform:

ISO9001 Certified | Class 1, Div II & Cenelec Zone 2 | Marine & Offshore | European Community | UL508 for Safety

Ensure the reliability of your network with fast automatic switchover on a segment failure.

SIXNET Industrial Switches Make Your Job Easier

Why an Industrial Ethernet Switch

SIXNET switches are designed for industrial environments. Their rugged packaging and protected circuitry keep them working under conditions that will likely cause other switches to fail. Industrial applications are demanding – it gets hot, it gets cold – the power browns out or spikes wildly. You need a reliable industrial switch that can keep on going.

Enhanced Network Reliability and Performance

SIXNET managed switches detect and report network irregularities before serious problems can occur. These switches support SNMP (Simple Network Management Protocol) that allows you to monitor Ethernet and RMON statistics, and SNMP Notifications (traps) to report possible problems as they occur. Then the detailed information from these reliability-enhancing switches can point you to the source of the errors and eliminate hours of frustration while hunting down problems. These ultra-reliable switches will improve the overall performance of your network.

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Industrial Ethernet Managed Switch with Gigabit

Performance Specifications		
General	9 Ethernet ports including Gigabit	
Ethernet switch type	Fully managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports 1 – 6 (shielded)	10/100BaseTX	
RJ45 port 7 (shielded)	10/100/1000BaseTX	
RJ45 ports 8 and 9 (shielded)	10/100/1000BaseTX (-1 model)	
RJ45 port speed	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
SFP ports 8 and 9 (pluggable)	Fiber or RJ45 depending on module	
Fiber optic port speed	100 Mbps or 1000 Mbps	
Fiber optic port wavelength	850, 1310 or 1550 nm center	
Fiber multimode (mm) optimal	62.5/125 um (LC connector)	
Fiber singlemode (sm) optimal	9/125 um (LC connector)	
Fiber max. distance (full duplex)	0.5 km (mm), 10 km or more	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	8192	
Memory bandwidth	32 Gbps	
"OK" Output	Power & operational status	
Voltage	Same as switch input voltage	
Maximum current output	0.5 Amp	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power @ 24 VDC	9.0 W (typical with all ports active)	
Power input voltage	10-30 VDC	
Transient protection	15,000 watts peak	
Spike Protection	5,000 watts (10x for 10 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	IEC68-2-6	
Electrical safety	CE	UL508/CSA C22, EN61010-1
EMI emissions		FCC part 15, ICES-003, EN55022
EMC immunity		IEC61326-1, IEEE C37.90
Hazardous locations		UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)
Marine and off-shore		DNV (Det Norske Veritas)
Eye safety (fiber models)		IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11
Packaging (high temp. Lexan & rust-free aluminum case)		IP30 protection; UL 94V-0 flame resistant packaging
Dimensions (L x W x H)		See next page

Specifications are subject to change. Consult factory for latest information.

Ethernet Compliance:

- IEEE 802.3z (Gigabit 1000 Mbps Ethernet connections)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1D/w (Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability)
- IEEE 802.1p (Priority Queuing – QoS, CoS, ToS/DS)
- IEEE 802.1Q (VLAN for traffic segregation)

Hardware Highlights:

- 9 port truly industrial Ethernet switch with up to three Gigabit ports (RJ45 copper, fiber optic or mixed)
- Up to two Gigabit fiber optic ports (multimode or singlemode for distances up to 70 km or more)
- Output for reporting power and operational status
- Redundant power inputs with surge/spike protection
- Industrial rated for -40 to +75 °C operation (no fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- 32 Gbps high throughput for max speed on all ports
- Support for up to 8192 MAC addresses
- Full-Duplex operation with flow control (no collisions!)
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- SNMP notifications (traps) for report on event
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telnet / SSH (network), terminal (RS232) or SNMP (v1, v2, v3)

Additional features are in the works and are provided through FREE Firmware Upgrades. Contact GreenMatic for the latest information.

Ordering Guide

ET-9MG-MM

1 all RJ45 copper ports
MM two multimode fiber ports
SS two singlemode fiber ports

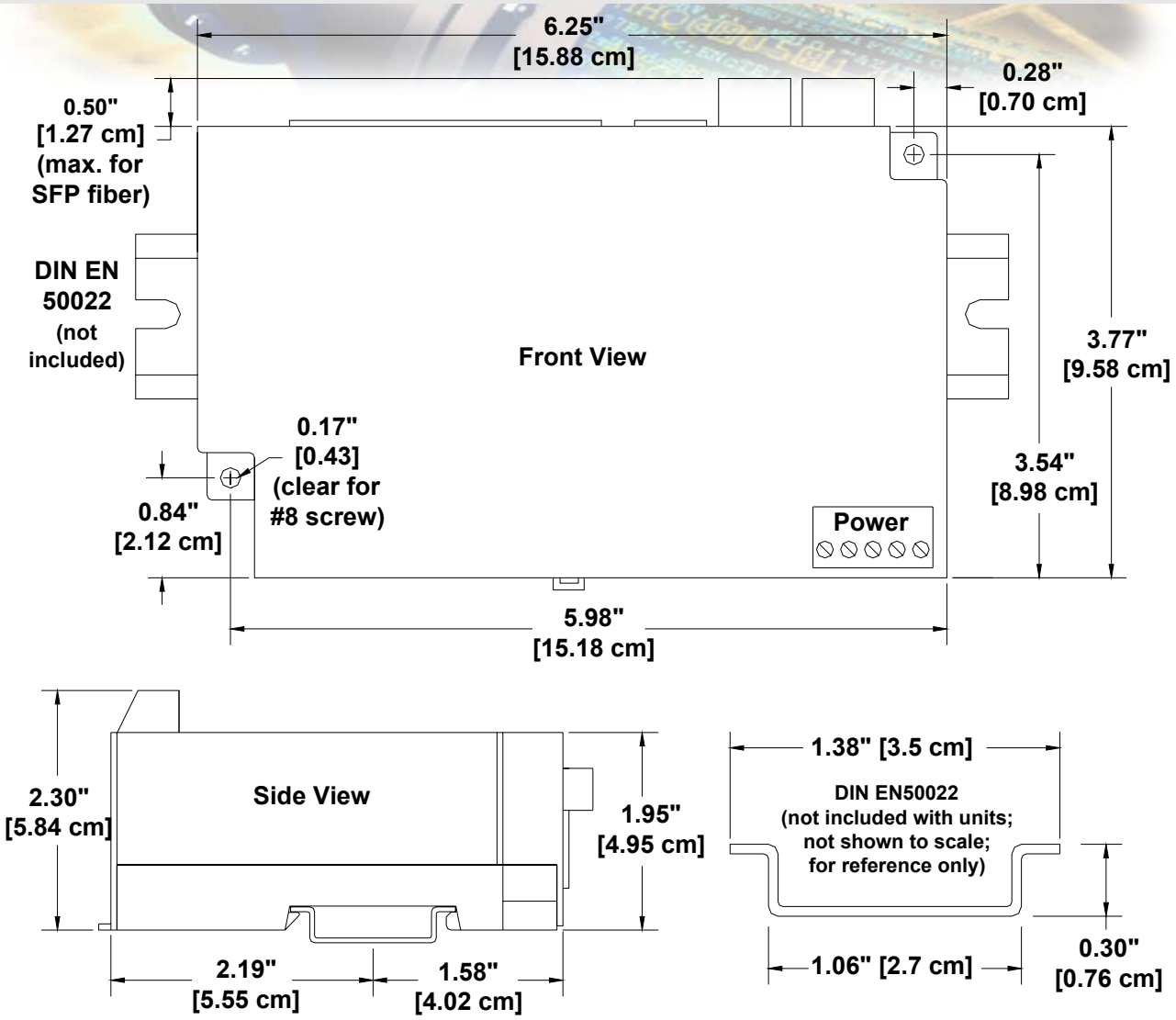
Many other combinations are available. Contact GreenMatic for details.

Part # Example: ET-9MG-MM has six 10/100 RJ45, one 10/100/1000 RJ45 and two Gigabit multimode fiber ports.

Accessories:	
RM-PS-024-01F	Power supply – AC to 24VDC, 1A
SP-ETH-2	Dual port Ethernet surge & lightning protector for the 10/100 ports only

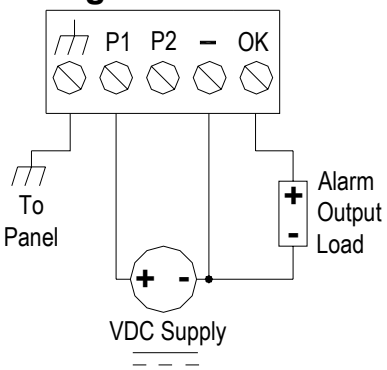
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ET-9MG Mechanical Dimensions

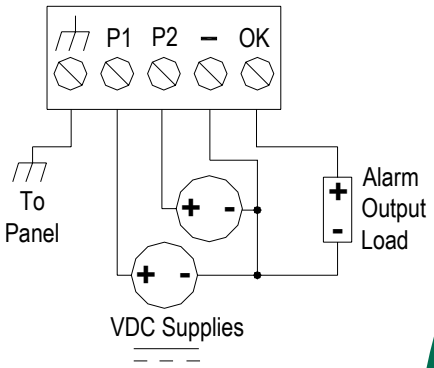


ET-9MG Power and Alarm Connections

Single DC Power



Redundant DC Power



Ultra-Reliable and Rugged with Flexible High Speed Gigabit

2 Gigabit Ports for Copper or Fiber Connections

- Each gigabit port supports both copper and fiber links
- Auto-detecting 10/100/1000 RJ45 ports
- Gigabit fiber (SFP) connections up to 70+ km
- Plus 8 auto-detecting 10/100 RJ45 ports

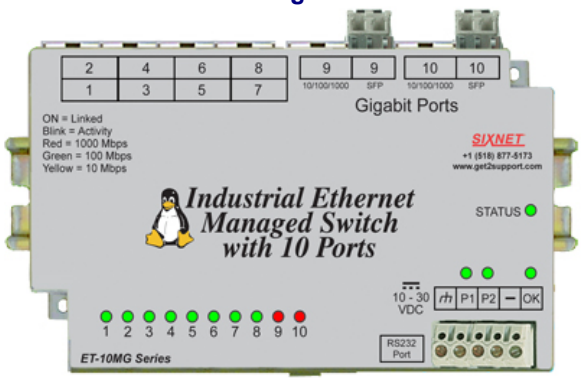
Real-time Secure Performance

- Rapid Spanning Tree (RSTP) for fast redundant rings
- SNMPv1 and v2 network management
- SNMPv3 authentication & encryption for security
- SNMP notifications (traps) for report on event
- Priority Queuing (QoS/CoS) for real-time operation
- IGMP for Multicast filtering (snooping & querying)
- VLAN for convenient traffic segregation
- Open-source programming for ultimate flexibility
- Broadcast & multicast storm protection
- RMON & port mirroring for advanced diagnostics
- Security with HTTPS, SSL, SSH, SNMPv3 & more

Trouble Free Operation

- Over 1,000,000 hours Mean Time Between Failures
- Twenty year support and service policy
- Free field-installable upgrades forever
- -40 to +75 °C operation – no fans or moving parts!
- Marine, offshore and hazardous locations rated
- UL, CSA (CUL), and CE certified
- Superior surge and spike protection
- Dual (redundant) power inputs
- Self-test/alarm output contact

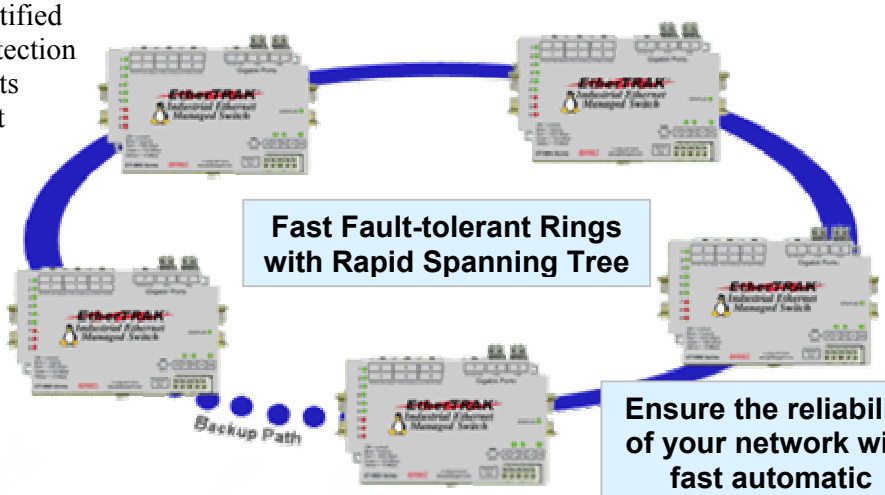
10 Ports with both Gigabit RJ45 and Fiber



Flexible Combination Gigabit Ports
Your choice – RJ45 (10/100/1000) or Fiber Optic (100 or 1000) in one product! Start with a RJ45 gigabit connection and upgrade to fiber at any time just by plugging in a fiber optic transceiver. These advanced gigabit ports make your job easier plus save you time and money!



The Power of Linux IPm Inside



Fast Fault-tolerant Rings with Rapid Spanning Tree

Ensure the reliability of your network with fast automatic switchover on a segment failure.

Certified to Perform:

- ISO9001 Certified
- Class 1, Div II & Cenelec Zone 2
- Marine & Offshore
- European Community
- UL508 for Safety
- USA/Canada Emissions
- Lead & Hazardous Substance Free

10-Port Industrial Ethernet Managed Switch

Performance Specifications		
General	9 Ethernet ports including Gigabit	
Ethernet switch type	Fully managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports 1 – 6 (shielded)	10/100BaseTX	
RJ45 port 7 (shielded)	10/100/1000BaseTX	
RJ45 ports 8 and 9 (shielded)	10/100/1000BaseTX (-1 model)	
RJ45 port speed	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
SFP ports 8 and 9 (pluggable)	Fiber or RJ45 depending on module	
Fiber optic port speed	100 Mbps or 1000 Mbps	
Fiber optic port wavelength	850, 1310 or 1550 nm center	
Fiber multimode (mm) optimal	62.5/125 um (LC connector)	
Fiber singlemode (sm) optimal	9/125 um (LC connector)	
Fiber max. distance (full duplex)	0.5 km (mm), 10 km or more	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	8192	
Memory bandwidth	32 Gbps	
"OK" Output	Power & operational status	
Voltage	Same as switch input voltage	
Maximum current output	0.5 Amp	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power @ 24 VDC	9.0 W (typical with all ports active)	
Power input voltage	10-30 VDC	
Transient protection	15,000 watts peak	
Spike Protection	5,000 watts (10x for 10 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	IEC68-2-6	
Electrical safety	CE	UL508/CSA C22, EN61010-1
EMI emissions		FCC part 15, ICES-003, EN55022
EMC immunity		IEC61326-1, IEEE C37.90
Hazardous locations		UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)
Marine and off-shore		DNV (Det Norske Veritas)
Eye safety (fiber models)		IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11
Packaging (high temp. Lexan & rust-free aluminum case)		IP30 protection; UL 94V-0 flame resistant packaging
Dimensions (L x W x H)		See next page

Specifications are subject to change. Consult factory for latest information.

Ethernet Compliance:

- IEEE 802.3z (Gigabit 1000 Mbps Ethernet connections)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1D/w (Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability)
- IEEE 802.1p (Priority Queuing – QoS, CoS, ToS/DS)
- IEEE 802.1Q (VLAN for traffic segregation)

Hardware Highlights:

- 9 port truly industrial Ethernet switch with up to three Gigabit ports (RJ45 copper, fiber optic or mixed)
- Up to two Gigabit fiber optic ports (multimode or singlemode for distances up to 70 km or more)
- Output for reporting power and operational status
- Redundant power inputs with surge/spike protection
- Industrial rated for -40 to +75 °C operation (no fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- 32 Gbps high throughput for max speed on all ports
- Support for up to 8192 MAC addresses
- Full-Duplex operation with flow control (no collisions!)
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- SNMP notifications (traps) for report on event
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telnet / SSH (network), terminal (RS232) or SNMP (v1, v2, v3)

Additional features are in the works and are provided through FREE Firmware Upgrades. Contact GreenMatic for the latest information.

Ordering Guide

ET-9MG-MM

1 all RJ45 copper ports
MM two multimode fiber ports
SS two singlemode fiber ports

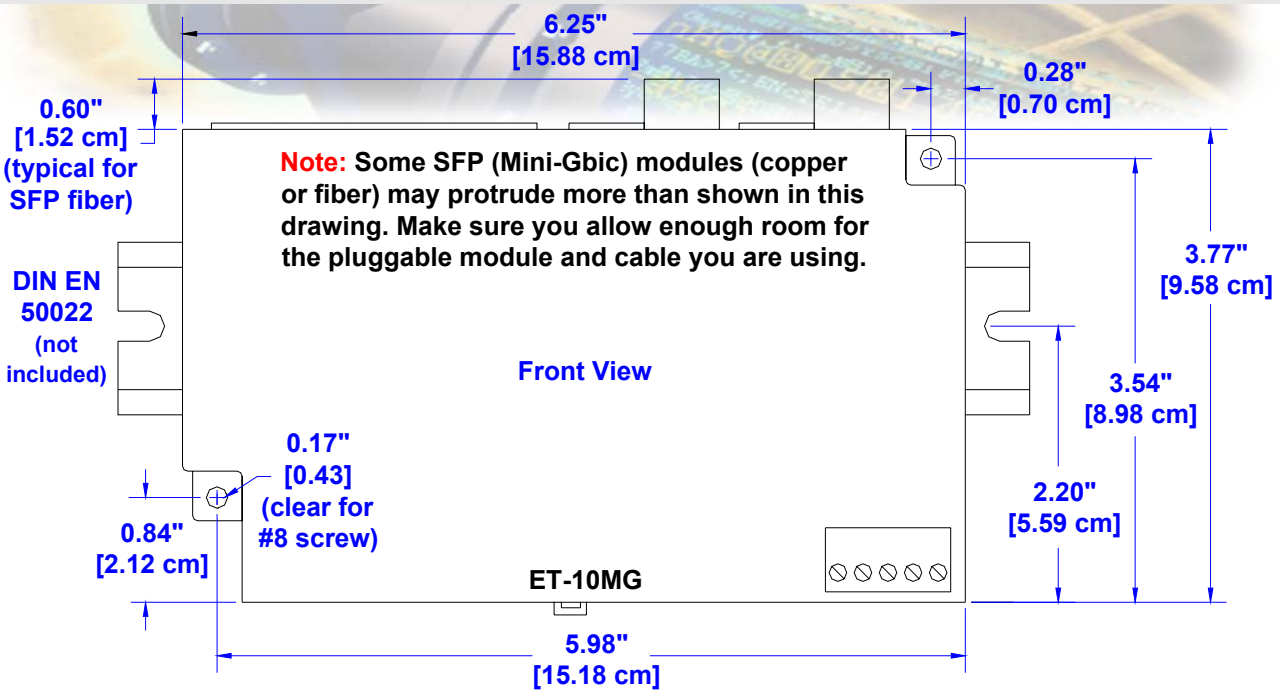
Many other combinations are available. Contact GreenMatic for details.

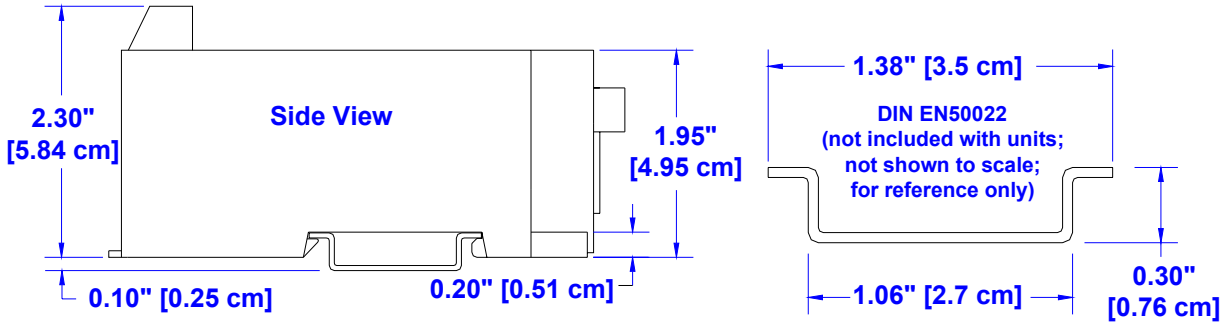
Part # Example: ET-9MG-MM has six 10/100 RJ45, one 10/100/1000 RJ45 and two Gigabit multimode fiber ports.

Accessories:	
RM-PS-024-01F	Power supply – AC to 24VDC, 1A
SP-ETH-2	Dual port Ethernet surge & lightning protector for the 10/100 ports only

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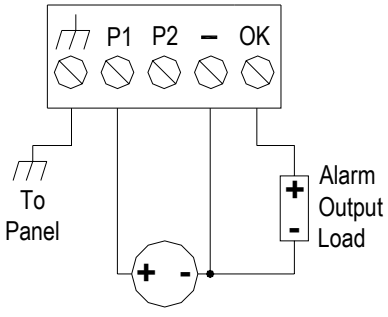
Mechanical Dimensions





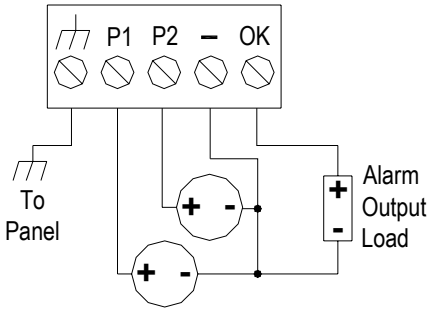
Power and Alarm Connections

Single DC Power



One DC Supply

Redundant DC Power



Dual DC Supplies

Ultra-Reliable and Rugged with High Density Ports plus Gigabit

2 Gigabit Ports for Copper or Fiber Connections

- Each gigabit port supports both copper and fiber links
- Auto-detecting 10/100/1000 RJ45 ports
- Gigabit fiber (SFP) connections up to 70+ km
- Plus 16 auto-detecting 10/100 RJ45 ports

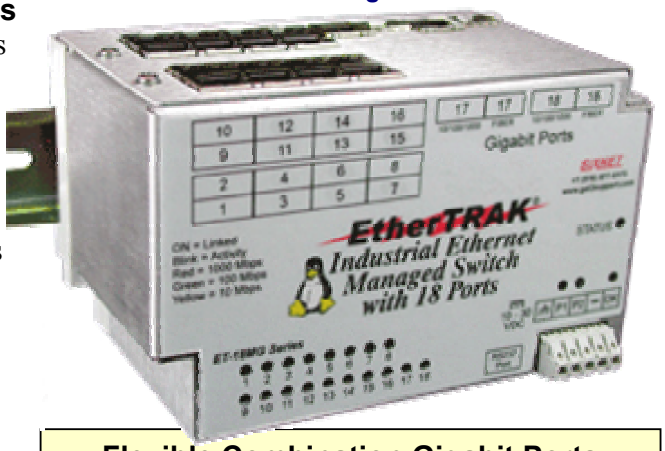
Real-time Secure Performance

- Rapid Spanning Tree (RSTP) for fast redundant rings
- SNMPv1 and v2 network management
- SNMPv3 authentication & encryption for security
- SNMP notifications (traps) for report on event
- Priority Queuing (QoS/CoS) for real-time operation
- IGMP for Multicast filtering (snooping & querying)
- VLAN for convenient traffic segregation
- Open-source programming for ultimate flexibility
- Broadcast & multicast storm protection
- RMON & port mirroring for advanced diagnostics
- Security with HTTPS, SSL, SSH, SNMPv3 & more

Trouble Free Operation

- Over 1,000,000 hours Mean Time Between Failures
- Twenty year support and service policy
- Free field-installable upgrades forever
- -40 to +75 °C operation – no fans or moving parts!
- Marine, offshore and hazardous locations rated
- UL, CSA (CUL), and CE certified
- Superior surge and spike protection
- Dual (redundant) power inputs
- Self-test/alarm output contact

18 Ports with both Gigabit RJ45 and Fiber

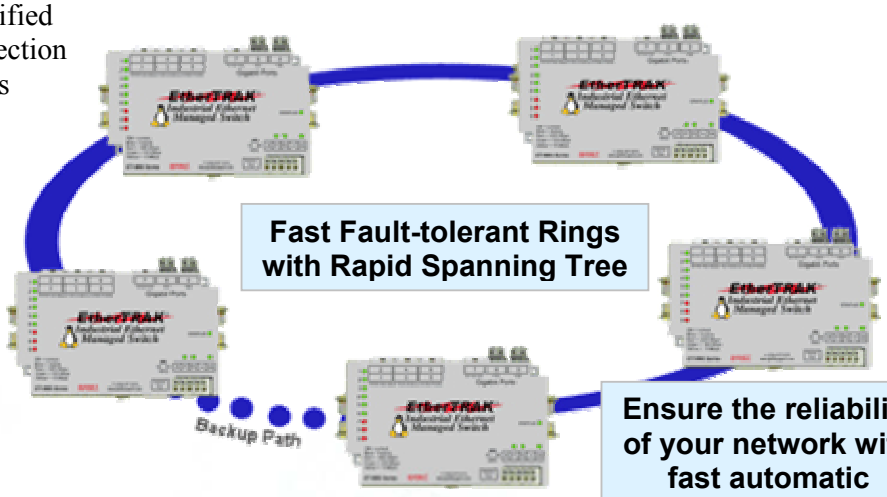


Flexible Combination Gigabit Ports

Your choice – RJ45 (10/100/1000) or Fiber Optic (100 or 1000) in one product! Start with a RJ45 gigabit connection and upgrade to fiber at any time just by plugging in a fiber optic transceiver. These advanced gigabit ports make your job easier plus save you time and money!



The Power of Linux IPm Inside



Fast Fault-tolerant Rings with Rapid Spanning Tree

Ensure the reliability of your network with fast automatic switchover on a segment failure.

Certified to Perform:

- ISO9001 Certified
- Class 1, Div II & Cenelec Zone 2
- Marine & Offshore
- European Community
- UL508 for Safety
- USA/Canada Emissions
- Lead & Hazardous Substance Free

18-Port Industrial Ethernet Managed Switch

Performance Specifications		
General	18 Ethernet ports including Gigabit	
Ethernet switch type	Fully managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports 1 – 16 (shielded)	10/100BaseTX	
RJ45 port 17 - 18 (shielded)	10/100/1000BaseTX	
RJ45 port speed	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Ports 17 and 18 are combination gigabit ports that have both a RJ45 connector and SFP Fiber connector. For each of these ports, only one of the connectors can be used at a time.		
SFP ports 17 and 18 (pluggable)	Accepts mini-GBIC transceivers	
Fiber optic port speed	100 Mbps or 1000 Mbps	
Fiber multimode (mm) typical	50-62.5/125 um (LC connector)	
Fiber singlemode (sm) typical	9-10/125 um (LC connector)	
Fiber optic port wavelength	850 nm (mm), 1310 nm (sm) or 1550 nm (long haul sm) center	
Fiber typ. distance (full duplex) (Contact SIXNET for details)	0.55 - 1.1 km (mm); 10+ km (sm); up to 70+ km (long haul sm)	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable per port	
MAC addresses supported	8192	
Memory bandwidth	32 Gbps	
"OK" Output	Power & operational status	
Voltage	Same as switch input voltage	
Maximum current output	0.5 Amp	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power @ 24 VDC	16 W (typical with all ports active)	
Power input voltage	10-30 VDC	
Transient protection	15,000 watts peak	
Spike Protection	5,000 watts (10x for 10 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	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, IEEE C37.90	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Marine and off-shore	DNV (Det Norske Veritas)	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging (high temp. Lexan & rust-free aluminum case)	IP30 protection; UL 94V-0 flame resistant packaging	
Dimensions (L x W x H)	See next page	

Specifications are subject to change. Consult factory for latest information.

Ethernet Compliance:

- IEEE 802.3z (Gigabit 1000 Mbps Ethernet connections)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1D/w (Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability)
- IEEE 802.1p (Priority Queuing – QoS, CoS, ToS/DS)
- IEEE 802.1Q (VLAN for traffic segregation)

Hardware Highlights:

- 18 port truly industrial Ethernet switch with Gigabit
- Two combination Gigabit ports that support both copper and fiber for connections up to 70 km or more
- Output for reporting power and operational status
- Redundant power inputs with surge/spike protection
- Industrial rated for -40 to +75 °C operation (no fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV tested for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

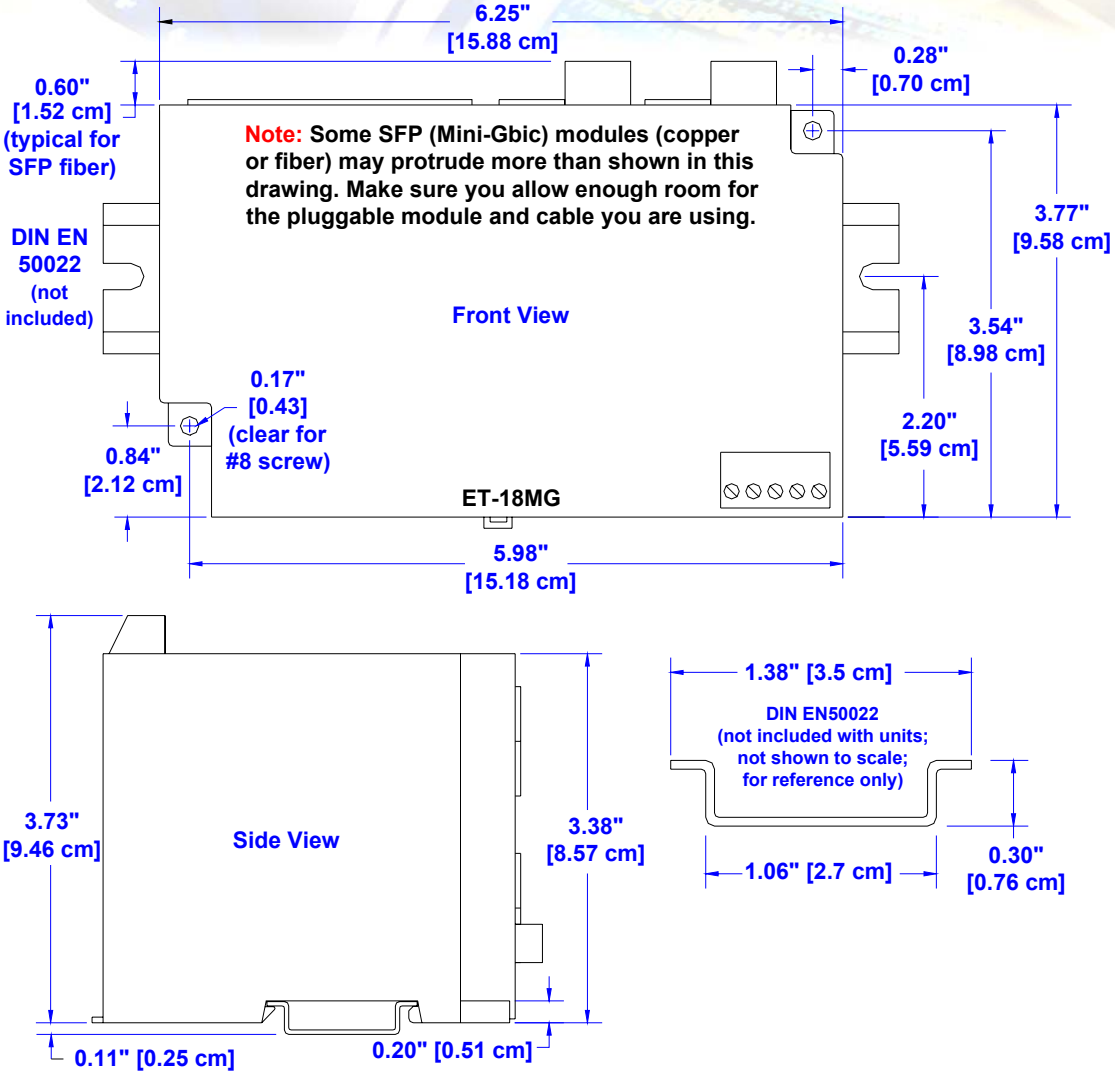
Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- 32 Gbps high throughput for max speed on all ports
- Support for up to 8192 MAC addresses
- Full-Duplex operation with flow control (no collisions!)
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- SNMP notifications (traps) for report on event
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telnet / SSH (network), terminal (RS232) or SNMP (v1, v2, v3)

Additional features are in the works and are provided through FREE Firmware Upgrades. Contact GreenMatic for the latest information.

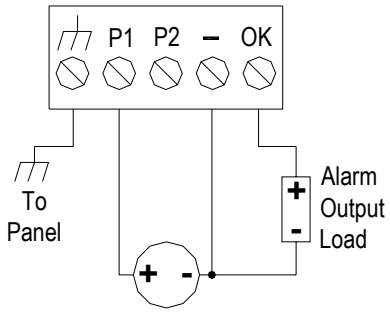
Ordering Guide	
ET-18MG-1	Switch with all RJ45 copper ports (no fiber transceivers populated)
ET-18MG-MX	Switch with 1 multimode fiber transceiver populated (Up to 1.1 km; 850 nm wavelength)
ET-18MG-MM	Switch with 2 multimode fiber transceivers populated (Up to 1.1 km; 850 nm wavelength)
ET-18MG-SX	Switch with 1 singlemode fiber transceiver populated (10+ km; 1310 nm wavelength)
ET-18MG-SS	Switch with 2 singlemode fiber transceivers populated (10+ km; 1310 nm wavelength)
Note: 100Mbps, special use and long haul transceivers are available as special order. Please contact SIXNET for details.	
Accessories:	
ET-PS-024-02	Power supply – AC to 24VDC, 2A
SP-ETH-2	Dual port Ethernet surge & lightning protector for the 10/100 ports only

Mechanical Dimensions



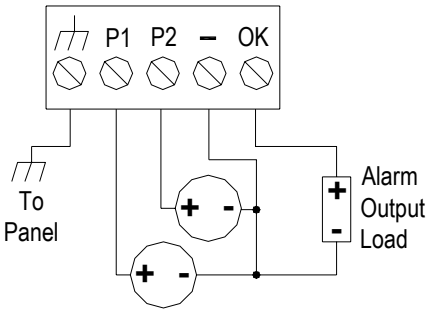
Power and Alarm Connections

Single DC Power



One DC Supply

Redundant DC Power

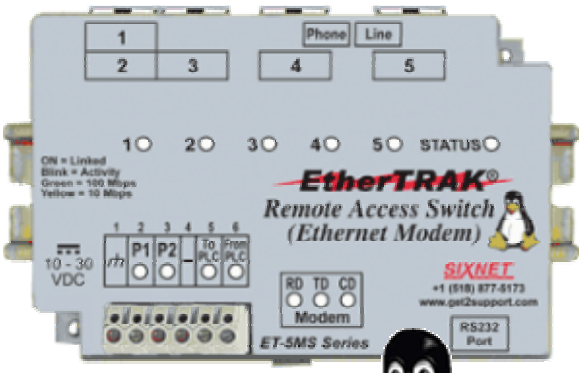


Dual DC Supplies

Remotely Access your Ethernet Network through a Phone Connection

The ET-5MS-MDM-1 combines a SIXNET Industrial Telephone Modem with a SIXNET Industrial Managed Switch. This powerful combination allows you to easily and securely access your Ethernet network from any remote location over standard telephone lines.

5 Ethernet Ports with Integrated Phone Modem





The Power of Linux IPm Inside

Save Time and Money

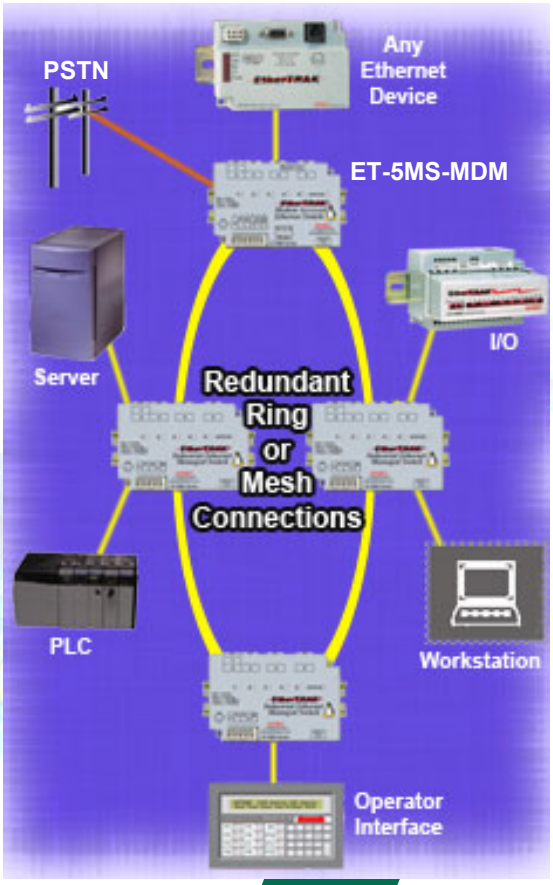
The ET-5MS-MDM-1 allows you to avoid those costly site visits and respond to network situations immediately! Now you can perform remote diagnostics and maintenance from the comfort of your office, home or another facility.

Real-time Secure Performance

- Advanced PSTN modem features
  - Make easy and secure dial-in connections
  - Automatic dial-out on a trigger input
  - Connection speeds up to Fast 56K (V.90)
  - Full data compression and error control supported
  - Compliant with telephone systems world-wide
- Advanced Ethernet switch features
  - Five 10/100 fast Ethernet ports
  - Auto-speed/duplex, auto-crossover & auto-polarity
  - Plug and play operation or full management ability
  - RSTP, VLAN, IGMP, QoS, SNMP and more
- Easy configuration with web or terminal interfaces
- Secure connections with HTTPS, SSL, SSH, SNMPv3 …

Trouble Free Operation

- High Mean Time Between Failure rating
- Twenty year support and service policy
- Free field-installable upgrades forever
- -40 to +75 °C operation – no fans or moving parts!
- UL, CSA (CUL), and CE certified
- Marine, offshore and hazardous locations rated
- Enhanced surge and spike protection
- Dual (redundant) power inputs
- Alarm output and trigger input for PLC (or other device)



Certified to Perform:

ISO9001 Certified
Class 1, Div II & Cenelec Zone 2
Marine & Offshore
European Community
UL508 for Safety

SIXNET Makes Your Job Easier

Performance Specifications

Industrial Ethernet Switch	5 Ethernet ports	
Ethernet switch type	Managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	
Industrial Telephone Modem	PSTN modem	
Maximum data rates	56 Kbps	
Compatibility	V.90, V.34, V.32, V.32 bis, V.22, V.22 bis, V.21	
Data compression	V.42 bis	
Error correction	V.42 MNP or LAP	
Ringer	0.3	
Jacks	2 RJ11 (phone and line)	
Command sets	Standard AT and S register	
Country compatibility	World-wide (100+ countries)	
Telecom ratings	FCC Part 68; Industry Canada CS03-8; CTR21 (98/482/EC); ACA TS 001 and ACA TS 002	
RS232 Management Port	RJ45 port	
Fixed baud rate, data bits, parity, stop bits, flow control	9600 Bps, 8, None, 1, None	
"PLC" Input and Output	Trigger (in) & alarm (out) signals	
PLC / Alarm output voltage	Same as switch input power voltage	
Maximum current output	0.5 Amp	
PLC / Trigger input voltage	10-30 VDC	
Typically current input	6.5 mA @ 24 VDC	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (all ports active)	5.0 W typical	
Input voltage (all models)	10-30 VDC (continuous)	
Transient protection	15,000 watts peak	
Spike protection	5,000 watts (10 times for 10 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	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, EN50082-1	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Packaging (Lexan & alum. case)	IP30 protection	
Dimensions (L x W x H)	See following page	

Specifications are subject to change. Consult factory for latest information.

Hardware Highlights:

- 5 port industrial Ethernet managed switch with integrated industrial telephone modem
- Output for reporting power and operational status
- Input for triggering automatic dial-out operation
- Redundant power inputs and surge/spike protection
- Industrial rated for -40 to +75 °C operation (no fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- Rated for marine and off-shore use
- DIN rail or direct panel mounting (no extra kits required)

Telephone Features:

- Dial-in and automatic dial-out capabilities
- PPP (Point-to-Point Protocol) for dial-up connections
- Fast phone connections up to 56 Kbps
- Full data compression and error correction options

Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- Support for up to 2048 MAC addresses
- Full-Duplex operation with flow control (no collisions!)
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing (QoS) for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- SNMP notifications (traps) for report on event
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- DHCP client for automatic IP address assignment
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telnet / SSH (network), terminal (RS232) or SNMP (v1, v2, v3)
- Router Information Protocol (RIP)

Ethernet Compliance:

- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1D/w (Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability)
- IEEE 802.1p (Priority Queuing – QoS, CoS, ToS/DS)
- IEEE 802.1Q (VLAN for traffic segregation)

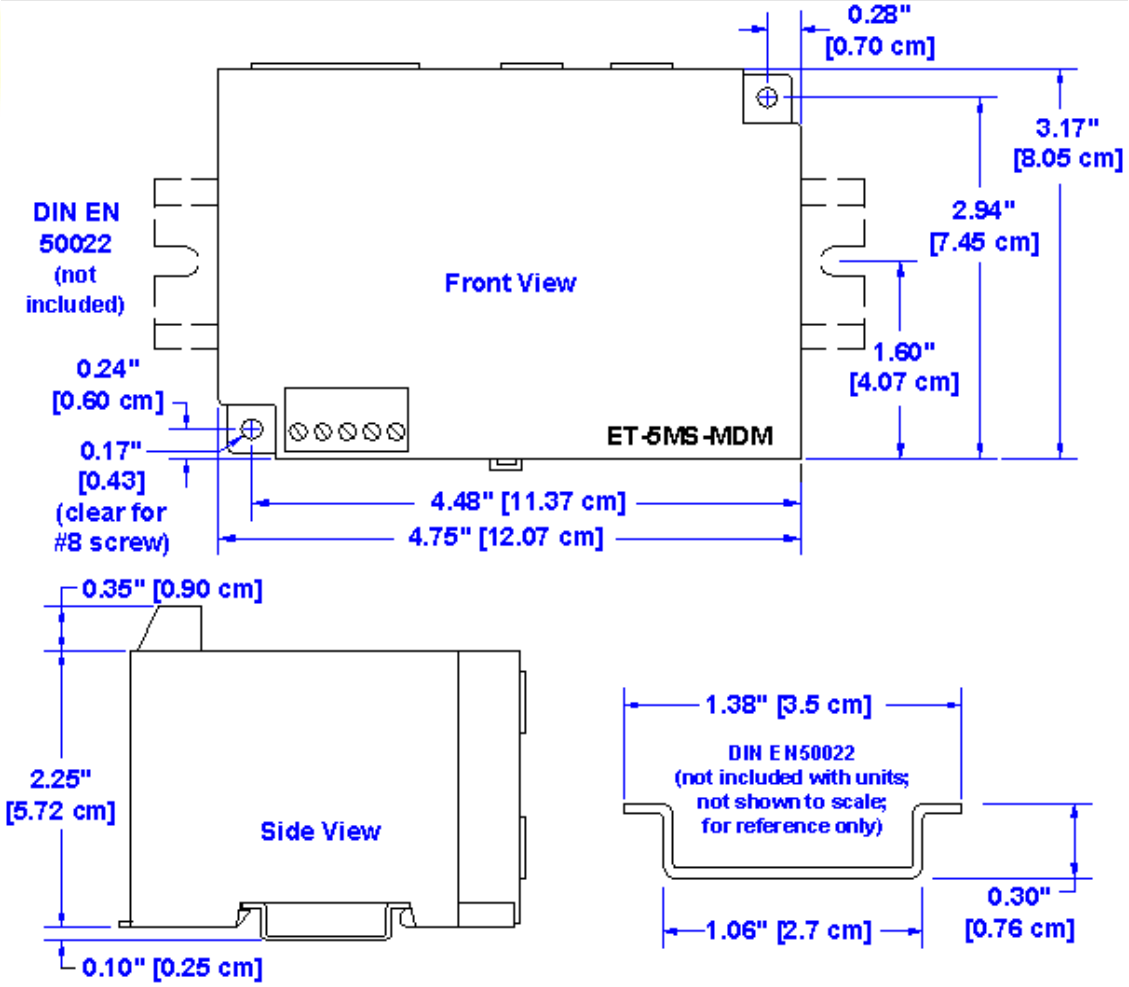
Additional features are in the works and are provided through FREE Firmware Upgrades. Contact SIXNET for the latest information.

Ordering Guide

Part Number: ET-5MS-MDM-1

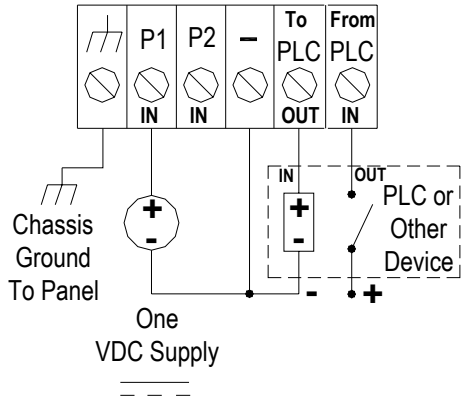
Accessories:	
ET-PS-024-02	Power supply – AC to 24VDC, 2A
SP-ETH-2	2 port Ethernet lightning protector
SP-TELCO-1	1 port phone lightning protector

ET-5MS-MDM-1 Mechanical Dimensions

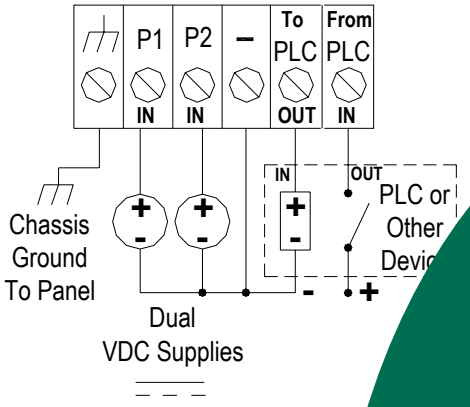


ET-5MS-MDM-1 Power and Alarm Connections

Single DC Power



Redundant DC Power



IP67 Sealed Industrial Ethernet Ring Switch

Direct Machine Mount Switch for Heavy Industrial Applications

The SIXNET IP67 Industrial Ethernet Switch mounts directly onto a machine or any convenient flat surface in the harshest industrial environments. The rugged packaging and Amphenol RJField connectors are IP67 (NEMA 6) rated to protect against water, oil, dust, vibration and much more. This advanced technology switch ensures real-time deterministic performance and super-fast ring redundancy. The switch is ultra-reliable with over 1,000,000 hours Mean Time Between Failure (MTBF) and protected by SIXNET's 20-year support and service policy.

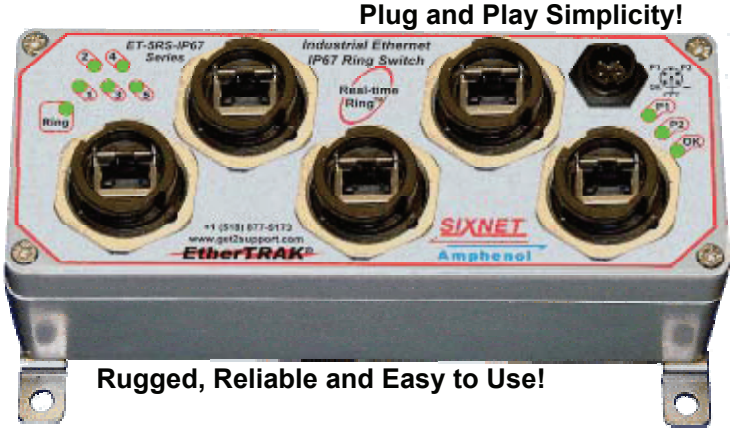
SIXNET IP67 Switch Benefits:

- Reduced installation cost
- Mount anywhere - save space
- Ensure real-time operation and allow for Deterministic Control
- Increased network reliability

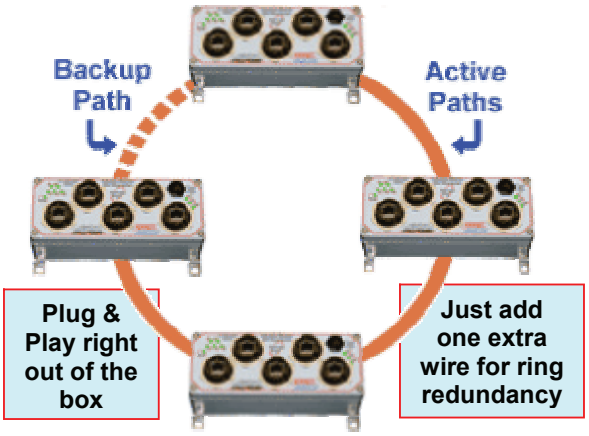
Ideal Ethernet Switch for:

- Direct machine mounting
- Outdoor or marine use
- Military applications & much more

Plug and Play Simplicity!



Rugged, Reliable and Easy to Use!

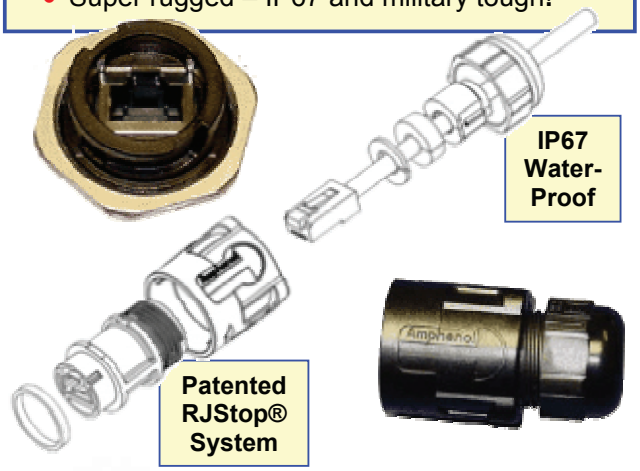


SIXNET Real-time Ring™ Redundancy:

- Easy to use - plug and play simple
- Super fast switch over on failure
- Modbus monitoring over Ethernet

Featuring Amphenol RJField Connectors:

- Fits over any standard Ethernet cordset
- Easy to install – no tools required!
- Super rugged – IP67 and military tough!



ISO9001 Quality

Hazardous Locations

Emissions, Immunity & Safety

US/Canada Safety

Marine & Offshore

US/Canada Emissions

Military Tough

Lead and Hazardous Substance Free

Real-Time Ring™ Switches Deliver Ultra-Reliable Results

The switch provides very fast, fault-tolerant network redundancy and prioritized message delivery needed in critical real-time systems. Real-time Rings self-configure and just run, without the complex configuration steps required by alternative solutions. This break-through technology delivers reliability, performance, saves you money, and makes your job easier.

Advanced Network Performance:

- Real-time fault tolerant rings
  - Fast ring recovery of 30 mS + 5 mS / hop!
  - Modbus over Ethernet monitoring
- Real-time traffic prioritization with QoS
  - Assure delivery of real-time data
  - Improve network utilization
  - User settable priority assignments
- Advanced switch features
  - User configurable port settings
  - Port mirroring for traffic diagnostics
  - Pre-configurable for plug & play simplicity

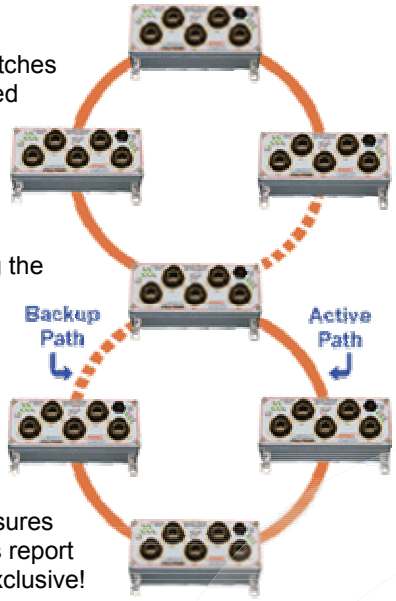
Rugged and Reliable Hardware:

- SIXNET reliability and long-term support
  - Ultra-reliable 1,000,000 hours MTBF
  - Unique 20-year support & service policy
  - Firmware upgrades are FREE forever
- Truly industrial design and packaging
  - Tough fiber-reinforced enclosure
  - Rugged Amphenol connectors
  - Dual power inputs and alarm output
- Industrial rated to perform
  - MIL-STD-1275 power protection (-E models)
  - Wide operating temperature -40 to +75°C

Fault-tolerant Systems Survive Network Breaks - Real-time Rings have an alternative network path in constant readiness. When a failure occurs, the Real-time Ring instantly redirects the traffic through the alternative path.

Achieve Deterministic Performance - Rings are simple by design. The alternative path is unique and the action to take when a failure occurs is predetermined. Ring Switches use this to deliver deterministic performance, with recovery times of 5 mS per hop plus some overhead.

Avoid the High Cost and Complexity of Managed Switches - Ring Switches are ideal for achieving fault tolerance without the higher cost and complexity of managed switches. In most cases, Ring Switches will do what you need with just the factory settings. Or a simple Windows wizard (FREE) allows you to fine tune the performance. Now you can get the job done without needing the "IT" department.



Priority Queuing For Real-time Performance - Security cameras and other devices can significantly slow down your real-time data delivery. Ring Switches can tag the camera ports as lower priority (or you can set the critical data as a higher priority). Then the data will travel from switch to switch using priority queuing best suited for your situation. Ring switches will cure your data overload headaches!

Connect Independent Rings Together - Ring Switches may be members of more than one ring. This allows you to design fast, work-cell oriented rings that are joined to exchange information. Smaller rings recover faster and are more reliable.

Alarm Output and Modbus Avoid Future Problems - An “OK” contact assures that the redundant power inputs and the ring (or rings) are complete. Modbus registers report the readiness of individual ports to your SCADA or control system. This is a SIXNET exclusive!

Real-time Switches Deliver Ultra-Reliability - Real-time Ring Switches have field-proven reliability of more than 1,000,000 hours MTBF. These SIXNET industrially hardened switches are certified to survive in your harsh environment – Even outdoors in marine and military applications.

SIXNET Industrial Switches Make Your Job Easier - In most applications, the factory pre-configuration will just work for you. Mount these switches, plug in your network cables, sit back and watch the data flow, year after year.

Operation and Performance Specifications

Performance Specifications		
General	5 Ethernet ports	
Ethernet switch type	Intelligent store & forward	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Typical latency @ 10 Mbps	16 us + frame time	Varies on load & settings
Typical latency @ 100 Mbps	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	
Status Reporting (RS model)	Power & operational status	
Modbus status registers	Modbus Ethernet over UDP	
"OK" contact output	Sourcing power @ 0.5 Amp	
Real-Time Ring™ Features	SIXNET Exclusive (RS model)	
Maximum switches in ring	50+	
Dual ring support	Yes	
Link loss recovery time	30 mS plus 5 mS per hop	
Environmental	Full industrial ratings	
Power input	Redundant input connections	
Input power (typical)	ES: 2.4 W, RS: 2.7 W	
Input voltage (-D models)	10-30 VDC	
Transient protection	15,000 watts peak	
Spike protection	5,000 watts (10 times for 10 uS)	
		
Input voltage (-E models)	10-50 VDC (Derate 1.8°C / V above 30V)	
Extended power protection	-E models	
Military surge protection	Exceeds MIL-STD-1275; 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)	
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, shock and freefall	IEC68-2-6, -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	
Hazardous locations (Class 1, Div. 2) (Zone 2)	UL1604, CSA C22.2/213, Cenelec EN50021	
Marine and off-shore	DNV (Det Norske Veritas)	
Protection rating	IP67 and NEMA 6	
Enclosure material	Fiber reinforced polyester	
Dimensions and mounting	See mechanical diagram	
Weight	1.2 lbs (0.54 kg)	

Specifications are subject to change. Consult factory for latest information.

Hardware Highlights:

- 5 port truly industrial IP67 water-proof Ethernet switch
- Output for reporting power and operational status
- Redundant power inputs and enhanced surge/spike protection (meets MIL-STD-1275 on "-E" models)
- Industrial rated -40 to +75 °C operation (without fans!)
- UL/CSA, CE and Zone 2 rated for hazardous locations
- DNV rated for marine and off-shore use
- Direct to panel or machine mounting

Networking Features:

- Store and forward wire speed switching – no delays
- Support for up to 2048 MAC addresses
- Automatic address learning and aging
- Full-Duplex operation with flow control (no collisions!)
- Auto crossover (MDI/MDIX) and auto polarity
- Real-Time Ring™ for ultra-fast fault-tolerant loops
- Priority queuing for real-time network performance
- Message filtering to prevent broadcast storms
- Port mirroring for advanced diagnostics
- Easy to use Windows configuration utility

Ethernet Compliance:

- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1p (QoS / CoS – Quality & Class of Service)

Pre-configured To Make Your Job Easier!

Ordering Guide

ET-5RS-IP67-D1

- **0** = Pre-set for 0 rings (special order)
- **1** = **Pre-set for 1 ring (standard)**
- **2** = Pre-set for 2 rings (special order)
- **C** = Custom configured for you
- **D** = dual power w/ industrial protection
- **E** = dual power w/ military-rated (MIL-STD-1275) protection
- **IP67** = water, oil and dust proof
- **RS** = Real-time Ring™ model
- **ES** = Unmanaged model (special order)
- **5** = 5 Ethernet ports
- **ET** = EtherTRAK family

IP67 Accessories:	
Setup Wizard	**Free** Windows configuration tool
ET-RJF-PWR-1	IP67 power plug
ET-RJFRB-6	IP67 Ethernet plug
ET-RJFRB-C7	IP67 cap for unused ports
ET-RJFRB-71	IP67 bulk-head connector
ET-RJF5E-xx	Industrial cordsets & bulk cable **(Kevlar Reinforced!)**

IP67 Accessories and Kevlar Protected Cabling



Performance Specifications	
Electrical characteristics	
Ethernet data rates supported	10BaseT, 100BaseT, 1000BaseT
Cat 5E cable supported per	TIA/EIA 568B and ISO/IEC 11801, Class D
Cat 6 cable supported per	TIA/EIA 568B and ISO/IEC 11801, Class E
Mechanical characteristics	
Coupling (connection method)	Reverse bayonet – just a quarter turn and lock
RJ45 cordset retention	70 N in the axis
Mating cycles	500 minimum
Environmental protection	
Sealing protection	IP67 and NEMA 6 – dust, oil and water-proof to 1 meter for >30 min
Salt spray protection	1000 hours minimum
Fire retardant / low smoke	UL94 V0; NFF 16102, DIN 5510-2
Thermal shock	5 cycles @ -40°C to +100°C
Operating temperature	-40°C to +85°C

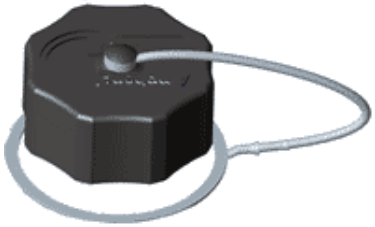
Specifications are subject to change. Consult factory for latest information.



Kevlar Protected Industrial Cabling:

- Category 5E for up to 1000BaseT connections
- Kevlar reinforced for superior strength & ruggedness
- Doubled shielded for the best noise immunity
- High flexibility makes routing easier
- Excellent UV, hydrolysis and microbial resistance
- Plenum rated - low smoke, halogen free flame retardant (HFFR) black polyurethane jacketing
- Available in cordsets and bulk cable reels
- **Part #: ET-RJF5E-xx** (xx = length in meters) (see separate datasheet for more details)

Protective Cap with Tether:



Part #: ET-RJFRB-C7

Benefits of IP67 Plug Accessories:

- IP67 protection – dust, oil and water-proof!
- Positive lock for shock & vibration resistance
- Strain relief prevents cable breaks
- Field-installable – No tools needed!
- Fits over standard Ethernet cables
- Quick ¼ turn reverse-bayonet latching reduces installation time and costs

RJ45 Ethernet Plug:



Part #: ET-RJFRB-6

RJ45 Bulkhead Connector:



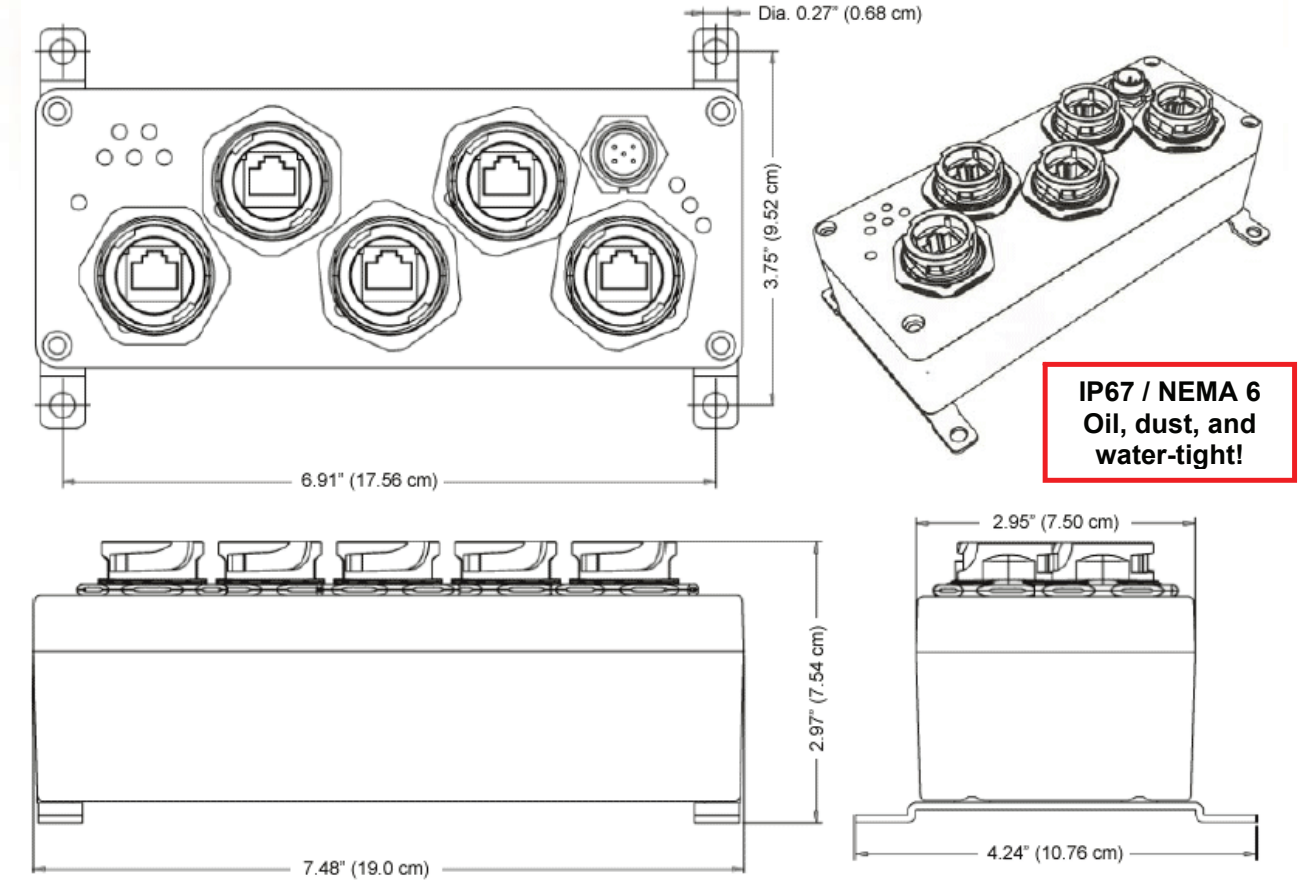
Part #: ET-RJFRB-71

Power Plug:



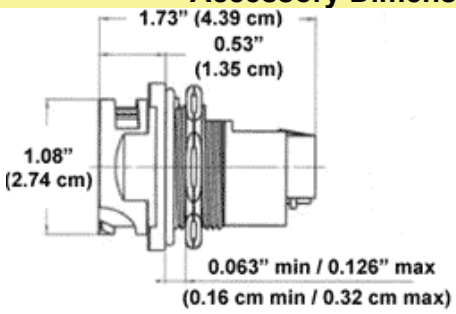
Part#: ET-RJF-PWR-1

Mechanical and Mounting Dimensions

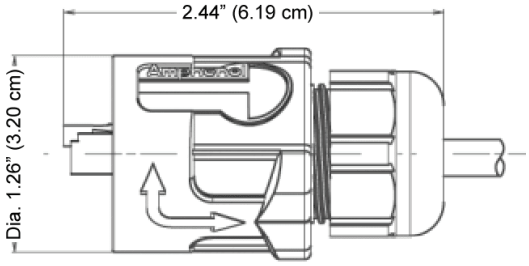


Fiber Reinforced Polyester Enclosure

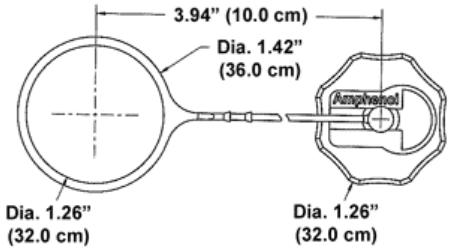
Accessory Dimensions (See User Manual for More Details)



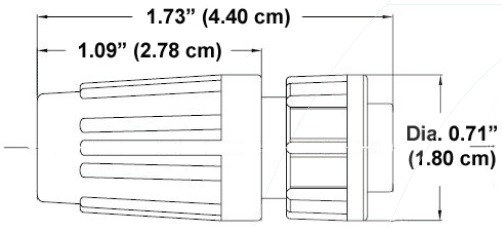
ET-RJFRB-71 (IP67 Bulkhead Connector)



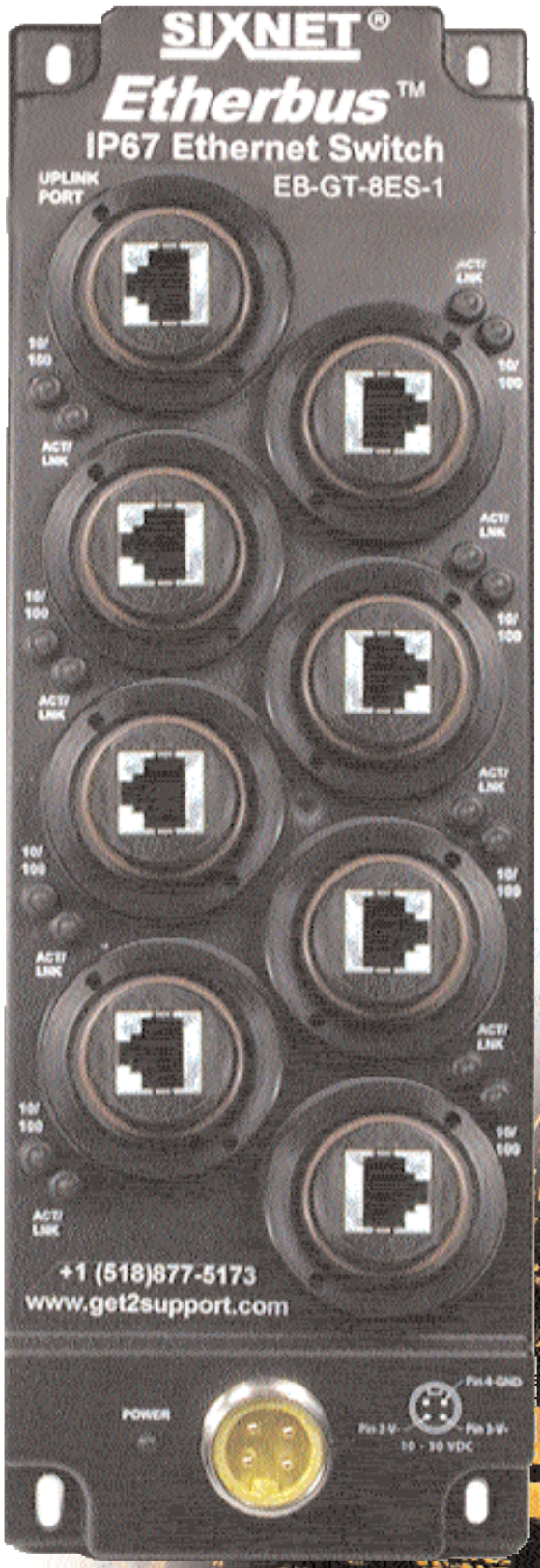
ET-RJFRB-6 (IP67 Ethernet Plug)



ET-RJFRB-C7 (IP67 Cap with Tether)



ET-RJF-PWR-1 (IP67 Power Plug)



IP67 Rated Industrial Ethernet Switches

Introducing Etherbus™

Fieldbus-style, real-time Ethernet technology that mounts directly onto a machine.

- **IP67 waterproof rating**
- **Direct fieldbus-style installation - No enclosure required.**
- **Real-time 10/100BaseT auto-detecting operation**
- **Auto-MDI/MDIX crossover on all 8 ports**
- **Compatible with Fieldbus H2, Ethernet IP, Modbus Open and all other Ethernet fieldbus networks.**
- **UL 508, CSA, CE and Zone 2 rated**
- **Certified for marine and offshore use**
- **Supports ALL standard IEEE 802.3 Ethernet protocols**
- **Extended power model (-1EP) meets military standard MIL-STD-1275**



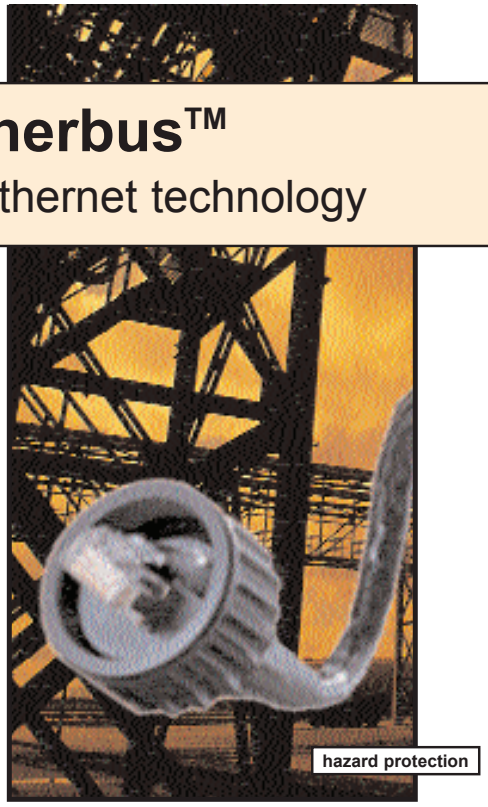
Introducing Etherbus™

direct machine-mountable Ethernet technology

Mount an Etherbus™ Industrial Switch directly onto a machine or convenient wall in any harsh industrial environment. SIXNET Industrial Switches insure real-time deterministic performance. The Etherbus packaging is IP67 rated against water, oil and dust.

Now you can have the convenience of durable Fieldbus packaging coupled with the open systems flexibility that only Ethernet provides.

- *Reduce installation cost*
- *Mount anywhere - save space*
- *Insure real-time operation*
- *Allow for Deterministic Control*



SIXNET switches eliminate collisions
Unlike a hub, SIXNET Switches buffer and intelligently transmit network packets in an orderly sequence. Since each network segment is now a controlled one-on-one link, Ethernet message collisions are completely eliminated.

Real-time deterministic performance
SIXNET Industrial Ethernet Switches automatically determine and remember where an Ethernet device is located and routes messages only through the appropriate port. This minimizes network loading, giving your deterministic software the open communications channels it needs.

The Fieldbus Direct-mount Advantage
Etherbus IP67 rated packaging transforms Ethernet into a Fieldbus by enabling you to mount our industrial switch directly onto a machine or an exposed wall in a harsh environment. This saves space and money by eliminating the need for environmentally rated electrical enclosures and expensive fittings for signal cables that enter the protected enclosure. Maintenance time is also reduced because you have direct access to the cable connections on this Industrial Ethernet Switch.

Compatible with standard RJ45 cables
Etherbus™ switches use the ingenious Woodhead RJLnxx environmental connectors (patent pending). These waterproof and vibration-protected connectors have a standard RJ45 core enabling you to plug a standard RJ45 cable in for bench testing and temporary field connection with a laptop computer.

Industrial switches survive heat & cold
SIXNET industrial switches work reliably through the dead of winter and those hot summer days. Unlike office-grade switches that are intended only for use in air conditioned offices, SIXNET industrial switches are designed for those places that you don't want to be.

Minimize your wiring headaches
Eliminate unwieldy bundles of ethernet cables by placing these efficient wiring concentrators right on the plant floor. Simpler and shorter cabling means higher reliability, too!

IP67 Rated Industrial Ethernet Switches

Performance Specifications

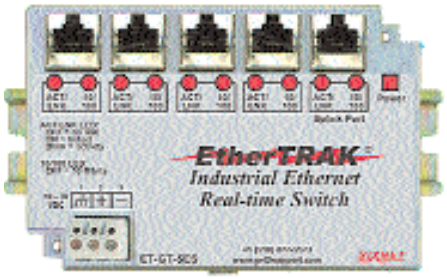
Ethernet switch type	Unmanaged, store & forward
RJ45 ports (shielded)	10/100BaseT(x) / Auto-MDI/MDIX
RJ45 speed (auto-negotiating)	10 Mbps or 100 Mbps
Ethernet protocols supported	All standard IEEE 802.3
Broadcast storm protection	5% of bandwidth
Memory bandwidth	2 Gbps
Completely compliant	IEEE 802.3 & IEEE 802.3u
Full or half duplex operation	Auto-sensing on RJ45 ports
MAC addresses supported	1K (automatic learning, aging, and migration)
Ethernet isolation	1500 VRMS 1 minute
Required supply voltage	10-30 VDC (-1 standard model); +/-16-40 VDC (-1EP model)
Power consumption (typical)	4 W (165 mA @ 24 VDC)
Maximum voltage surge	100 volts for 1 sec. (-1EP model)
Maximum voltage spike	250 volts for 100 usec. (-1EP model)
Operating temperature	-40 to +70 °C (for -1 model) -40 to +60 °C (for -1EP model)
Storage temperature	-40 to +85 °C
Humidity	100% RH
Flammability	UL 94V-0 materials
Electrical safety	UL 508, CSA C22/14 EN61010-1 (IEC1010) CE
EMI emissions	FCC part 15, ICES 003, EN55022, Class B CE
EMC immunity	EN61326-1 (EN61000-4-2, 3, 4, and 6) CE
Surge withstand	IEEE-472 (ANSI C37.90)
Vibration	IEC68-2-6
Hazardous locations	UL 1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)
Environmental rating	IEC IP67



Ordering Information

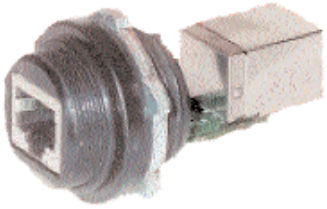
Part	Description
EB-GT-8ES-1	8 port IP67 rated Ethernet switch
EB-GT-8ES-1EP	8 port IP67 switch with extended power
EB-CC-PS-F1	Field-installable IP67 rated DC power input connector (1 included with each switch)
EB-CC-CAT5-M4	Field-installable IP67 rated RJ45 connector (4 piece pack)
EB-CC-CAP-L4	Watertight Ethernet receptacle closure cap with tether (4 piece pack)
EB-CP-RJ45-F1	IP67 rated bulkhead connector with tethered cap (for making waterproof connections to the outside of electrical enclosures)

Other SIXNET Industrial Switches



5 port, 9 port, dual fiber ports, and copper to fiber converter models available

IP67 Waterproof Accessories



EB-CP-RJ45-F1
IP67 rated bulkhead connector



EB-CC-CAT5-M1
Field-installable IP67 rated RJ45 connector

A Complete Family of I/O Solutions

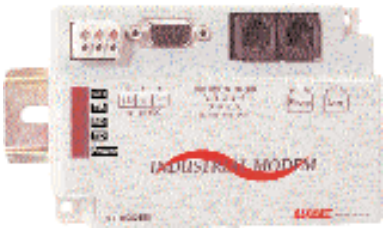
Ethernet I/O



Remote Terminal Unit



Industrial Phone Modems



Ethernet and RS485 I/O

SIXNET can provide you the building blocks for the open systems you are looking for. Three complementary families of modular DIN rail mounted I/O provide local, remote, enterprise level, or Internet I/O solutions.

Ethernet-Ready RTU

VersaTRAK is a versatile RTU with powerful 32-bit programming, discrete and analog I/O, datalogging and communications, including support for Ethernet, radios and telephones integrated into a single compact package.

Industrial Modems

SIXNET rugged industrial modems eliminate the hassles of mounting a telephone modem in an industrial enclosure. These robust modems are rated for -30 to +70 °C industrial operation.

TrakPAK Packaged Systems

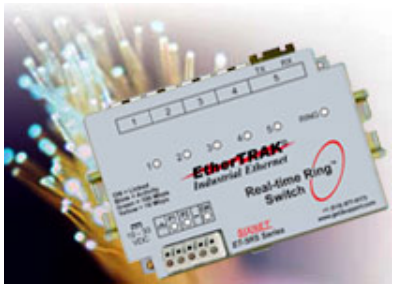
SIXNET delivers complete I/O cabinets that come to you designed; built; tested; and ready for installation.



Fiber Optic Guidelines

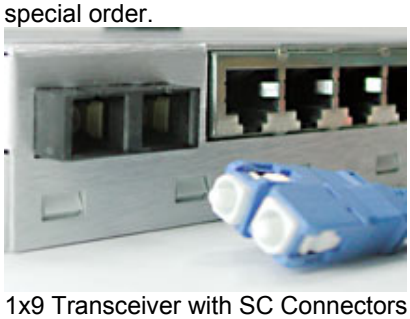
Most SIXNET Industrial Ethernet Switches are offered with optional fiber optic ports. The advantage to fiber optics is that it provides noise immunity along with extended link distances. Since light is unaffected by electrical interferences (EMI) it is noise immune and ideal for applications with electrically noisy environments. Whereas traditional Ethernet copper cabling (Cat 5/5E/6) is limited to 100 meters (due to noise and degradation of the signals), the light of fiber optic links can be transmitted over much greater distances up to 120 km or more. SIXNET offers several standard options for fiber optic ports. Many other options may be available as special order.

- **SIXNET Standard Fiber Optic Transceivers**
- **SIXNET Fiber Transceivers Performance Specs**
- **Typical Fiber Optic Cable Typical Parameters**
- **Calculating Fiber Optic Distances**
- **Summary of Maximum Fiber Optic Distances**
- **Important Note about these Guidelines**



Fiber Optic Transceivers:

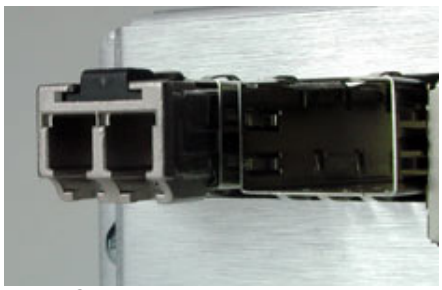
1x9 Transceivers with SC or ST Connectors:
These are offered on the fiber optic fast Ethernet (100 Mbps) ports. The “1x9” refers to the industry-standard pin-out of 1 row by 9 pins. SIXNET offers these transceivers with dual ST or SC style connectors. They are available as Multimode, Singlemode, or Singlemode Long Haul. Other variations are available as special order.


1x9 Transceiver with SC Connectors

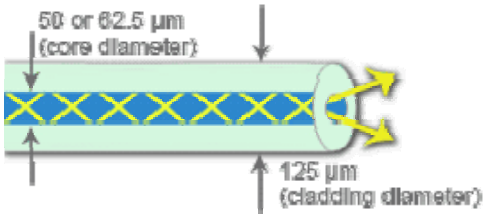

1x9 Transceivers with ST Connectors

SFP (Small Form Pluggable) Transceivers (aka Mini-Gbic) with LC Connectors:
These are offered on the fiber optic gigabit Ethernet (1000 Mbps) ports. These transceivers plug into a cage assembly that is already in place in the SIXNET switch. They are more compact than the more traditional 1x9 style transceivers. SIXNET offers these transceivers with dual LC connectors. They are available as Multimode, Singlemode, or Singlemode Long Haul. Other variations such as CDWM (Coarse Wavelength Division Multiplexing) are available as special order.


SFP Transceiver out of cage

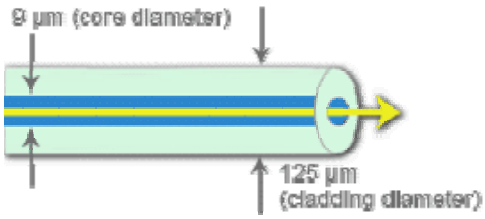

SFP Transceiver inserted in cage

Multimode:
Multimode fiber optic links are the most popular because they generally have the lowest cost cabling and transceivers. However, they have limited lengths of up to 4 or 5 km. To form a multimode link you must use both multimode cable (50 or 62.5 µm core diameter) and multimode transceivers. With multimode fiber the light travels multiple paths down the cable and actually bounces side to side. Because of the nature of multimode fiber the distance it can go is limited primarily by a phenomenon called modal dispersion or multimode distortion.



Multimode Cable

Singlemode and Long Haul:
Singlemode fiber optic links are less popular because of their higher cost cabling and transceivers but they can operate over extended distances up to 120 km or more. To form a singlemode link you must use both singlemode cable (8, 9 or 10 µm core diameter; 9 um is most common) and singlemode transceivers. With singlemode fiber the light travels in a single path down the cable. This is more efficient and allows for the extended distances. Singlemode fiber is not affected by modal dispersion so its distance is limited mostly by the power and sensitivity of the transceivers being used.



Singlemode Cable

SIXNET Fiber Transceivers Performance Specifications:

Ethernet Type	Mode	Data Rate (Mbps)	Signal Rate (MHz)	Wave-length (nm)	IEEE Standard
Fast Ethernet	Multi	100	125	1310	100BaseFX
Fast Ethernet	Single	100	125	1310	100BaseFX
Fast Ethernet	Single – long haul	100	125	1310	100BaseFX
Gigabit Ethernet	Multi	1000	1250	850	1000BaseSX
Gigabit Ethernet	Single	1000	1250	1310	1000BaseLX
Gigabit Ethernet	Single – long haul	1000	1250	1310	1000BaseLX
Gigabit Ethernet	Single – long haul	1000	1250	1550	1000BaseLH
Gigabit Ethernet	Single – long haul	1000	1250	1550	1000BaseLH

SIXNET Fiber Transceivers Performance Specifications (continued):

Ethernet Type	Mode	Power Budget (Power - Sensitivity)		Transmitter Power*			Receiver Sensitivity*		
		Typical	Worst	Min. dB	Typ. dB	Max. dB	Min. dB	Typ. dB	Max. dB
Fast Ethernet	Multi	14 (-17 minus -31)	10 (-21 minus -31)	-21	-17	-14	--	-34	-31
Fast Ethernet	Single	20 (-11 minus -31)	16 (-15 minus -31)	-15	-11	-8	--	-36	-31
Fast Ethernet	Single-Long haul	31 (-3 minus -34)	29 (-5 minus -34)	-5	-3	0	--	-36	-34
Gigabit Ethernet	Multi	12 (-6 minus -18)	9 (-9 minus -18)	-9	-6	-3	--	--	-18
Gigabit Ethernet	Single	14 (-6 minus -20)	11 (-9 minus -20)	-9	-6	-3	--	--	-20
Gigabit Ethernet	Single-Long haul	22 (-1 minus -23)	19 (-4 minus -23)	-4	-1	2	--	--	-23
Gigabit Ethernet	Single-Long haul	22 (-1 minus -23)	19 (-4 minus -23)	-4	-1	2	--	--	-23
Gigabit Ethernet	Single-Long haul	25 (2 minus -23)	23 (0 minus -23)	0	2	5	--	--	-23

* Note: For transmitter power the higher the number the better. The opposite is true for receiver sensitivity, the lower the number the better.

Fiber Cable Parameters (typical):

Cable Size (core/cladding) (µm)	Mode	Wavelength (nm)	Connector Losses (dB per connection)	Splice Loses (db per splice)	Distance Losses (dB per km)	Multimode Modal Dispersion* (MHz x km)	Singlemode Dispersion (ps / nm x km)
62.5/125 µm	Multi	850 nm	1 dB	0.2 dB	3.3 dB	300	--
50/125 µm	Multi	850 nm	1 dB	0.2 dB	2.7 dB	700	--
62.5/125 µm	Multi	1310 nm	1 dB	0.2 dB	1 dB	500	--
50/125 µm	Multi	1310 nm	1 dB	0.2 dB	0.8 dB	800	--
9/125 µm	Single	1310 nm	1 dB	0.2 dB	0.5 dB	--	3.5
9/125 µm	Single	1550 nm	1 dB	0.2 dB	0.25 dB	--	19
8/125 µm	Single	1550 nm	1 dB	0.2 dB	0.2 dB	--	19

* Note: These are just guideline numbers. Refer to your cable specifications for more accurate values.

Calculating Fiber Optic Distances:

There are two primary ways to calculate how far you can go with your fiber optic links. To be safe you should go by the shortest result from the two methods, if you use both such as you can with Multimode fiber. Also, you should design for up to a 25% safety margin to be conservative and allow for degrad the signal and cable over time.

Method 1: Modal Dispersion for Multimode links only

Maximum Distance = modal Dispersion / Signal rate

Speed	Mode	Wavelength (nm)	Cable Diameter (µm)	Modal Dispersion*	Signal Rate (MHz)	Max. Distance Based on Modal Dispersion
Fast Ethernet	Multi	850 nm	62.5/125	300	125	2.4 km
Fast Ethernet	Multi	850 nm	50/125	700	125	5.6 km
Fast Ethernet	Multi	1310 nm	62.5/125	500	125	4 km
Fast Ethernet	Multi	1310 nm	50/125	800	125	6.4 km
Gigabit Ethernet	Multi	850 nm	62.5/125	300	1250	240 km
Gigabit Ethernet	Multi	850 nm	50/125	700	1250	560 m
Gigabit Ethernet	Multi	1310 nm	62.5/125	500	1250	400 m
Gigabit Ethernet	Multi	1310 nm	50/125	800	1250	640 m

Method 2: Based on Optical Budget

Power Budget = Transmitter Power – Receiver Sensitivity
Spare Optical Budget = Power Budget – Power Losses (splices and connectors)
Maximum Distance = Spare Optical Budget / Distance Losses

Speed	Mode	Cable Size	Wave-length	Power Budget (Worst case)	Typical Losses*	Spare Power	Distance Losses	Max. Distance
Fast Ethernet	Multi	62.5/125 µm	1310 nm	10 dB	6 dB	4 dB	1 dB	4 km
Fast Ethernet	Multi	50/125 µm	1310 nm	10 dB	6 dB	4 dB	0.8 dB	5 km
Fast Ethernet	Single	9/125 µm	1310 nm	16 dB	6 dB	10 dB	0.5 dB	20 km
Fast Ethernet	Long haul	9/125 µm	1310 nm	29 dB	6 dB	23 dB	0.5 dB	46 km
Gigabit Ethernet	Multi	62.5/125 µm	850 nm	9 dB	6 dB	3 dB	3.3 dB	0.9 km
Gigabit Ethernet	Multi	50/125 µm	850 nm	9 dB	6 dB	3 dB	2.7 dB	1.1 km
Gigabit Ethernet	Single	9/125 µm	1310 nm	11 dB	6 dB	5 dB	0.5 dB	10 km
Gigabit Ethernet	Long haul	9/125 µm	1310 nm	19 dB	6 dB	13 dB	0.5 dB	26 km
Gigabit Ethernet	Long haul	9/125 µm	1310 nm	19 dB	6 dB	13 dB	0.25 dB	52 km
Gigabit Ethernet	Long haul	9/125 µm	1310 nm	23 dB	6 dB	17 dB	0.2 dB	85 km

* Note: Typical losses include 2 dB (two connectors), 3 dB (safety margin) & 0.4 (two splices) = 6 dB (rounded up)

Fiber Optic Maximum Distance Summary:

Speed	Mode	Cable Size	Wave-length	IEEE Recommended Distance	Max. Distance Based on Power Budget*	Max. Distance Based on Modal Dispersion*
Fast Ethernet	Multi	62.5/125 µm	1310 nm	2 km	4 km	4 km
Fast Ethernet	Multi	50/125 µm	1310 nm	2 km	5 km	6.4 km
Fast Ethernet	Single	9/125 µm	1310 nm	15 km	20 km	--
Fast Ethernet	Long haul	9/125 µm	1310 nm	--	46 km	--
Gigabit Ethernet	Multi	62.5/125 µm	850 nm	220 m	0.9 km	240 m
Gigabit Ethernet	Multi	50/125 µm	850 nm	550 m	1.1 km	560 m
Gigabit Ethernet	Single	9/125 µm	1310 nm	5 km	10 km	--
Gigabit Ethernet	Long haul	9/125 µm	1310 nm	--	26 km	--
Gigabit Ethernet	Long haul	9/125 µm	1310 nm	--	52 km	--
Gigabit Ethernet	Long haul	9/125 µm	1310 nm	70 km	85 km	--

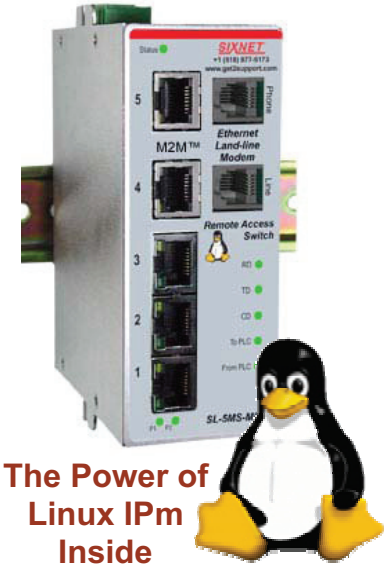
Note: These numbers are just guidelines and are highly dependent on your cable and transceiver specifications.

Important Note:
This information is provided as a guideline for planning your fiber optic links using SIXNET Industrial Ethernet switches. It is not a guarantee of performance. The actual distance limits depend on the factors described above and other factors such as the actual optical fiber attenuation, wear and age of your transceivers and cables, and quality of connectors and splices. Whenever possible you should measure and verify the characteristics of your links to make sure that they will perform as expected.

Remotely Access your Ethernet Network through a Phone Connection

The SL-5MS-MDM-1 combines a SIXNET Industrial Telephone Modem with a SIXNET Industrial Managed Switch in our slimmest package.
This powerful combination allows you to securely access your Ethernet network from any remote location over standard telephone lines - using less din rail space than ever before.

5 Ethernet Ports with Integrated Phone Modem

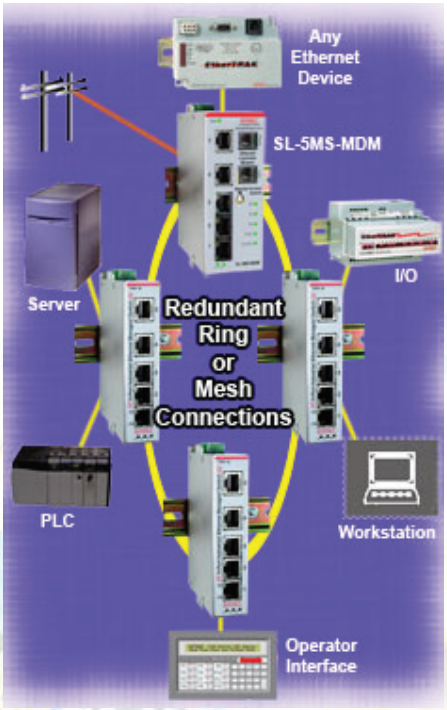


Save Time and Money

The SL-5MS-MDM-1 allows you to avoid those costly site visits and respond to network situations immediately! Perform remote diagnostics and maintenance from the comfort of your office, home or another facility.

Real-time Secure Performance

- Advanced PSTN modem features
  - Make easy and secure dial-in connections
  - Automatic dial-out on a trigger input
  - Connection speeds up to Fast 56K (V.90)
  - Full data compression and error control supported
  - Compliant with telephone systems world-wide
- Advanced Ethernet switch features
  - Five 10/100 fast Ethernet ports
  - Auto-speed/duplex, auto-crossover & auto-polarity
  - Plug and play operation or full management ability
  - RSTP, VLAN, IGMP, QoS, SNMP and more
- Easy configuration with web or terminal interfaces
- Secure connections with HTTPS, SSL, SSH, SNMPv3 …
- ***Router Information Protocol (RIP)***



Trouble Free Operation

- High Mean Time Between Failure rating
- Twenty year support and service policy
- Free field-installable upgrades forever
- -40 to +75 °C operation – no fans or moving parts!
- UL, CSA (CUL), and CE certified
- Marine, offshore and hazardous locations rated
- Enhanced surge and spike protection
- Dual (redundant) power inputs
- Alarm output and trigger input for PLC (or other device)

Certified to Perform:

ISO9001 Certified | Class 1, Div II & Cenelec Zone 2 | Marine & Offshore | European Community | UL508 for Safety

Performance Specifications

Industrial Ethernet Switch	5 Ethernet ports	
Ethernet switch type	Managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Typical latency for 10 Mbps ports	16 us + frame time	Varies on load & settings
Typ. latency for 100 Mbps ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	
Industrial Telephone Modem	PSTN modem	
Maximum data rates	56 Kbps	
Compatibility	V.90, V.34, V.32, V.32 bis, V.22, V.22 bis, V.21	
Data compression	V.42 bis	
Error correction	V.42 MNP or LAP	
Ringer	0.3	
Jacks	2 RJ11 (phone and line)	
Command sets	Standard AT and S register	
Country compatibility	World-wide (100+ countries)	
Telecom ratings	FCC Part 68; Industry Canada CS03-8; CTR21 (98/482/EC); ACA TS 001 and ACA TS 002	
RS232 Management Port	RJ45 port	
Fixed baud rate, data bits, parity, stop bits, flow control	9600 Bps, 8, None, 1, None	
"PLC" Input and Output	Trigger (in) & alarm (out) signals	
PLC / Alarm output voltage	Same as switch input power voltage	
Maximum current output	0.5 Amp	
PLC / Trigger input voltage	10-30 VDC	
Typically current input	6.5 mA @ 24 VDC	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (all ports active)	5.0 W typical	
Input voltage (all models)	10-30 VDC (continuous)	
Transient protection	15,000 watts peak	
Spike protection	5,000 watts (10 times for 10 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	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1, EN50082-1	
Hazardous locations	UL1604, CSA C22.2/213 (Class 1, Div. 2), Cenelec EN50021 (Zone 2)	
Packaging (alum. case)	IP30 protection	
Dimensions (L x W x H)	See following page	

Specifications are subject to change. Consult factory for latest information.

Hardware Highlights:

- 5 port industrial Ethernet managed switch with integr industrial telephone modem
- Output for reporting power and operational status
- Input for triggering alarm dial-out operation
- Redundant power inputs and surge/spike protection
- Industrial rated for -40 to +75 °C operation (no fans!)
- UL/CSA, CE and Zone 2 rated for hazardous location
- Rated for marine and off-shore use

Telephone Features:

- Dial-in or automatic dial-out capabilities
- PPP (Point-to-Point Protocol) for dial-up connections
- Fast phone connections up to 56 Kbps
- Full data compression and error correction options

Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- Support for up to 2048 MAC addresses
- Full-Duplex operation with flow control (no collision
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing (QoS) for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- DHCP client for automatic IP address assignment
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telne SSH (network), terminal (RS232) or SNMP (v1, v2, v
- Router Information Protocol (RIP)

Ethernet Compliance:

- IEEE 802.3 (10Mbps Ethernet supports legacy device
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devic
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1D/w (Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability)
- IEEE 802.1p (Priority Queuing – QoS, CoS, ToS/DS)
- IEEE 802.1Q (VLAN for traffic segregation)

Additional features are in the works and are provided through FREE Firmware Upgrades Contact SIXNET for the latest information.

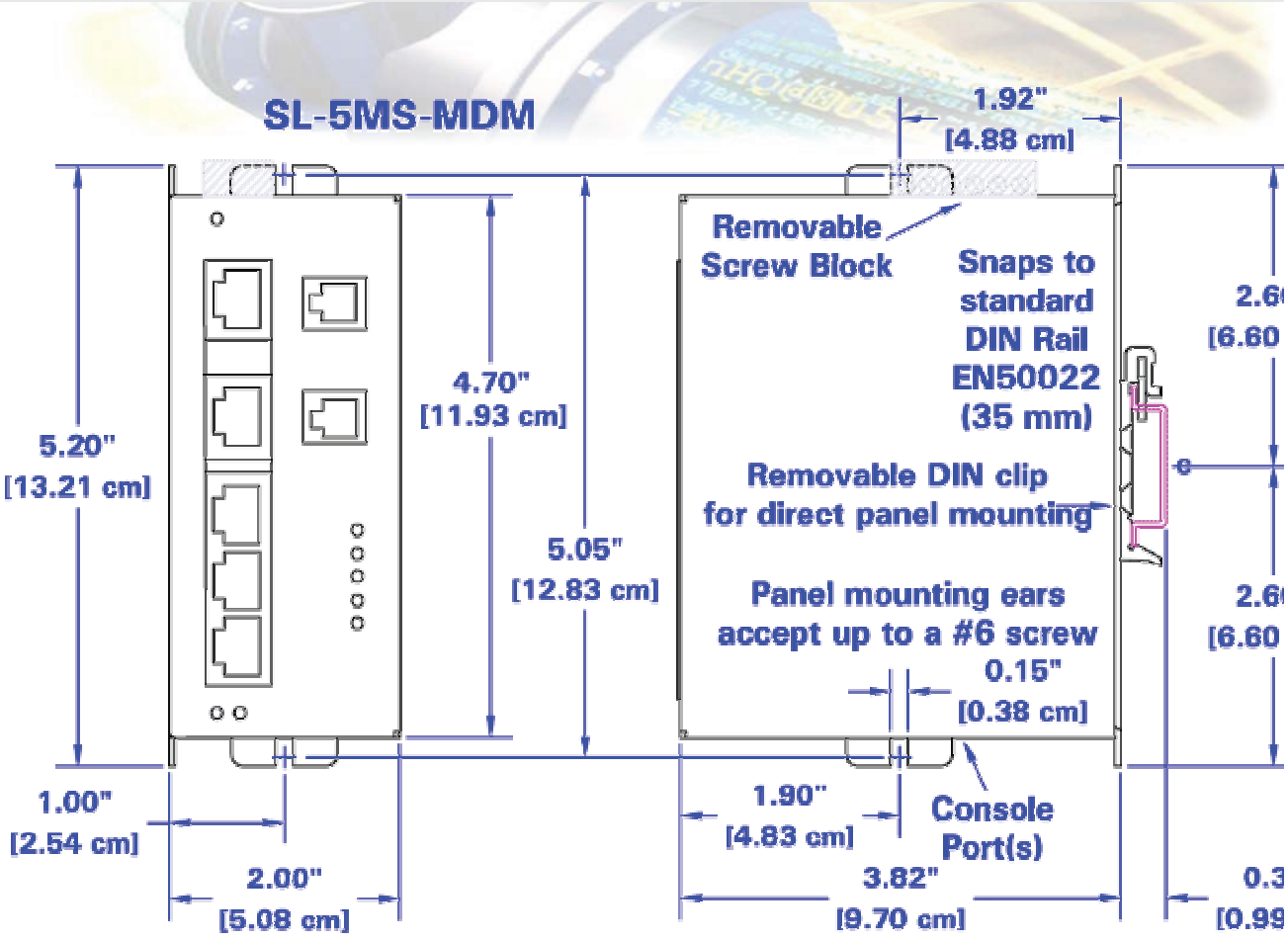
Ordering Guide

Part Number: SL-5MS-MDM-1

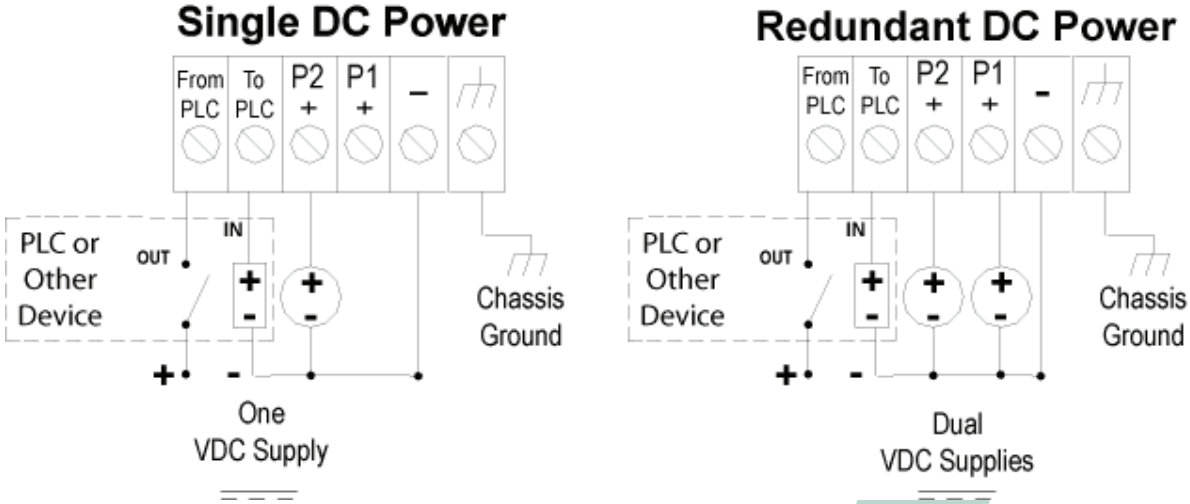
Accessories:

ET-PS-024-01F	Power supply – AC to 24 VDC, 2A
SP-ETH-2	2 Port Ethernet lightning protector
SP-TELCO-1	1 port phone lightning protector
RJ45-DB9F-CBL	PC to managed switch serial cable

SL-5MS-MDM-1 Mechanical Dimensions



SL-5MS-MDM-1 Power and Alarm Connections



Low Cost and Ultra-Reliability in the Same Package!

SIXNET Slim Line Industrial Ethernet Copper to Fiber Media Converters provide fast performance allowing for real-time operation. These ruggedized converters are industrial hardened to provide superior reliability. They require no user setup and immediately start operating as soon as you power them up. These SIXNET converters are designed to make your job easier.

Product Highlights

- **Slim packaging fits on your DIN rail**
- **High performance and value**
- **Truly industrial hardened design**
- **Dual power inputs keeps you running**
- **Plug & play saves you time and money**

Multimode, singlemode or long haul fiber optic ports are available



Auto-detecting 10/100 RJ45 copper port

High throughput for real-time operation
- 10/100 RJ45 copper port
- 100 Mbps fiber optic port with SC or ST

SIXNET reliability and long-term support
- Ultra-reliable 1,000,000+ hours MTBF

Plug and play simplicity
- Auto-sensing for speed and duplex
- Auto-mdi/mdix-crossover and auto-polarity

Industrial tough – ready for any application
- Dual power inputs with spike protection
- DIN rail or direct panel mounting

Replace those office-grade or other so-called industrial grade devices with these truly rugged converters from SIXNET.

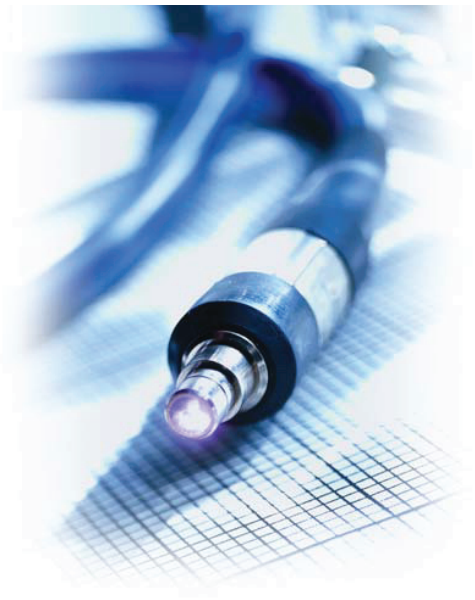
SIXNET knows industrial –
We have been designing industrial hardware such as Remote Terminal Units for over 25 years and have used this expertise to design the toughest Ethernet switches and converters on the market. Don't trust your critical communications to so-called industrial hardware from commercial switch manufacturers. SIXNET switches give you proven assurance that your system will keep running for years to come.

Certified to Perform:

ISO9001 Certified	European Community	UL508 for Safety	USA/Canada Emissions	Lead & Hazardous Substance Free

GM/0308

Real-time, Rugged and Reliable



SIXNET Industrial Ethernet Media Converters

Now, any industrial Ethernet device can connect to a high reliability and noise immune fiber optic network with links up to 70 km or more. These rugged media converter ensure that your critical automation and control communications stays running.

Why a SIXNET Industrial Ethernet Converter?

SIXNET industrial Ethernet converters are truly industrial. SIXNET has over 25 years experience designing Remote Terminal Units for the toughest applications and has applied this expertise to design the most rugged and reliable Ethernet switches and media converters. Their tough packaging and protected circuitry keep them working under conditions that may cause other so-called industrial switches to quickly fail. Industrial applications are demanding - it gets hot, it gets cold - the power browns out or spikes wildly - and you need a reliable industrial converter that can keep on going.

Real-time deterministic performance

SIXNET industrial Ethernet converters are built upon SIXNET's industrial Ethernet switch technology. By providing high throughput to ensure no delays and enhanced message routing to eliminate message collision, these converters allow for true network determinism. With plug and play ease, simply install these industrial Ethernet converters and you'll immediately reap the benefits of increased performance.

SIXNET Converters deliver ultra-reliability

SIXNET industrial Ethernet converters have field-proven reliability of more than 1,000,000 hours MTBF. These SIXNET industrially hardened converters are rated to survive on the plant floor. You can count on SIXNET, who has been making industrial hardware for over 25 years!

Industrial switches survive heat & cold

SIXNET industrial Ethernet converters work reliably through the dead of winter and those hot summer days. Unlike some industrial converters that are only screened commercial devices (this means they are not truly designed for extended temperatures), SIXNET industrial converters are designed for those places that you don't want to be - over a wide operating temperature range.

Lose those bulky power transformers

SIXNET industrial Ethernet converters run directly on the DC power that you already have in your control cabinet. Get rid of those cumbersome AC outlet transformers. No AC power means fewer safety issues. If you ship your equipment internationally, you can forget about the headaches caused by different voltages and incompatible power plugs.

Fiber optics increase distance and reliability

Fiber optic cables are absolutely immune to electrical and magnetic interference. Fiber optics cannot be damaged by voltage transients. You will never spend time tracking down a ground loop in a fiber optic network. This is because an optical cable is not an electrical device. Fiber optic cabling not only enhances reliability, it saves all the time you might have spent tracking down those nasty communications problems. In addition, fiber cables increase the allowable direct cable lengths to 70 km or more.

Forget the Velcro and makeshift brackets

SIXNET industrial Ethernet converters can be DIN rail or direct panel mounted - right out of the box. Their compact footprint fits easily into equipment-filled enclosures. No extra mounting accessories are need!

SIXNET Industrial Converters Make Your Job Easier

Just snap these converters onto the rail, plug in your network cables, and sit back and watch the data flow, year after year. These switches have been specifically designed to make your job easier.

GM/0308

Slim Line Industrial Ethernet Media Converter

Performance Specifications		
General	2 Ethernet ports	
Ethernet switch type	Unmanaged, store & forward	
Ethernet protocols supported	All IEEE 802.3	
RJ45 port (shielded)	10/100BaseTX	
RJ45 speed (10 or 100 Mbps)	Auto-negotiation	
RJ45 MDI/MDIX and TD/RD	Auto-crossover and auto-polarity	
Fiber optic port speed	100BaseFX (100 Mbps)	
Fiber optic port wavelength	1300 nm center	
Fiber multimode (mm) typical	50 or 62.5/125 um (SC or ST)	
Fiber singlemode (sm) typical	9 or 10/125 um (SC or ST)	
Fiber max. distance (full duplex) (see web for details)	4 km (mm), 20 (sm) or 40 km (long haul) or more (contact SIXNET)	
Typ. latency for 100 Mbps ports	5 us + frame time	Varies on load
Fiber duplex operation	Full duplex	
MAC addresses supported	1024	
Memory bandwidth	3.2 Gbps	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (typical)	2.0 W (all ports active)	
Power Input	10-30 VDC	
Transient protection	15,000 watts peak	
Spike Protection	5,000 watts (10 times for 10 uS)	
Ethernet isolation	1500 VRMS 1 minute	
Operating temperature range	-10 to +60 °C	
Storage temperature range	-40 to +85 °C	
Humidity (non-condensing)	5 to 95% RH	
Vibration	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging material & protection	ABS with IP30 protection	
Dimensions (L x W x H)	See next page	

Specifications are subject to change. Consult factory for latest information.

Ordering Guide	
SL-2ES-2SC **SL-2ES-2ST**	1 RJ45 port & 1 multimode fiber optic port with SC or ST style connector
SL-2ES-3SC **SL-2ES-3ST**	1 RJ45 port & 1 singlemode fiber optic port with SC or ST style connector
Accessories:	
RM-PS-024-01F	Power supply – AC to 24VDC, 1A, with integrated power bus
ET-PS-024-02	Power supply – AC to 24VDC, 2A, with compact packaging
SP-ETH-2	Dual port surge & lightning protector

Hardware Highlights:

- Industrial Ethernet media converter with a fiber optic port (multimode or singlemode) and copper RJ45 port
- Redundant power inputs and industrial surge protection
- UL/CSA and CE rated for industrial applications
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Store and forward wire speed switching – no delays
- Support for up to 1024 MAC addresses
- Automatic address learning, aging and migration
- Full-Duplex operation with flow control (no collisions!)
- Auto crossover (MDI/MDIX) and auto polarity

Ethernet Compliance:

- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)

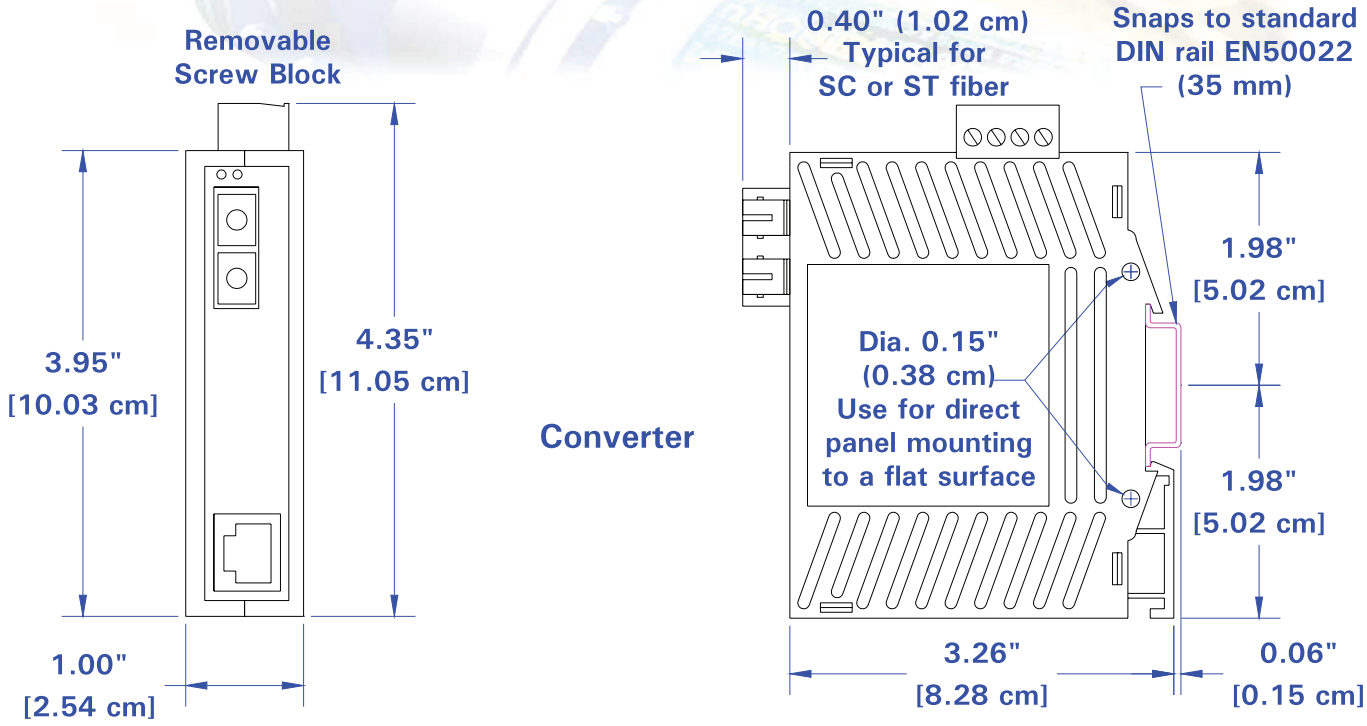


This rugged converter is part of the SIXNET family of Slim Line Industrial Ethernet switches.



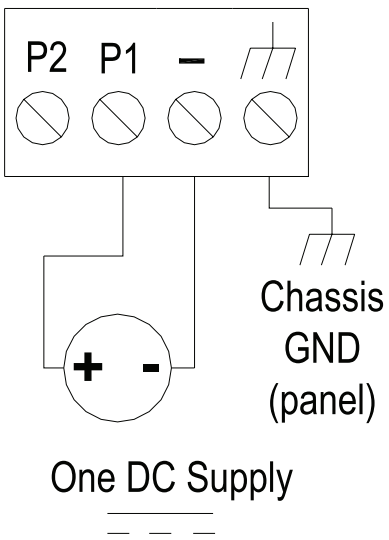
5, 8 and 9 Port Models are available with an optional fiber optic port

Mechanical Dimensions



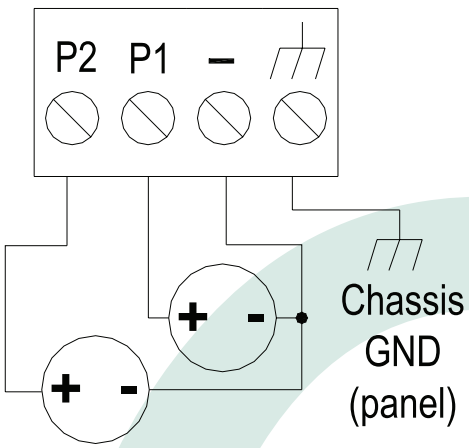
Power Connections

Single DC Power



One DC Supply

Redundant DC Power



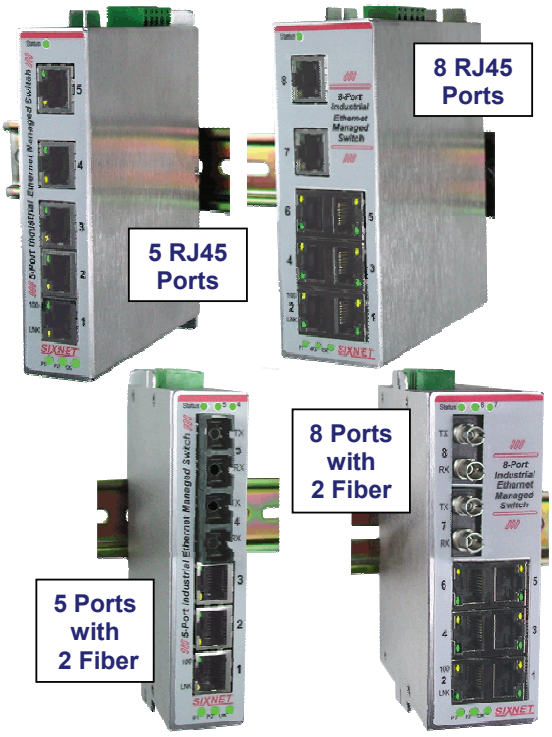
Dual DC Supplies

True Reliability, Performance and Value in a Compact Package

Product Highlights

- **Slim packaging fits on your din rail**
- **High performance and value**
- **Truly industrial hardened design**
- **Advanced features and security**

Now with up to 4 Fiber Ports!



Real-time Secure Performance

- Rapid Spanning Tree (RSTP) for fast redundant rings
- SNMPv1 and v2 network management
- SNMPv3 authentication & encryption for security
- SNMP notifications (traps) for report on event
- Priority Queuing (QoS/CoS) for real-time operation
- IGMP for Multicast filtering (snooping & querying)
- VLAN for convenient traffic segregation
- Open-source programming for ultimate flexibility
- Broadcast & multicast storm protection
- RMON & port mirroring for advanced diagnostics
- Security with HTTPS, SSL, SSH, SNMPv3 & more

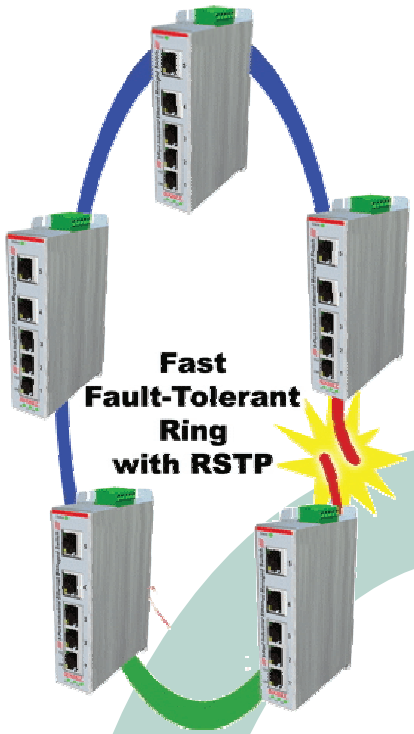
Trouble Free Operation

- Free field-installable upgrades forever
- UL, CSA (CUL), CE and Hazloc (Zone 2) rated
- -40 to 75°C operating temperature (SLX models)
- Dual (redundant) power inputs with spike protection
- Self-test and alarm output contact
- Rugged corrosion-resistant metal packaging
- DIN rail or direct panel mounting in multiple positions – No accessories required!

The Power of Linux IPm Inside



Ensure the reliability of your network with fast automatic switchover on a segment failure.



Certified to Perform:

ISO9001 Certified	European Community	Class I, Div. 2 & Zone 2	UL508 for Safety	USA/Canada Emissions	Lead & Hazardous Substance Free

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Slim Line Industrial Ethernet Managed Switches



Why an Industrial Ethernet Switch

SIXNET switches are designed for industrial environments. Their rugged packaging and protected circuitry keep them working under conditions that will likely cause other switches to fail. Industrial applications are demanding – it gets hot, it gets cold – the power browns out or spikes wildly. You need a reliable industrial switch that can keep on going.

Enhanced Network Reliability and Performance

SIXNET managed switches detect and report network irregularities before serious problems can occur. These switches support SNMP (Simple Network Management Protocol) that allows you to monitor Ethernet and RMON statistics, and SNMP Notifications (traps) to report possible problems as they occur. Then the detailed information from these reliability-enhancing switches can point you to the source of the errors and eliminate hours of frustration while hunting down problems. These ultra-reliable switches will improve the overall performance of your network.

Fast Fault-Tolerant Redundancy

SIXNET managed switches ensure that your system stays running even after a break in a communications pathway. This is possible due to the Rapid Spanning Tree Protocol (RSTP) which lets you wire fault-tolerant loops or redundant rings within your Ethernet network. When a communications path is lost, the switches will automatically and quickly re-route messages through backup or alternate pathways.

Real-time Performance Ensures Deterministic Results

SIXNET managed switches intelligently route messages to eliminate collisions, and use priority queuing (QoS & CoS) to ensure that higher priority messages are delivered first and in real-time. This automatic capability maximizes your network performance by making sure that priority traffic such as I/O control messages are delivered without delay, giving your deterministic software the open communication channels it needs. These switches also support IGMP for IP Multicast filtering for use with industrial protocols like Ethernet/IP. Plus they support VLANs for convenient network segregation, and they automatically limit the number of broadcast and multicast messages to protect you from undesirable "broadcast storms" that can cripple your network.

Ultra-Reliability and True Industrial Performance

SIXNET managed switches are likely to provide maintenance free service for the life of your equipment. Reliability data reported from field installed units proves the amazing track record of these rugged industrial switches. On average, you will enjoy over 1,000,000 hours of trouble free operation before service is required on even one unit!

Advanced Security without Holes or Back Doors

The reality is that security is measured by its weaknesses, not its strengths. Unless your Ethernet switches have every aspect of security adequately protected, access to your network management is not secure. SIXNET managed switches make sure that you are completely secure, with no holes or “back doors” for hackers to sneak into. They include SSH (Secure Shell) for secure and encrypted terminal access, HTTPS protected web server (the same protocol used to manage many e-commerce sites), authenticated communications (user name and password), plus SNMP v3 which provides authenticated and encrypted SNMP messaging.

The LINUX Advantage - Free Industrial Computer with each SIXNET Managed Switch

The powerful IPm embedded-Linux engine is inside each SIXNET managed switch. The IPm engine provides a Linux computer with plenty of horsepower to run your own application programs. Save the expense of a separate computer and enhance the reliability of your systems through this cost-saving combination. Contact SIXNET for details.

Experience how easy it is to configure and use a SIXNET managed switch.

See the Live Demo!

http://www.sixnetio.com/switch-demo.html

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Slim Line Industrial Ethernet Managed Switches

Performance Specifications		
General	5 or 8 Ethernet ports	
Ethernet switch type	Managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100BaseTX	
RJ45 speed (10M or 100M)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Fiber optic port speed	100BaseFX (100 Mbps)	
Fiber optic port wavelength	1300 nm center	
Fiber multimode (mm) typ.	50 or 62.5/125 um (SC or ST)	
Fiber singlemode (sm) typ.	9 or 10 /125 um (SC or ST)	
Fiber max. distance (full duplex) (see web for details)	4 (mm), 20 (sm) or 40 km (long haul) or more (contact SIXNET)	
Typ. latency for 10M ports	16 us + frame time	Varies on load & settings
Typ. latency for 100M ports	5 us + frame time	
Full or half duplex operation	Configurable	
MAC addresses supported	2048	
Memory bandwidth	3.2 Gbps	
"OK" Output	Power & operational status	
Voltage	Same as switch input voltage	
Maximum current output	0.5 Amp	
Environmental	DIN rail or direct panel mounting	
Power input	Redundant input terminals	
Input power (typical - all ports active at 100 Mbps) (Max. 7 W)	3.6 W (5-port without fiber) 4.3 W (8-port without fiber) 5.6 W (5-port with 2 fiber) 6.3 W (8-port with 2 fiber)	
Input voltage (all models)	10-30 VDC (continuous)	
Transient protection	15,000 watts peak	
Spike protection	5,000 watts (10 times for 10 uS)	
Ethernet isolation	1500 VRMS 1 minute	
Operating temperature range	-10 to +60°C (SL models) -40 to +75°C (SLX models) Cold startup at -40°C for SLX models	
Storage temperature range	-40 to +85 °C	
Humidity (non-condensing)	5 to 95% RH	
Vibration	IEC68-2-6	
Electrical safety	UL508/CSA C22, EN61010-1	
EMI emissions	FCC part 15, ICES-003, EN55022	
EMC immunity	IEC61326-1	
Hazardous Locations Class I, Division 2; Zone 2	UL1604, CSA C22.2/213; EN50021,EN60079-15,ATEX	
Eye safety (fiber models)	IEC60825-1, Class 1; FDA 21 CFR 1040.10 and 1040.11	
Packaging	Aluminum with IP30 protection	
Weight	8 oz (0.23 kg) for 5MS-1/4/5 10 oz (0.28 kg) for 8MS-1/4/5	
Dimensions (L x W x H)	See next page	

Specifications are subject to change. Consult factory for latest information.

SIXNET also offers Slim Line industrial Ethernet unmanaged switches and fiber optic media converters.



Hardware Highlights:

- 5 or 8 port industrial Ethernet managed switch with up to 4 fiber optic ports (multimode or singlemode)
- Output for reporting power and operational status
- Redundant power with industrial surge/spike protection
- UL/CSA, CE and Zone 2 rated for industrial applications
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- Support for up to 2048 MAC addresses
- Full-Duplex operation with flow control (no collisions!)
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- SNMP notifications (traps) for report on event
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telnet / SSH (network), terminal (RS232 or USB) or SNMP (v1, v2, v3)

Additional features are in the works and are provided through FREE Firmware Upgrades. Contact SIXNET for the latest information.

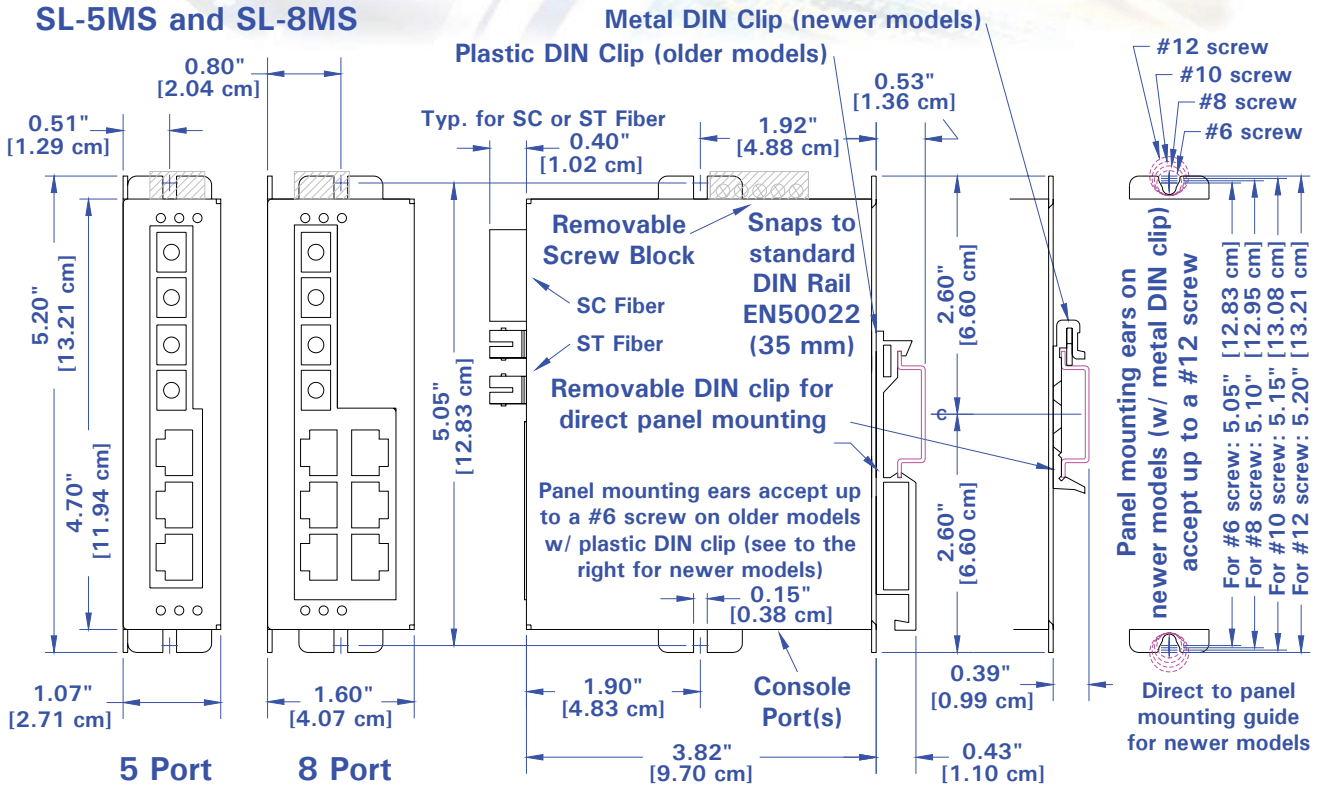
Ethernet Compliance:

- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1D/w (Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability)
- IEEE 802.1p (Priority Queuing – QoS, CoS, ToS/DS)
- IEEE 802.1Q (VLAN for traffic segregation)

Ordering Guide	
SL-5MS-1	5 RJ45 10/100 ports
SL-5MS-4SC **SL-5MS-4ST**	3 RJ45 ports & 2 multimode fiber optic port with SC or ST style connector
SL-5MS-5SC **SL-5MS-5ST**	3 RJ45 ports & 2 singlemode fiber optic port with SC or ST style connector
SL-8MS-1	8 RJ45 10/100 ports
SL-8MS-4SC **SL-8MS-4ST**	6 RJ45 ports & 2 multimode fiber optic port with SC or ST style connector
SL-8MS-5SC **SL-8MS-5ST**	6 RJ45 ports & 2 singlemode fiber optic port with SC or ST style connector
SL-8MS-8/9	See separate datasheet for managed slim line models with up to 4 fiber optic ports
SLX-	Specify SLX for wide temperature operation
Special, mixed or long-haul (up to 120 km) fiber transceivers are available for special order. Contact SIXNET for details.	
Accessories:	
ET-PS-024-02	AC to 24VDC, 2A, for din rail mounting
SP-ETH-2	Dual port surge & lightning protector
RJ45-DB9F-CBL	PC to managed switch serial cable

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Mechanical Dimensions

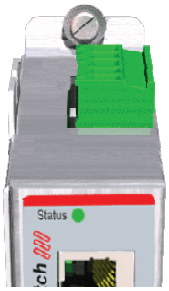


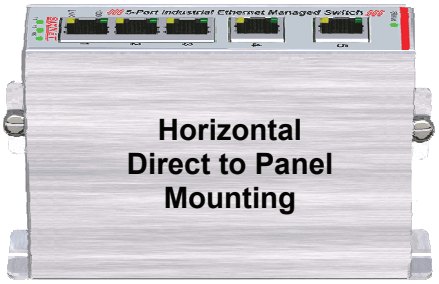
Optional Mounting Positions

Snap On DIN Rail Mounting



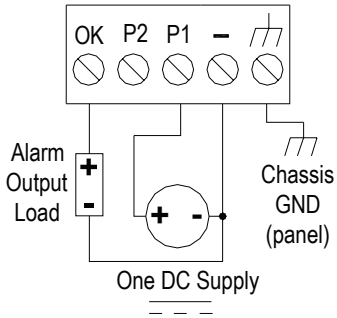
Vertical Direct to Panel Mounting



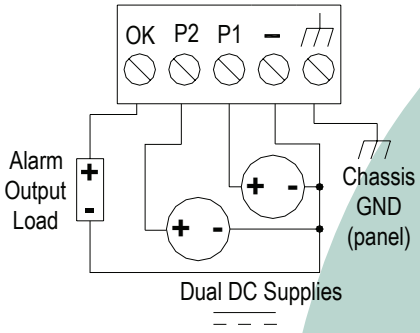


Power and Alarm Connections

Single DC Power



Redundant DC Power



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Slim Line Industrial Ethernet oversigt



Slim Line Ethernet Managed Switch with 5 RJ45 (10/100BaseTx) Ports
SL-5MS-1

Slim Line Ethernet Managed Switch with 3 RJ45 (10/100) and 2 Multimode Fiber (100BaseFX; Type SC)
SL-5MS-4SC



Slim Line Ehernet Managed Switch with 3 RJ45 (10/100) and 2 Multimode Fiber (100BaseFX; Type ST)
SL-5MS-4ST

Slim Line Ethernet Managed Switch with 3 RJ45 (10/100) and 2 Singlemode Fiber (100BaseFX: Type SC)
SL-5MS-5SC

Slim Line Ethernet Managed Switch with 3 RJ45 (10/100) and 2 Singlemode Fiber (100BaseFX; Type ST)
SL-5MS-5ST



Slim Line Ethernet Managed Switch with 8 RJ45 (10/100BaseTX) Ports
SL-8MS-1

Slim Line Ethernet Managed Switch with 6 RJ45 (10/100) and 2 Multimode Fiber (100BaseFx; Type SC)
SL-8MS-4SC

Slim Line Managed Switch with 6 RJ45 (10/100) and 2 Multimode Fiber (100BaseFX; Type ST)
SL-8MS-4ST

Slim Line Ethernet Switch with 6 RJ145 (10/100) and 2 Singlemode Fiber (100BaseFX; Type SC)
SL-8MS-5SC

Slim Line Ethernet Managed Switch with 6 RJ45 (10/100) and 2 Singlemode Fiber (100BaseFX; Type ST)
SL-8MS-5ST

Slim Line Industrial Ethernet oversigt

Slim Line Ethernet Media Converter with 1 RJ45 (10/100) and 1 Multimode Fiber (100BaseFX; Type SC)
SL-2ES-2SC

Slim Line Ethernet Media Converter with 1 RJ45 (10/100) and 1 Multimode Fiber (100BaseFX; Type ST)
SL-2ES-2ST

Slim Line Ethernet Media Converter with 1 RJ45 (10/100) and 1 Singlemode Fiber (100BaseFX; TypeSC)
SL-2ES-3SC)

Slim Line Ethernet Media Converter with 1 RJ45 (10/100) and 1 Singlemode Fiber (100BaseFX; Type ST)
SL-2ES-3ST



Slim Line Ethernet Unmanaged Switch with 5RJ45 (10/100BaseTX) Ports
SL-5ES-1

Slim Line Ethernet Unmanaged Switch with 4 RJ45 and 1 Multimode Fiber (100BaseFX; Type SC)
SL-5ES-2SC

Slim Line Ethernet Unmanaged Switch with 4 RJ45 and 1 Multimode Fiber (100BaseFX; Type ST)
SL-5ES-2ST

Slim Line Ethernet Unmanaged Switch With 4 RJ45 and 1 Singlemode Fiber (100BaseFX; Type SC)
SL-2ES-3SC

Slim Line Ethernet Unmanaged Switch with 4 RJ45 and 1 Singlemode Fiber (100BaseFX; Type ST)
SL-5ES-3ST

Slim Line Industrial Ethernet oversigt



Slim Line Ethernet Unmanaged Switch with 8 RJ45 810/100BaseTX) Ports
SL-8ES-1

Slim Line Ethernet Unmanaged Switch with 8 RJ45 and 1 Multimode Fiber (100BaseFX; Type SC)
SL-9ES-2SC

Slim Line Ethernet Unmanaged Switch with 8 RJ45 and 1 Multimode Fiber (100BaseFX; Type ST)
SL-9ES-2ST

Slim Line Ethernet Unmanaged Switch with 8 RJ45 and 1 Singlemode Fiber (100BaseFX; Type SC)
SL-9ES-3SC

Slim Line Ethernet Unmanaged Switch with 8 RJ45 and 1 Singlemode Fiber (100BaseFX; Type ST)
SL-9ES-3ST



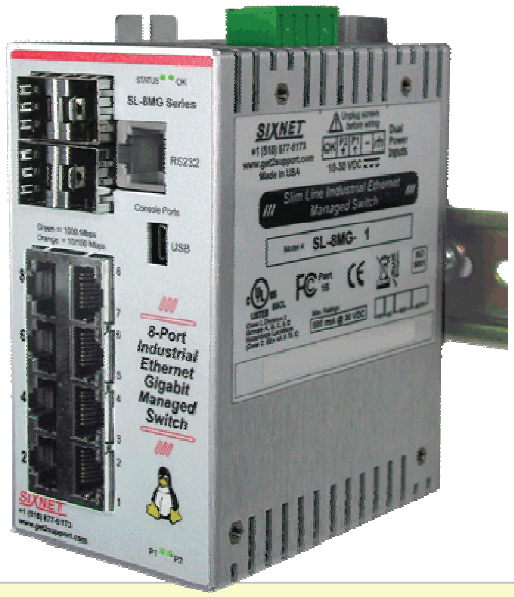
Serial Cable – Computer to Managed Switch Console Port
RJ45-DB9F-CBL

Slim Line 5-port Remote Access Ethernet Modem
SL-5MS-MDM

Ultra-Reliable and Rugged with Flexible High Speed Gigabit

SL-8MG Product Highlights

- **8 Gigabit ports for 10/100/1000 Ethernet links**
- **4 advanced combination ports accept copper RJ45 or noise-immune fiber optic links up to 80+ km**
- **Fully managed w/ advanced features and security**
- **Flexible mounting on DIN rail or direct to panel**
- **Truly rugged design for -40 to +75˚C operation**



Real-time Secure Performance

- Rapid Spanning Tree (RSTP) for fast redundant rings
- SNMPv1 and v2 network management
- SNMPv3 authentication & encryption for security
- SNMP notifications (traps) for report on event
- Priority Queuing (QoS/CoS) for real-time operation
- IGMP for Multicast filtering (snooping & querying)
- VLAN for convenient traffic segregation
- Open-source programming for ultimate flexibility
- Broadcast & multicast storm protection
- RMON & port mirroring for advanced diagnostics
- Security with HTTPS, SSL, SSH, SNMPv3 & more

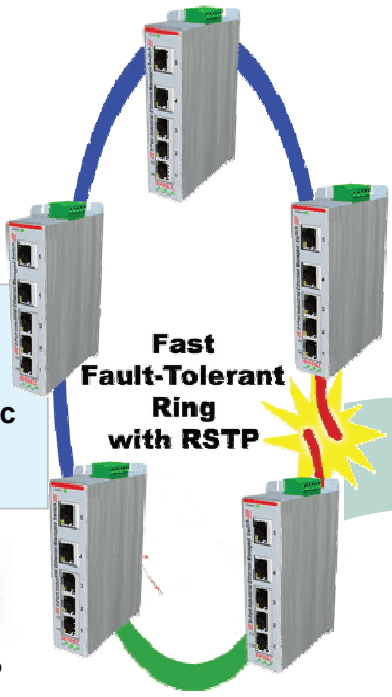
Trouble Free Operation

- Wide temperature -40 to +75 °C operation – no fans!
- Twenty year support and service policy
- Free field-installable upgrades forever
- UL, CSA (CUL), CE and HazLoc (Zone 2) rated
- Dual (redundant) power inputs with spike protection
- Self-test and alarm output contact
- Rugged corrosion-resistant metal packaging
- DIN rail or direct panel mounting in multiple positions – No accessories required!

Four Flexible Combination Gigabit Ports
Your choice – RJ45 (10/100/1000) or Fiber Optic (100 or 1000) in one product! Start with a RJ45 Gigabit connection and upgrade to fiber at any time just by plugging in a fiber optic transceiver. These advanced gigabit ports make your job easier plus save you time and money!

The Power of Linux IPm Inside





Ensure the reliability of your network with fast automatic switchover on a segment failure.

Industrial Rated to Perform:

ISO9001 Certified	Class I, Div 2 & Zone 2	European Community	UL508 for Safety	USA/Canada Emissions	Lead & Hazardous Substance Free	Wide Temp Range
ISO	c UL us LISTED	CE	c UL us	FC	RoHS Compliant	-40°C +75°C

0908

All Gigabit Industrial Ethernet Managed Switch

Why an Industrial Ethernet Switch

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Experience how easy it is to configure a SIXNET managed switch.



http://www.sixnetio.com/switch-demo.html

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All Gigabit Industrial Ethernet Managed Switch

Performance Specifications		
General	8 Ethernet ports (all Gigabit)	
Ethernet switch type	Managed	
Ethernet protocols supported	All IEEE 802.3	
RJ45 ports (shielded)	10/100/1000BaseTX	
RJ45 speed (10, 100 or 1000)	Auto-negotiation	
RJ45 MDI/MDIX	Auto-crossover	
RJ45 TD and RD polarity	Auto-polarity	
Ethernet isolation	1500 VRMS 1 minute	
Note: Four ports are combination gigabit ports that have both a RJ45 connector and SFP fiber connector. For each of these ports, only one of the connectors can be used at a time.		
SFP (pluggable) ports	Accepts mini-GBIC transceivers	
Fiber optic port speed	1000Base or 100Base depending on transceiver	
Note: The SFP ports on the SL-8MG support both Gigabit (1000M) and fast Ethernet (100M) mini-gbic SFP fiber optic transceivers.		
Fiber optic port wavelength for typical gigabit transceivers	850 nm (mm), 1310 nm (sm) or 1550 nm (long haul sm) center	
Fiber multimode (mm) typical	50 or 62.5/125 um (LC typical)	
Fiber singlemode (sm) typical	9 or 10 /125 um (LC typical)	
Fiber typ. distance (full duplex) (Contact SIXNET for details)	0.55-1.1 km (mm); 10+ km (sm); up to 70+ km (long haul sm)	
Note: See separate fiber transceiver datasheet for more details.		
Typical latency	<5 us plus frame time	Varies on load & settings
Full or half duplex operation	Configurable per port	
MAC addresses supported	8192	
Memory bandwidth	32 Gbps	
Console ports	RS232 (RJ45) and USB	
Power Input	Redundant input terminals	
Input power (typical with all ports linked and active)	12 W (8-ports without fiber) 15 W (8-ports with 4 fiber)	
Input voltage (all models)	10-30 VDC	
Transient protection	15,000 watts peak	
Spike protection	5,000 watts (10 times for 10 uS)	
"OK" Output	Power & operational status	
Voltage	Same as switch input voltage	
Maximum current output	0.5 Amp	
Environmental	Industrial rated	
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 optional)	
Vibration and shock	IEC68-2-6, -27, -32	
Compliances	Industrial rated	
Electrical safety	CE	UL508/CSA C22, EN61010-1
EMC emissions and immunity	CE	FCC part 15, ICES-003, EN55022, IEC61326-1
Hazardous locations (Class I, Div. 2 and Zone 2)		UL1604, CSA C22.2/213; EN50021/EN60079-15
Mechanical	Corrosion-resistant aluminum	
Protection	IP30	
Mounting	Din rail or direct to panel	
Dimensions (L x W x H)	See next page	
Weight	12 oz. (0.34 kg)	

Specifications are subject to change. Consult factory for latest information.

Hardware Highlights:

- 8 port (all Gigabit) industrial Ethernet switch with 4 flexible combination ports for RJ45 or fiber optic links
- Output for reporting power and operational status
- Redundant power with industrial surge/spike protection
- Wide temperature operation -40 to +75˚C – no fans!
- UL/CSA, CE and Zone 2 rated for industrial applications
- DIN rail or direct panel mounting (no extra kits required)

Networking Features:

- Auto-detecting, auto-crossover and auto-polarity
- Store and forward wire speed switching
- Support for up to 8192 MAC addresses
- Full-Duplex operation with flow control (no collisions!)
- Rapid Spanning Tree (RSTP) for fault-tolerant loops
- Priority queuing for real-time performance
- SNMP v1 and V2 for network management
- SNMP v3 for authentication and encryption
- SNMP notifications (traps) for report on event
- IGMP v1 & v2 for IP multicast filtering
- VLAN (port & tag based) for traffic segregation
- Message filtering to stop broadcast/multicast storms
- RMON and port mirroring for diagnostics
- Configuration via secure (https) Web interface, Telnet / SSH (network), terminal (RS232/USB) or SNMP (v1,2,3)

Additional features are in the works and are provided through FREE Firmware Upgrades. Contact SIXNET for the latest information.

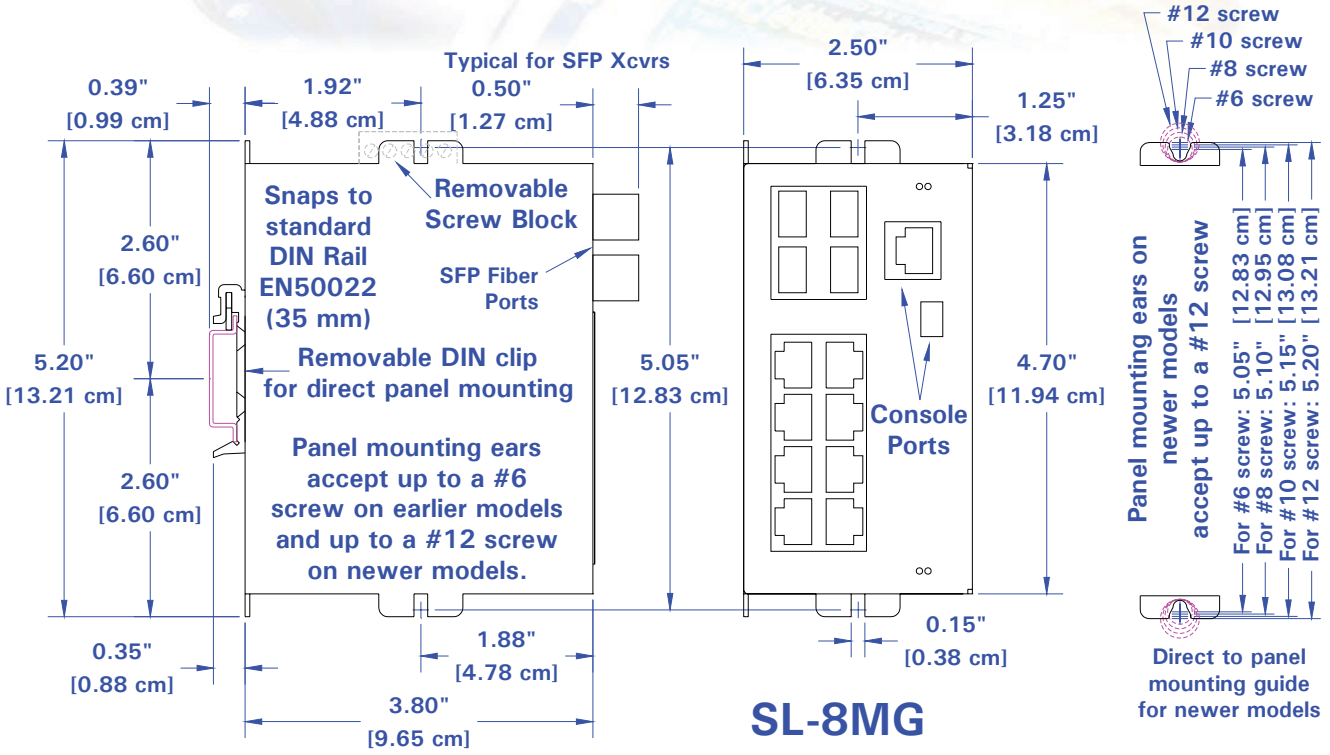
Ethernet Compliance:

- IEEE 802.3ab/z (Gigabit 1000 Mbps Ethernet links)
- IEEE 802.3u (Fast Ethernet 100Mbps for newer devices)
- IEEE 802.3 (10Mbps Ethernet supports legacy devices)
- IEEE 802.3x (Full-Duplex with Flow Control)
- IEEE 802.1D/w (Rapid Spanning Tree for redundant rings and Spanning Tree for interoperability)
- IEEE 802.1p (Priority Queuing – QoS, CoS, ToS/DS)
- IEEE 802.1Q (VLAN for traffic segregation)

Ordering Guide	
SL-8MG-1	Managed switch with no fiber transceivers populated
SL-8MG-MMXX	Managed switch with 2 multimode fiber transceivers populated
SL-8MG-MMMM	Managed switch with 4 multimode fiber transceivers populated
SL-8MG-SSXX	Managed switch with 2 singlemode fiber transceivers populated
SL-8MG-SSSS	Managed switch with 4 singlemode fiber transceivers populated
SL-8MG-xxxx	Managed switch with up to 4 fiber transceivers of your choice
x =	S = singlemode, 1310nm, 10 km, LC M = multimode, 850nm, 550 m, LC or **Contact SIXNET for 100 Mbps, special and long haul fiber optic transceivers.**
Accessories:	
ET-PS-024-02	Power supply, AC to 24VDC, 2A
RJ45-DB9F-CBL	PC to managed switch serial cable

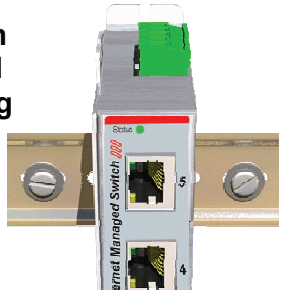
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Mechanical Dimensions

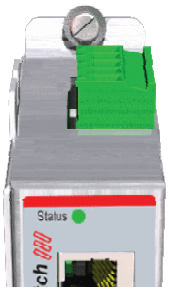


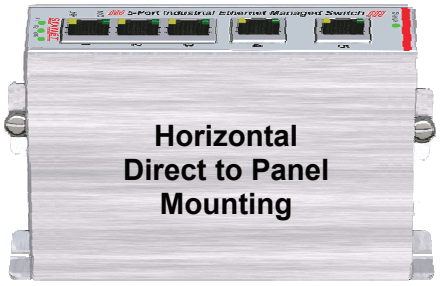
Optional Mounting Positions

Snap On DIN Rail Mounting

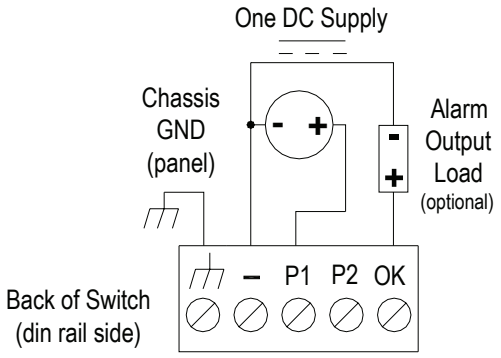


Vertical Direct to Panel Mounting

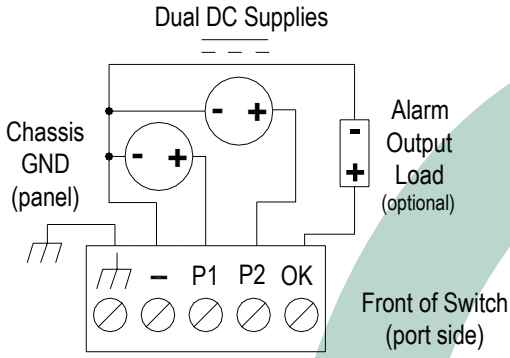




Power and Alarm Connections



Single DC Power

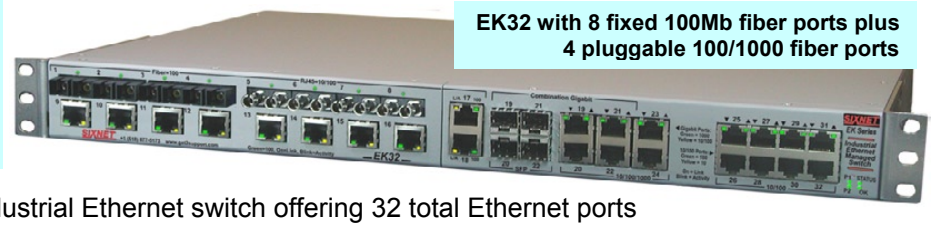


Redundant DC Power

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32 Port Industrial Ethernet Rack Switch

Rugged, Reliable and Ready for Your Application



EK32 with 8 fixed 100Mb fiber ports plus 4 pluggable 100/1000 fiber ports

The SIXNET EK32 is a truly industrial Ethernet switch offering 32 total Ethernet ports including 6 super fast Gigabit ports, up to 20 noise-immune fiber optic ports and optionally 8 advanced PoE ports. Its rugged and compact 1U case fits into standard EIA, WECO and ETSI racks from 19” to 24”.

EK32 Product Highlights

- **32 total Ethernet ports including**
  - 6 Gigabit ports for 10/100/1000 RJ45 Ethernet links (4 are advanced combination ports that also accept industry standard 100Mb or 1000Mb SFP fiber optic transceivers)
  - 10 fast Ethernet ports for 10/100 RJ45 Ethernet links (8 optionally can be PoE per IEEE 802.3af)
  - 16 flexible ports that can be ordered as 10/100 RJ45 or 100 Mbps fiber optic for links up to 120 km
- **Designed to meet the toughest industrial standards**
  - IEC 61850 and IEEE 1613 (for power substations)
  - NEMA TS2 (for traffic control systems)
  - EN 50121-4 (for railway applications)
  - Marine, maritime and offshore (ABS/DNV/GL)



EK32 with 32 RJ45 ports including 4 pluggable 10/100 fiber ports

- **Fully managed with powerful software capabilities and advanced security**
- **Truly rugged design for -40 to +85˚C operation**

Real-time Secure Performance

- Easy to configure and secure web interface
- Non-blocking wire-speed performance on all ports
- Rapid Spanning Tree (RSTP) for fast redundant rings
- SNMPv1 and v2 network management
- SNMPv3 authentication & encryption for security
- SNMP notifications (traps) for report on event
- Priority Queuing (QoS/CoS) for real-time operation
- IGMP for Multicast filtering (snooping & querying)
- VLAN for convenient traffic segregation
- Broadcast & multicast storm protection
- RMON & port mirroring for advanced diagnostics
- Advanced security features and much more . . .

Rugged and Flexible Hardware

- 32 ports total including Gigabit, fiber optic and PoE
- Space efficient 1U rack-mount design fits into 19”, ETSI, 23” and 24” racks or can be directly wall mounted
- Redundant AC and DC power options
- Relay output contact to signal alarms
- RS232 and USB console ports for local management
- Rugged corrosion-resistant aluminum enclosure
- Wide temperature -40 to +85 °C operation
- Sealed IP50 option protects against dust, dirt and debris
- UL/CSA (cUL), CE and FCC rated (pending)

Firmware updates are FREE!
Contact SIXNET for the latest software features list.

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