



## USER MANUAL

# 18-Port IP67 Military Ethernet Switch

## Installation and Wiring Manual



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This manual applies to the following products:

- **ET-18MG-MIL-SS** Switch with 16 10/100 ports and 2 Gigabit fiber optic ports

**RED LION Protected Technology Policy** - Red Lion protects your investment in Red Lion systems with long-term planned technology and our unique Protected Technology Policy. We will continue to support the specified capabilities of standard Red Lion products for at least five years (twenty years for Industrial Managed Switches). We plan each product improvement and new feature to be upward compatible with existing designs and installations. Our goals are to make each new software release bring new power to your Red Lion 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. Red Lion protects your long-term productivity with state-of-the-art planned technology and continued support.

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**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, Red Lion 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. See section 1 for other important installation warnings.

**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.

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

# Section 1

## Overview

# General Specifications

This manual will help you install and maintain the switch. Installation of these switches will enable the user to manage the network by monitoring/gathering network data, allow for browser or telnet configuration, increase network performance, and much more.

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

## Basic Operation

Unlike an Ethernet hub that broadcasts all messages out all ports, these industrial Ethernet switches will intelligently route Ethernet messages only out the appropriate port. The major benefits of this are increased bandwidth and speed, reduction or elimination of message collisions, and deterministic performance when tied with real-time systems.

The switch can support 10BaseT (10 Mbps) or 100BaseT (100 Mbps) on 16 ports. Each of these ports independently auto-sense the speed and duplex. The remaining two ports are Gigabit (1000 Mbps) for copper or fiber connections depending on the model.

## Performance Specs

The switch has the following performance specifications.

Performance Specifications	
<b>General</b>	18 Ethernet ports
Ethernet switch type	Managed (unmanaged optional)
Ethernet protocols supported	All IEEE 802.3
10/100 Ethernet ports 1-16 receptacle	MIL-DTL-38999 Series III w/ 22D socket contacts (insert style 35)
Ethernet speed (10/100BaseTX)	Auto-negotiation (10 or 100 Mbps)
Ethernet MDI/MDIX & TD/RD	Auto-crossover and auto-polarity
Ethernet isolation	1500 VRMS 1 minute
Gigabit Ethernet ports 17-18 receptacle	See section 3
Fiber optic port speed	1000 Mbps (Gigabit)
Fiber optic port wavelength	850, 1300 or 1550 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)	0.5 km (mm), 10 (sm) or 30+ km (long haul - contact Red Lion)
Typ. latency for 100 Mbps	5us + frame time   Varies on load
Full or half duplex operation	Full for fiber; Auto/Config. for 10/100
MAC addresses supported	2048
Memory bandwidth	3.2 Gbps
<b>“OK” Alarm Output</b>	For power & operational status
Voltage	Same as switch input voltage
Maximum current output	0.5 Amp
<b>Management Port</b>	RS232 (TD, RD and GND)
Management port receptacle	MIL-DTL-38999 Series III w/ 22D socket contacts (insert style 35)
<b>Power Input</b>	PoE (PD) or dual power inputs
Input voltage (on power port)	10-30 VDC on power connector
Input power (typical)	<15 W with all ports active
Power input receptacle	MIL-DTL-38999 Series III w/ size 20 pin contacts (insert style 35 or 98) (See section 3)
Redundant power input pins	Automatic switchover to backup
Automatic power savings	When ports are inactive

Military surge protection	Exceeds <b>MIL-STD-1275</b> ; 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)
<b>Environmental</b>	Truly industrial design
Operating temperature range	-40 to +75 °C (cold startup at -40 °C)
Storage temperature range	-40 to +85 °C
Humidity (non-condensing)	5 to 95% RH
Vibration, shock and freefall	MIL-STD-810F; IEC68-2-6/27/32
Electrical safety	 EN61010-1
EMC – emissions and immunity	
Packaging	Corrosion-resistant aluminum with IP67 waterproof rating
Dimensions (W x D x H)	See mechanical diagram

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

## Safety Warnings



**WARNING  
(EXPLOSION  
HAZARD)**

**WARNING  
(EXPLOSION  
HAZARD)**

**WARNING  
(EXPLOSION  
HAZARD)**

## Consignes de Sécurité



**AVERTISSEMENT  
(RISQUE  
D'EXPLOSION)**

**AVERTISSEMENT  
(RISQUE  
D'EXPLOSION)**

**AVERTISSEMENT  
(RISQUE  
D'EXPLOSION)**

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

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

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

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

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

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

Le strict respect de ces avertissements contribuera à assurer la sécurité de l'installation, le démarrage et le fonctionnement de l'interrupteur.

**INSTALLEZ L'APPAREIL CONFORMÉMENT AUX CODES ÉLECTRIQUES LOCAUX ET NATIONAUX.**

**DANGER DE FOUDRE: NE PAS TRAVAILLER SUR L'ÉQUIPEMENT PENDANT LES PÉRIODES D'ACTIVITÉS DE FOUDRE.**

**LA SUBSTITUTION DE TOUT COMPOSANT PEUT NUIRE À LA CONFORMITÉ DE CLASSE I, DIVISION 2 (ZONE 2).**

**LORSQUE DANS DES ENDROITS DANGEREUX, DÉBRANCHEZ LE CORDON D'ALIMENTATION AVANT DE REMPLACER OU DE BRANCHER DES MODULES.**

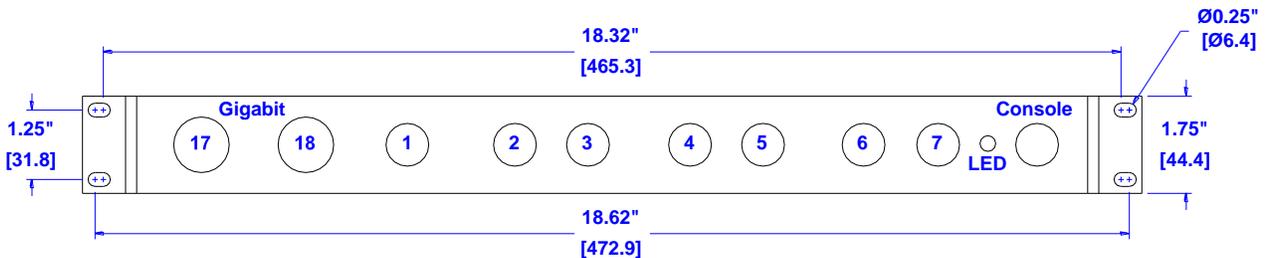
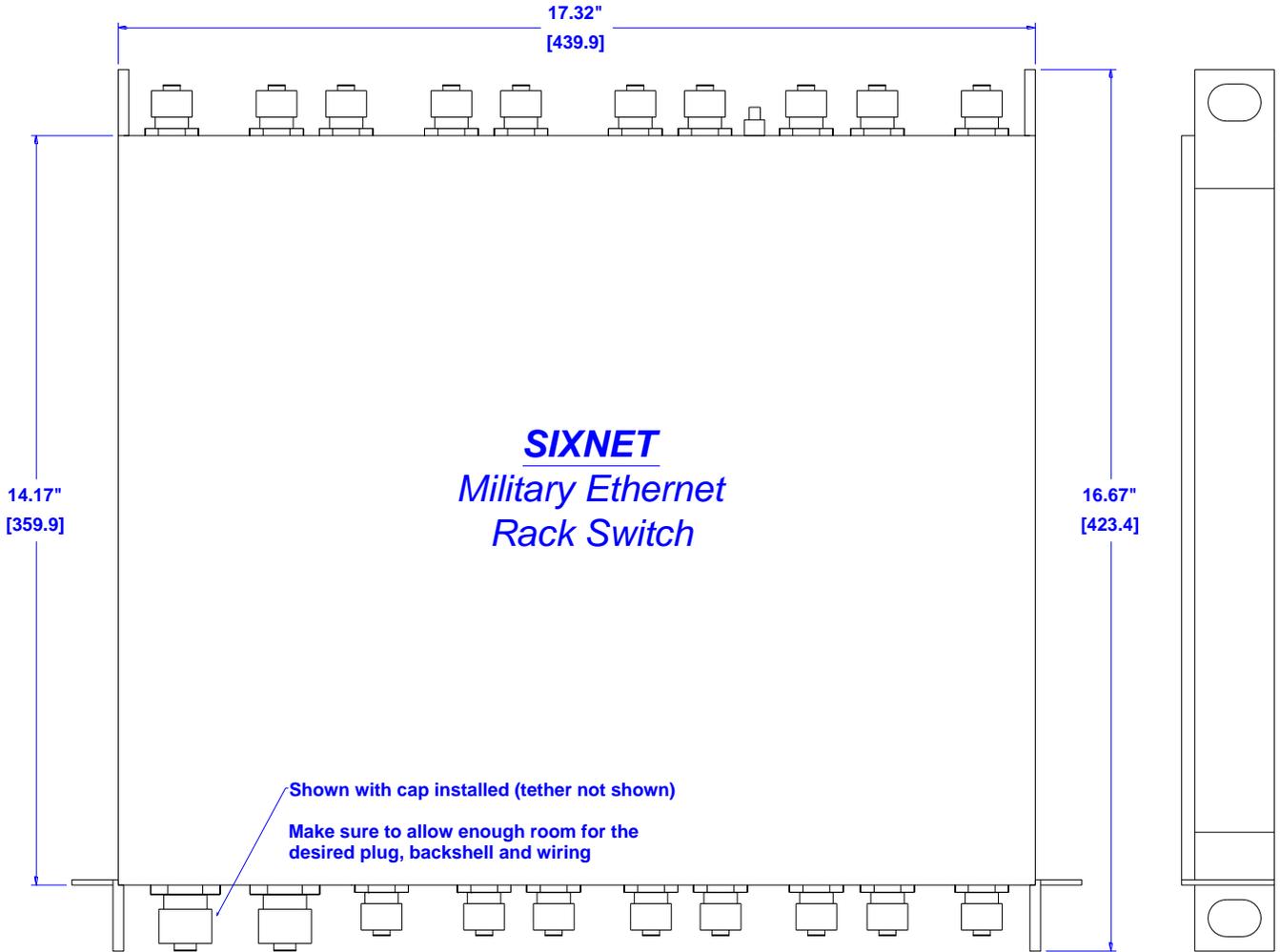
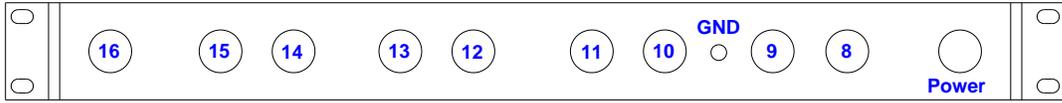
**NE DÉBRANCHEZ PAS L'ÉQUIPEMENT PENDANT QUE LE CIRCUIT EST DIRECT OU À MOINS QUE L'ENVIRONNEMENT SOIT CONNU POUR ÊTRE LIBRE DE CONCENTRATIONS INFLAMMABLES.**

## Section 2

## Mechanical Dimensions and Installation

### Overview

The switch is designed to be mounted into a typical 19" rack. Use the mechanical diagram below as a reference guide when installing the switch. The mounting ears are included and pre-attached to the switch. They may be removed and reversed as desired.

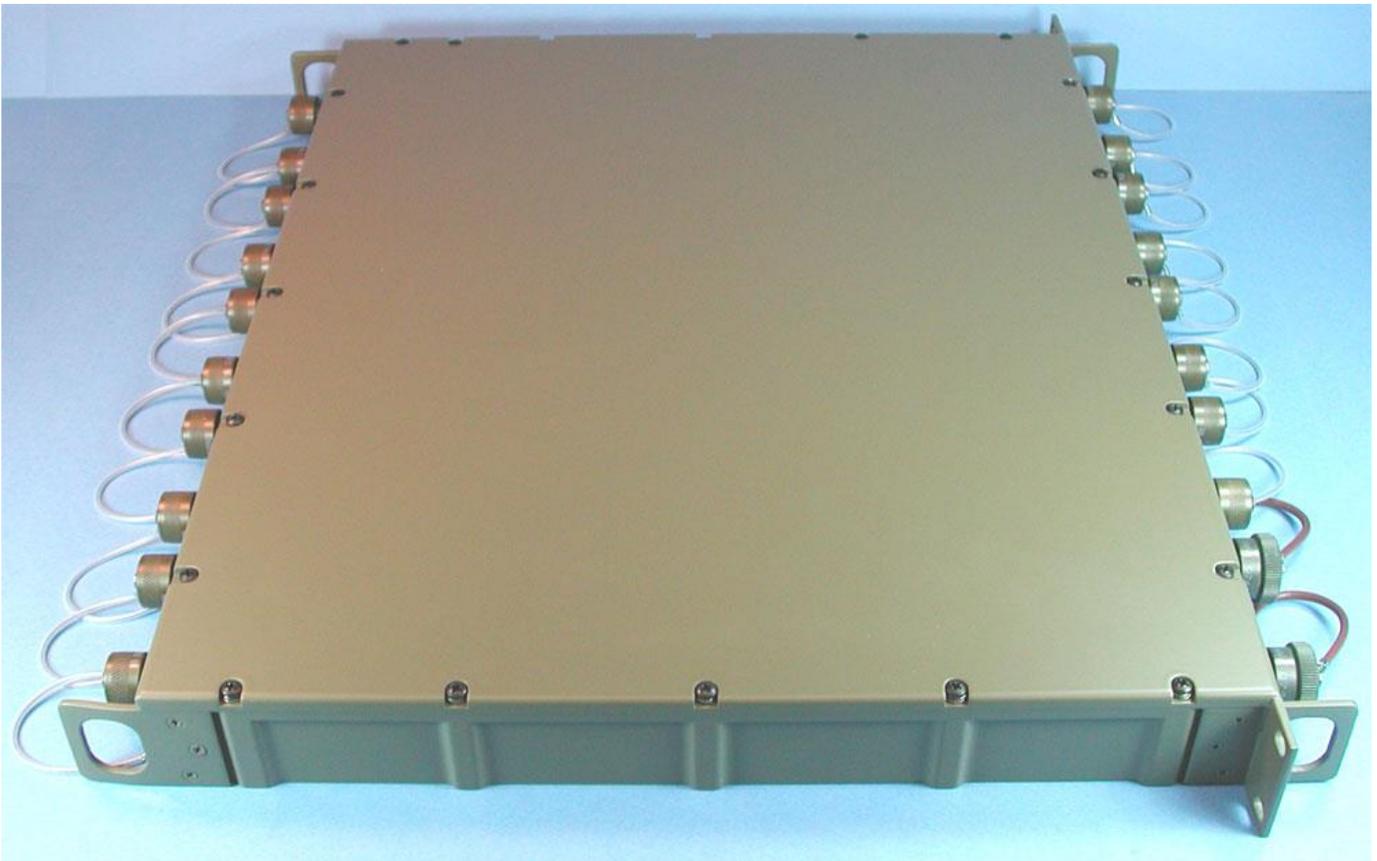




**Front View of Switch**



**Back View of Switch**



**Side and Top View of Switch**

## Section 3

## Power and Communication Connections

### Overview

The switch features MIL-DTL-38999 Series III style connectors which meet or exceed the MIL-STD-38999 standard for military connectors. All these connectors have EMI shielding, ESD protection, plus moisture and corrosion resistance. All mating connectors will self-lock with one 360 degree turn of the coupling nut.

### Typical MIL-STD-38999 Connectors

(shown with tethered plugs)



### Typical MIL-STD-38999 Plug

(not typically supplied with switch)



### Grounding

Use the provided ground stud and nut to connect the switch to a suitable safety, chassis or earth ground. Use of heavy gauge (at least 16 AWG) grounding wire is recommended. Make sure to check your local or national codes for the proper ground connection for your application.

### Chassis Ground Connection



**Power Connector**

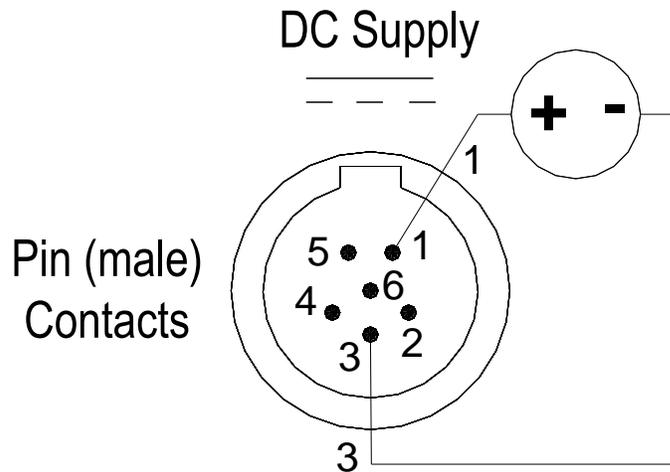
The switch requires a positive voltage between 10 and 30 VDC. Make the power connections as shown in the diagram below.

Power Connector Location



# ET-18MG-MIL Power Input Receptacle

Power Connector Pinout



Shell=A (9), Insert=35, Contacts=P, Keying=N  
(no connection on pins 2, 4, 5 and 6)

**Recommended Plug:** (w/ cadmium plating, socket contacts, Normal keying)

Amphenol # **D38999/26WA35SN**

## Console Connector

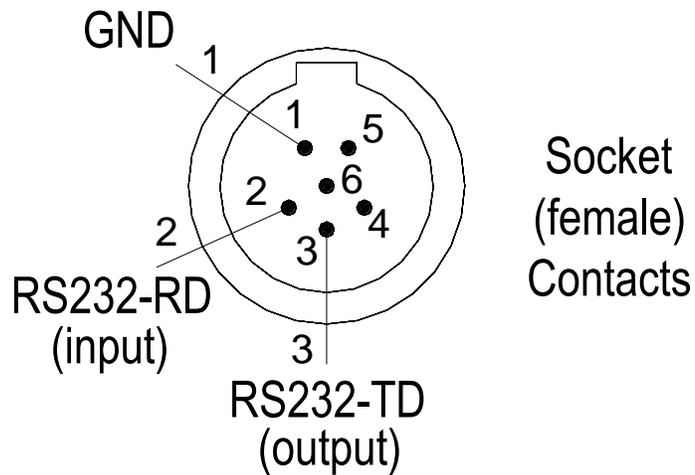
The switch offers a RS232 serial port for accessing the local management interface. Once you have made a physical connection refer to the software user manual on how to access the switch via this console port.

Console Connector Location



## ET-18MG-MIL Console Port Receptacle

Console Connector Pinout



Shell=A (9), Insert=35, Contacts=S, Keying=N  
(no connection on pins 4, 5 and 6)

**Recommended Plug:** (w/ cadmium plating, pin contacts, Normal keying)

Amphenol # **D38999/26WA35PN**

## Ethernet Connector

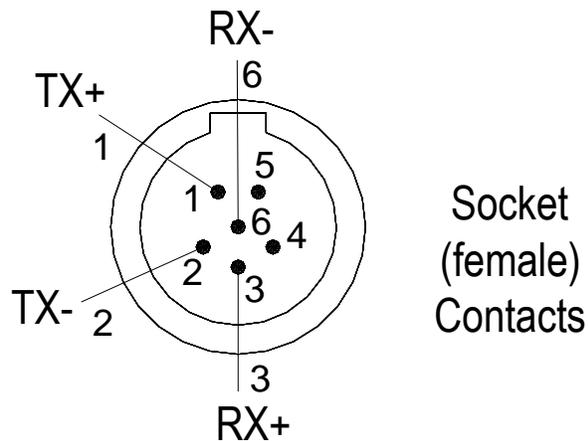
The switch has 16 fast (10/100) Ethernet ports. These ports will auto-detect the speed and duplex of the connection. Alternatively the ports can be disabled or configured for fixed settings via one of the management interfaces. See the software user manual for details.

Ethernet Connector Location (typical)



## ET-18MG-MIL Ethernet 10/100 Receptacles

Ethernet Connector Pinout



Shell=A (9), Insert=35, Contacts=S, Keying=N  
(no connection on pins 4 and 5)

**Recommended Plug:** (w/ cadmium plating, pin contacts, Normal keying)

Amphenol # **D38999/26WA35PN**

## Gigabit Fiber Connector

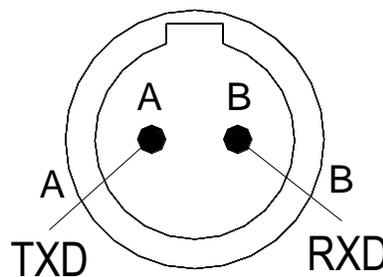
For the ET-18MG-MIL-SS the two Gigabit (1000 Mbps) ports are fiber optic. They are singlemode (1310 nm) for connection distances up to 10 km.

Ethernet  
Connector  
Location



## ET-18MG-MIL Gigabit Fiber Receptacle

Ethernet  
Connector  
Pinout



Socket  
(female)  
Contacts

Shell=B (11), Insert=2, Contacts=S, Keying=Normal

**Recommended Plug:** (w/ cadmium plating, pin contacts, Normal keying)

Amphenol Plug # **CF-529611-2P**

Amphenol Contact # **CF-198096-008** (125 microns)

## Section 4

## Service Information

### Service Information

We sincerely hope that you never experience a problem with any **Red Lion** product. If you do need service, call **Red Lion** at 877-432-9908. 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.

**Red Lion** 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 **Red Lion** system for future reference:

Serial #: \_\_\_\_\_ Date Purchased: \_\_\_\_\_

Purchased From: \_\_\_\_\_

### Product Support

To obtain support for Red Lion products:

**Latest product info:** [www.redlion.net](http://www.redlion.net)

**Phone:** 1-877-432-9908

**Fax:** 1-518-877-8346

**E-mail:** [support@redlion.net](mailto:support@redlion.net)

**Mailing address:** Red Lion Controls, 20 Willow Springs Circle, York, PA 17406