



RTU and Datalogger

Installation & Maintenance



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Applicable standards and certifications:

ISO
9001

Total Quality



Hazardous Locations



Standard Locations



European Directives



Marine & Offshore



US Emissions

This manual applies to the following products:

SR-4160-1E-1, SR-4160-1S-1, SR-4160-1T-1, SR-4160-1SL-1

SIXNET Protected Technology Policy:

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

SIXNET Statement of Limited Warranty:

SIXNET LLC, manufacturer of SIXNET products, warrants to Buyer that products, except software, manufactured by SIXNET will be free from defects in material and workmanship. SIXNET' obligation under this warranty will be limited to repairing or replacing, at SIXNET' option, the defective parts within one year of the date of installation, or within 18 months of the date of shipment from the point of manufacture, whichever is sooner. Products may be returned by Buyer only after permission has been obtained from SIXNET. Buyer will prepay all freight charges to return any products to the repair facility designated by SIXNET. This limited warranty does not cover losses or damages which occur in shipment to or from Buyer or due to improper installation, maintenance, misuse, neglect or any cause other than ordinary commercial or industrial applications. In particular, SIXNET makes no warranties whatsoever with respect to implied warranties of merchantability or fitness for any particular purpose. All such warranties are hereby expressly disclaimed. No oral or written information or advice given by SIXNET or SIXNET's representative shall create a warranty or in any way increase the scope of this warranty. This limited warranty is in lieu of all other warranties whether oral or written, expressed or implied. SIXNET's liability shall not exceed the price of the individual units, which are the basis of the claim. In no event shall SIXNET be liable for any loss of profits, loss of use of facilities or equipment, or other indirect, incidental or consequential damages.

INSTALLATION AND HAZARDOUS AREA WARNINGS:

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

- WARNING (EXPLOSION HAZARD) -** SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS 1, DIVISION 2.
- WARNING (EXPLOSION HAZARD) -** WHEN IN HAZARDOUS LOCATIONS, DISCONNECT POWER BEFORE REPLACING OR WIRING UNITS.
- WARNING (EXPLOSION HAZARD) -** DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NONHAZARDOUS.

FCC Statement:

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

Copyright & Trademarks:

Copyright © SIXNET, All Rights Reserved. RemoteLog is a registered trademark of SIXNET.

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

Section 1

Overview

Operation

Standards and Safety



General Information

This manual will help you install and maintain RemoteLog RTU and Dataloggers.

Refer to the SIXNET I/O Tool Kit online help for more information on RemoteLog modes of operation and features.

RemoteLog RTU and Datalogger meet the following standards:

Electrical safety - UL 508, CSA C22/14; EN61010-1 (IEC1010)
EMI emissions - FCC part 15, ICES 003, EN55022; Class B
EMC immunity – EN61326-1(EN61000-4--2, 3, 4, and 6)

Hazardous locations – UL 1604, CSA C22.2/213 (Class 1, Div. 2), Groups A, B, C, D;
Cenelec EN50021 (Zone 2)

Install the RemoteLog RTU and Datalogger in accordance with local and national electrical codes.

Lightning Danger: Do not work on equipment during periods of lightning activity.

Do not connect a telephone line into one of the Ethernet RJ45 connectors.

Section 2

LED Indicators

Overview

Each RemoteLog RTU and Datalogger has a Power LED, a User LED for the discrete output, an Alarm LED, a CD LED and a pair of Transmit / Receive LEDs for each port. Refer to the picture below for the typical location of these LEDs.



SR-4160-1T-1

User LED (all models)

This LED will be on whenever the user-configurable discrete output in the module has been turned on.

Alarm LED (all models)

This LED will be on whenever any of the user-configured alarms in the module has occurred.

Status LED (all models)

ON Solid (not flashing) – This indicates normal operation.

Half Blink (1 second ON, 1 second OFF)

The I/O module is not adequately configured and requires a download from the I/O Tool Kit utility.

OFF – This indicates that there is no power or improper power to the module. Make sure the power wiring is correct. Refer to Section 5 for proper power cabling.

TD / RD LEDs (all models)

The TD LED indicates transmitted data when lit. The RD LED indicates received data when lit. There is one pair of TD / RD LEDs for the System port and one pair of LEDs for the Ethernet, Telephone or RS232 remote port.

LNK LED (-1E model)

This LED functions as a Link indicator on the SR-4160-1E-1 Ethernet model.

OFF – This would indicate that there is not a proper Ethernet connection (Link) between the port and another Ethernet device. Make sure the proper cable type is in use and that it has been plugged securely into the ports at both ends. See section 5 for proper Ethernet cabling.

ON Solid (not flashing) – This would indicate that there is a proper Ethernet connection (Link) between the port and another Ethernet device, but no communications activity is detected.

CD LED (-1S, -1T models)

The CD LED will be lit if a phone line carrier has been detected by the internal modem (SR-4160-1T-1 model only) or by an external modem (SR-4160-1S-1 only).

Discrete I/O LEDs

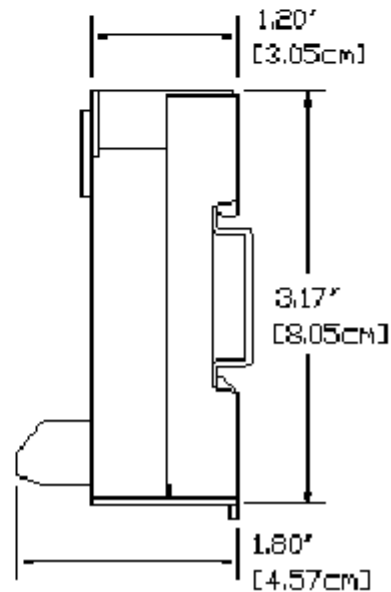
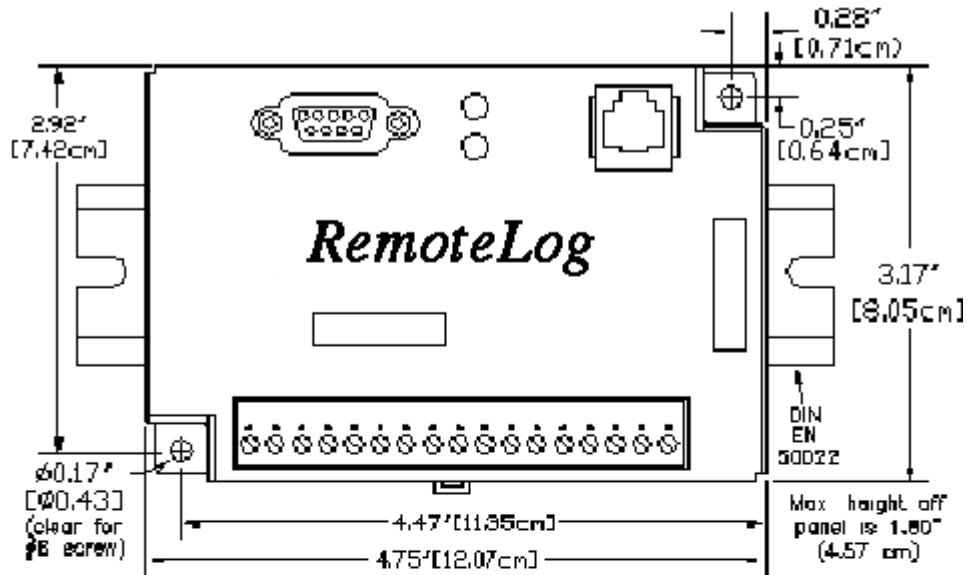
These five LEDs indicate the status of the four discrete inputs and the one discrete output. The corresponding LED will be lit when the input or output is ON.

Section 3

Installation

Overview

The RemoteLog RTU and Datalogger can be latched onto standard DIN rail (EN50022) or screwed directly to a flat panel. Refer to the mechanical drawings below.



SR-4160-1x-1

Section 4

Power and I/O Wiring

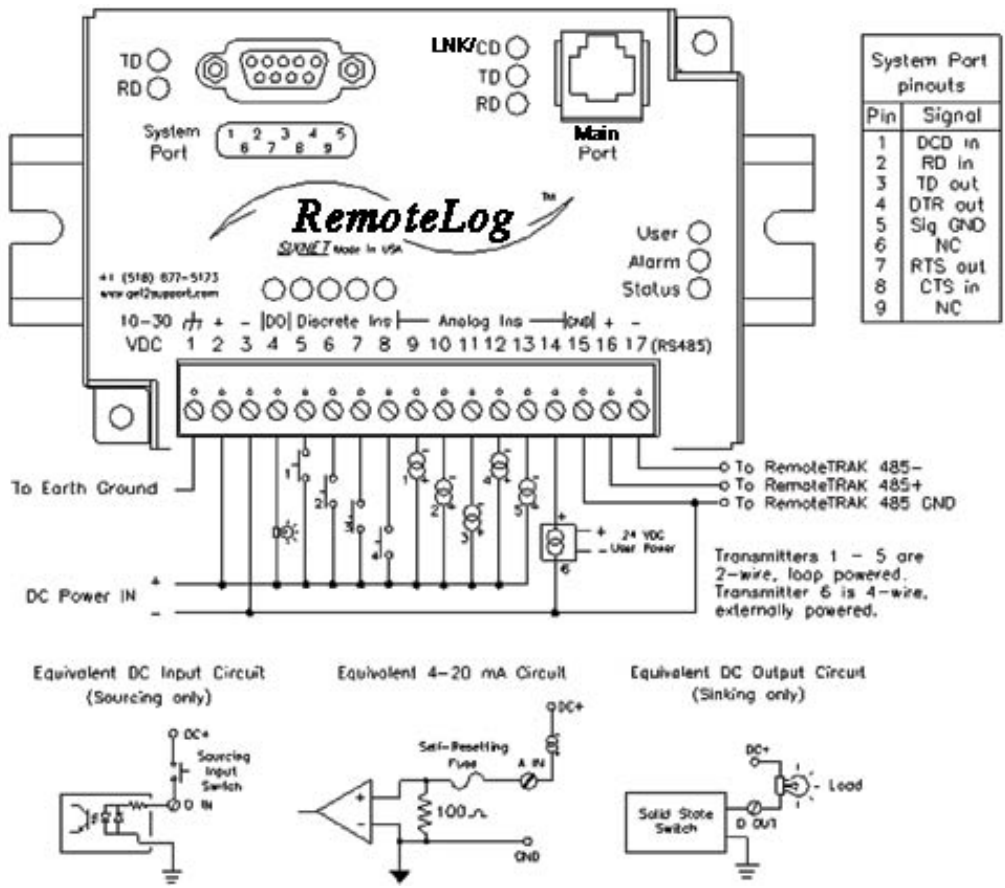
Overview

RemoteLog RTU and Dataloggers can be powered from the same DC source that is used to power your I/O devices. 10 to 30 VDC needs to be applied to terminals 2 and 3. Refer to the wiring diagram below.

Notes:

For Ethernet (-E) models, use a "straight through" cable to connect the "Ethernet" 10BaseT port to a hub or switch. Use a cross-wired cable when connecting directly to a computer's Ethernet port.

For all models, connect the "System" port directly to a computer using a null modem ("crossover") cable, such as the ST-CABLE-PF.

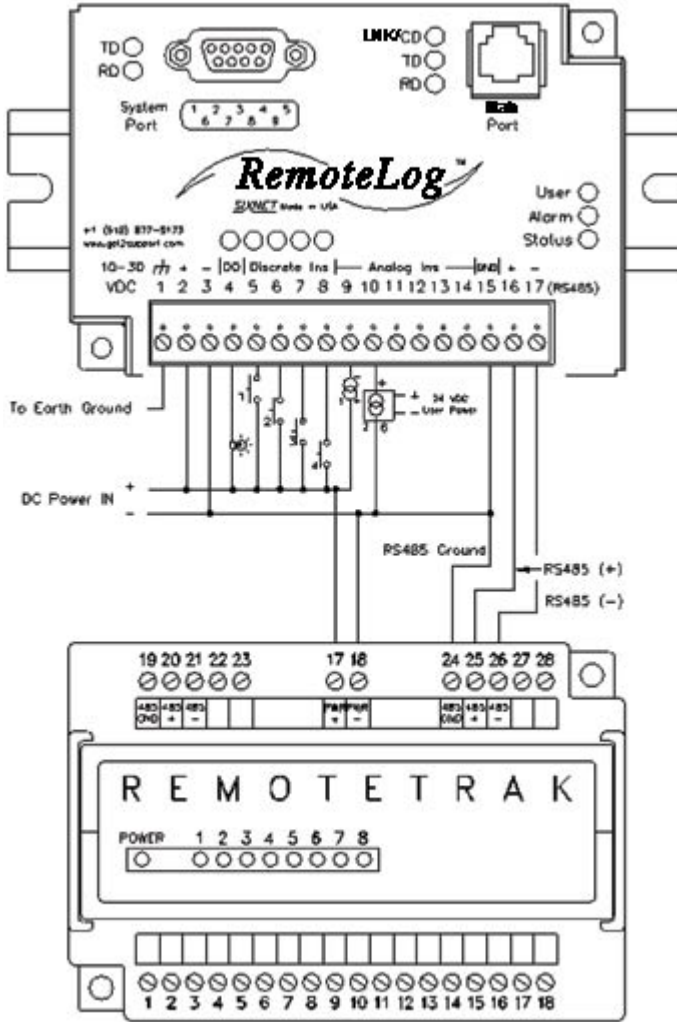


Screw Torque

The screw terminals should be tightened as follows:
For the SR-4160-1x-1, tighten screw terminals to a maximum 3.48 in-lbs (0.4 Nm).

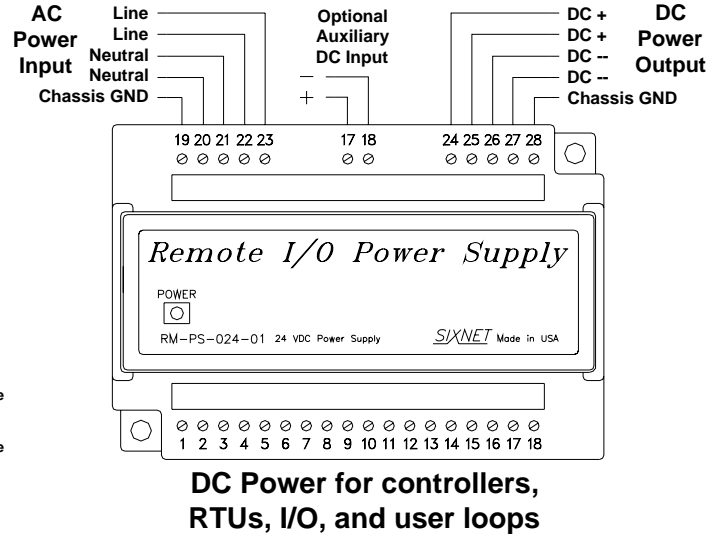
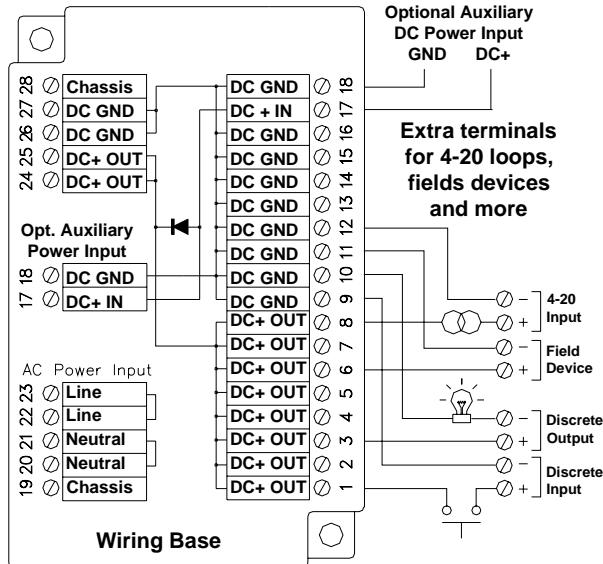
Optional RS485 Expansion module

One RemoteTRAK or EtherTRAK module can be used to expand the I/O of a RemoteLog RTU and Datalogger. Refer to the figure below for the power and RS485 connections. A RemoteTRAK module is shown. Connections to an EtherTRAK module are identical.



**RM-PS-024-01N
(optional)**

The RM-PS-024-01 can be used to power your RemoteLog RTU and Dataloggers, instrumentation loops, and other devices. It operates on 85-264 VAC (47-63 Hz) or 120-370 VDC and outputs 24 VDC at up to 1 Amp. Refer to its data sheet for details. Refer to the figure below for the power connections. Tighten the screw terminals to a maximum 3.48 in-lbs (0.4 Nm).



DC Power for controllers, RTUs, I/O, and user loops

Section 5

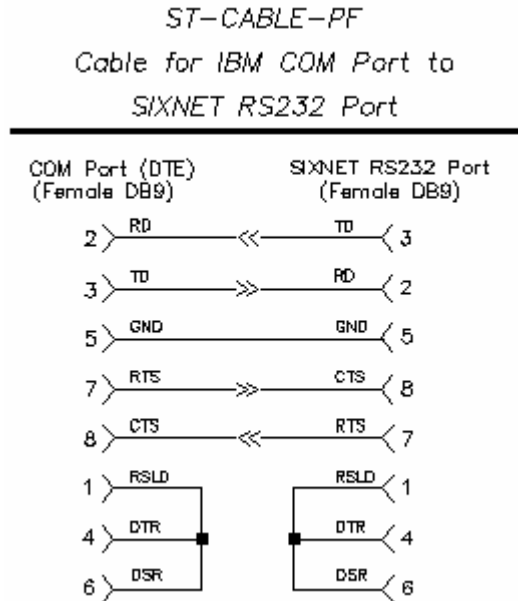
Communications Wiring

Overview

Each RemoteLog has one system port (DB9) and one Ethernet, telephone or RS232 port (RJ45).

System Port Wiring

Use the system port to load a configuration into the RemoteLog module. Connect a ST-CABLE-PF or equivalent cable. The wiring for this cable is as follows:



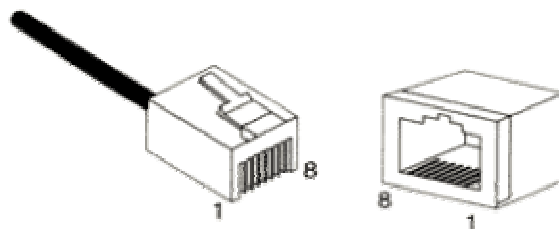
Ethernet Port (SR-4160-1E-1)

Use data-quality (not voice-quality) twisted pair cable rated category 5 with standard RJ45 connectors. For best performance use shielded cable. Please note that these cables are available in straight-thru or cross-over configurations. The following is a guide for when to use each type:

RemoteLog Ethernet Port to	Cable Type to Use
PC card direct (no hub or switch)	Cross-wired
PC card through a hub or switch	Straight-thru

Straight-thru Cable Wiring	
Pin 1	Pin 1
Pin 2	Pin 2
Pin 3	Pin 3
Pin 6	Pin 6

Cross-over Cable Wiring	
Pin 1	Pin 3
Pin 2	Pin 6
Pin 3	Pin 1
Pin 6	Pin 2



RJ45 Connector
Pin Positions

Pin #	Assignment	RJ45 Connector Ethernet Pin Assignments
1	TX+	
2	TX-	
3	RX+	
6	RX-	

Cable Distance

The maximum cable length for 10BaseT is typically 100 meters (328 ft.). Refer to the following chart for some general guidelines.

From	To	Maximum Distance
Switch	Switch or Hub	100 meters (328 feet)
10Mbps Hub	10Mbps Hub	100 meters (328 feet)
100Mbps Hub	100Mbps Hub	5 meters (16 feet)
Switch or Hub	PLC, Ethernet I/O, PC, etc.	100 meters (328 feet)

**Telephone
Port
(SR-4160-1T-1)**

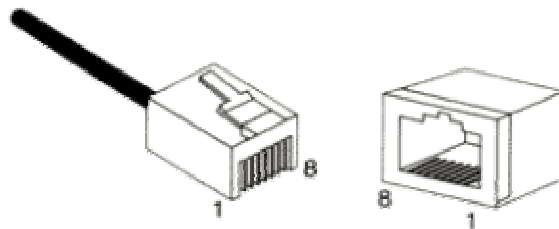
RJ11 Cable Connection

The RJ45 jack on the SR-4160-1T-1 will accept a standard RJ11 male jack from a telephone cord.

**RS232 Port
(SR-4160-1S-1
or -1SL-1)**

RJ45 Cable Connection

The RJ45 jack on the -1S or -1SL has standard RS232 signals. To make connections to this port, plug in a straight-thru RJ45 Ethernet cable to the RJ45 jack on the RemoteLog module. On the other end of the RJ45 cable can be plugged into one of the supplied RJ45 to DB9 male adapter. The wiring in this adapters is user configurable. Insert the pins into the body of the DB9 connector.



RJ45 Connector Pin
Positions

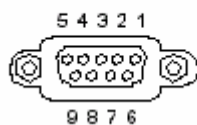
RJ45 Pin #	RS232 Assignment	Adapter Wire Color
1	RI/DSR	Blue
2	DCD	Orange
3	DTR	Black
4	GND	Red
5	RD	Green
6	TD	Yellow
7	CTS	Brown
8	RTS	White

DB9 Adapter Wiring

For Serial (-S or -SL) models, connect the "RS232" port to an external modem using a "straight through" RJ45 Ethernet cable and the supplied RJ45 to DB9 male adapter. Assemble the adapter by plugging the eight wires into the DB9M connector body as follows:

RJ45 Pin #	Wire Color	DB9M Pin #
1	Blue	6
2	Orange	1
3	Black	4
4	Red	5
5	Green	2
6	Yellow	3
7	Brown	8
8	White	7

"Pin Insertion" side of the DB9M



Section 6

Technical Specifications

Technical Specifications

Here are the technical specifications for the RemoteLog RTU and Dataloggers covered by this manual.

Analog Inputs	6 (4-20 mA) - <i>Expand with one RemoteTRAK</i>
Input resolution	0.1% (10 bits)
Input protection	Self-resetting fuses
Discrete Inputs	4 (10–30 VDC or switch closure)
Counting Range	16 or 32 bits (to over 2 billion counts)
Max count rate	50 KHz (channel 1 only) 200 Hz (any channel)
Discrete Output	1 (closure to ground) for reporting alarms or user-controlled output
Maximum load	0.25 Amps at 30 VDC
Internal Modem (-T option)	100% PC modem and Windows compatible
Maximum data rate	33.6 kbps (v.34)
Compatibility	V.34, V.32 bis, V.32, V.22, V.22A/B, V.23.V.21, Bell 212A and 103
Data compression	V.42 bis MNP 5
Error correction	V.42 MNP 2-4
Command compatibility	All standard AT and S register commands
Ringer equivalent, Line Jack	0.3, RJ11 connector
Telecom Certifications	FCC part 68, CS03-8 (CSA), CTR21(98/482/EC), ACA TS 001-1997,ACA TS 002-1997)
Ethernet Port (-E option)	10BaseT (100% IEEE 802.3 compliant)
Protocols	TCP/IP, ARP, UDP, ICNP, DHCP, Modbus
RS232 Serial Port (-S option)	All standard rates up to 57,600 baud
Connections (Standard RJ45)	TD, RD, CTS, RTS, CD, DTR, RI, GND
Supported Protocols	Modbus ASCII and RTU, SIXNET Universal
Extra Serial Ports (All Models)	For setup or a local computer and expansion
RS232	DB9 female (standard PC connector)
RS485	For one RemoteTRAK module only
Internal Flash Memory	1 Megabyte (consult factory for more)
Datalogging storage	40,000 records (all I/O)
Time of day clock	Run for 30 days without external power
Firmware upgrades	Reloadable to support future features
General Characteristics	DIN rail or flat panel mount
Input power	10-30 VDC
Input current	10 mA @24 VDC (-SL serial model) 25 mA @24 VDC (-S serial model and -E Ethernet model) 30 mA @24 VDC (-T model with telephone modem in standby) 70 mA @24 VDC (-T model with telephone modem active)
Operating temperature	-30° to 70°C (-40° to 85°C storage)
Humidity	5% to 95% RH (non-condensing)
Flammability	UL 94V-0 materials
Electrical Safety	UL 508, CSA C22.2/14; EN61010-1 (IEC1010), IEC 950: 1991, AS/NZS3260-1993;
EMI emissions	FCC part 15, ICES-003, Class A; EN55022; AS/NZS3548-1995;
EMC immunity	EN50082-1 (IEC801-2, 3, 4)
Surge withstand	IEEE-472 (ANSI C37.90)
Vibration	IEC68-2-6
Hazardous locations	UL 1604, CSA C22.2/213-M1987, (Class 1, Div 2, Groups A, B, C, D), Cenelec EN50021 (EEx nA II T4) Zone 2

Section 7

Service Information

Service Information

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

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

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

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

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

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

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

For Your Convenience:

Please fill in the following and keep this manual with your **SIXNET** system for future reference:

P.O. #: _____ Date Purchased: _____

Purchased From: _____

Product Support

To obtain support for SIXNET products:

On-line support: www.get2support.com

Order on-line: www.industrialmodem.com

Latest product info: www.sixnetio.com

Phone: +1 (518) 877-5173

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