

A photograph of a high-voltage power line tower against a blue sky with power lines stretching across the frame. The tower is a complex lattice structure.

Superior Products and Solutions for the Power Industry

Digital Fault and Disturbance Recorders

Sequence of Events Recorders

DC/DC Converters & Power Supplies

Battery Monitors & Relays

Trip Circuit Monitors

Trip Indication Relays

Auxiliary Voltage Relays

Analog and Digital Optical Isolators

About E-MAX

E-MAX Instruments, Incorporated is a leading provider of Digital Recorders, Relays, Power Supplies, and Control Accessories to the power industry. The company is headquartered in Englewood, Colorado. Founded in 1975, E-MAX is a major source of innovative products that stress quality, reliability, and performance. All E-MAX products and systems are comprehensively supported with training, prompt assistance, and incomparable customer service. The E-MAX commitment to product quality and after-sale service sets the standard for the industry.



E-MAX is dedicated to acting in an environmentally responsible manner, to complying with the law, to meeting customer commitments, and to supporting our customers' businesses. E-MAX manufactures over 70 relays and products with UL recognition, nine full product lines that are RoHS compliant, and we routinely query and audit our suppliers for conflict resources.

As the industry changes, E-MAX will lead the way with new products and updates to current product lines. Our unmatched commitment to quality, customer service and technical assistance continues as E-MAX responds to the needs of the power industry.



E-MAX Instruments, Incorporated
13 Inverness Way South
Englewood, Colorado 80112
303.799.6640
www.e-maxinstruments.com

Certifications and Compliance

E-MAX was founded with attention to product quality control, exacting standards and a determination for superior customer satisfaction. In direct response to our customer base, E-MAX completed ISO 9001 Certification and has followed the strict quality standards since 2003.

In addition, E-MAX is determined to act in an environmentally responsible manner, to comply with the law, to meet customer requirements, and to support our customers' businesses. E-MAX manufactures over 70 relays and products with UL recognition, nine full product lines that are RoHS compliant, and we routinely query and audit our suppliers for conflict resources.

To view full E-MAX Certifications and Statements,

Conflict Metals



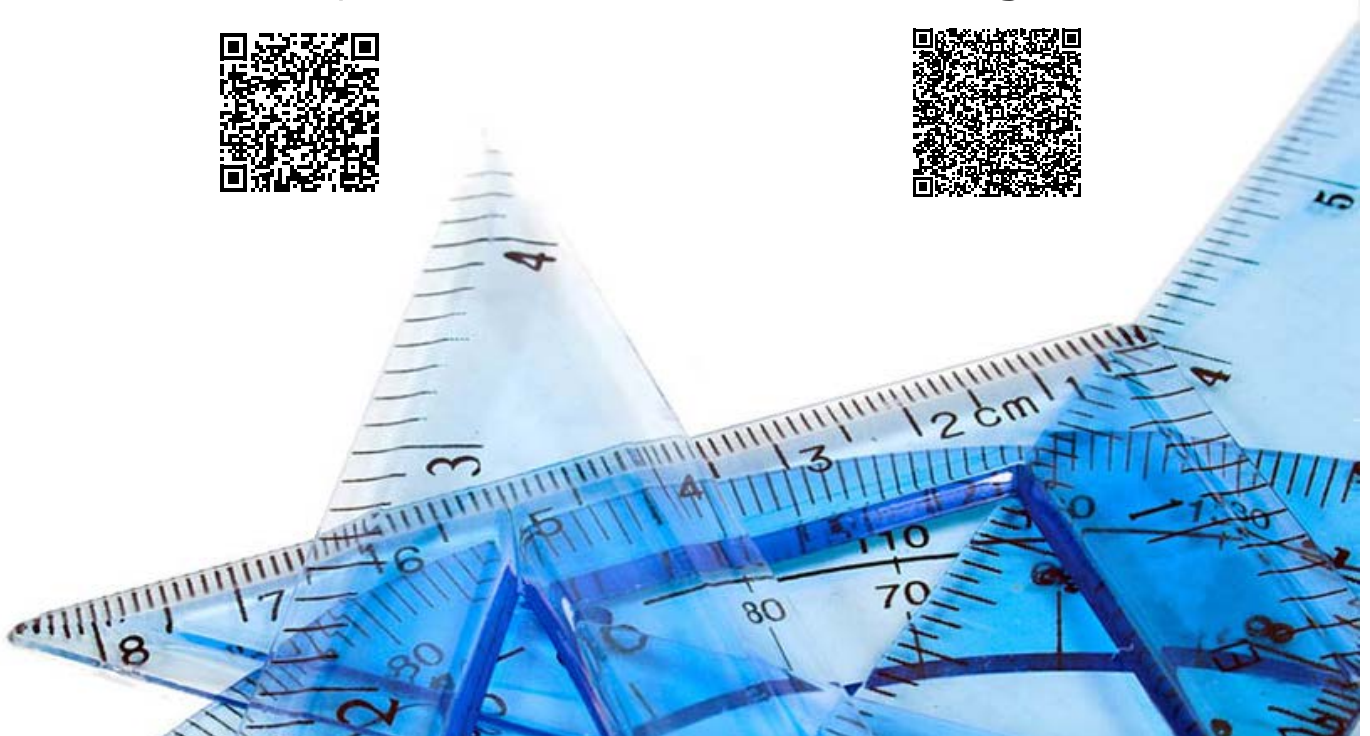
ISO 9001:2015



RoHS Compliance



UL Recognition



Digital Fault Recorders **DFR/DDR**

E-MAX Digital Fault Recorders feature Sigma Delta Conversion and offer complete Transient and Long-Term Phasor Data Recording, Power Quality Monitoring, Analysis, and Transmission.

The networking capabilities of E-MAX systems combined with Windows 10® provides the power and capacity to monitor and collect data from other substation equipment. The TCP/IP addressing and data handling also allow communications with a Master Station and other devices. All E-MAX DFRs/DDRs include complete remote control.



Continuous Data Streaming Compliant

NERC - PRC-002-2

IEEE C37.232

NERC Compliant

IEEE - C37.118-2005

IEC 61850

E-MAX DII has a maximum capacity of 128 Analog and 256 Digital directly connected channels.

With up to 4 Remote Input Units, the Surveyor Distributed Recorder combines with a Controller Unit and Receiver to monitor, record, and store records distributed across an entire substation.

Remote Input Communication up to 500 meters uses Multi-mode 62.5/125 fiber optic cable. For distance up to 10 kilometers, single mode is available.



Digital Fault Recorders **DFR/DDR**

The E-MAX Portable is designed with all of the same capabilities as the larger E-MAX DFR/DDR's but in a compact unit designed for easy transport.

16 Analog Inputs and 16 Event Inputs are offered as the maximum capacity in this small-scale unit.



**High Noise Immunity
Data Conversion**

**Non-Volatile Software & Data
Storage Memory**

**Fanless CPU and Low Power
Supporting Circuitry**

Sequence of Events Recorder **SER**

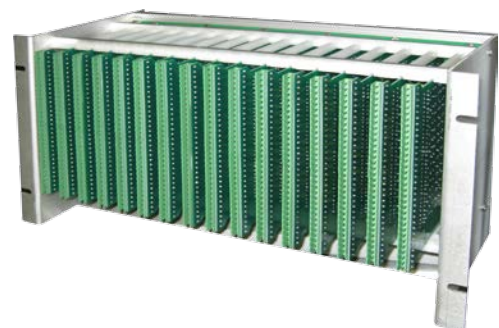
**Monitor from 16 events
up to 2048 events**

**NERC - PRC-002-2
IEEE C37.232**



The E-MAX Sequential Event Recorder is a high-speed, high-resolution system which records relay and power system equipment alarms and status contacts.

Common to all E-MAX recorders, the SER includes ethernet and USB ports and can be controlled remotely using communication software from any PC connected to it by any of the above ports.



The 16-point input card layout isolates individual points from each other and from the system electronics by opto-couplers.

DC/DC Converters Power Supplies



E-MAX offers a full line of DC/DC Converters designed specifically for use by the power utilities. Converters are available for 24, 48, 125 and 250 Vdc applications. Single circuit board and chassis for rack or panel mounting are available.

Single and multiple output voltages of ± 5 , ± 12 , ± 15 , 24, 48, and 125 Vdc. All units have SWC protection, current limiting, low output noise and voltage regulation of $\pm 2\%$.



**Supplies for Programmable
Logic Controllers**

**Multiple Output Supplies for
Custom Data Systems**

**Operating Temperature -20°
to 70° C without Derating**



Battery Relays/Monitors **BGD, BVR, BMR**

The Battery Ground Detector, BGD supplies contact closures for alarm indications at precise ground fault resistance settings. Available in 24, 48, 125, and 250 Vdc, the BGD delivers fault resistance adjustment of 2 to 75 kOhm.

Precision setting of overvoltage and undervoltage set points can be made with the Battery Voltage Relay, BVR. The BVR is protected from the anticipated transient conditions to prevent damage and incorrect operations

E-MAX Battery Relays and Monitors feature

High Reliability
High Input Impedance
Simple Installation

The Battery Monitor Relay, BMR contains over/under voltage sensor similar to the BVR combined with positive and negative ground detection similar to the BGD. The BMR is available with a single relay alarm for any out-of-tolerance condition or with separate relays for voltage and fault conditions.



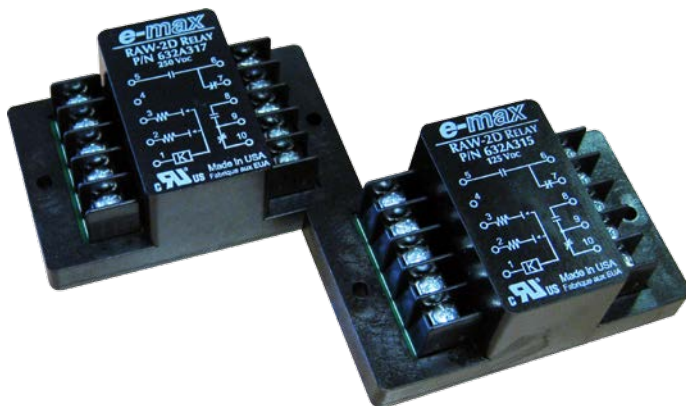


Self-monitoring — long-life

Also used as a self-latching, high speed target for trip indication

UL Recognized

RoHS Compliant
(Directive 2002/95/EC)



Trip Circuit Monitors **RAW-1, RAW-1D**

The RAW-1 and the CM are panel mounted relays containing a series LED for visual indication and blocking diodes for prevention of alarm indication when the breaker is opened. If a trip coil or auxiliary trip relay coil opens, the LED goes out, and the relay is deenergized. The relay itself is self-monitoring since opening of any of the series components causes the same conditions as the loss of the trip coil. On breaker opening, the RAW-1 is energized through the breaker "B" contact. The time delay auxiliary relay does not time out.

The CM acts as a continuous monitor of the breaker position and the trip coil.

The RAW-1D and the CMD contain the additional feature of delayed drop-out. The delay of approximately 200 milliseconds is designed to allow auxiliary contacts to transfer.

Trip Circuit Monitors **RAW-2, RAW-2D**

The RAW-2 is a panel mounted relay for monitoring trip coil continuity. The relay itself is self-monitoring since opening of any of the series components causes the same conditions as the loss of the trip coil. On breaker opening, the RAW-2 is energized through the breaker "B" contact.

Output contacts for the RAW-2 Relay are 2 form C. The RAW-2 is available for 125 Vdc, 48 Vdc, 24 Vdc, and 250 Vdc input. The RAW-2D contains the additional feature of delay on drop-out.

Trip Indication Relays

TIR

The E-MAX Trip Indication Relays detect the presence of current in power system circuit breaker trip coils. The TIR has a current coil designed for installation in circuit breaker trip coil circuits. The coil is designed for extreme overloads to ensure safe operation. The relay high-speed contact closure assures positive indication of breaker coil currents where slower speed devices may fail to actuate. Contact speed is 3 milliseconds or less.

With over 70 models UL certified, there are over 2.5 million E-MAX Control Accessories in service worldwide.

Auxiliary Voltage Relay

AVR

Type AVR voltage actuated relays are designed for indication alarm of annunciation in electric utility applications. The relays are used for data inputs to supervisory control/data acquisition systems and sequential event recorders.

Protected Voltage Relay

PVR

PVR voltage-actuated relays are designed for indication alarm or annunciation in electric utility applications. They are used for data inputs to supervisory control/data acquisition and sequential event recorders. The relays contain a low power dc coil with circuitry to protect it from damage due to high voltage transients.



High Reliability

Millisecond Actuation

Low Coil Resistance

Simple Installation

Low Cost

RoHS Compliant (Directive 2002/95/EC)

 Recognized Models



Contact Time Extender **CTX, CTX-2, CTX-3**

CTX relays supply 1.5 to 2.5 seconds of contact output time extension for a momentary contact input and allows slower devices such as SCADA systems and annunciators to operate thus preventing data loss on the action of protective relays/devices or trip indicators such as the E-MAX Trip Indication Relay (TIR).

The CTX-2 is a complete unit containing a fast input sensing relay which triggers the maintained output when the input contact closes.

The CTX-3 delivers the same 1.5 to 2.5 seconds of output time extension on the form C output contact while the form A output contact is instantaneous.

Diode Assemblies **CDA, TDA**

The Control Diode Assemblies are designed to supply diode isolation in control circuits. The CDA is molded of rugged glass-coupled acetal copolymer having high dielectric strength and rigid terminal studs for ease in mounting and connection. The CDA is available in single, dual and triple diode packages.

The Tripping Diode Assemblies are designed for rectifier isolation to trip more than one device. The line of TDAs include single and dual diode packages. The 910A011 and 910A012 feature surge suppression protection to the diode. Like the CDA, the TDA is molded of rugged glass-coupled acetal copolymer. Installation is easy and cost-effective.



Analog Isolators **Optical Isolation Device**

The Analog Optical Isolator module is a single isolated current in/current out or voltage in/voltage out channel of physical separation and electrical isolation for establishing and maintaining the independence of Class 1E equipment from non -Class 1E instrumentation circuits.



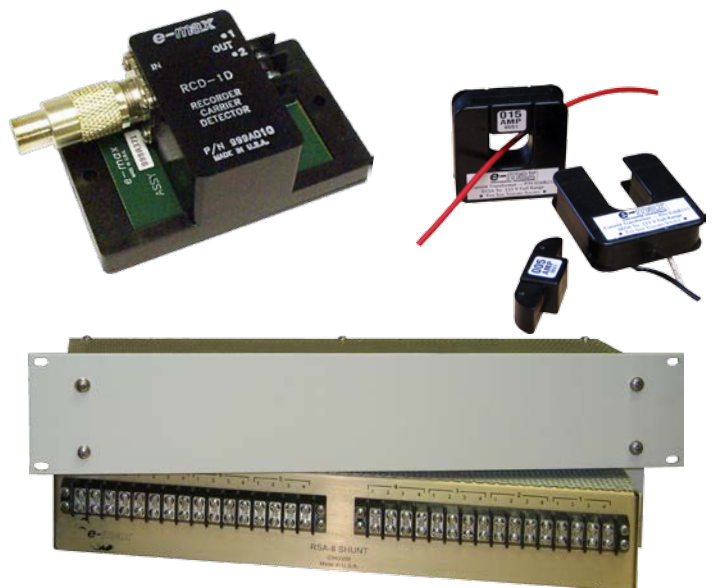
Digital Isolators **Optical Isolation Device**

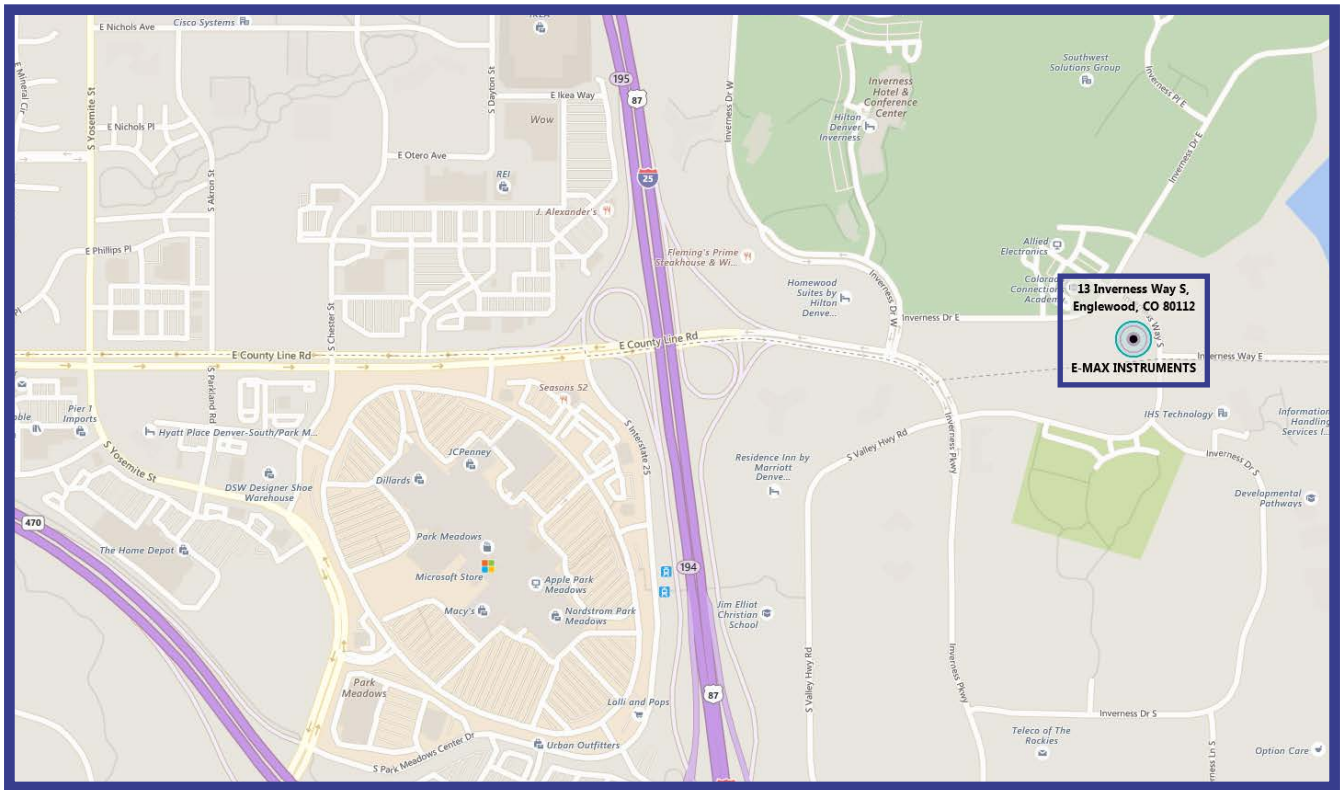
The E-MAX Optical Isolation Device is completely solid state and is designed to be utilized to isolate the interface between nuclear power generating station systems and monitoring equipment. They are particularly useful in instrumentation and control applications.



Accessories

E-MAX offers a wide variety of products and many accessories to complement our product lines. Please visit our website or contact us to see how we can find the perfect solution to fit your needs.





Located just south of Downtown Denver, E-MAX manufactures and ships all products from our facility in Englewood, Colorado.

Proudly made in the U.S.A.

Come visit us and take a tour.

For More Information



E-MAX Instruments, Incorporated
13 Inverness Way South
Englewood, Colorado 80112
303.799.6640



www.e-maxinstruments.com

Sales Information: sales@e-maxinstruments.com

Technical Support: techsupport@e-maxinstruments.com