

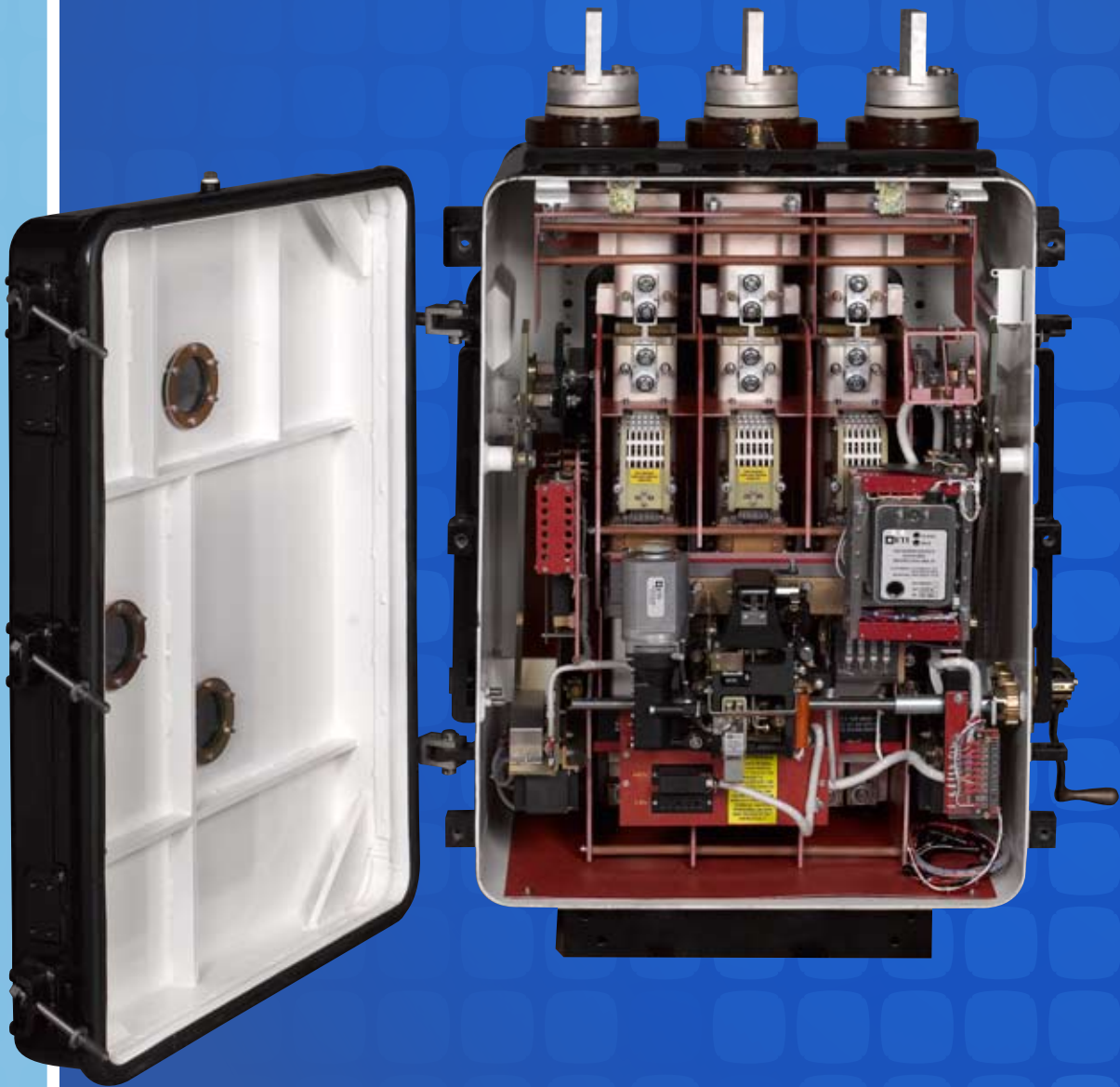


Electronic Technology Incorporated

Secondary Network Communications Products

2010/2011 CATALOG







RICHARDS MANUFACTURING & ETI

are the LARGEST PROVIDERS of network protectors in the WORLD.

We can provide you with network protectors, fuses, relays, and cable limiters as well as a comprehensive monitoring system for secondary networks. Our monitoring system was specifically designed to meet the demands of customers like you and exceeds expectations both in terms of benefits and performance ...

- ▣ Easy to install
- ▣ Reliable
- ▣ Flexible
- ▣ Connects to any existing communicating system
- ▣ DNP3 (or any other common protocol) embedded into the relay. Easily incorporated into your existing SCADA system.
- ▣ Incorporates a variety of sensors to monitor:
 - Transformer pressure
 - Transformer oil temperature
 - Transformer oil level
 - Customer specific

Systems Integration

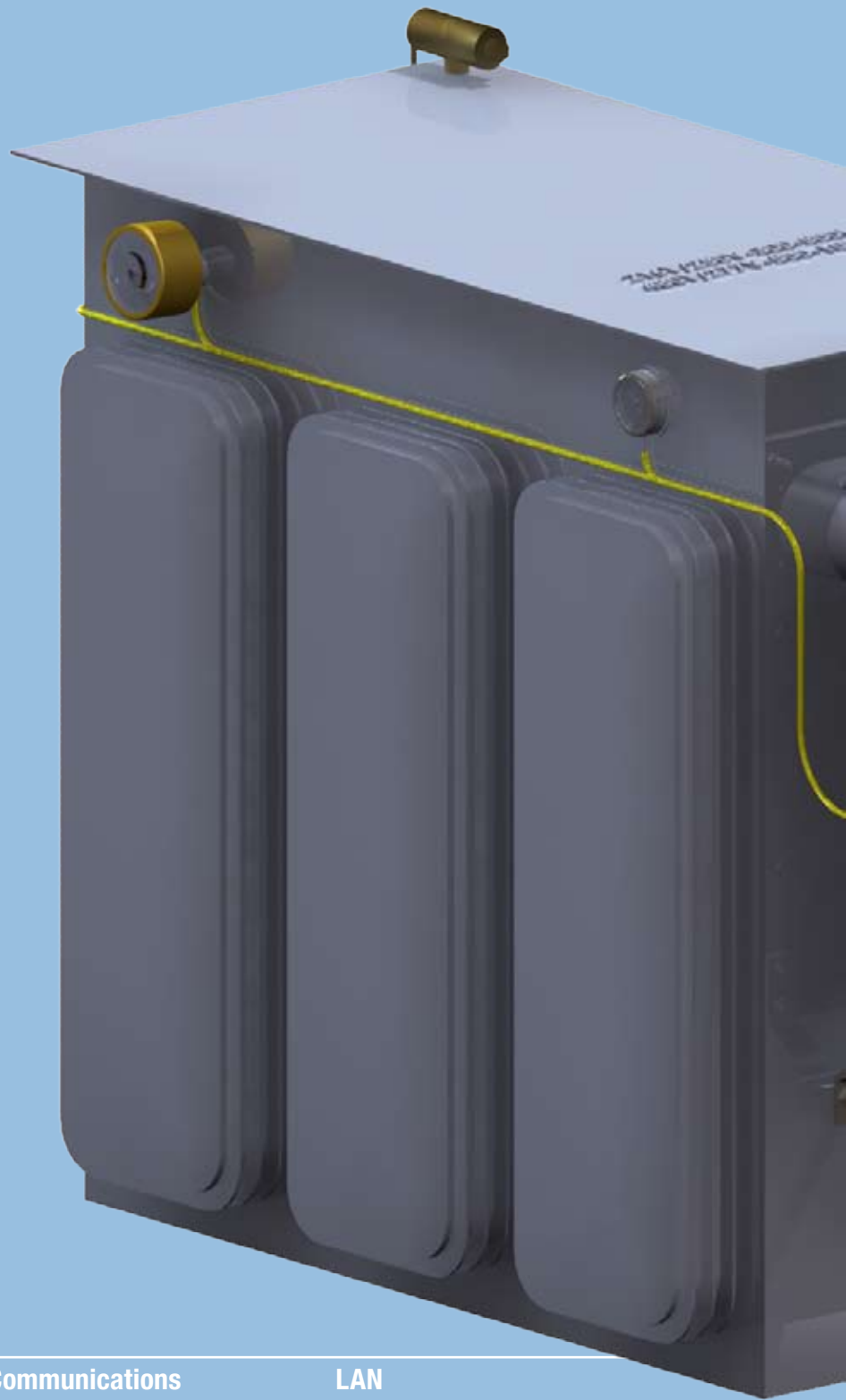
In addition to being a manufacturer, Electronic Technology Incorporated also provides design and installation services for automating entire underground network distribution services. ETI creates custom solutions that incorporate information from MNPR[®] relays, sensors, and other intelligent devices. ETI can also provide means for transmitting, reporting, storing and displaying that data.

ETI monitoring systems can be ordered with different options and features to best meet your particular needs. Consult the following pages for available offerings.

The basic monitoring system consists of the Communicating ETI Microprocessor Network Protector Relays (MNPR[®]) which will interface with your existing Wide Area Network (WAN). Virtually any WAN is compatible, from radio, to fiber optics, to phone line.

The ETI MNPR[®] communicates with your WAN via the Local Area Network (LAN) in each vault. Our basic system is an RS485 communicating relay that either plugs directly into a WAN device or into a RS485/232 converter. It also utilizes an RS485 serial link from the communicating relay. This allows multi-drop communications — up to 32 MNPR[®] relays can share one WAN device.

Simply use a PDA or a laptop to communicate with the MNPR[®] via a cable or Bluetooth optical head (cable, PDA and Bluetooth optical head are available from ETI). PDAs utilize Commander software which can be loaded into any PDA that uses the PalmOS operating system. Laptops run the Field Pro software.



NETWORK PROTECTOR

Sensors/Indicators

- ❑ Vault Water Level
- ❑ Transformer Oil Level
- ❑ Transformer Temperature
- ❑ Transformer Pressure
- ❑ Protector Status
- ❑ Protector Housing Pressure
- ❑ Protector Handle Position
- ❑ Protector Water Sensor

Auxiliary I/O

- ❑ Analog Inputs
- ❑ Digital Inputs
- ❑ Digital Outputs
- ❑ Custom Configurations

WAN Communications

Communicating ETI Microprocessor Network Protector Relays interface with a wide variety of WANs

- ❑ Fiber Optics
- ❑ Radio
- ❑ Cellular
- ❑ Phone line

Protocols

- ❑ DNP3
- ❑ Modbus
- ❑ Customer specific (i.e. SES-92)

LAN

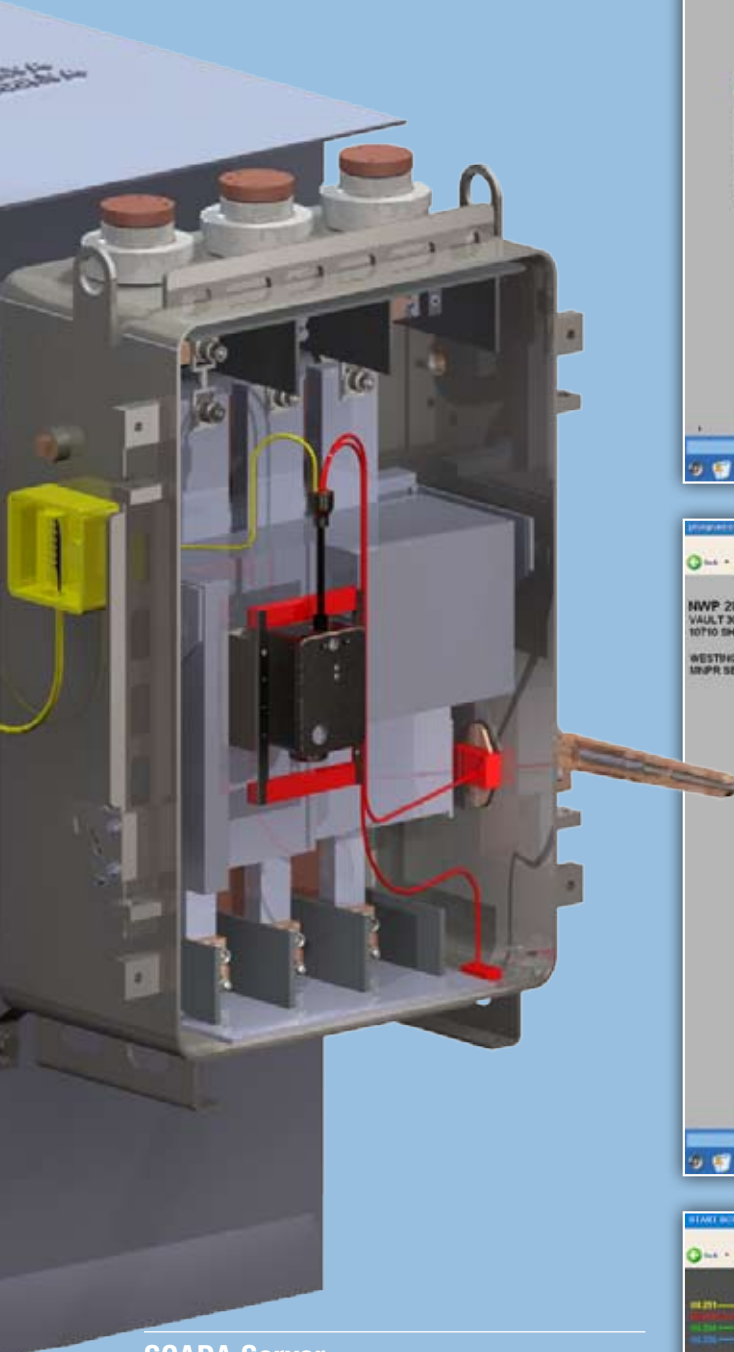
Communications

- ❑ RS-485
- ❑ RS-232

Local

Communications

- ❑ PDA/Laptop via Bluetooth or cable



| | PHASE A | PHASE B | PHASE C |
|---------------|---------|---------|---------|
| NETWORK VOLTS | 124.3 | 124.2 | 124.9 |
| NETWORK AMPS | 105 | 107 | 173 |
| DFF VOLTS | 0.0 | 0.0 | 0.0 |
| POWER FACTOR | 0.93 | 0.88 | 0.88 |
| PHASE ANGLE | -32 | -31 | -32 |
| TOTAL HW | 60.0 | | |
| TOTAL KVA | 69.1 | | |
| TOTAL HVAR | -32.7 | | |

| | NEW SETTINGS | ACTUAL SETTINGS |
|--------------------------|--------------|-----------------|
| RECLOSE VOLTS | 0.00 Volts | 1.50 Volts |
| RECLOSE ANGLE | 0 Deg | -5 Deg |
| SENSITIVE TRIP CURRENT | 0.0 Amper | 3.2 Amper |
| TIME DELAY SECONDS | 0 Sec | 100 Sec |
| INSTANT TRIP CURRENT | 0.0 Amper | 2400.1 Amper |
| EXTENDED DELAY | 0 Sec | 0 Sec |
| ROSENSITIVE TRIP CURRENT | 0.0 Amper | 0.0 Amper |
| WATT-VAR CURRENT | 0.0 Amper | 0.0 Amper |
| WATT-VAR ANGLE | 0 Deg | 0 Deg |
| CT RATIO | 0.5 | 1800:5 |
| PHASE COMPENSATION | 0 | 0 |

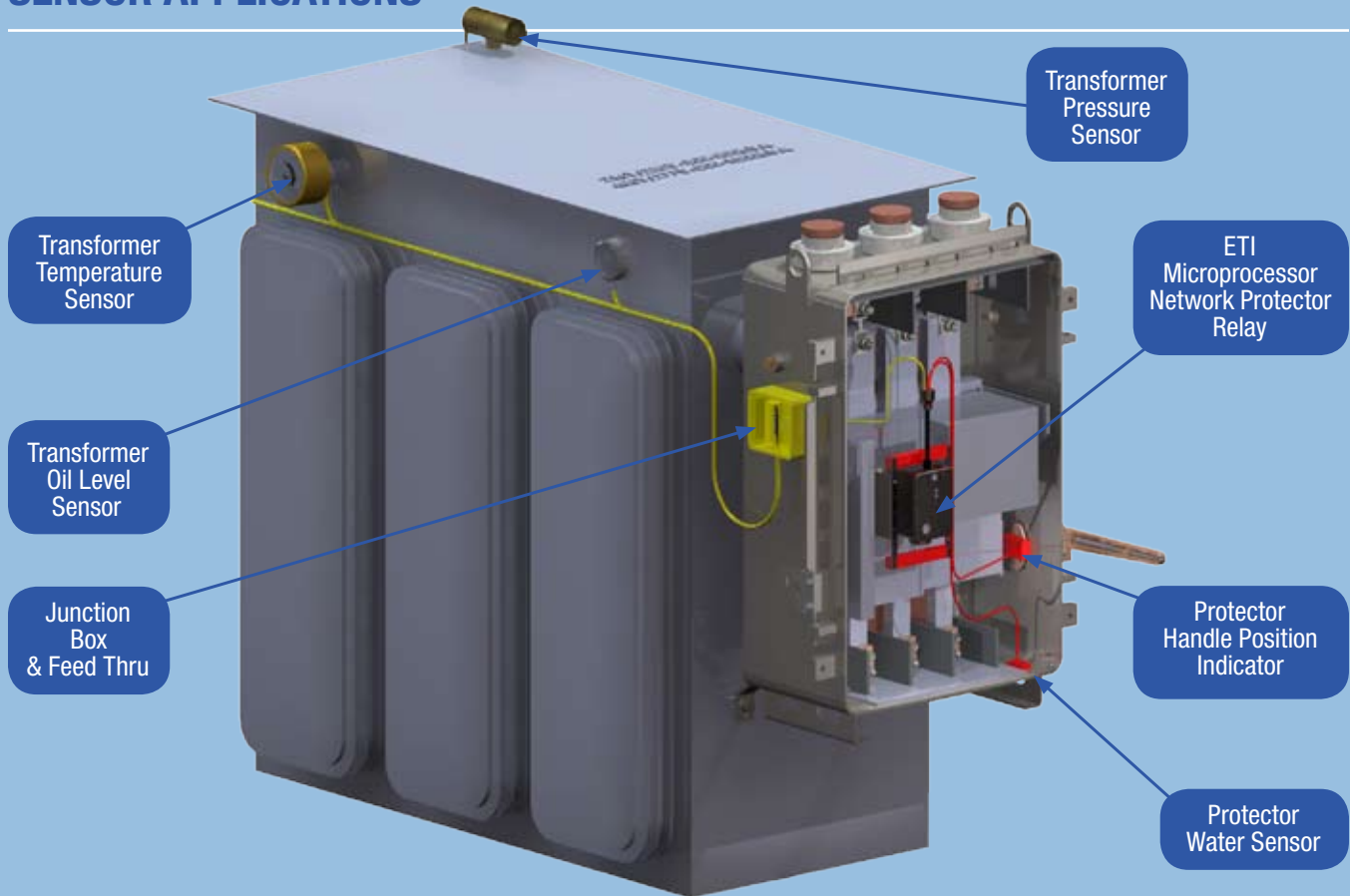
SCADA Server

- Automate Network Protectors
 - Remote Open and Close

- Monitor System Conditions
 - 3Φ Voltage & Current
 - NP Status (Open/Closed)
 - Transformer Pressure/Temperature/Oil level — identify potential failures before they happen

- *The ETI system is easy to install and compatible with all SCADA Systems*

SENSOR APPLICATIONS



TRANSFORMER SENSORS



Transformer Pressure Sensor

Monitor transformer pressure to detect leaks or pressure buildup from internal faults

- ❑ Range -2 to 20 psi
- ❑ Submersible to 30 ft.
- ❑ Remote indication 0 to +5Vdc
- ❑ +/- 2% accuracy



Transformer Temperature Sensor

Monitor transformer temperature to detect overheating

- ❑ Available with a short or long stem
- ❑ Provides both visual and remote electronic indication
- ❑ Remote indication 0 to +5Vdc or +/-5Vdc
- ❑ Range 0° to 200° C
- ❑ Can be installed while the transformer is in service
- ❑ Submersible to 30 ft.

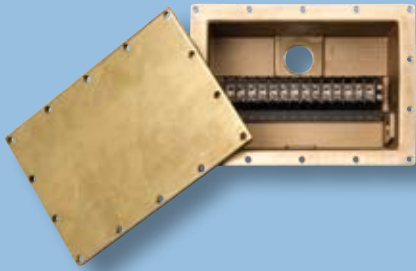


Transformer Oil Level Sensor

Monitor transformer oil level to catch leaks before it's too late

- ❑ Available in many different styles ... both top and side mount
- ❑ Electronically indicates angle
- ❑ -40° C to 125° C operating range
- ❑ Remote indication 0 to +5Vdc
- ❑ Submersible to 30 ft.

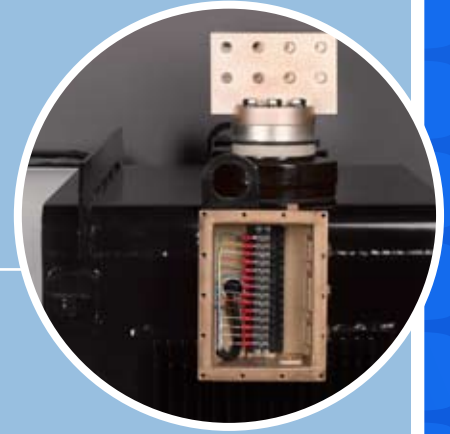
NETWORK PROTECTOR SENSORS



Junction Box

Provides a convenient submersible point for terminating all wires

- ▣ Features gasketed all-brass construction
- ▣ NP housing
- ▣ Standard housing
- ▣ 1" NPT fitting



Submersible Feed Thru

- ▣ Hermetically sealed
- ▣ Military grade



Vault Water Level Sensor

- ▣ Provides a signal when water reaches a critical level in the vault



Protector Water Sensor

- ▣ Provides a signal when water enters the protector housing



Protector Handle Position Indicator

- ▣ Available for both 137 NP (GE Style) or 313 NP (WH Style) protectors
- ▣ Indicates when the handle is in the open position



Protector Housing Pressure Sensor

- ▣ Monitors network protector housing pressure
- ▣ Available as a pressure switch or an analog pressure transducer



Protector Temperature Sensor — Internal NP Temperature

- ▣ Monitors network protector ambient temperature

ETI MNPR[®] COMMUNICATING RELAY

ETI MNPR[®]

- ❑ ETI MNPR[®] is the backbone of the system
- ❑ DNP3 Protocol in the MNPR[®]
 - No protocol translator needed
 - Open architecture ... not proprietary
 - Other protocols available upon request
- ❑ Monitor currents and voltages
 - Provide vital data for system planning
 - Powerful tool for riding out contingencies

Communicating Relays Also Have:

- ❑ Up to 8 Analog inputs — typically used to monitor bus temperatures, pressure, and water level
- ❑ 2 Digital inputs — typically used to monitor NP Status (O/C)
- ❑ 1 Digital output — typically used to control an external device, such as a sump pump
- ❑ +/- 5Vdc — typically used to power sensors
- ❑ Isolated RS485 serial communication port

Note: Communicating relays are also available with RS232 instead of RS485 and/or reconfigured I/O. Please contact the factory for more information.



LOCAL RELAY COMMUNICATIONS

Palm Tungsten with Commander Software

Communicates to the MNPR[®]

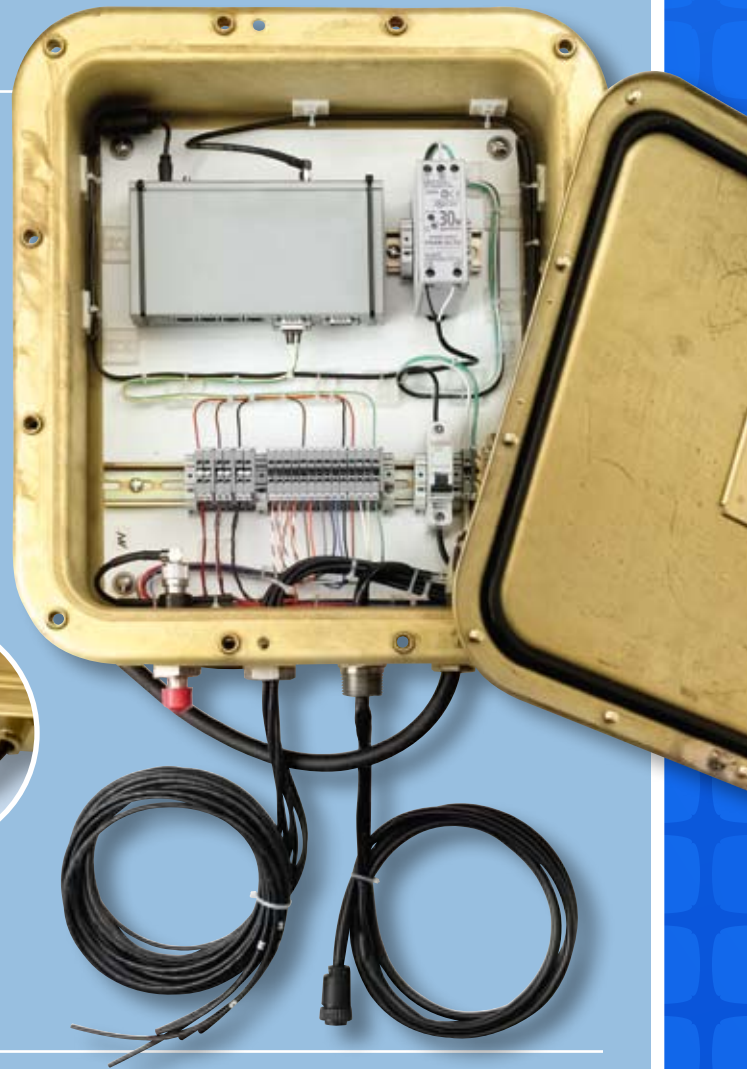
- ❑ Program relay settings
- ❑ Troubleshoot the Network Protector
- ❑ Connect via cable or Bluetooth head

COMMUNICATIONS ENCLOSURE

ETI WAN Enclosure

Electronic Technology Incorporated 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 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®.

- ❑ Continuously submersible to 30 ft.
- ❑ Packing glands or threaded hubs for penetrating the enclosure
- ❑ Made of 1/8" thick brass
- ❑ Proven track record
- ❑ Continuous gasket inside box
- ❑ Multi-bolt cover design

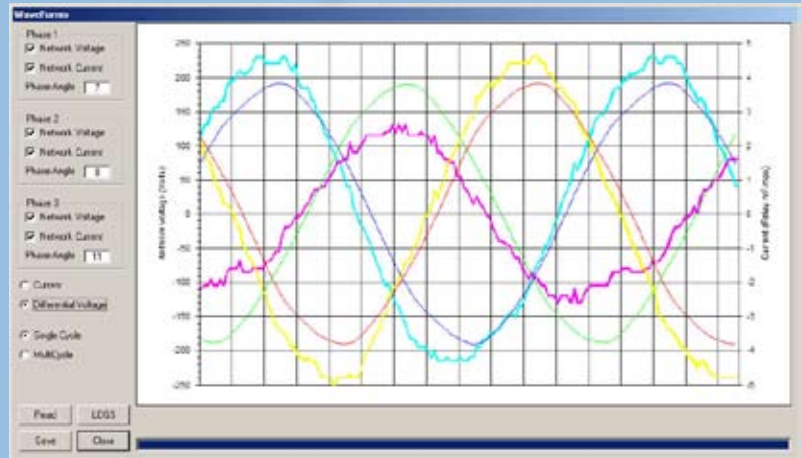


LOCAL RELAY COMMUNICATIONS

Laptop with FieldPRO Software

Communicates with the MNPR®

- ❑ Program relay settings
- ❑ Troubleshoot the network protector
- ❑ Connects via a cable from a computer to the MNPR®



| Currents and Voltages | | | | |
|-----------------------|---------|---------|---------|-------|
| | Phase 1 | Phase 2 | Phase 3 | Units |
| Current (Amps) | 21 | 3.6 | 33 | |
| V (line) (Volts) | 125.5 | 128.4 | 125.3 | |
| V (line) (Volts) | 47.8 | 12.8 | 12.7 | |
| Phase (Degrees) | 7 | 18 | 33 | |

The screenshot shows the 'ETI FieldPRO Field Programming v4.01' window. It displays various settings for the relay, including 'Model: WAN', 'Serial Number: 143627', and 'Revision Number: 02.00'. There are fields for 'Factory Value: 1.4', 'Retries-Angle: 5', and 'Cycle Close: 0'. There are also checkboxes for 'Cache Close' and 'Dist Phase: 0H'. The interface includes buttons for 'Reset', 'Load Settings', 'Feed Settings', 'Status', 'Back', 'Unlock', 'Tap', 'View', 'Advanced', 'Save Settings', 'Retrieve', 'Connect', 'View Data', and 'Exit'. Copyright © 1999-2010 Electronic Technology Incorporated.

The screenshot shows the 'Analog and Digital I/O' window. It displays four analog gauges and two digital input/output sections. The gauges show: 126 Counts, 0.08 Volts, -1.70 PSI Pressure; 126 Counts, 0.08 Volts, 101 °C Temperature; 126 Counts, 0.08 Volts, -8 Degrees above MIN Oil Level; and 126 Counts, 0.08 Volts, Analog 4. The digital input/output section shows 'Digital Input 1', 'Digital Input 2', and 'Digital Output 1' (OFF). The interface includes buttons for 'Update', 'Sync ITC', 'Save as IFC', and 'Close'. Relay RTC: 1/3/2010 1:06:36 PM.

LOCAL COMMUNICATIONS FEED-THRU

The ETI Local Communication System is utilized only by personnel with access to the vault. The operator has access to the relay without having to enter the vault.



Housing Feed-Thru Connection & Relay Connection

The ETI Local Communication System:

- ▣ Enables you to communicate to the MNPR® from outside of the vault — SAFELY and SECURELY
- ▣ Allows authorized personnel to take load readings, reprogram the relay, and open a protector BEFORE ENTERING the vault.
- ▣ Available with wireless Bluetooth access

System includes:

- ▣ Relay optical connection
- ▣ Housing feed-thru
- ▣ Extension cable
- ▣ Laptop cable or PDA cable

PLEASE CONTACT RICHARDS MANUFACTURING FOR MORE INFORMATION.



Relay Optical Connection

