



Sequence of Events Recorder (SER)

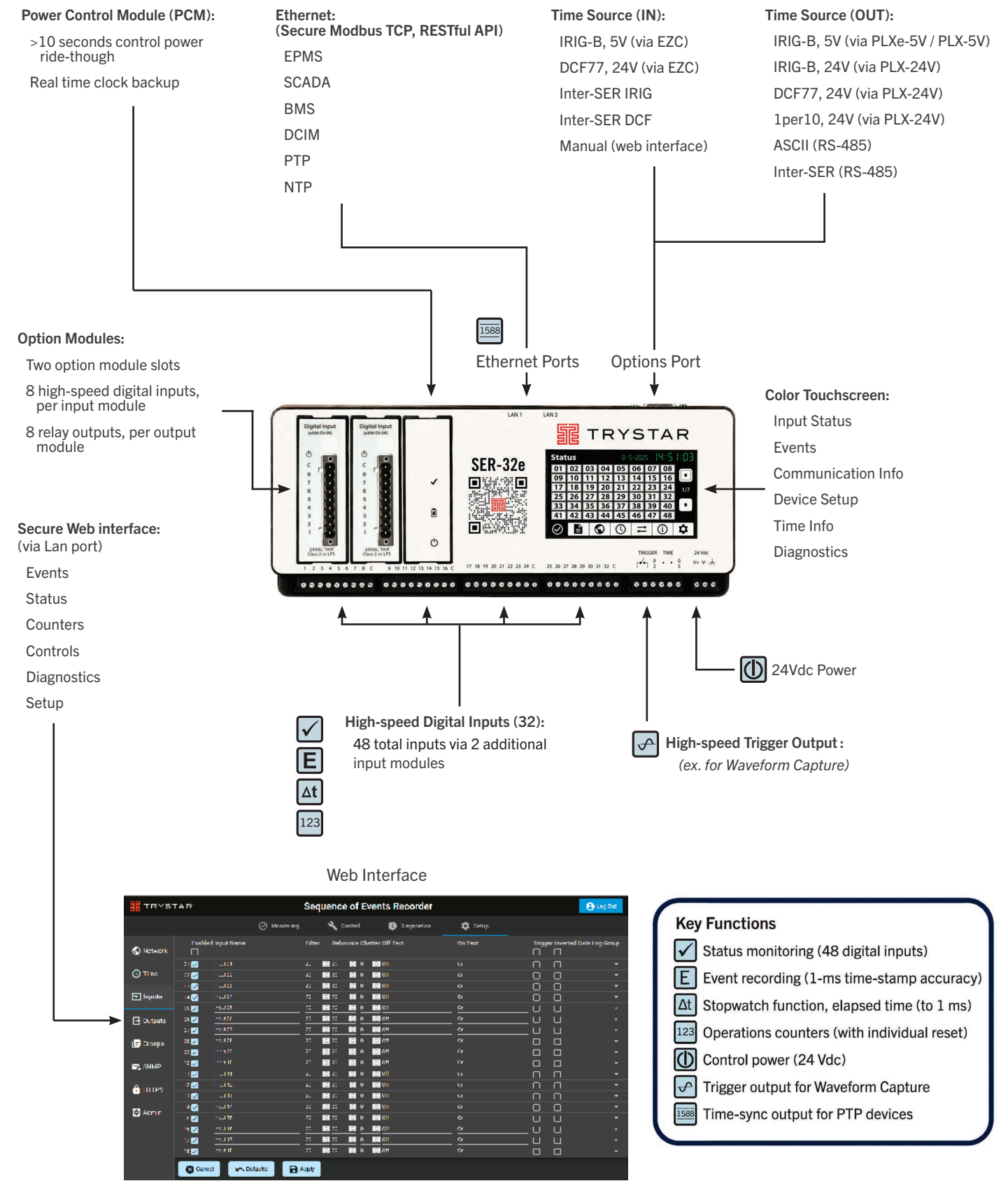
Know what happened and when—to 1ms!

The Trystar Sequence of Events Recorder monitors the status of 48 channels and records state changes with 1ms accuracy.

An embedded web server enables setup and monitoring over an Ethernet network using a standard web browser. Flexible time synchronization and Modbus TCP communications enable easy integration with supervisory systems such as an electrical power management system (EPMS).

Key Functions

-  Status monitoring (48 digital inputs)
-  Event recording (1-ms time-stamp accuracy)
-  Stopwatch function, elapsed time (to 1 ms)
-  Operations counters (with individual reset)
-  Control power (24 Vdc)
-  Trigger output for Waveform Capture
-  Time-sync output for PTP devices



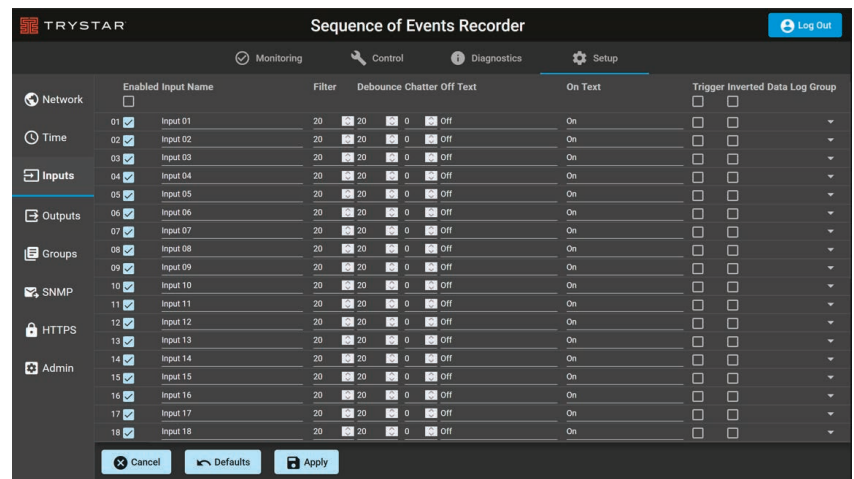
Setup and Monitoring Using any Web Browser

Customize

Trystar Event Recorders offer simple setup using a web browser - no proprietary software required. An embedded web server hosts user-friendly pages for setup and monitoring. Digital inputs have user-configurable filters, debounce, and chatter functions. Each input can be customized with a descriptive name (32-char. max.), and assigned text to describe on and off states.

SER typical monitored points:

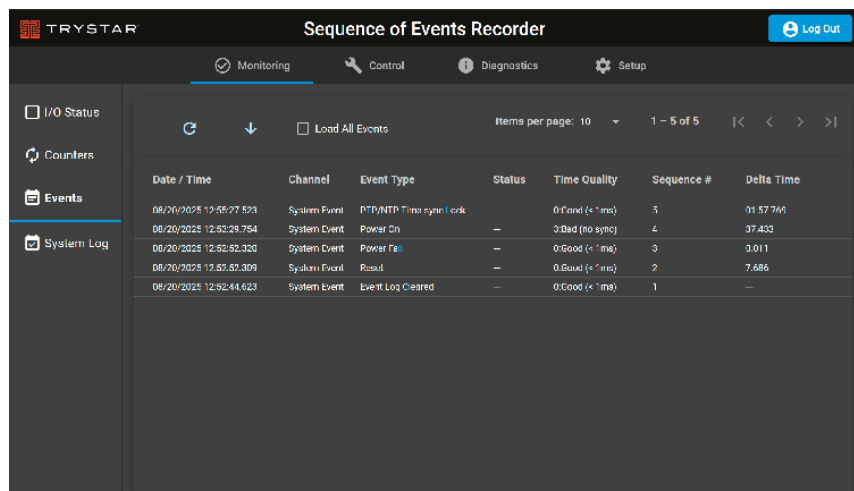
- Breaker status: open/closed/tripped
- Relay trip signal: normal/trip
- Control switches: open/close commands
- Control scheme status: auto/manual/test
- Auto-transfer switch (ATS) status: normal/emergency/test
- UPS status: normal/transfer/bypass
- Generator status: stopped/running
- Battery status: normal/alarm
- TVSS, transformer temperature, fan status and other auxiliary contacts and alarms

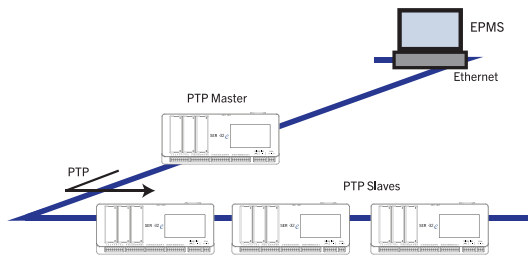


View Events, Export to Excel, Access via Modbus TCP

The Trystar Event Recorder's Events web page displays detailed information for all event records, sortable by any field. The Export button (📄) makes it easy to save data to Excel for further analysis or reports. These tools are useful during commissioning or troubleshooting, even if the same data is also integrated into a comprehensive power monitoring system, building management system or other host software.

Note: See the SER-32e Instruction Bulletin for more details.

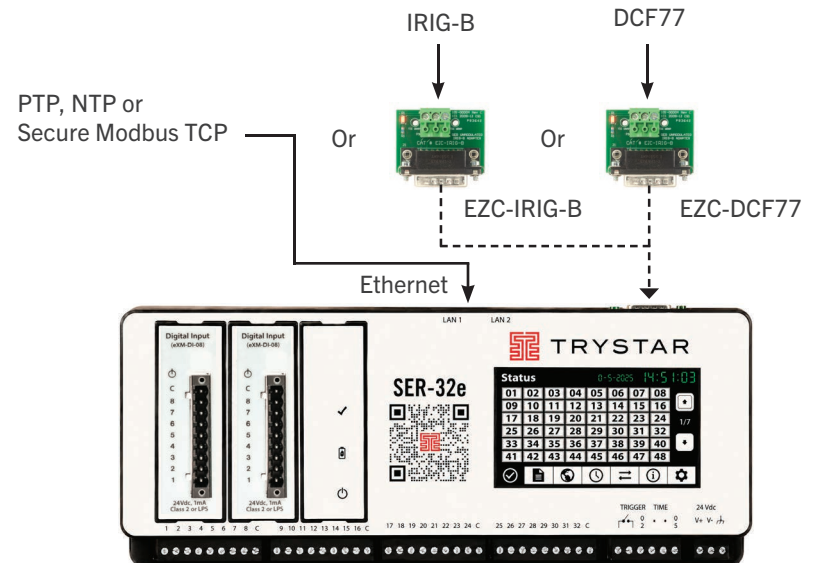




Time Synchronization Made Simple

Automatic Time Sync (within 100 microseconds)

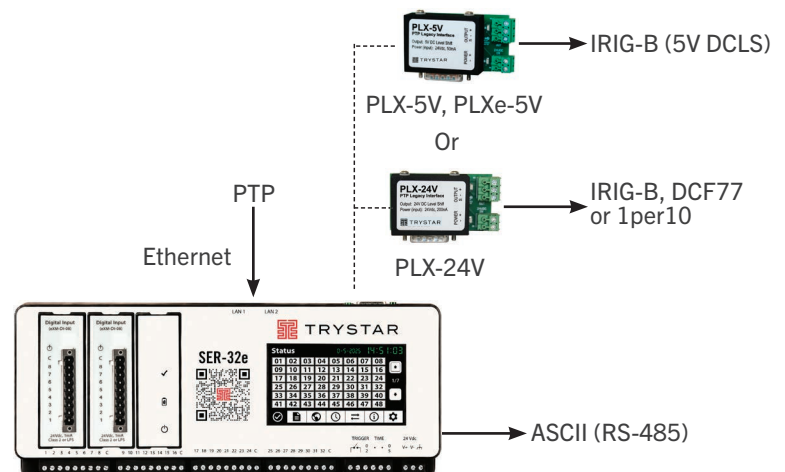
Trystar enables hi-res (sub-millisecond) time synchronization over the same Ethernet network used for the Electrical Power Monitoring System (EPMS). Set the time in the first Trystar Event Recorder, and all other SER devices sync automatically over Ethernet. The breakthrough technology: PTP (Precision Time Protocol), per IEEE Std 1588. Time-sync input (time source) options are shown below:



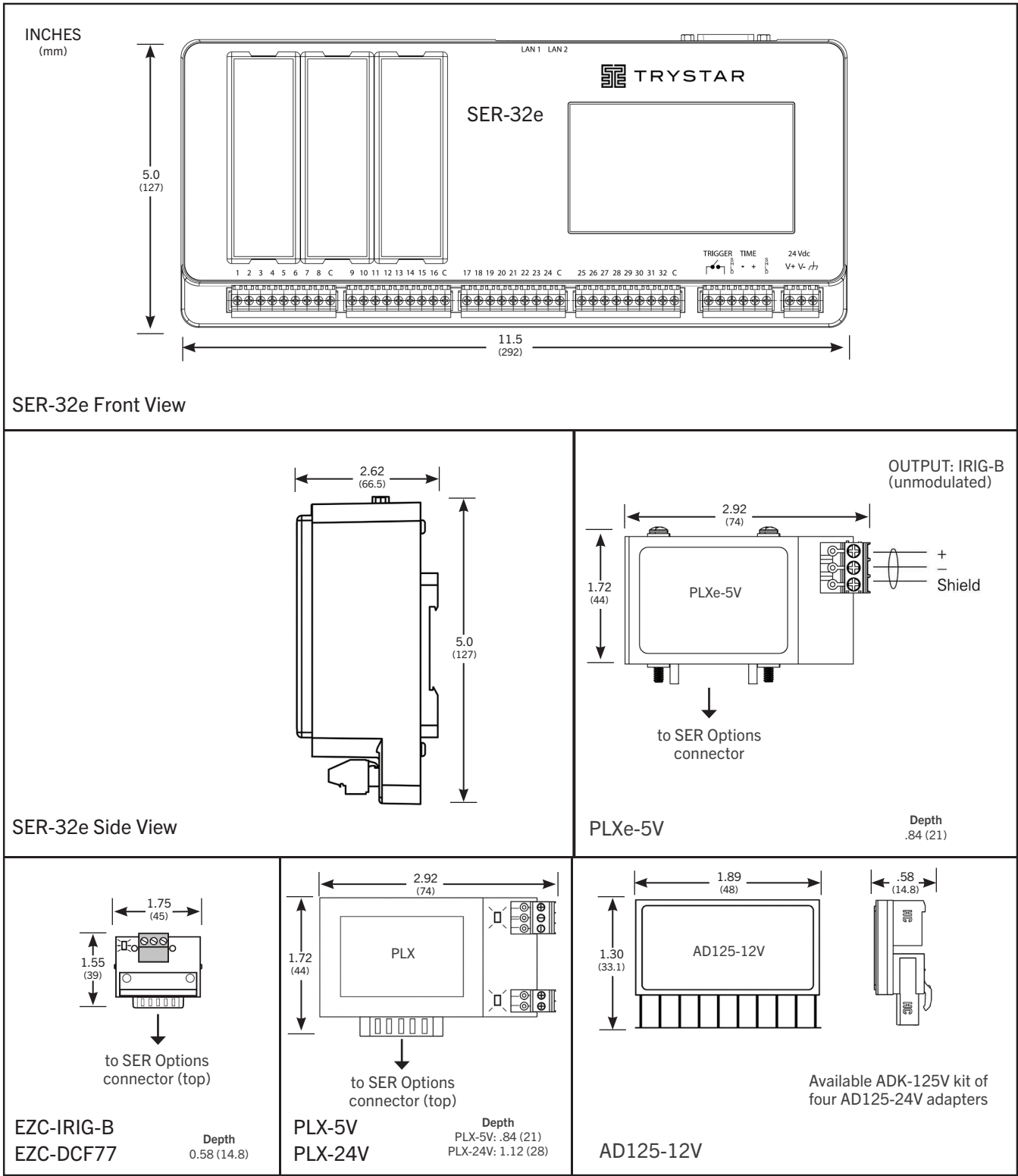
No PTP? No Problem.

Trystar SER Output Legacy Protocols

Trystar Event Recorders don't simply leverage the power of PTP for themselves. Any SER-32e configured to accept PTP or NTP as its time input can in turn output the legacy protocols required by complementary devices, such as relays or meters. IRIG-B, DCF-77, 1 per 10 or ASCII time outputs are available directly from the SER through a small wiring adapter, PTP Legacy Interface (PLXe-5V/PLX-5V or PLX24V), according to the required protocol and voltage supported by the target device.



Dimensions



Specifications

Electrical		
Digital inputs	Number of inputs	32 standard, up to 48 via 2 x 8 option modules.
	Voltage, operating	24 Vdc (-15% to +10%)
	Must turn on/off voltage	20 Vdc (on) / 9 Vdc (off)
	Input impedance	10K ohms resistive, 1 mA
High-speed Trigger Output	Relay type	Form A relay
	Maximum current	100 mA at 24 Vdc nominal
	Contact closure characteristics	Momentary contact closure, duration of 100 ms
Control Power	Voltage, operating	24 Vdc ($\pm 10\%$)
	Burden, steady state (max.)	7 VA
	Burden, momentary (max.)	Inrush current 0.8 A for 5-8 ms
	Ride-thru	> 10 seconds

Time Synchronization		
Time Source (IN) Protocols Supported	PTP slave	IEEE 1588-2019 (v2.1), E2E Default Profile, per Annex I.
	IRIG-B (via optional EZC-IRIG-B connector)	Unmodulated IRIG-B (5V DCLS) types B004 or B007 (with year), C37.118 or IEEE 1344
	DCF77 (via optional EZC-DCF77 connector)	DCF77 (24 Vdc)
	SER inter-device time sync (legacy applications)	RS-485 (IRIG-B or DCF77 time code)
	NTP (SNTP) client	User-configurable NTP primary/secondary servers and update interval
Time-sync Output Protocols Supported	PTP master	IEEE 1588-2019 (v2.1), E2E Default Profile, per Annex I
	IRIG-B (via optional PLX-5V connector)	Unmodulated IRIG-B (5V DCLS) type B007, C37.118 or IEEE 1344
	IRIG-B (via optional PLX-24V connector)	IRIG-B (24V DCLS) type B007, C37.118 or IEEE 1344
	DCF77	DCF77 (24 Vdc)
	1per10 (via PLX-24V connector)	1 pulse per 10 seconds (24 Vdc)
	RS-485	ASCII / RS-485 (ASCII + Quality) or inter SER time sync (legacy)
Clock	Accuracy	< 100 μ s (with time source = PTP, IRIG-B or DCF77)
	Holdover (after initial time sync lock)	5 min. (remains within 100 μ s even after loss of sync for up to 5 min.)

Communications		
Ethernet Interface	Ethernet Ports (10/100 Mbps)	Modbus TCP, Secure Modbus TCP, PTP, NTP, HTTPS, RESTful API
	Serial port (time-sync IN/OUT)	RS-485 (2-wire plus shield)
	Web server (for setup and monitoring)	Ethernet via a standard secure web browser (HTTPS)
	Simultaneous TCP connections	44 (Modbus TCP sockets port 502, Secure Modbus port 802)
	SNMP	SNMPv2c or SNMPv3
	NOTE: Gen2 (SER32e) devices has no fixed limit on the maximum concurrent TCP connections. There is a managed limit on Modbus TCP (or Secure Modbus TCP) connections (sockets) to a total of 44.	

Mechanical / Environmental / Regulatory		
Mechanical	Mounting	Standard DIN rail (EN 50022, 35 mm x 15 mm)
	Wire sizes supported	#24 to #12 AWG (#26 to #14 AWG for 3-position EZC connectors)
	Dimensions (W x H x D)	11.5 x 5.0 x 2.62 inches (292 x 127 x 66.5 mm)
	Dimensions (W x H x D), in carton	12.5 x 6.5 x 4.5 inches (318 x 165 x 114 mm)
	Weight (Device / Device in package)	2.4 lbs. (1.1 kg) / 3.5 lbs. (1.6 kg)
Environmental	Temperature	-25° to +70° C (Operating) / -40° to +85° C (Storage)
	Humidity rating	5% to 95% relative humidity (non-condensing) at 40° C
	Altitude rating	0 to 3000 meters (10,000 feet)
	Sustainability	RoHS 3 (EU Directive 2015/863), REACH (EC 1907/2006)

Electrical		
Regulatory Compliance	UL Listing	(NRAQ-cULus, UL 61010-1, UL 61010-2-201)
	Global standards	CE Mark, EN standards
	Emissions / Immunity	EN 61326-1 / IEC 61326-1 : 2012, CISPR 11 Class A (EN 55011) FCC Part 15B Class A
	Country of Origin	USA

The following models and accessories are available for the Trystar SER-32e

Ordering Information		
	Catalog no.	Description
Trystar Sequence of Events Recorder	SER-32e	Trystar Event Recorder, 32-inputs
Relay Output Module	eXM-RO-08	Option Module adds 8-outputs to SER-32e, 24 VDC, pluggable screw terminal connector
Digital Input Module	eXM-DI-08	Option Module adds 8-inputs to SER-32e, 24 VDC, pluggable screw terminal connector
Accessories	EZC-IRIG-B	EZ connector for SER (IRIG-B input)
	EZC-DCF77	EZ connector for SER (DCF77 input)
	PLX-5V	PTP Legacy Interface (5V DCLS, for unmodulated IRIG-B output)
	PLX-24V	PTP Legacy Interface (24V DCLS, for DCF77, 1per10 or 24V IRIG-B
	PLXe-5V	PTP Legacy Interface (5V DCLS, for unmodulated IRIG-B output), self-powered
	ADK-125V	Input voltage adapter kit, 125Vdc to 24Vdc, 32 inputs

