

# Nexus<sup>®</sup> 1250

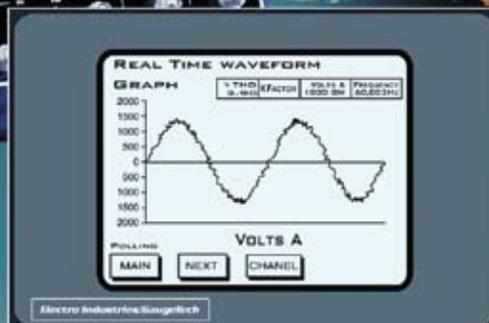
For Industry and Utilities

Accu-Measure<sup>™</sup>  
Technology

Performance Power Meter

and Power Quality Recorder

Auto-Calibrating  
Metrology



- Billing Grade Energy Meter
- Accu-Measure<sup>™</sup> Auto-Calibrating Technology
- DNP 3.0 Serial Communication
- Advanced Power Quality Recorder
- Graphical Touch-Screen Display
- AI Reports Artificial Intelligence Power Quality Reporting
- Onboard Rapid Response<sup>™</sup> Ethernet Connectivity (100BaseT)
- Onboard Modem with Dial-Out on Alarm

www.electroind.com

 **Electro Industries/GaugeTech**  
The Leader in Power Monitoring and Control



ELECTRICAL & ELECTRONIC  
MEASURING & TEST EQUIP.  
64JA

# A Quantum Leap in Metering Technology

## Introduction

From today's utility giants or Fortune 100 companies, to local electrical municipals, an effective energy management and power monitoring program is critical to success. The Nexus® 1250 meter is the most advanced monitoring product on the market today, providing you with the total picture of energy usage and power quality from any metered point in a power distribution network, allowing you to make power related decisions quickly and effectively.

- Technology specifically designed for Utilities and Industry.
- Real Time power quality monitoring and analysis identifies PQ and reliability events quickly.
- Manage peak demand electrical power usage.
- Report Data Quickly and Reliably using Ethernet or optional onboard modem, featuring Dial-Out/Dial-In capability.
- Also the perfect solution for Circuit Breaker or Transformer Monitoring.
- Using AI Reports, diagnose causes of power quality problems and receive suggested solutions.

## High Performance Revenue Metering Features

- Transformer Loss and Line Loss Compensation: For both iron and copper losses.
- Load Aggregation/Universal Metering: Pulse inputs can be used to aggregate or accumulate different loads; utility products, such as gas and water can also be accumulated.
- Time of Use Capability: Bi-directional consumption and demand; 20 year calendar.
- Max/Min Integration and Recording: Time-stamped max and min values for all measured readings.
- Coincidental Readings: Identify number of capacitors needed, peak inefficiencies, etc.
- Password Protection Prevents Unauthorized Tampering: User programmable passwords.
- Predicted Demand: The meter uses rate of change to predict the peak demand of the next demand interval. Perfect for proactive load shedding.
- MV90 Compatibility (Utility meter reading software).

## Accu-Measure™ Auto-Calibrating Measurement Technology

EIG's patented Accu-Measure™ Auto-calibration technology allows a field-mounted metering device to achieve precision accuracy and maintain the accuracy over temperature and time. This technique is unique to EIG and consists of precise measurement technology and high precision internal reference standards.

Accu-Measure™ Technology features:

- Dual High-Powered 16-Bit A/D Converters.
- Dual Internal References for Periodic Auto-calibration.
- Internal temperature sensor to sense deviations in instrument temperature.

PARAMETER	100 MSEC*	1 SECOND <sup>+</sup>	DISPLAY RESOLUTION
Voltage (L-N)	0.1%	0.05%	5 Digit
Voltage (L-L)	0.1%	0.05%	5 Digit
Current	0.1%	0.025%	5 Digit
Frequency	0.03 Hz	0.03 Hz	00.001 Hz
KW @ Unity PF	0.1%	0.04%	5 Digit
KW @ .5 PF	0.1%	0.1%	5 Digit
KVA	0.1%	0.08%	5 Digit
VAR	0.1%	0.08%	5 Digit
PF	0.1%	0.06%	3 Digit
Harmonic Magnitudes	N/A	0.2%	3 Digit
KW/Hours	N/A	0.04%	16 Digit
KVA/Hours	N/A	0.08%	16 Digit
KVAR/Hours	N/A	0.08%	16 Digit

\* When high-speed readings are brought through the analog output modules, update time is at approx. 180 msec. for each 2 channels of analog signals.

<sup>+</sup> Note: Readings are in percent of reading where applicable (more accurate standard) not in percent of full scale (less accurate standard).



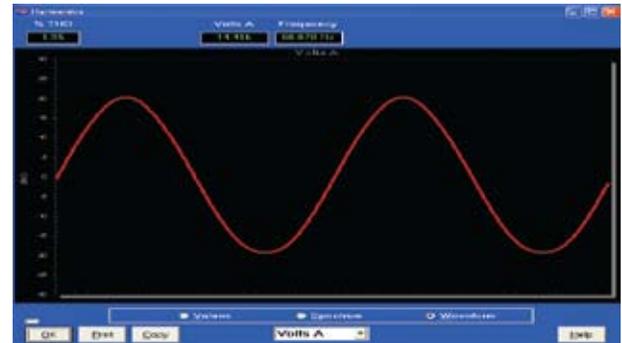
*Billing Data and System Reliability Monitoring*

# High Resolution Power Quality Recorder

## Detailed Power Quality Reporting and Waveform Recording

EIG's Nexus® 1250 meter is one of the industry's premier fault and voltage disturbance recorders. This instrument captures a comprehensive picture history of voltage reliability and power quality events within mass memory for detailed and extensive forensic engineering analysis.

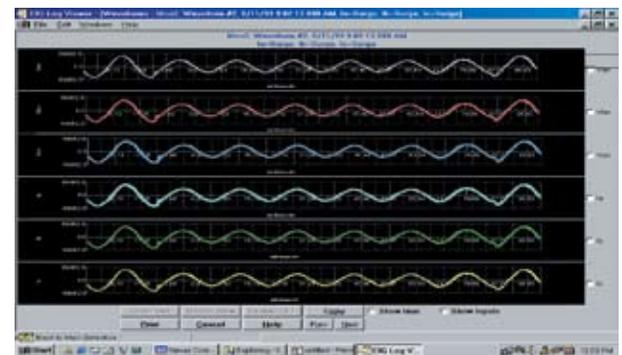
- **16 Bit Waveform and Fault Recorder:**
  - Record up to 512 samples/cycle.
  - Voltage and current recording with pre and post-event analysis.
  - Fault recording offers 8 times full scale capture capability.
  - 16 bit A/D converter provides precise waveform resolution.
  - Both hardware and software triggers available.
  - Measure harmonic magnitudes to 255th order for each voltage and current channel.
  - Real time harmonic magnitudes are resolved to the 128th order.
  - Percent THD and K-Factor are calculated.
  - Conduct power quality analysis at the high end of the harmonic magnitude spectrum.
- **High-Speed Status Input Triggers:**
  - Waveforms are recorded at time of status change.
  - Input change and waveform recording are time-stamped to a 1msec resolution.
- **Subcycle Transient Recorder:** Transients often cause intermittent, expensive periods of downtime. The subcycle transient recorder allows you to:
  - Record subcycle transients for voltage and current.
  - Monitor switching noise from capacitors, static transfer switches, SCRs, and other devices that negatively impact power quality.
- **Independent ITIC/CBEMA Log Plotting:**
  - Quickly view total surges, sags, and average duration on the independent ITIC/CBEMA log.
- **Phasor Analysis:**
  - The monitor reads a phase angle analysis between the voltage and current channels, allowing you to analyze efficiency and system integrity.



THD Waveform Screen



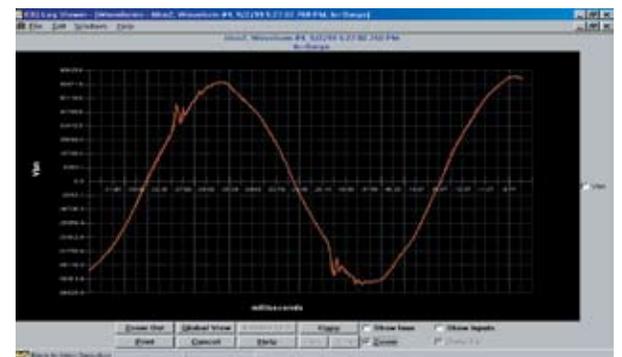
THD Spectrum Screen



Multi-channel Waveform Recorder



Phasor Screen

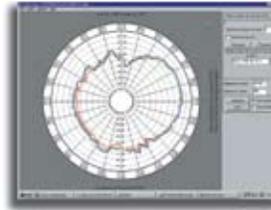


Sub-cycle Transients

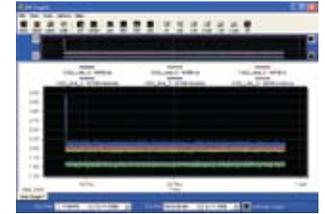
# Extensive On-Board Mass Memory Securely Records All Data

## Nexus® 1250 Meter Logging Capability

- **Two historical logs:** Provide advanced historical trending analysis to trend any desired measured parameter.
  - Primary Historical Trending Log File - Log 1: Log any measured parameter from the meter. Either 8, 16, 32, or 64 values can be logged per a user-programmed interval.
  - Secondary Historical Trending Log File - Log 2: Either 8, 16, 32, or 64 values can be logged per a user-programmed interval.
- **Out of Limit Log:** Stores out of limit information to 1 msec resolution to determine a sequence of events for any occurrence. This allows you to assemble an accurate system-wide depiction of a power disturbance.
- **Event-Triggered Waveform Recording Log:**
  - Record waveforms on voltage or current events with a resolution of 512 samples per cycle.
  - Records are recorded and stored using 16 bit resolution.
  - The meter stores both when condition went out of tolerance and when it returned to normal.
  - The length of the record per event is programmable from 12 cycles minimum to thousands of cycles.
  - The Waveform log also stores status of the 8 high speed inputs to provide breaker and relay timing.
- **ITIC/CBEMA Log:** This log records magnitude and duration of voltage and current surges/sags for every power quality event and allows the user to plot the ITIC and CBEMA curve relating to the magnitude and duration of power quality events within the system.
- **Relay Output Log:** This log records when a relay output from the external Output option is activated, timestamps the event, and provides a reason for the relay's changed status.
- **Input Status Log:** This log records when the meter's high-speed inputs change status.



Trend Parameters Over Time



Trend Multiple Parameters for Comparison

Log Storage Options	512K RAM	512K Record Size	2 Meg RAM	2 Meg Record Size	4 Meg RAM	4 Meg Record Size
Historical Log 1	176K	58 Days	288K	96 Days	1808K	602 Days
Historical Log 2	256K	42 Days	400K	66 Days	400K	66 Days
Out of Limit Log	48K	512	96K	1024	96K	1024
CBEMA Log	16K	256	64K	1024	64K	1024
Relay Output Log	N/A	N/A	48K	N/A	32K	512
Input Status Log	N/A	N/A	48K	512	32K	512
<b>Waveform Recording</b>						
Number of Events	N/A	N/A	1040K	64	1568K	96

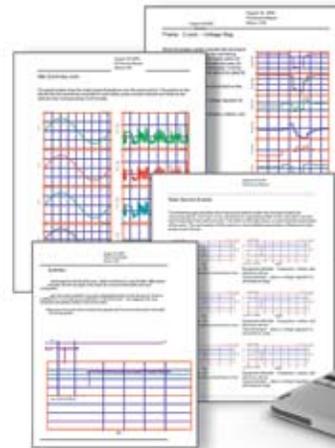
Note: Historical Log 1 is calculated recording 8 values every 15 minutes. Historical Log 2 is calculated storing all integrated hour readings every 15 minutes. Every log reading is recorded with exact time stamps.

## AiReports EXT – PQ Analysis

AiReports EXT provides automated analysis and reports for abnormal events:

- Uses Artificial Intelligence.
- Evaluates All Data from Nexus® Meters.
- Rates Events for Severity.
- Identifies Probable Causes.
- Identifies Possible Impact.
- Recommends Corrective Actions or Solutions.
- Prepares & Formats Reports of All Power Quality Events.
- PQDIF File Format Converter allows Nexus® meter data to be read by standard EPRI Power Quality viewing software.
- COMTRADE File Converter changes fault records to standard fault analysis file formats.

Samples Per Cycle	Number of Cycles Recorded Per Screen	Max. Number of Cycles Recorded Per Event	Number of Channels
16	8 Pre/56 Post Event Screen	5760	7
32	4 Pre/28 Post Event Screen	2880	7
64	4 Pre/12 Post Event Screen	1536	7
128	1 Pre/7 Post Event Screen	768	7
256	1 Pre/3 Post Event Screen	384	3
512	1 Pre/3 Post Event Screen	384	1



*Using Artificial Intelligence, Diagnose the Source and Severity of Power Quality Problems*

# Robust Communication and Output Features

## On-Board Communication for Every Application

### 4 Isolated High-Speed Communication Ports:

- Identical built-in serial ports – Up to 115K baud.
- Standard protocols include Modbus RTU/ASCII and DNP 3.0 Protocol.
- Logs and waveform events available in Modbus format.

### 8 Built-In Digital High - Speed Status Inputs:

- Inputs automatically sense whether the circuit is externally wetted.
- If externally wetted, input up to 300V DC is accepted.
- If internally wetted, the meter supplies the necessary voltage for the control application.

### Sync. Check-Aux. Volt Input: High-speed Vaux input can be used for:

- Neutral to ground.
- Voltage readings.
- Synchronizing schemes.
- Obtaining the frequency, magnitude, and phase angle on both sides of a switch, or between generator and bus voltage.

### Rapid Response™ Ethernet:

- INP200 Rapid Response™ Ethernet allows for 12 simultaneous connections of Ethernet Modbus TCP protocol. Rapid Response™ technology insures that the Nexus® meter is optimized to download data as quickly as possible.

### Analog Transducer Signal Outputs:

- 1mAON4/1mAON8: 4 or 8 Analog Outputs, 0-1mA, self-powered, scalable, bidirectional.
- 20mAON4/20mAON8: 4 or 8 Analog Outputs, 4-20mA, self-powered, scalable, bidirectional.

Wiring: Common Mode.  
 Accuracy: 0.1% of Full Scale.  
 Calibration: Self-calibrating.  
 Scaling: Programmable.  
 Ordering: Up to 4 Analog Output modules for each Nexus® 1250 meter. More than 2 Modules requires an external Power Supply, Model #PSIO.

### Digital Dry Contact Relay Outputs:

- 4RO1: 4 Relay Outputs, 5 amps, 125 AC/DC, Form C – Latching Relays.
- Ordering: Up to 4 modules can be used.

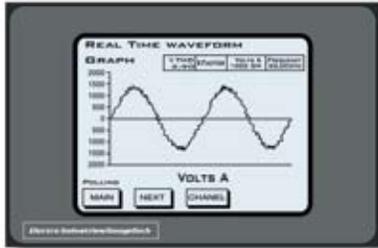
### Digital Solid State Pulse Outputs:

- 4PO1: 4 Solid State Pulse Outputs, Form A or C KYZ pulses.
- Maximum Pulse Speed: 20 pulses per second.
- Ordering: Up to 4 modules can be used.

### Output Module Accessories:

- PSIO: Additional power supply for up to 4 Output modules. Needed when using 3 or more displays and/or Output modules. See manual for specific VA allotments.
- MBI0: Mounting bracket for Output modules. Must be ordered with output module.

## Expandable Displays and Outputs



P60N TOUCH SCREEN LCD DISPLAY



P40N MULTIFUNCTION LED DISPLAY

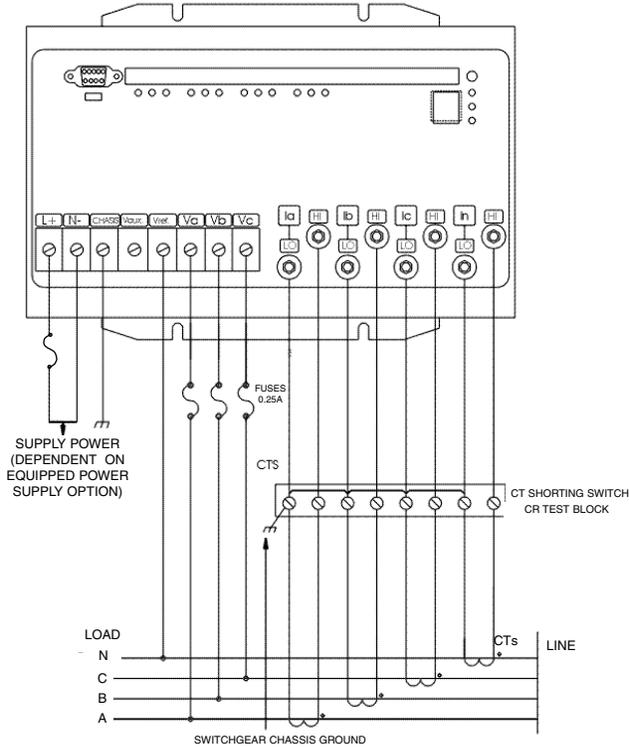


EXPANDABLE OUTPUT MODULES

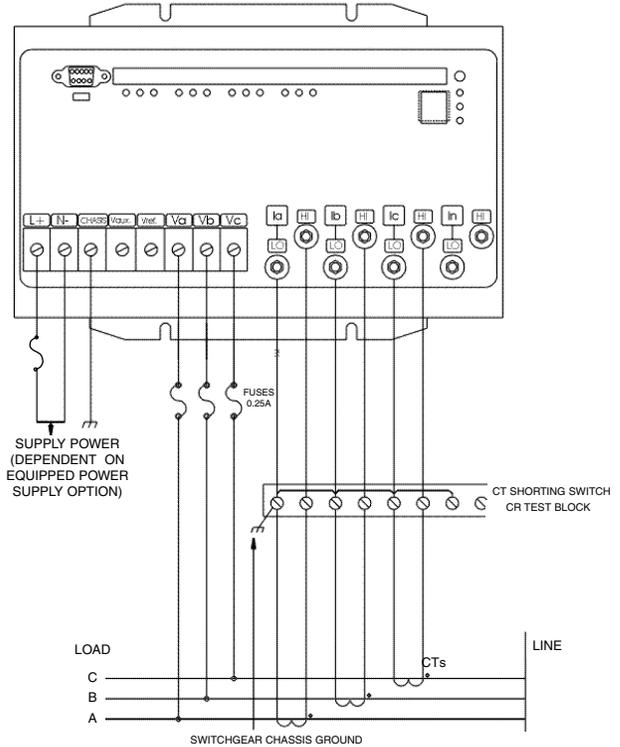


# Wiring Diagrams

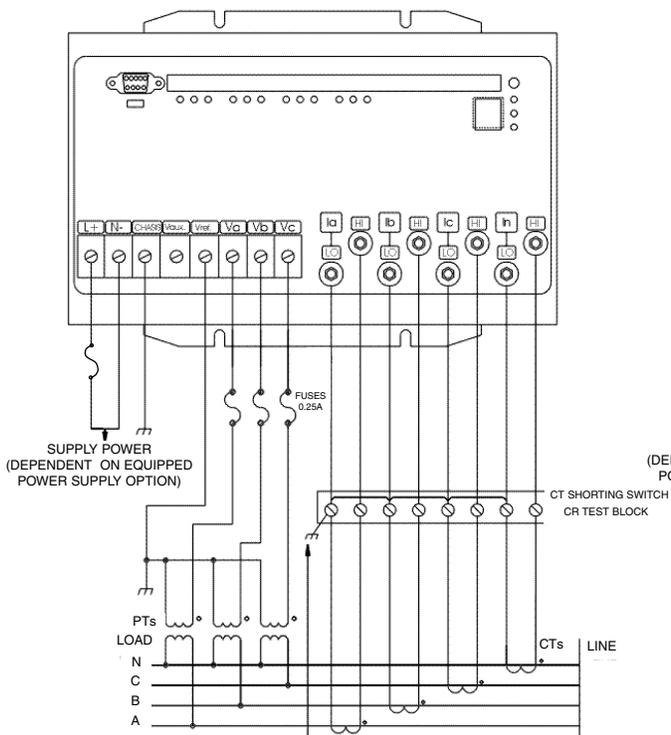
The Nexus® meter supports every wiring and configuration. It configures easily for 2, 2 1/2 or 3 element. All wiring and hookup configurations are software configured.



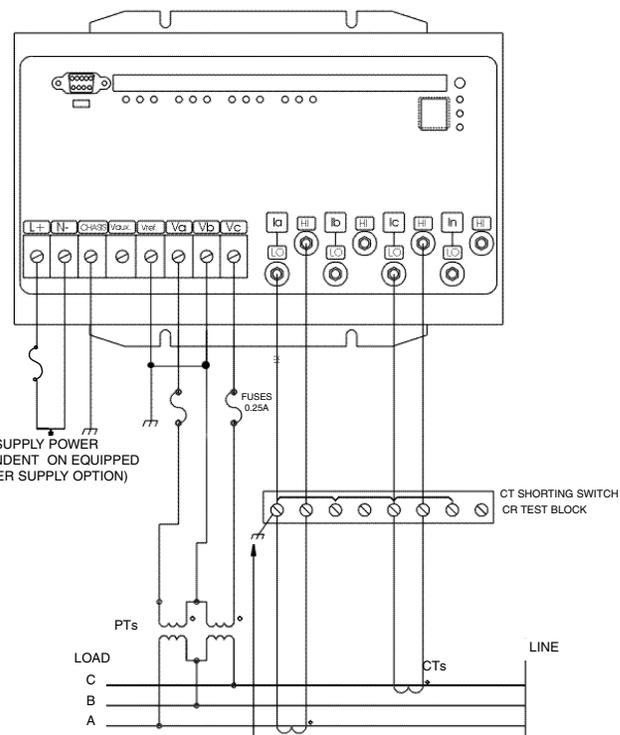
4 WIRE WYE: 3 ELEMENT DIRECT VOLTAGE



3 WIRE: 3 ELEMENT DIRECT DELTA



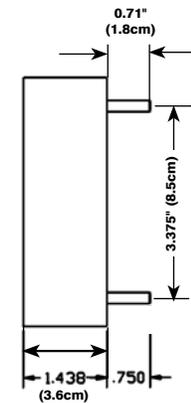
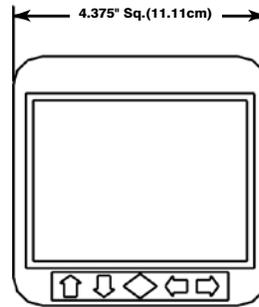
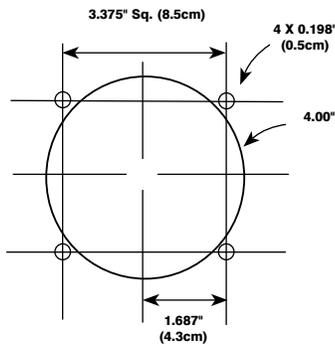
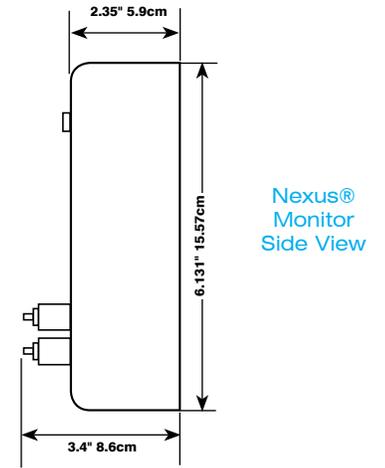
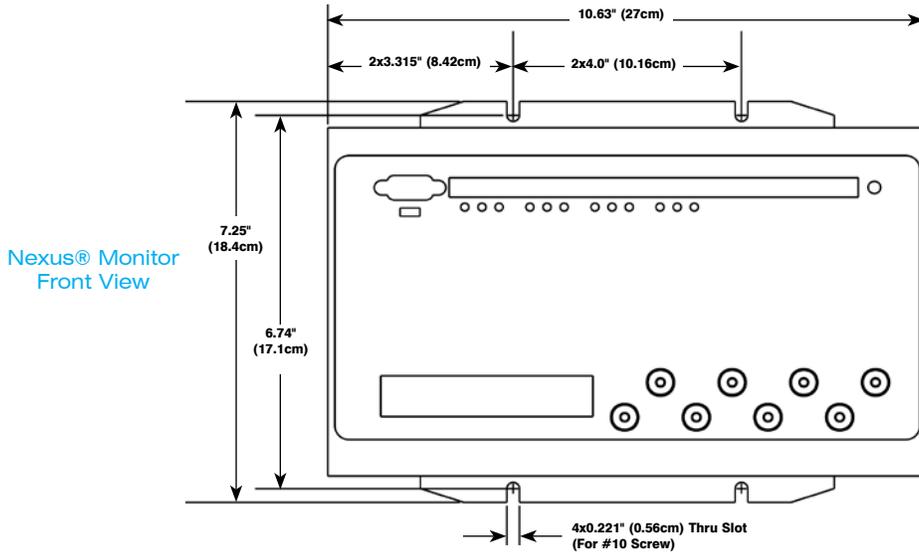
4 WIRE WYE: 3 ELEMENT CONNECTION USING 3 PTs and 4 CTs



3 WIRE: 3 ELEMENT OPEN DELTA

# Mounting Information

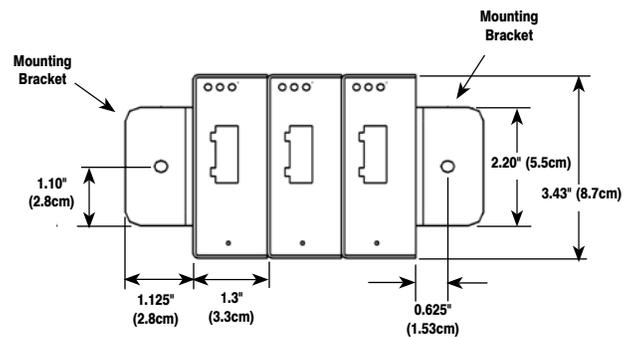
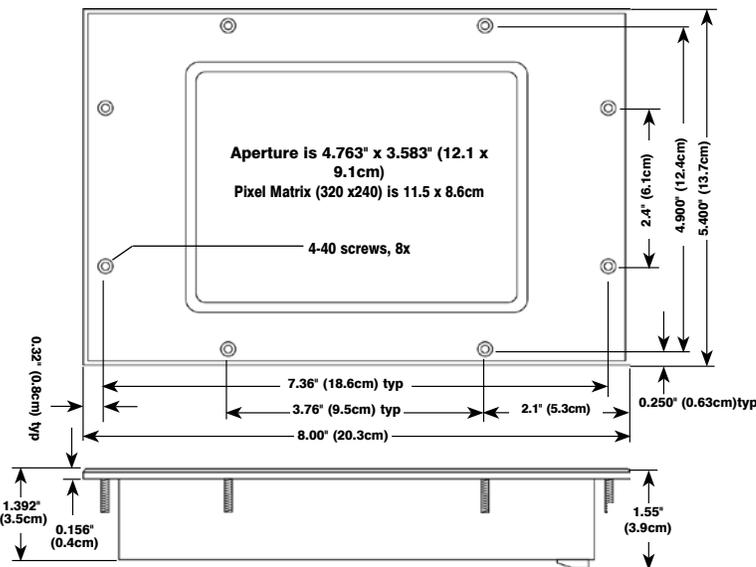
Contact Electro Industries for different mounting options.



**Nexus® P40N Display Cutout Pattern**

**Nexus® P40N Display Front View**

**Nexus® P40N Display Side View**



**Nexus® P60N Touch-Screen Display Front and Side View**

**Nexus® Output Modules Front View**

# Specifications

## INPUT VOLTAGE RANGE

- 150 Volt PH-N, 300V PH-PH (Suffix-120)  
(Used with PTs for Extended Range)
- 300 Volt PH-N, 600 Volt PH-PH (Suffix-G)

## VOLTAGE INPUT WITHSTAND CAPABILITY

- Voltage Inputs optically isolated to 2500V DC.  
Meets ANSI C37.90.1 (Surge Withstand Capability)

## INPUT CURRENT RANGE

- 5 Amp Inputs 2x continuous programmable to any CT range
- Fault Current recording to 60 Amps peak secondary based on 5 Amp full scale  
Note: 1 Amp and 0.25 Amp current inputs available as special order

## CURRENT INPUT WITHSTAND CAPABILITY

- 100 Amps for 10 Seconds
- 300 Amps for 1 Second
- Continuous Rating: 20 Amps

## BURDEN

- Voltage Inputs: 0.05VA Max
- Current Inputs: 0.005VA Max

## ISOLATION

All inputs and outputs are isolated to 2500 Volts. All Com Ports are additionally isolated from each other.

## TEMPERATURE RATING

- Operating Temperature: (-40 to +80)°C
- Humidity: Up to 95% Noncondensing

## SENSING METHOD

- Up to 512 Samples per Cycle (Programmable)
- 16 Bit A/D Resolution – Dual Converters
- Accu-measure™ Auto-Calibration Technology
- True RMS

## ACCURACY RATING

- This unit complies with and exceeds ANSI C12.20 and IEC687 accuracy requirements.
- Industry Canada Revenue Metering Approval:#AE-1069

## UPDATE TIME

- 200 msec. — High-Speed Readings
- 1 Second — Revenue Accurate Reading

## CONTROL POWER REQUIREMENTS

- 90–276 Volts AC/DC (Suffix -D2)
- 18–60 Volts DC (Suffix -D)
- Burden: 20 VA Max

## FREQUENCY RANGE

20–60Hz or 400Hz

## COMMUNICATION FORMAT

- Programmable parity and stop bits
- Communication Protocols: Modbus TCP/IP ASCII/RTU and DNP 3.0
- 4 Communication ports, 2 slave ports
- All ports use 2-wire RS485 communication; Port 1 is RS232 or RS485 Selectable

- INP2 - 56k Modem with Dial-Out Capability
- INP200 - 10/100BaseT Rapid Response™ Ethernet

## CONSTRUCTION

Constructed in a metal case. All hardware is stainless steel.

## SHIPPING

Total shipping weight:  
approx. 12 lbs (5.4 kgs)  
Shipping container dimensions: 16" x13" x11"  
(40.64cm x 33.02cm x 27.94cm)

## COMPLIANCE

- ANSI C12.20 Class 0.2 and IEC687 (Accuracy)
- ANSI C37.90.1 (Surge Withstand)
- ANSI C62.41 (Surge)
- ANSI/IEEE C37.90.1 – Surge Withstand
- IEC 1000-4-2 – ESD
- IEC 1000-4-3 – Radiated Immunity
- IEC 1000-4-4 – Fast Transient
- IEC 1000-4-5 – Surge Immunity
- IEC 868 – Flicker Meter
- IEC 61000-4-15 – Flicker Meter
- IEC 61000-4-30 – Power Quality Measurement Methods

- CE Marked
- UL and cUL Listed

(See product manual for further details)

# Ordering Information

## To order a Nexus® 1250 meter:

- 1 Fill out the options desired on the order chart below. List accessories separately.
- 2 Specify display type and number.
- 3 Specify desired Output modules and mounting bracket(s).
- 4 Specify Communicator EXT 3.0.
- 5 If you provide CT and PT ratios and wiring, EIG will program the units at the factory.

## Example:

OPTIONS:

ACCESSORIES:

### Nexus1250-2Meg-120-D2-60Hz-V1-INP200-P40N-1mAON4-MBIO-COMEXT3.1C

This equates to a Nexus® 1250 Monitor with 2Meg memory, an operating voltage of 120, a 90-276 Volts AC/DC power supply, a 60 Hz frequency, V1, an internal 10/100BaseT Ethernet port, a multifunction LED display, a 0-1mA Output module, mounting bracket and one site license for Communicator EXT 3.0 software.

# Ordering Specifications

	Nexus Base	Memory Options	Operation Voltages	Control Power	Frequency Range	V-Switch™ Pack	Internal Expansion Port Options	Standards Compliance
Option Numbers:	-	-	-	-	-	-	-	-
Example:	Nexus 1250	2Meg	120	D	60 Hz	V1	INP200	ICR
	Nexus 1250	512k	120 0-150 Volts PH-N 0-300 Volts PH-PH	D 18-60V DC Power Supply	60 Hz	V1 Standard Nexus®1250 Meter	X No Expansion Port	X
		2Meg	G 300 Volts PH-N 600 Volts PH-PH	D2 90-276 Volts AC/DC Power Supply	50 Hz		INP2 56k with Dial-Out	ICR Industry Canada Revenue Metering Approval
		4Meg			400 Hz		INP200 10/100BaseT Rapid Response™ Ethernet	

# Accessory Options

## OUTPUT MODULES

- 1mAON4** 4 Analog Outputs, 0–1mA
- 1mAON8** 8 Analog Outputs, 0–1mA
- 20mAON4** 4 Analog Outputs, 4–20mA
- 20mAON8** 8 Analog Outputs, 4–20mA
- 4RO1** 4 Relay Outputs
- 4PO1** 4 Solid State Pulse Outputs
- PSIO** Power Supply for Additional Output modules
- MBIO** Output Mounting Bracket (must be ordered with purchase of module)

## SOFTWARE

- COMEXT3.1** Communicator EXT 3.0 for Windows® Single-Computer License (One Site)
- COMEXT3.MC** Communicator EXT 3.0 for Windows® Multiple-Computer License (One Site)
- AIEXT.1C** AiReports EXT Power Analysis Software for Windows® Single-Computer License (One Site)
- AIEXT.MC** Multiple-Computer License (One Site)

- DIEXT.1C** Dial-In Server EXT For Modems Single-Computer License (One Site)
- DIEXT.MC** Dial-In Server EXT For Modems Multi-Computer License (One Site)
- DISPLAYS**
- P60N** Graphical LCD Touch-Screen Display
- P40N** Multi-Function LED Display