

RELAY OUTPUT MODULE

eXM-RO-08

(for use with SER-32e)

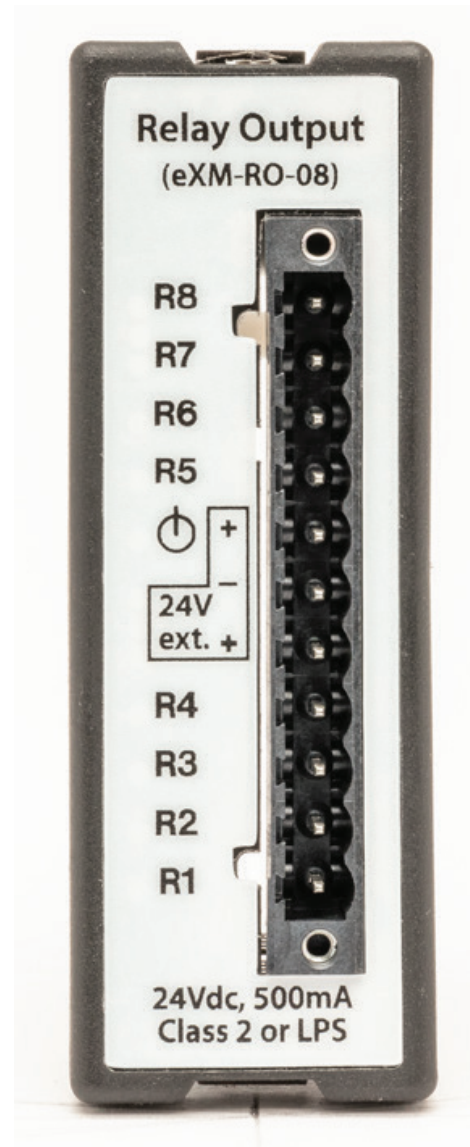


TABLE OF CONTENTS

SAFETY -----3

INTRODUCTION -----4

INSTALLATION -----6

WIRING -----7

OPERATION-----8

SETUP (WEB SERVER) -----9

PRODUCT SPECIFICATIONS----- 10

TROUBLESHOOTING ----- 11

NOTICE

FCC (Federal Communications Commission)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense. The user is cautioned that any changes or modifications not expressly approved by Trystar, LLC., may void the user’s authority to operate the equipment.

The Class A digital apparatus complies with CISPR 11, Class A, Group 1 (EN 55011) and Canadian ICES-003. (EN 61326-1) L’appareil numérique de classe A est conforme aux normes CISPR 11, classe A, groupe 1 (EN 55011) et à la norme Canadienne ICES-003. (EN 61326-1)

SAFETY

SAFETY PRECAUTIONS

Important safety precautions must be followed before attempting to install, service, or maintain electrical equipment. Carefully read and follow the safety precautions.

Note: Electrical equipment should be serviced by qualified personnel. No responsibility is assumed by Trystar, LLC., for any consequences arising out of the use of this material. Document not intended as an instruction manual for untrained persons.



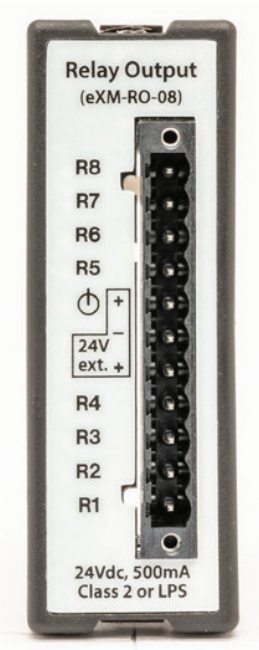
DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Only qualified workers should install this equipment. Such work should be performed only after reading this entire set of instructions. **NEVER** work alone.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power. Assume that all circuits are live until they have been completely de-energized, tested, and tagged. Pay particular attention to the design of the power system. Consider all sources of power, including the possibility of backfeeding.
- Apply appropriate personal protective equipment (PPE) and follow safe electrical practices. For example, in the USA, see NFPA 70E.
- Turn off all power supplying the equipment in which the device is to be installed before installing and wiring.
- Always use a properly rated voltage sensing device to confirm that power is off. Beware of potential hazards, wear personal protective equipment, and carefully inspect the work area for tools and objects that may have been left inside the equipment.
- The successful operation of this equipment depends upon proper handling, installation, and operation. Neglecting fundamental installation requirements may lead to personal injury as well as damage to electrical equipment or other property.

Failure to follow these instructions can result in serious injury or death.

INTRODUCTION



Introduction Relay Output Module

The Relay Output Module is an optional accessory for the SER-32e Sequence of Events Recorder. Each Output Module provides eight (8) solid-state Form-A relay outputs. The SER-32e provides two (2) option slots allowing its native high-speed inputs to be complimented with up to sixteen (16) relay outputs for status indication and non-critical control applications. Outputs on the SER-32e and eXM-RO-08 are not recommended or intended for critical control applications.

Example: 2 x Relay Output Modules for a total of 16 additional outputs.

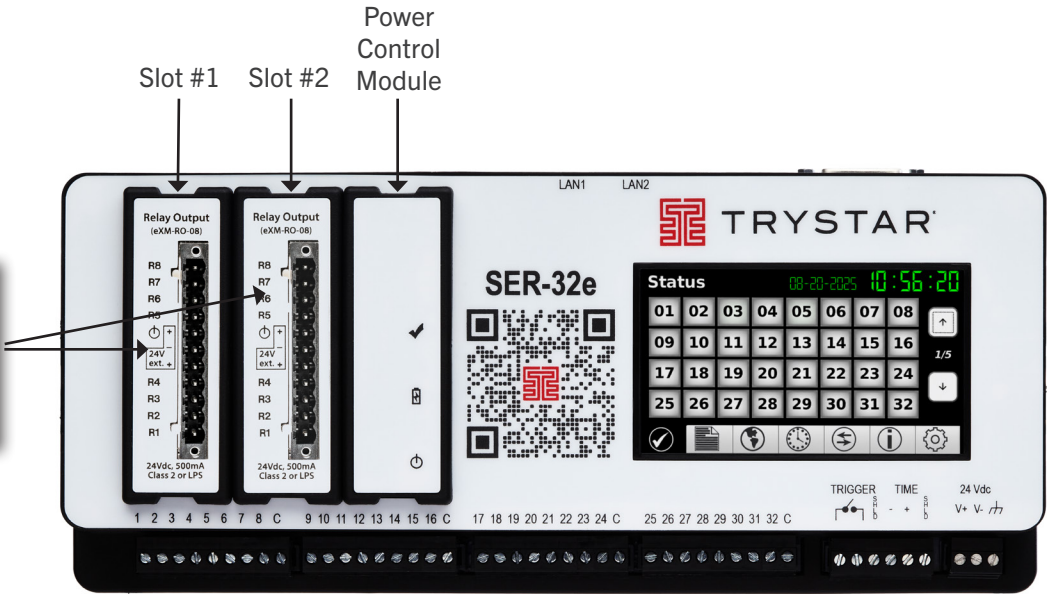


Figure 1-1. SER-32e with 2 x Output Modules Added

Relay Output Module Overview

The Output Module provides 8 solid-state relay outputs, status indicators, an indicator for the presence of 24 Vdc wetting voltage and an indicator for module control power and module status.

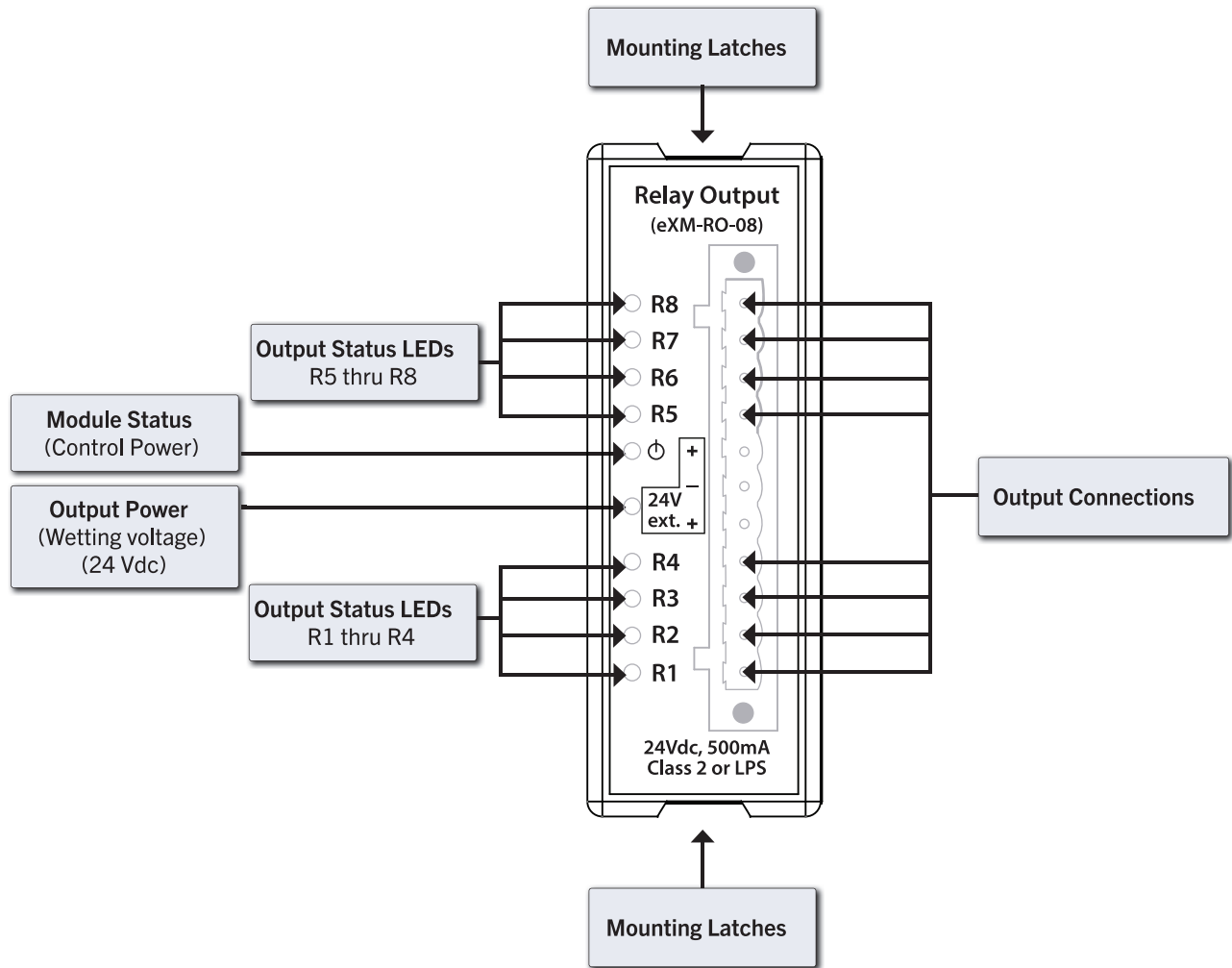


Figure 1-2. eXM-RO-08

Table 1-1 . Ordering Information

Catalog Number	Description
SER-32e	Trystar Event Recorder, 32-input, PTP, secure web, 2x option slots, control power ride-thru
eXM-RO-08	8-output option module, 24 Vdc, pluggable screw terminal connector
eXM-DI-08	8-input option module, 24 Vdc, pluggable screw terminal connector
EZC-IRIG-B	EZ connector for SER (input: IRIG-B time source)
EZC-DCF77	EZ connector for SER (input: DCF77 time source)
PLXe-5V	PTP Legacy Interface, Self-Powered (5V DCLS, for unmodulated IRIG-B output)
PLX-5V	PTP Legacy Interface (5V DCLS, for unmodulated IRIG-B output)
PLX-24V	PTP Legacy Interface (DCF77, 1per10 or 24V IRIG-B output to STR-IDM)
ADK-125V	125 Vdc to 24 Vdc Input voltage adapter kit

INSTALLATION

Installing the Relay Output Module

The Relay Output Module is installed by inserting it into either of the two option slots on the SER-32e (slot 1 or slot 2). See Figure 1-1.

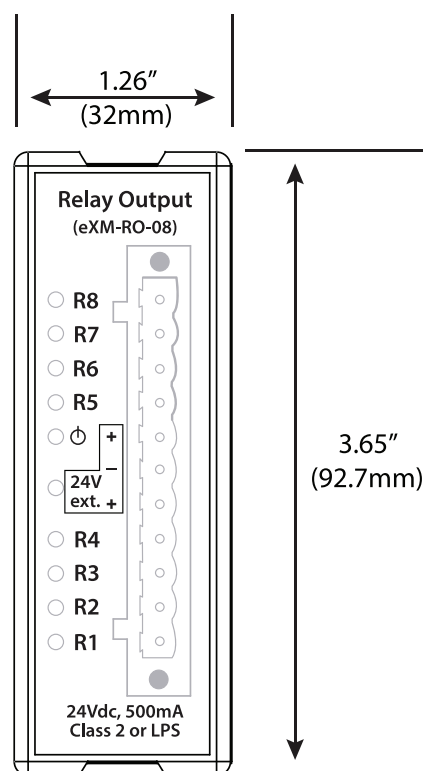


Figure 2-1. Relay Output Module Dimensions

Note: It is recommended to retain the cover for future use.

Installation Procedure

1. Refer to Safety Precautions for electrical safety guidance.
2. Remove control power from the SER and monitor the LED indicators on the Power Control module until they are all OFF.
3. Remove the blank cover from the desired option module slot by pressing the two latches on the top and bottom and pull out.
4. Align the module in the guide rails with the connector on the right.
5. Insert the module into the option slot by pressing it into the SER until the latches click into place.
6. Reapply control power to the SER and confirm the SER recognizes the option module by viewing the Monitoring Status screen on either the SER display or web page.

WIRING

Wiring Connections for the Relay Output Module

The Relay Output Module has 8 solid-state relay outputs, each sharing a common return and requiring a 24 Vdc (Class 2 / LPS) wetting source, wired as shown below. Control power for the module is provided by the SER the module is mounted in. Each output is rated for 24 Vdc, 500 mA, maximum load. Recommended wiring for the outputs is Belden 8760 (18 AWG, shielded, twisted pair) cable, or equivalent.

Output connections are made via a removable screw terminal plug equipped with locking screws for mounting. It is recommended the locking screws be secured to ensure retention of the plug-in connector.

Refer to Safety Precautions for electrical safety guidance, proper PPE and procedures before wiring the Output Module.

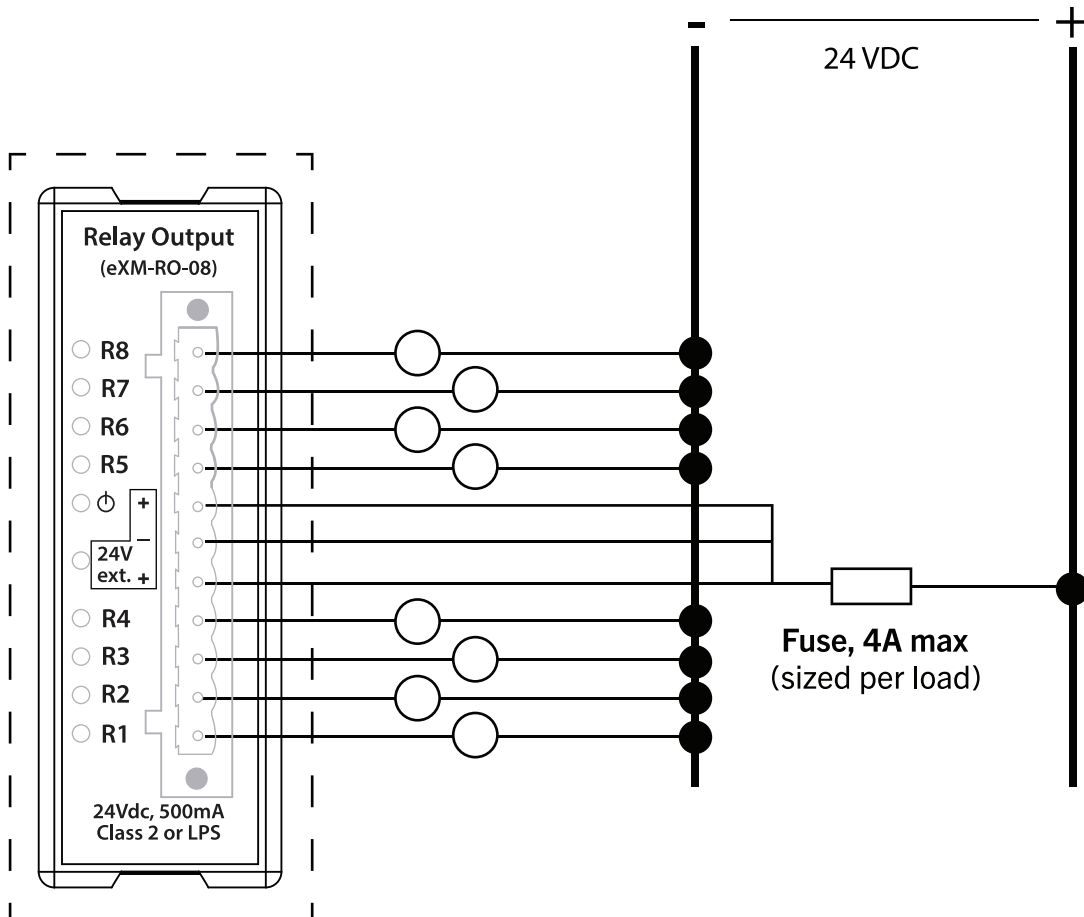


Figure 3-1. Relay Output Module Wiring

OPERATION

The outputs are reflected based on the option slot in which they are installed.

Table 4-1. Output Channels

Module(s) Installed		Channels
Slot #1	Slot #2	
Yes	No	33 - 40 (R1 - R8)
No	Yes	41 - 48 (R9 - R16)
Yes	Yes	33 - 48 (R1 - R16)

Note: If an Output Module is installed in option slot #2, but not option slot #1, channels 33 - 40 will be reported as disabled.

The status can be viewed on the SER's display and web interface on the Monitoring - Status screen.

Figure 4-1 shows one additional Output Module added (Outputs: R1 - R8). The additional 8 (up to 16) outputs are shown at the bottom of the display screen.

Note: The SER-32e's operating temperature must be derated to 60°C when Output Modules are installed.

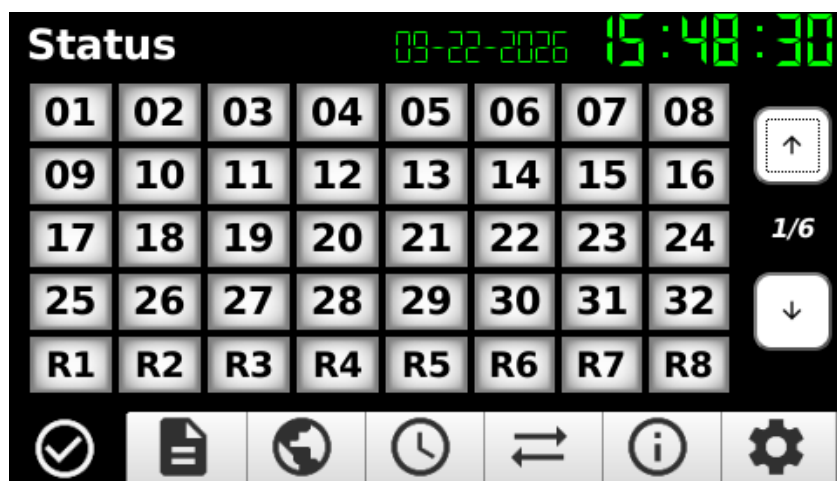


Figure 4-1. Monitoring - (on SER) Status screen.

Additional outputs (up to 16) are shown on the right side of the Monitoring - Status web page.

Note: Refer to SER-32e Instruction Manual for additional information on display screen and web client.

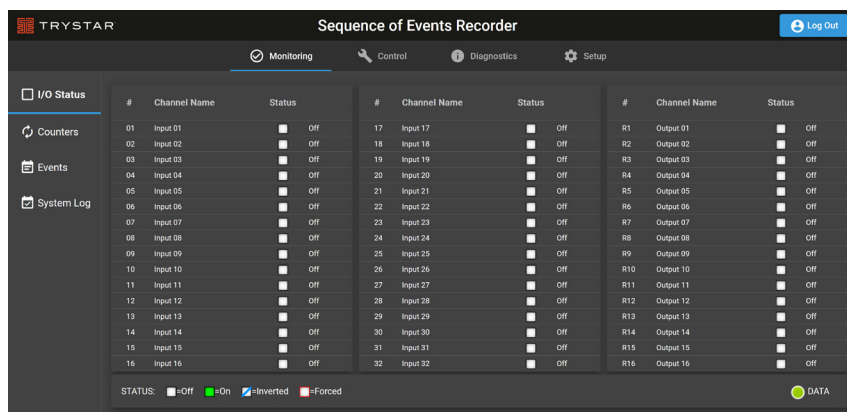


Figure 4-2. Monitoring - Status web page

SETUP (WEB SERVER)

Output(s) Setup

Clicking Outputs under the Setup tab brings up the Output’s setup page:

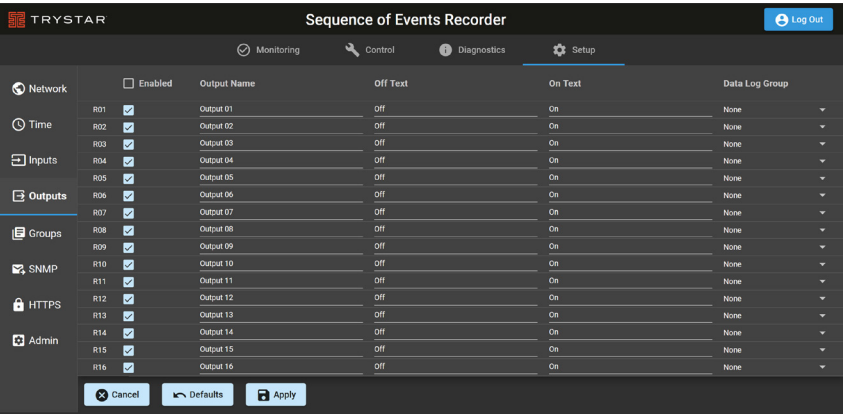


Figure 5-1. Output setup web page (SER-32e)

This web page allows the configuration of each individual output.

Table 5-1. Output Configuration Settings

Option	Description	Available values	Default
Event Logging	Each output can be enabled for event recording. This does not affect status monitoring—only recording of state changes.	Enabled or Disabled	Enabled
Output Name	Text string (UTF-8) to describe a given output.	32 characters max ⁽¹⁾	Output 01, Output 02, etc.
OFF Text	Customized label to describe an Output’s OFF state.	UTF-8 text string, 16 characters max. ⁽¹⁾	OFF
ON Text	Customized label to describe an Output’s ON state.	UTF-8 text string, 16 characters max. ⁽¹⁾	ON
Group Assignment (for Data Logs)	Each output can be assigned to a data log group for reporting purposes	None, or Group 01 to Group 16	None

⁽¹⁾ Only the following special characters are available: ! @ # \$ % & * () _ - + = { } [] ; . ~ ` ' `

PRODUCT SPECIFICATIONS

Electrical		
Relay Outputs	Number of outputs	8 Form A, solid-state relays
	Signal type	Normally open, true high
	Voltage, operating range	17.5 to 36 Vdc (24 Vdc nominal), Class 2 / LPS
	Current (load) capacity	500 mA per relay output
	Maximum current (surge current)	2 A for 10 seconds, max.
	Leakage current	< 2 μ mA at 24 Vdc
	ON-state voltage drop	< 0.5 volts at 0.5A
	Response time	< 0.1 ms OFF to ON, < 0.1 ms ON to OFF (not including Modbus command)
	Wetting Source	24 Vdc, 4 A max., Class II/LPS
	Fault sensing	Overload and over-temperature (upon removal of fault, output returns to operating state)
	Fault reporting	Fault status available via status LED, LCD, Modbus TCP and web page
	Isolation	Output group to output group: 2 kV Input(s) to output group: 2 kV Output to Earth ground: 2 kV Output to communications interface: 5 kV

Mechanical		
	Mounting	Option slot on SER-32e Sequence of Events Recorder
	Wire sizes supported	#22 to #12 AWG
	Dimensions (W x H x D)	1.26" x 3.65" x 1.71" (32mm x 92.7mm x 43.5mm)
	Dimensions (W x H x D) in packaging	8.0" x 3.0" x 8.0" (203.2mm x 76.2mm x 203.2mm)
	Weight (product alone / product packaged)	0.375 lbs. (0.17kg) / 0.75 lbs. (0.34kg)

Environmental		
	Operating Temperature	-25 to +60 OC
	Storage Temperature	-40 to +85 OC
	Humidity Rating	5% to 95% relative humidity (non-condensing) at +40 oC
	Altitude Rating	0 to 3000 meters (10,000 feet)
	Sustainability / Compliance	RoHS 2 (2011/65/EU), RoHS 3 (2015/863/EU), Pb free California Proposition 65, Low Halogen, Conflict Minerals

Regulatory		
	Safety, USA	UL listed (NRAQ-cULus, UL 61010-1, UL 61010-2-201)
	Safety, Canada	CAN/CSA-C22.2 (61010-1-12, 61010-2-201)
	Safety, Europe	CE Mark (EN 61010-1 : 2010, EN 61010-2-201 : 2017)
	Emissions / Immunity	EN 61326-1 (IEC 61326-1 : 2012)
	Radiated emissions	CISPR 11, Class A, Group 1 (EN 55011) / FCC Part 15B, Class A
	Electrostatic discharge	EN 61000-4-2
	Radiated immunity	EN 61000-4-3
	Electrical fast transient / burst immunity	EN 61000-4-4
	Surge immunity	EN 61000-4-5
	Conducted radio frequency immunity	EN 61000-4-6

TROUBLESHOOTING

Symptom	Possible Cause	Suggested Action(s)
Module status LED not ON	Connection issue with SER	Remove power from SER. Remove Output Module. Examine the edge connector for damage. Re-insert Output Module.
Output(s) not functioning	Wetting voltage or common connection issue or missing. Output connector dislodged. Module control power missing.	Confirm wetting voltage (24 Vdc) and common connections. Ensure Output connector is secured. Check status of module Status LED.
Module 24 Vdc LED 'red' in color.	Wetting voltage outside acceptable range or connection issue. 24 Vdc common connection issue or missing.	Confirm wetting voltage is in acceptable range (24 Vdc). Confirm 24 Vdc common connection.
Output status for Outputs 33-40 is reporting as disabled.	No Output Module installed in option slot #1.	There is no issue using option slot #2 and not using option slot #1. For sequential output numbering, move the Output Module to option slot #1. NOTE: you will need to reconfigure the Output Module when moving it from option slot #2 to slot #1.

