



Hanley Energy

Ensuring Reliable Power For Data Centers

www.hanleyenergy.com

**HANLEY
ENERGY**
TRUSTED ENERGY PARTNERS

Promoting Confidence in Your Always-on and Standby Power

28%

of Data Centers experienced outage losses of \$100k to \$1 million

33%

of Data Centers experienced business impacts from power outages

\$1M

10% of Data Centers reported power outage costs upwards of \$1 million

Preventing Downtime

Hanley Energy is the world leader for critical power loss event recording. In critical power facilities always-on power is essential, and power outages can be costly, as well as damage your corporate reputation and lead to liability and compliance issues.

Hanley Energy is the industry leader for precision time synchronization, ensuring all equipment is aligned to one time clock with 1 ms accuracy. Sequence of Events Recorders (SERs) monitor and record status changes of inputs from equipment such as automatic transfer switches, switchgear breakers and uninterrupted power systems. This provides the confidence to know the system is operating exactly as designed and if any changes occur over time, threatening system stability.

At Hanley Energy, we provide precision timing for accurate power loss event recording, helping minimize cost and time of recovery after a power system event.



Prepare for Unavoidable Disruptions

The number of data center infrastructure outages and “severe service degradation” incidents are increasing, as are the costs. According to a recent survey, the overall average cost of data center outage is \$740,357. And to add to this, over the past three years, nearly half of the Data Centers in the U.S. experienced an outage at their own site or a service provider’s site.

Today we’re seeing an increasing shift in disruptions to power. Whether it be from natural causes such as earthquakes, fire, lightning or hurricanes, or from electrical events such as rolling blackouts or component/breaker failure, power and IT equipment failure and even human error. Your confidence in a facilities main and back-up power systems is essential. As the frequency and severity of these power outages increase, so should a facilities cost mitigation.





x2

The number of blackouts related to weather events has doubled since 2003

\$27 billion

Power outages in the U.S. cost businesses over \$27 billion annually

Knowledge is Power

Know What Happened and Why

What about when a power event happens? When the lights go out, understanding the root cause of the issue and how it cascaded in the system is paramount to getting things back up and running as soon as possible. Our Sequence of Event Recorder captures the power incident in detail from the first event to the last in precise order, so you have the information you need to take decisive action quickly and reduce the effect of the power outage.

In complex electrical networks, state changes can occur quickly, thus system-wide clock synchronization and precision time stamped data is needed for meaningful data analysis. Hanley Energy provides accurate event recording to 1 millisecond. This data is easily integrated into any EPMS system for enhanced analysis allowing for quicker recovery, as well as preventing possible future recurrences.

What can precision time-stamped data logged by a Sequence Events Recorder be used for?

- Root-cause analysis, and event reconstruction after a power outage or anomaly
- Verification, testing and maintenance of emergency power supply systems
- Advanced warning of slow breakers - before they fail or increase arc-flash hazard
- Verification for electric utility, insurance, warranty, or legal purposes

Protection of a Data Centers' Back-up Power Systems

The ability to move from normal to stand-by power seamlessly is essential for every data center. Regular testing of these systems increases the probability of identifying reliability issues and reduces risks of losing emergency power. Verify these systems are running properly with accurate time stamping whenever there is a scheduled or unscheduled switch from utility to back up power. This provides the confidence to know the system is operating exactly as designed or if changes occur to the equipment over time, threatening system stability.

Whether its event reconstruction, post event analysis or detailed reporting of switching to backup systems, the top data centers trust Hanley Energy to help ensure the reliability, efficiency and safety of normal and emergency power systems.



Our Solutions

Hanley Energy is the global leader in precision time solutions for critical power facilities, including data centers, hospitals, industrial applications, universities, airports, microgrids, and alternative energy.

Key applications include sequence of events recording and GPS time synchronization. We help facility managers ensure the reliability, efficiency and safety of their normal and emergency power systems.

Hanley Energy Sequence of Event Recorders

Sequence of Events Recorder (SER) models SER-3200 and SER-2408 record status changes time-stamped to 1 ms. Time synchronization is achieved via PTP (IEEE 1588), IRIG-B, DCF77, NTP, Modbus TCP or an RS-485 signal from another SER. An embedded web server allows setup over a network using a standard browser, plus easy access to all events, status and even custom pages.

Sequence of Events Recorders

	SER-2408	SER-3200
Digital Inputs	24	32
Relay Outputs	8 (Solid State)	N/A
High Speed Trigger Output	1	1
Input Voltage	24 Vdc	24 Vdc
Time Source (IN) Protocols: NTP, PTP, IRIG-B, DCF77, ASCII/RS485	Yes	Yes
Time Sync (OUT) Protocols: PTP, IRIG-B, DCF-77, ASCII/RS485	Yes	Yes
Clock Accuracy - better than 100 microseconds	Yes	Yes
Communications: Modbus TCP, FTP, RESTful API	Yes	Yes
Dimensions (W x H x D)	11.25 x 4.75 x 3.13 in. (286 x 121 x 79 mm)	11.25 x 4.75 x 3.13 in. (286 x 121 x 79 mm)



Sequence of
Events Recorder

Features/Benefits

- **Status monitoring** of 24 or 32 digital inputs
- **Event recording** with up to 100 microseconds time stamp accuracy
- **Elapsed time**, stop-watch function: 1ms
- **Operations counters** per input with individual reset
- **Web interface** for setup and monitoring
- **Remote control** of (On/Off) input status via Modbus TCP
- **Waveform Trigger output** to power meter and relay
- **Clock sync:** (IN) via PTP, IRIG-B, NTP or others
- **Time master:** (OUT) PTP, IRIG-B, DCF77, ASCII/RS485, 1per10

Hanley Energy Event Manager

The Hanley Energy Event Manager provides the ability to view and monitor I/O status from multiple Sequence of Event Recorders (SERs) in one easy to understand web interface. This helps to provide an overall view of the diagnostic health of a critical power system.

This intuitive, simple to use tool lets users take advantage of precision time recordings of status changes in electrical equipment. Where critical power applications are concerned, the Event Manager helps easily identify I/O status and speeds up troubleshooting efforts when an event has occurred.

The Event Manager allows the consolidation of events from all downstream SERs pertaining to a single incident, providing fast and powerful event reconstruction analysis. A valuable resource to help identify power loss events quicker, saving time and money for power restoration in critical power applications.

Event Manager

Memory	512 MB
Storage	8 GB
Communications: Modbus TCP	Yes
Input Voltage	9 to 48 Vdc
Time Source (IN)	NTP or Manual
Dimensions (W x H x D)	3.90 x 4.37 x 1.0 in. (99 x 111 x 25.5 mm)



Event Manager

Features/Benefits

- **Easy Setup** of Event Manager via web interface
- **Status Monitoring** of unlimited SERs from one web browser
- **Remote Firmware Update** any SER located on the network
- **Custom Templates** for use in duplicating settings for setup of multiple SERs
- **Password Management** for all connected SER devices
- **Event Log** view system wide connected SERs
- **I/O Status** view of the I/O status
- **Diagnostics information** on any SER on the network

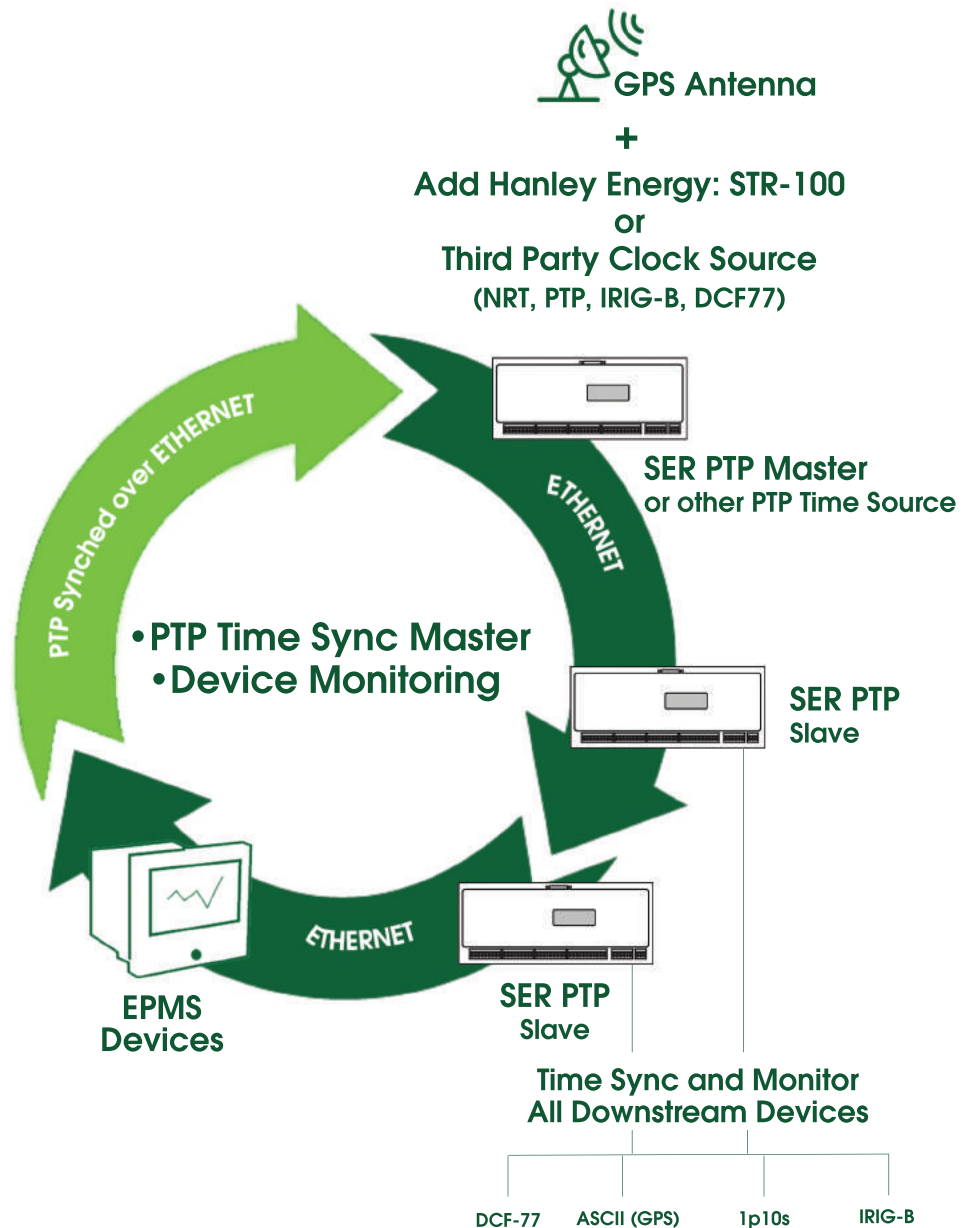
Simple Topology. Easily Scalable.

Now precision time-sync via PTP over the Ethernet data network makes time stamping and 1ms recording simple and affordable for projects of all sizes.

Sequence of Event Recorders provide precision time synchronization to all connected Intelligent Electrical Devices (IEDs) and captures the status change of device inputs such as breakers with 1 msec time stamping.

This provides the information required during post event analysis to pinpoint the root cause of the incident, verify proper operation of electrical equipment and determine how to prevent future occurrences.

‘Reduce time, save money and protect your reputation during a power outage’



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BR-HE-01
January-2021

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