ETI™

Electronic Technology Incorporated

Secondary Network Communications

PRODUCT BROCHURE
2024 EDITION

Richards
MANUFACTURING CO.™

Introduction

Richards and ETI Secondary Network Communications

Richards and Electronic Technology Incorporated (ETI) produces a wide range of network protectors, fuses, relays, and cable limiters, as well as comprehensive monitoring systems for secondary networks.

These monitoring systems are specifically designed to meet the demands of utility customers and exceed expectations both in terms of benefits and performance.

The products are easy to install, reliable, and flexible. They are designed to connect to any existing communication system, and feature a variety of sensors to monitor data, such as transformer pressure, oil temperature, oil level, or any other customer-specific requirements.

In addition to being a manufacturer, ETI also provides design and services for automating entire underground network distribution systems. ETI has partners who can provide complete installed turnkey systems for power utilities.

In This Brochure

ETI creates custom solutions that incorporate information from ETI MNPR™ relays, sensors, and other intelligent devices. We can also provide a means for transmitting, reporting, storing and displaying that data. This brochure serves as an introduction to our line of customizable products suited to your individual needs. Our team is available to walk you through part selection and to answer any questions you may have.

Our Secondary Network Communications products are tested and engineered in the USA. Our designs exceed industry requirements to provide the highest level of quality and dependability.

TABLE OF CONTENTS

Pressure Sensor

Oil Level Sensor

Communications Enclosure

Temperature Sensor

Junction Box

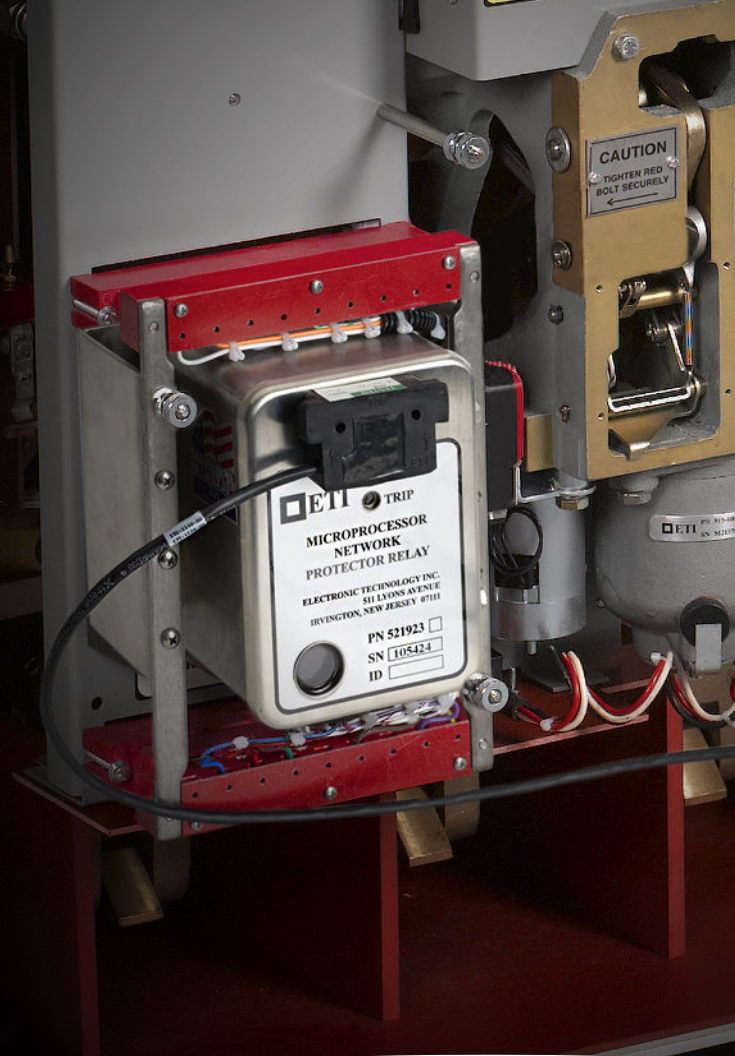Network Protector

Vault Water Sensor

OVERVIEW

The basic monitoring system consists of the communicating ETI Microprocessor Network Protector Relay (MNPR™) which uses a Local Area Network (LAN) and communication enclosure in the vault to interface with a Wide Area Network (WAN). Virtually any WAN is compatible, from radio, to fiber optics, to cellular modem. In the serial-based system an RS-485 communicating relay either plugs directly into a WAN device or into an RS-485/RS-232 converter. RS-485 allows multi-drop communications — up to 32 MNPR™ relays can share one WAN port. The INCOM communicating relays interface into existing INCOM systems in a plug-and-play manner. The Ethernet communicating relays provide high speed multiplexed access to the relay using the LAN/WAN infrastructure. Simply use an Android™, Apple® device, or a laptop to locally program or monitor the MNPR™. USB optical cables are used for the PC, and Bluetooth Optical heads are used for Android™ or Apple®. Android™ and Apple® devices utilize Commander software which is available for free download on the Google Play™ and Apple® App Store®. PC's run the FieldPro software.

ETI MNPR™ Communicating Relay

The ETI MNPR™ communicating relay is the backbone of the Secondary Network Communications system, and our featured product. The relay reports network protector status, currents, voltages, and vault, network protector, and transformer sensor data which provide vital information for system management and planning. The DNP3 Communication Protocol is embedded into the relay for easy interface into an existing SCADA system. While in service, all relays have upgradable firmware. No protocol translator is necessary to interface with DNP3-based SCADA systems. Other protocols may be available upon request. The monitoring system is a powerful tool for riding out network contigencies, and is designed with standards-based architecture.

- The backbone of the Secondary Network Communications System
- Easy installation into existing SCADA systems, no protocol translator needed
- Optical programming port for local setup and monitoring
- Highly resilient and fully submersible

ETI MNPR™ H9 Communicating Relay

The MNPR™ relay can directly replace any existing WH or GE style network protector relay. The MNPR™ combines the Master, Phasing, De-sensitizing, and Time Delay functions into one microprocessor relay package. Through multiple operating modes, the relay reliably Trips and Closes the network protector to prevent backfeed current from the secondary network flowing into the medium voltage primary distribution system when faults or scheduled circuit outages occur. After the outage has been resolved, the MNPR™ automatically closes the network protector, restoring power flow from the medium voltage distribution circuit to the secondary network. The MNPR™ relay has a 4-character local scrolling display to provide live information about relay status, and measured values. An optically isolated programming port is provided to allow configuration and monitoring of all relay functions. This can be accomplished by phone, tablet, or personal computer as outlined later in this brochure. Green-Trip and Red-Close indicating lights show clear status information.

Auxiliary I/O with up to:

- 8 analog inputs for monitoring NP, transformer or vault sensors
- 4 digital inputs for monitoring NP status (O/C) and other contact-type sensors
- 3 digital outputs to control external devices, such as indicator lights
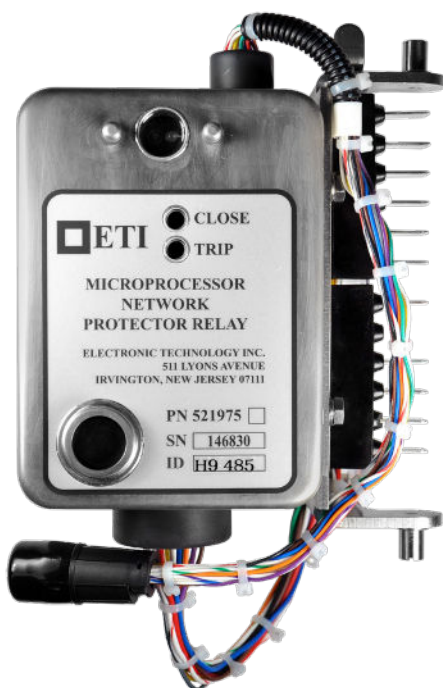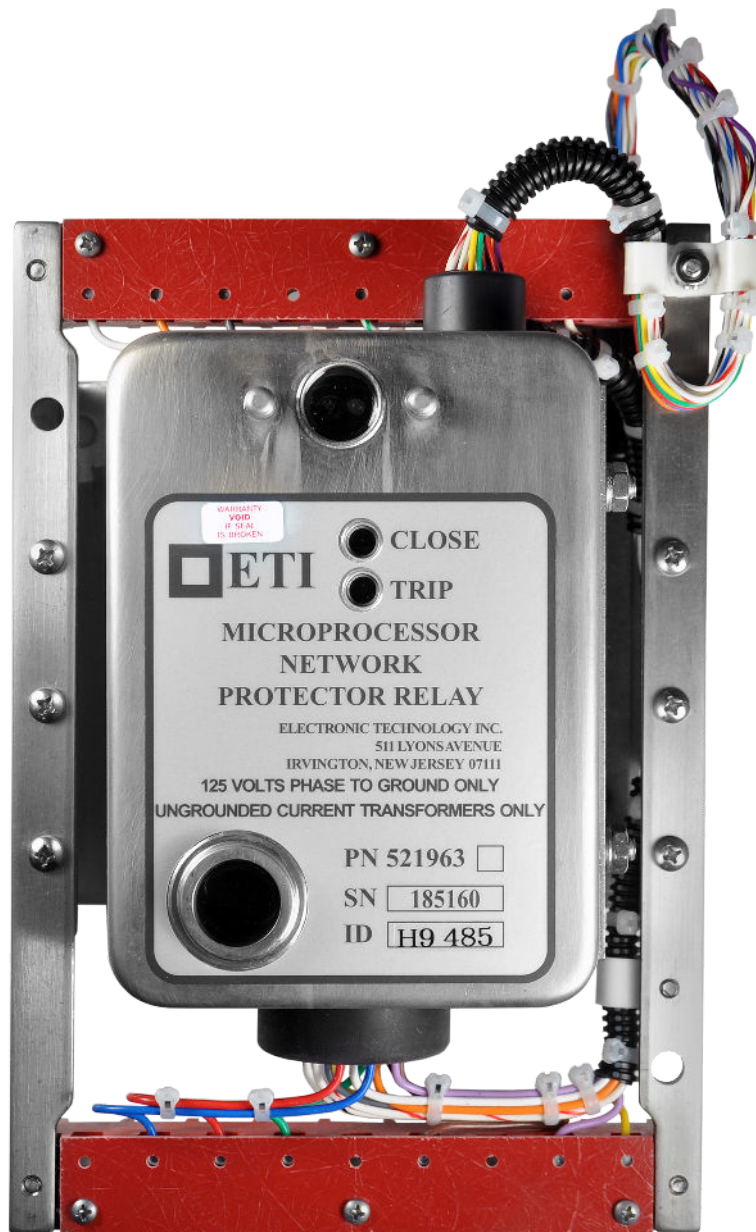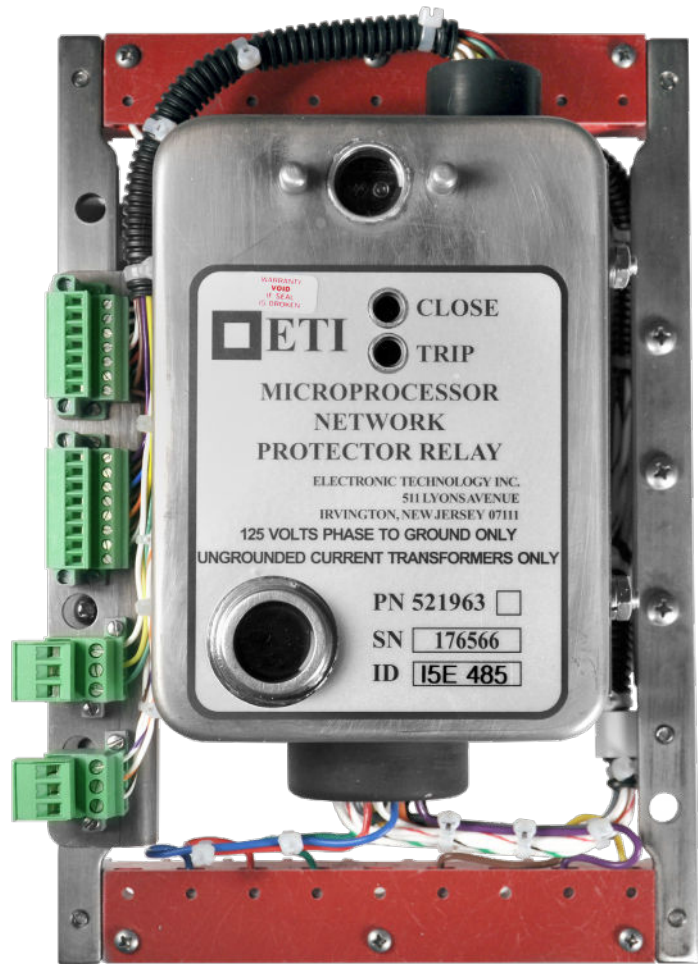

Communicating Relay

ETI Incom MNPR™ Communicating Relay

The Incom communicating relay monitors currents and voltages and can directly replace any WH or GE relay. This relay features communications for connection to the INCOM communication system. It provides support for event-based polling and unsolicited reporting, and features a customizable points list via loadable DNP profiles. A local scrolling display and optical programming port are built in for local set up and monitoring. It features a real time clock built in for time-based data recording.

Auxiliary I/O with up to:

- 7 analog inputs
- 4 digital inputs
- 2 digital outputs
- Optically isolated RS485 serial communication port
- DNP3 and INCOM protocols in this relay may be used independently or concurrently


Incom Relay

ETI MNPR™ Communicating Relay with Ethernet

The ETI MNPR™ communicating relay with Ethernet is a state-of-the-art product for directly integrating the network protector, network transformer and vault with high-speed remote communication systems. The relay is designed with security built-in to every process, and provides IPSec, HTTPS, DNP3-SA protocols for secure communications. Role based access control is implemented in the device, with centralized authentication, authorization and accounting protocols options included. A rich interactive web interface is provided for programming, monitoring and controlling the relay. This includes the ability to retrieve and display 50 logs of 64-cycles each showing trip and close events the relay has recorded. The event is defined at the middle of the log, so pre and post event data is captured. Failsafe remote firmware updates can be initiated via the webpage to take advantage of any new features without downtime or field resources being utilized.

The Ethernet relay can directly replace any WH or GE relay, and compatibility with INCOM remains available. The Ethernet relay retains the local scrolling display, optical programming port and serial communication port, along with all available auxiliary input and output configurations.

Auxiliary I/O with up to:

- 8 analog inputs for monitoring NP, transformer, or vault sensors
- 4 digital inputs for monitoring NP status (O/C) and other contact-type sensors
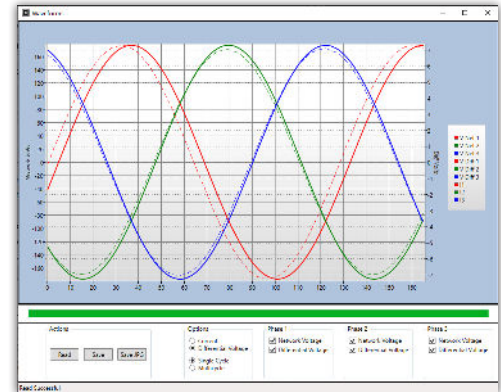- 3 digital outputs to control external devices, such as indicator lights
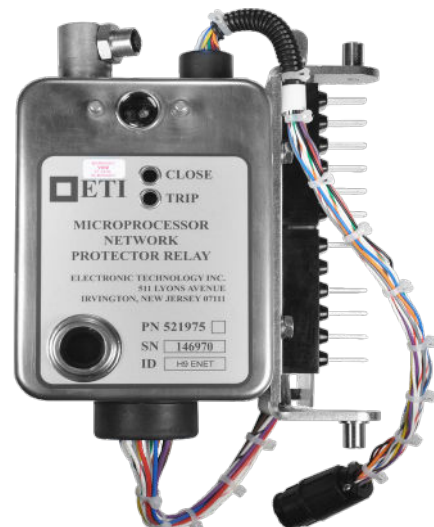
Ethernet Relay
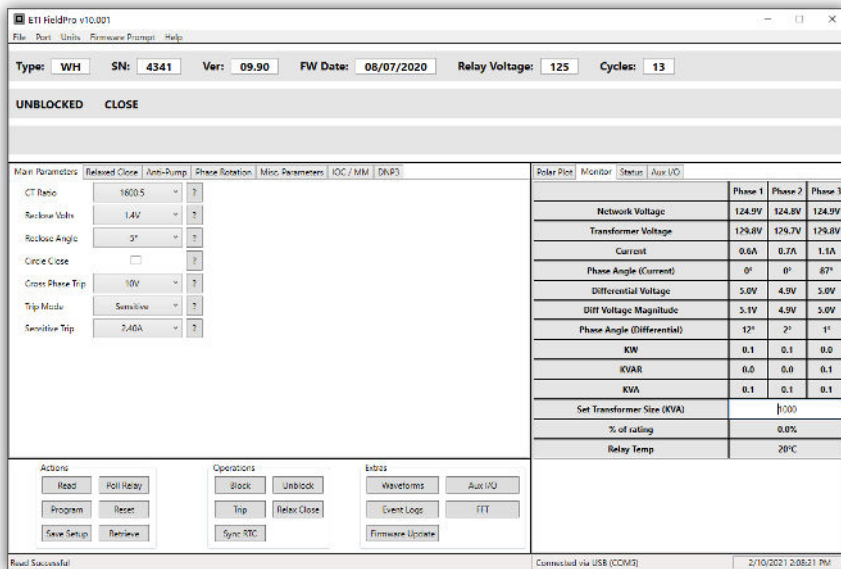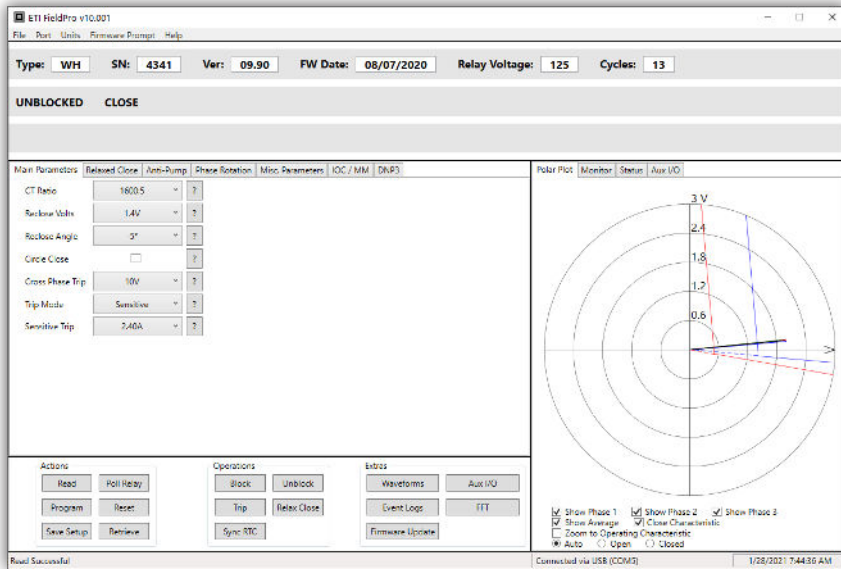
FieldPRO Software

A laptop or computer installed with FieldPRO Software communicates with the MNPR™ via cable connection. With it, you can program relay settings and troubleshoot the network protector.

Commander Software for Android and Apple Devices

With an Apple or Android device in hand, you can program, monitor, and operate the MNPR™ with the Commander software. Using it, you can troubleshoot the network protector and MNPR™ operation. A Bluetooth optical head connects your device to the MNPR™ wirelessly. The software is available to download on Google Play and the App Store for free.

Communication Enclosure

ETI provides a wide array of custom communications enclosures and electronics for bridging the gap between a wide area network and the electric distribution infrastructure, including network protectors, network transformers, and the ETI MNPR™. The enclosure itself is a fully submersible brass or steel box with penetrations for various cable diameters. Many different wide area networks have been used with these enclosures, including fiber optics, cellular modems, and licensed and unlicensed radios. Various sensors can also make use of the enclosure as a junction box for bringing signals back to the ETI MNPR™.

- Multiple configurations for enclosure and circuitry
- Adjustable for customer-specific use
- Integral pressure fitting for safety
- Secure design for reliable stability

Communication Enclosure

The communication enclosure is submersible to 30 feet. Inside the box is a continuous gasket, and the outside has a multi-bolt cover design with water-tight ports, keeping the inside safe. It contains packing glands or threaded hubs for penetrating the enclosure and has a proven track record of stability and performance.
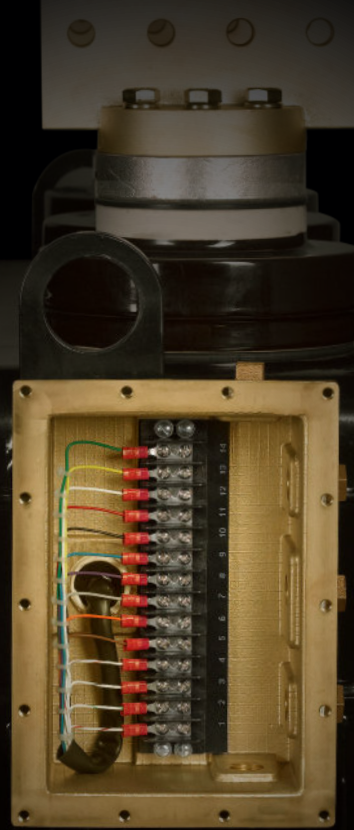
- Made of 1/8" thick brass or stainless steel for solid protection
- Integral pressure fitting is used for pressuring the enclosure
- Enclosure can be customized to different specifications
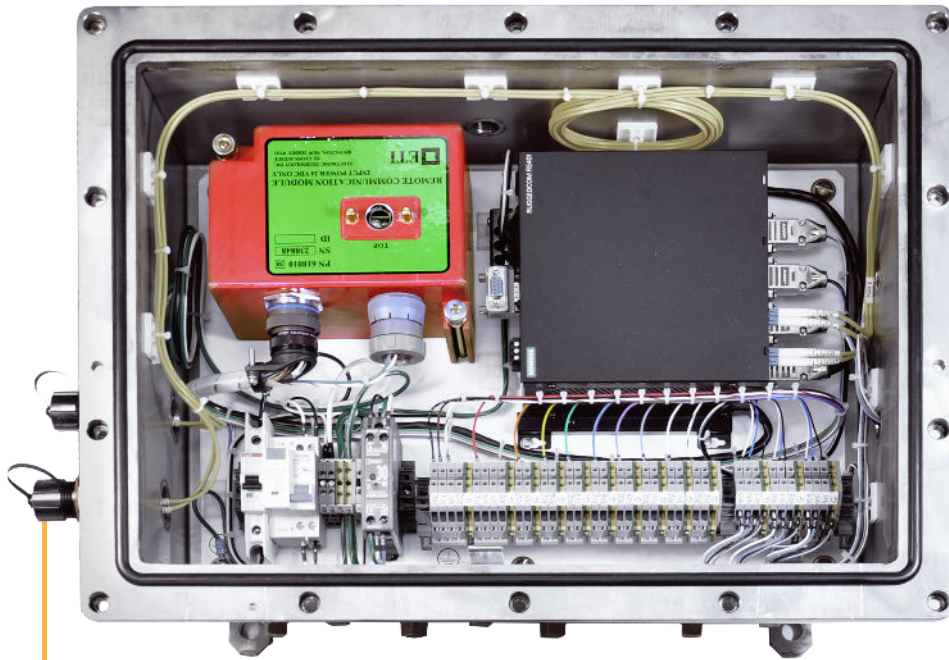
Enclosure Ports
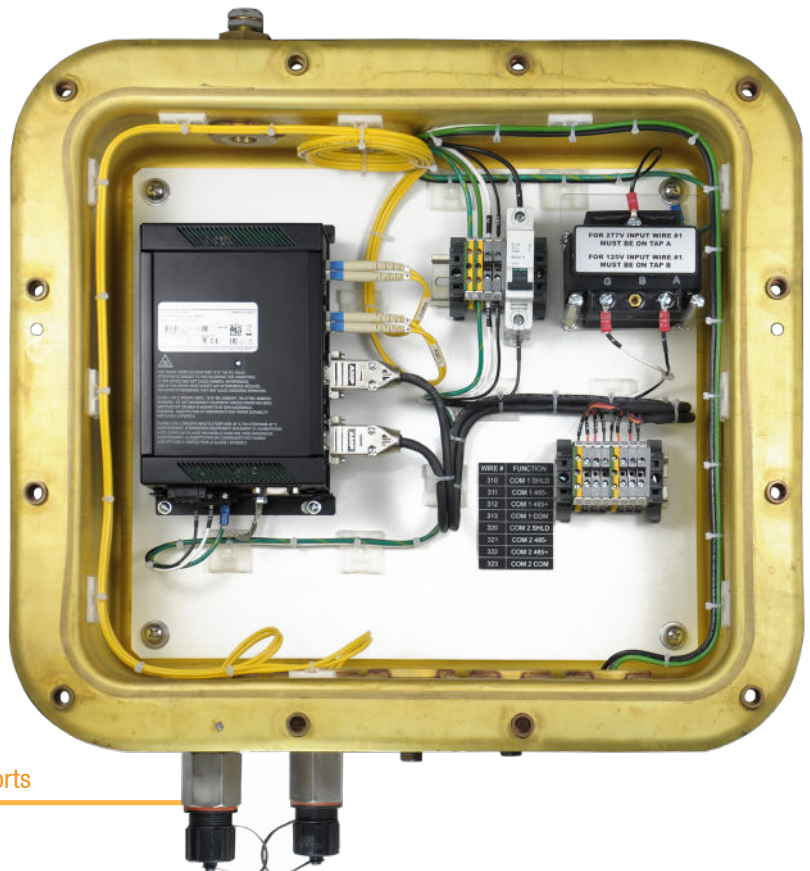
Junction Box

The junction box provides a convenient submersible point for terminating all wires. It features gasketed all-brass construction, NP housing, standard housing, and 1" NPT fitting. Junction boxes are fully customizable with pre-wiring, different port sizes, and forward or side-facing display, allowing for ideal organization.

- Multiple configurations and set-ups
- Adjustable ports for cable variety
- Submersible feed-thru bulkhead
- Durable design
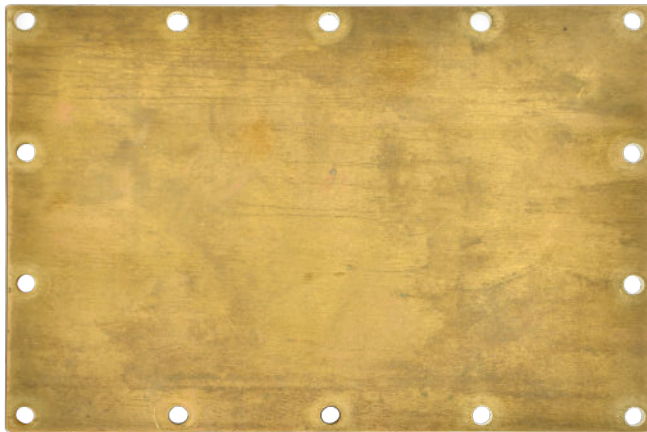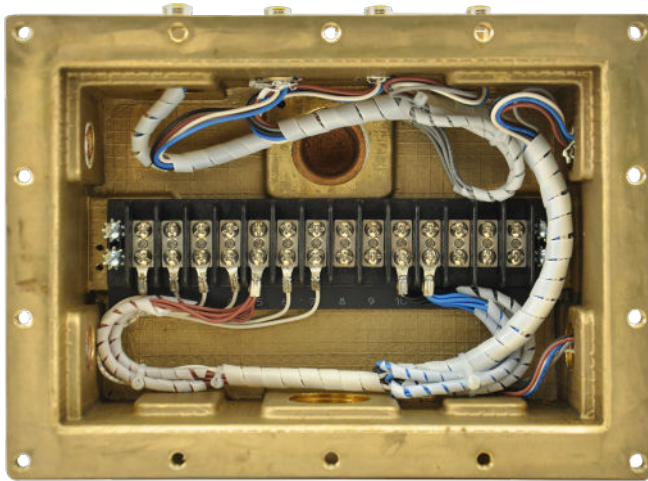
Junction Box

With customizable ports and adjustable cable breaks, it can connect to an Ethernet, sensors, and other parts of the communications system.

- Rugged, can withstand high impact
- Gasket support providing water-tight security
- More than one junction box can be installed onto a network protector

Submersible Feed-Thru Bulkhead

The submersible feed-thru bulkhead penetrates the network protector and connects to the junction box.

- Hermetically sealed and uses military-grade material
- Modular design allowing for easier assembly and incorporation of separate wires
- Pressure tested to 80 PSI
- Allows for submersible termination of RS485 cabling for multi-drop application
- Submersible to 30 ft.

Relay Optical
Connection

ETI0424

LOCAL COMMUNICATIONS FEED-THRU

The ETI Local Communication System enables you to communicate to the MNPR™ from outside of the vault safely and securely. It allows authorized personnel to take load readings, reprogram the relay, and open a protector before entering the vault. Also available with wireless Bluetooth access.

- Laptop interface- connects the feed-thru to the laptop

- Extension cable - allows operator to reach access to the relay without entering the vault, connecting the computer to the housing

- Housing feed-thru - connects the laptop cable to the feed inside of the protector

- Relay optical connection - connects to the relay inside of the protector

Programming Module
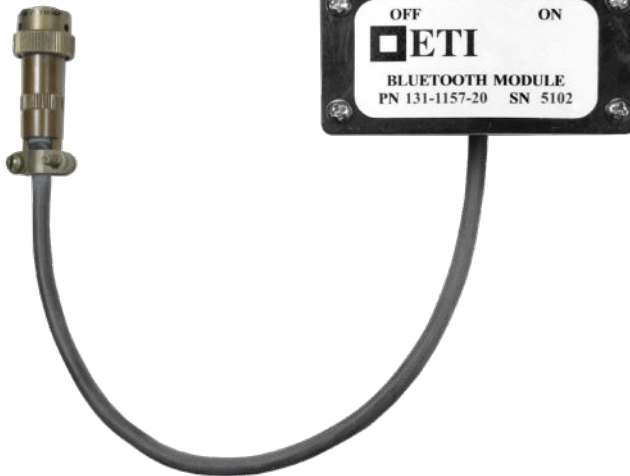
Extension Cable

Bluetooth Interface

Laptop Interface

Housing Feed-thru

Communication Sensors

Transformer Sensors

Transformer
Pressure Sensor

Transformer
Temperature Sensor

Transformer
Oil Level Sensor

Network Protector Sensors

Protector Handle
Position Indicator

Protector Housing
Pressure Sensor

Protector
Temperature Sensor

ETI0424

Richards MANUFACTURING CO.™

The Secondary Network Communications system relies on various sensors to track information coming from within the vault. They play a crucial role in detecting and preventing critical issues, so it is imperative to have reliable and robust sensors that can capture sensitive data while also being sturdy enough to handle their environment. The following pages will introduce you to the solutions we offer for monitoring your specific needs.
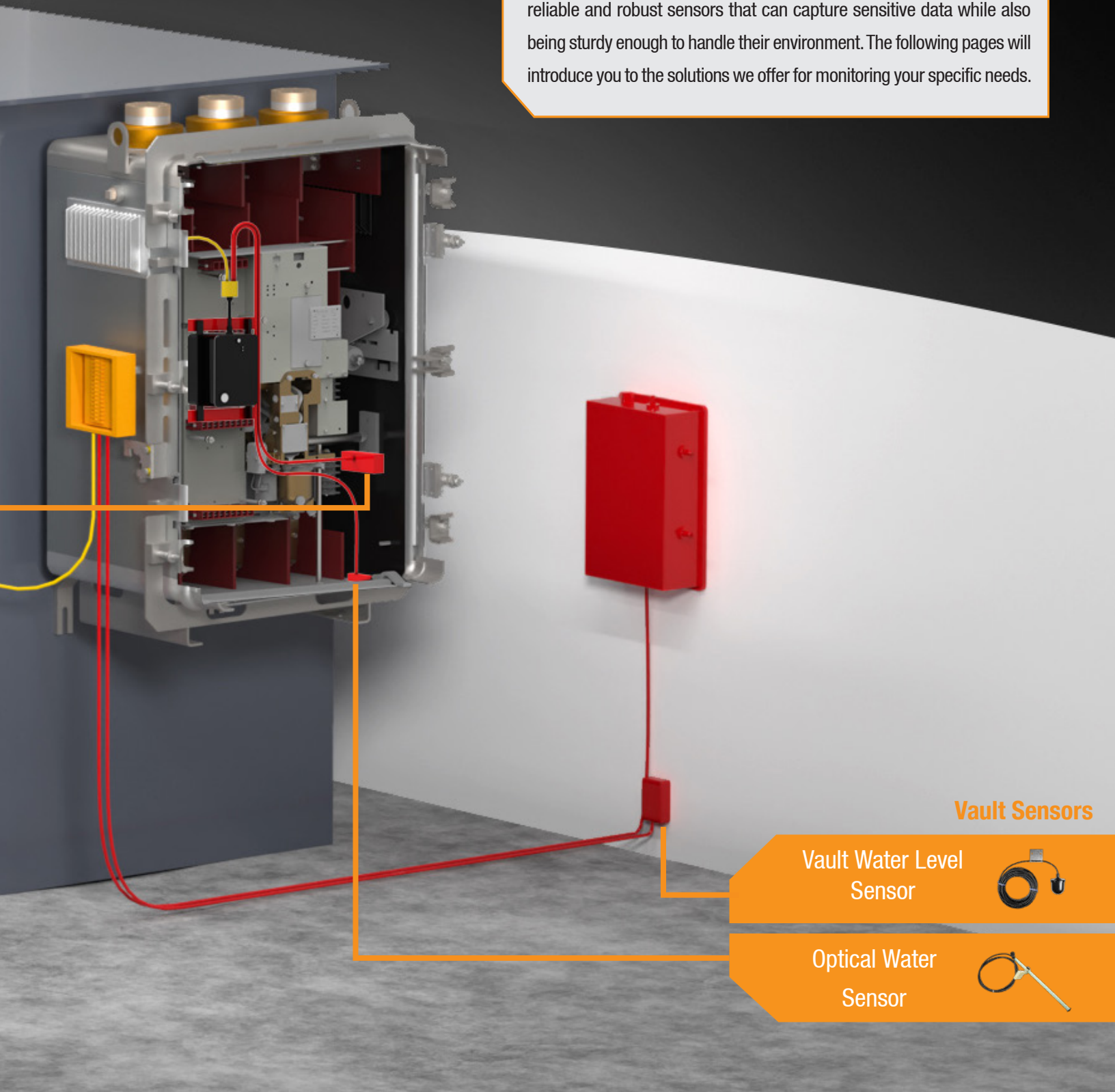
Vault Sensors

Vault Water Level Sensor

Optical Water Sensor

Transformer Pressure Sensor

The transformer pressure sensor monitors transformer pressure to detect leaks or pressure buildup from internal faults. It threads onto an existing pressure fitting, and the fill and test fitting are replicated on the sensor assembly, so there is no need to depressurize the tank or remove the device for routine maintenance.

- Available in Belknap, Waterbury, 302, and more
- Range -2 to 20 psi
- Submersible to 30 ft.
- Remote indication 0 to +5Vdc
- ± 2% accuracy

Transformer Temperature Sensor

The transformer temperature sensor monitors transformer temperature to detect overheating. It comes available with a short or long stem, and provides both visual and remote electronic indication. This sensor can be installed into drywell while the transformer is in service.

- Remote indication 0 to +5Vdc or ±5Vdc
- Range 0° to 200° C
- Submersible to 30 ft.
- Composite body available

Transformer Oil Level Sensor

The transformer oil level sensor magnetically monitors transformer oil level to detect leaks and dangerously low oil conditions, and electronically indicates angle. It easily replaces existing gauges, with only two screws to install. Both top and side mounting are featured to match any existing OEM gauge.

- Retrofits available for many different styles.
- -40°C to 125°C operating range
- Remote indication 0 to +5Vdc
- Submersible to 30 ft.

Vault Water Level Sensor

The vault water level sensor provides a signal when water reaches a critical level in the vault.

- Features mechanically activated snap action contacts
- Excellent corrosion resistance capable of withstanding high impacts
- Extra flexible 18 gauge, 2-conductor cable
- Not sensitive to rotation or turbulance, allowing for reliable stability

Optical Water Sensor

The optical water sensor detects the presence of liquid and provides optical indication.

- Can be mounted inside the network protector,
- Features adjustable height and configuration
- Made of polysulphone material
- No moving components
- Multiple mounting kits are available

We produce a variety of customizable solutions and these sensors are just a selection of what we have to offer. Contact the factory for more options, or if you have any questions regarding part selection.

Protector Handle Position Indicator

The protector handle position indicator is available for both 137 NP (GE Style) or 313 NP (WH Style) protectors. It monitors the position of the network protector operating handle.

- Indicates when the handle is in the open position.
- Auto or manual
- Kits available for various types of protectors
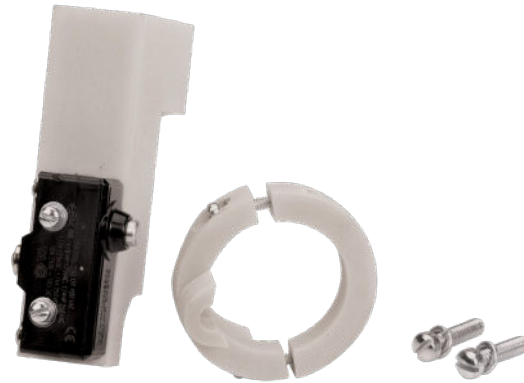
Protector Housing Pressure Sensor

The housing pressure sensor monitors network protector housing pressure. It can detect leaky gaskets before water instrusion.

- Pressure switch or analog pressure transducer
- Available with connectors or flying leads
- Submersible to 30 ft.
- Operating Temperature: -40 to 125 °C
- ±2% accuracy

Protector Temperature Sensor

The protector temperature sensor monitors internal network protector ambient temperature.

- Detects overheating inside the network protector
- Suitable for mounting inside network protector or inside vault
- Powered from +5 Vdc

SCADA
Screens

AVEVA™ Plant SCADA has been customized by Richards to monitor and control the Secondary Network Communications infrastructure. Through the network of sensors, information from the vault is gathered into a program where you can view and analyze data in real time. The SCADA provides remote access and control over the processes being monitored, allowing you to make adjustments or take action in response to any changes. A reliable SCADA is important for operators to manage complex processes efficiently, helping to improve safety by detecting early warnings of potential issues. We also offer installation services of the SCADA into your existing communications system.

- Organized data for consolidating, simplifying, and optimizing control
- Seamless weaving of information for ideal operational context
- Out-of-the-box equipment and content for streamlined set up
- Native connectivity for keeping software up to date
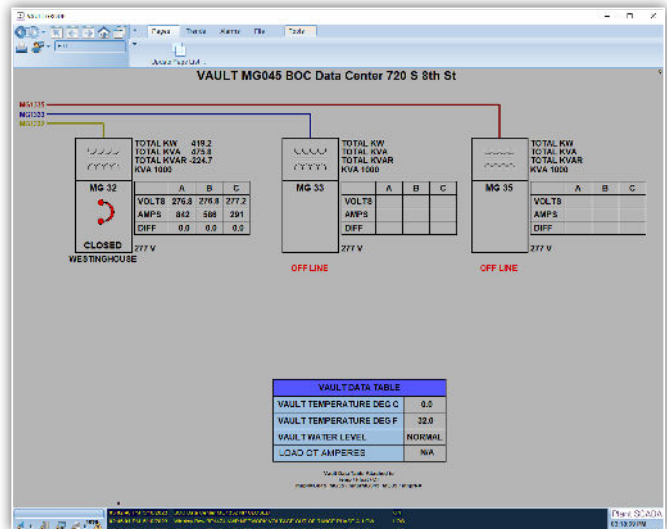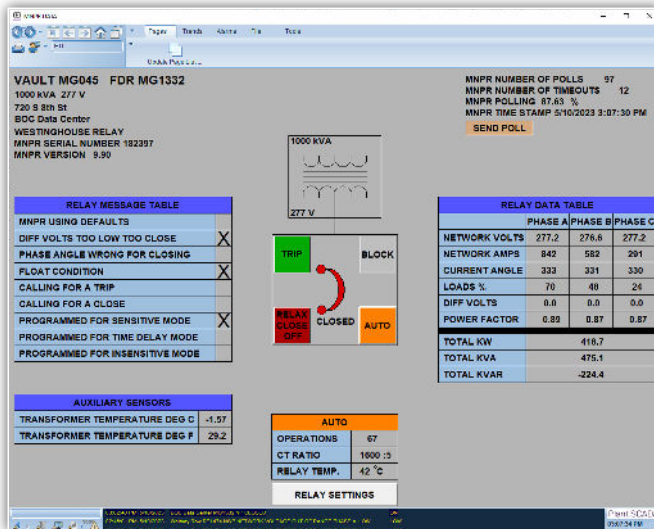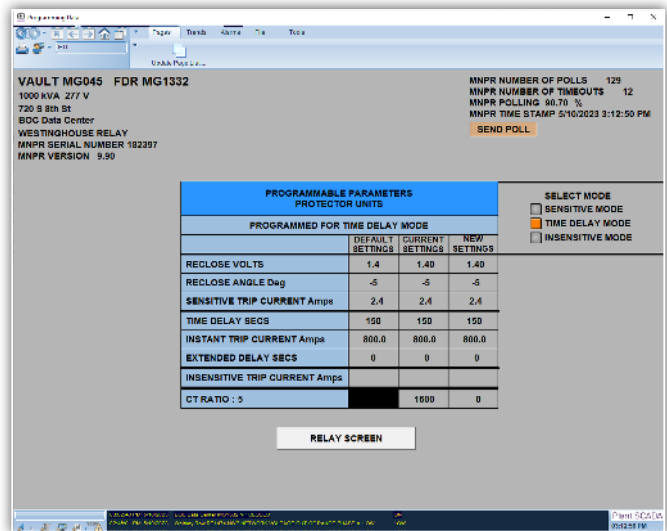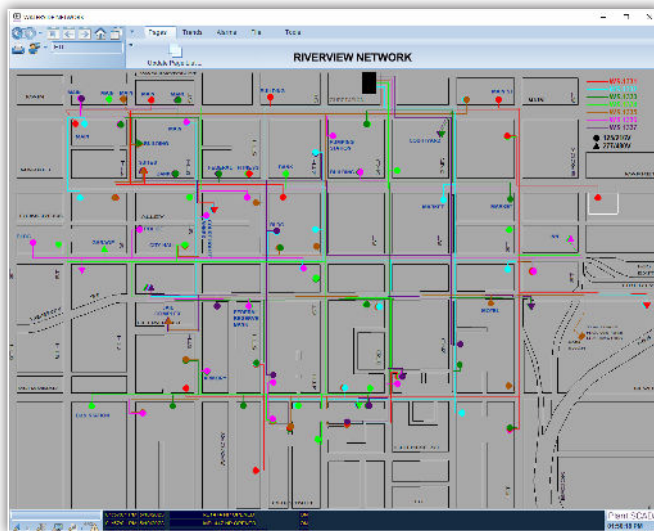
SCADA Screens

With a context-aware, organized workspace, the SCADA allows you to seamlessly consolidate, simplify, and optimize control. The equipment-driven interface provides users with real time context to help facilitate timely corrective action.

- Out-of-the-box with quick set up time
- Offers flexibility to customize visuals to suit your needs

Notes

ETI0424

ETI™
Electronic Technology Incorporated

Connectors
PRODUCT CATALOG
2022 EDITION

Overhead &
Underground Equipment

R Richards
MANUFACTURING CO.

Medium
Voltage
PRODUCT CATALOG
2015 EDITION

15kV   25kV   35kV

R Richards

Renewable
Energy
Solutions
PRODUCT BROCHURE
2015 EDITION

Innovative Solutions

R Richards

Network
Protector
Housing
PRODUCT CATALOG
2015 EDITION

137NP   313NP
800-3500 A   800-3500 A

R Richards

ETI
Electronic Technology Incorporated

Secondary
Network
Communications
PRODUCT CATALOG
2017 EDITION

R Richards

R Richards™
MANUFACTURING CO.