

Nexus[®] 1450

Cyber Secure Energy Panel Meter with Advanced Power Quality & Multiport Communication



Nexus[®] 1450 Meter

P40N+ Remote Multifunction Display

Metering and Communication

- New** Multilevel Cyber Secure Encrypted Configuration
- Advanced Web Server with Waveform Analysis Tools
- Up to 1024 Samples per Cycle-based Measurements
- 0.06% Energy Accuracy Over Wide Dynamic Measurement Range
- Highly Accurate and Stable Measurements Using Multi-Gain[™] Sensing
- 6 Available Communication Ports, Including Modbus and DNP 3.0 Protocols
- Two Independent Ethernet Ports, with Unique IP Addressing

Advanced Power Quality Analysis

- Class A IEC 61000-4-30 Edition 3 Power Quality Measurements
- IEC 61000-4-15 Flicker Measurements
- IEC 61000-4-7 Harmonic Measurements
- EN 50160 Power Quality Reports
- New CORE[™] Logging Architecture
- Easy-install Transducer and Separate Display
- Direct Physical Retrofit to Nexus[®] 125X Series Meter/Transducer with Greater Functionality
- Separate 3 Line LED Displays

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Introduction

Electro Industries' Nexus® 1450 meter is a powerful energy meter that provides accurate electrical energy measurements and offers advanced capabilities for power quality analysis and determining electrical power reliability. The meter is a transducer base with a separate display. The transducer base retrofits to existing Electro Industries' Nexus® 1250 and 1252 meters. The Nexus® 1450 meter is ideal for existing switchboard panels, since it can be installed without cutting panel doors. The separate display mounts into existing analog meter knockouts.

The Nexus® 1450 meter is protected with a multi-level Cyber Secure configuration with 10 highly secure encrypted user IDs and passwords that help prevent tampering and hacking of your power system data. The meter's built in WebView™ Energy Dashboard allows you to analyze metering data without needing software. You can navigate easily through multiple webpage views and get detailed information on energy usage and power quality: view real time data, analyze stored history logs, view alarms and waveform records.

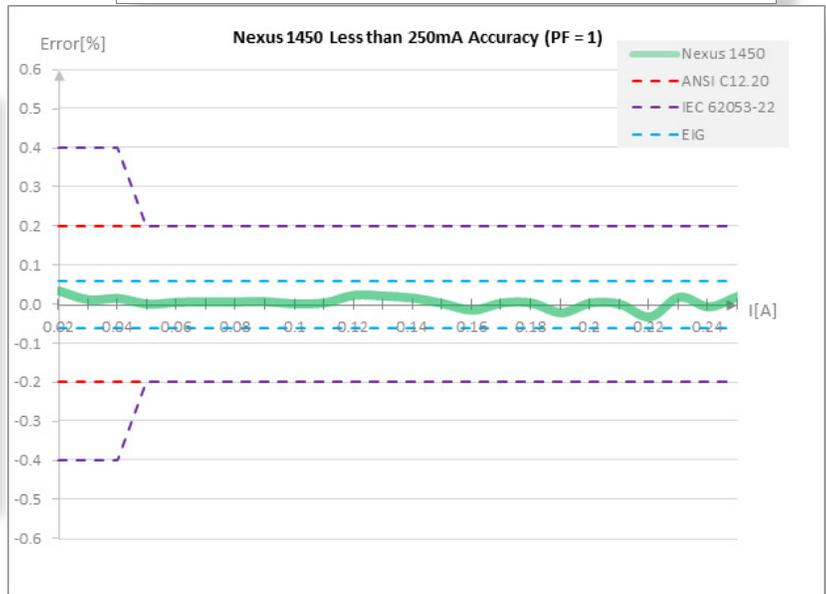
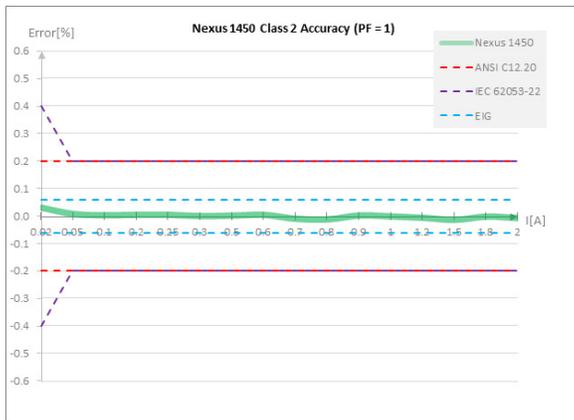
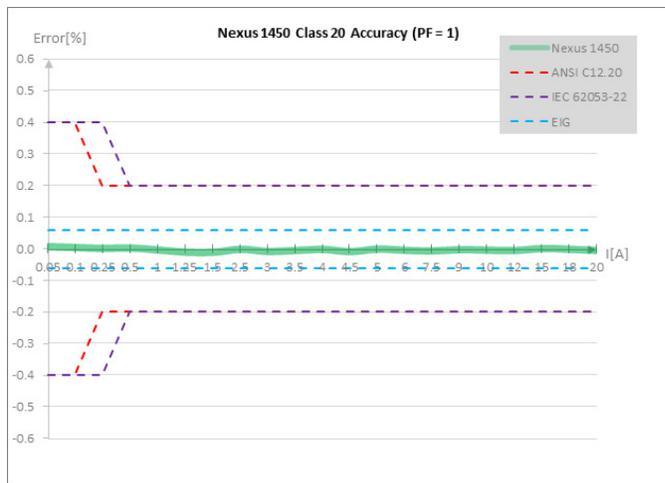
With 6 simultaneously operating communication ports, the meter is a communication hub to multiple software systems. The Nexus® 1450 meter has 4 serial ports that speak Modbus and DNP 3.0 protocols. It also has two independent Ethernet ports, consisting of a 10/100BaseT copper RJ45 connector and an ST Terminated 100Base FX Fiber Optic Ethernet port. Each Ethernet port has a unique IP address. Through the meter's 6 ports, a user is able to communicate to multiple computer-based systems, providing data to entities throughout an enterprise.

The meter also excels at measuring power quality, including waveform recording and IEC 61000-4-7, IEC 61000-4-15, and IEC 61000-4-30 Class A compliance. The Nexus® 1450 meter lets you look at the reliability of the electrical power circuit to determine causes of faults, voltage surges and sags, and harmonics.

Multi-Gain™ Sensing Provides Superior Accuracy

The Nexus® 1450 meter utilizes EIG's latest measurement-sensing technology - Multi-Gain™. Multi-Gain™ technology uses two sensors on the current inputs - a high gain sensor and a lower gain sensor. Each sensor simultaneously measures the current signal coming from the external current transformers. The meter's intelligent processing looks at the signal level and determines the optimal sensing circuit for the highest accuracy measurement. With this technique, the meter has 0.06% accuracy throughout an extended measurement range, which is a defining trait of Nexus® Series meters.

The meter's standard pickup range starts as low as 1 mA, and high accuracy is attained at 25 mA. Multi-Gain™ metrology allows the same meter to be used on both 5 A secondary and 1 A secondary CTs. The meter should maintain high accuracy measurement throughout its installed life. Refer to the accuracy chart on the next page, for details.



Multi-Gain™ Metrology allows the Nexus® 1450 meter to have highly repeatable and stable measurements throughout range

Typical accuracy charts

Meter Accuracy Specification

Measurement	
Voltage L-N	0.04% of reading
Voltage L-L	0.04% of reading
Current	0.04% of reading
Neutral Current	0.1%
Frequency	0.004 Hz
Watts	0.06% of reading
Watt-hour*	0.06% of reading
VAR	0.15% of reading
VARh	0.15% of reading
VA	0.06% of reading
Power Factor	0.15% of reading
THD	2.5% of reading

*(0.025 A to 20 A at PF=1); full accuracy specifications are given in the *Nexus® 1450 Meter Installation and Operation Manual*.

Precision Crystal Time Reference:

The Nexus® 1450 meter is equipped with an internal clock crystal accurate to 3.5 PPM over the full operating temperature range and 5 PPM at over ten years of use. This highly accurate trimmed clock design allows users to maintain accurate time when running on crystal synchronization. The meter's clock crystal will drift less than 6 seconds per month from (0-40) °C.

Additional time sync methods include:

- Modbus time sync.
- IRIG-B time sync.
- DNP 3.0 time sync.
- SNTP time sync.

Advanced Energy Meter for Primary Loads

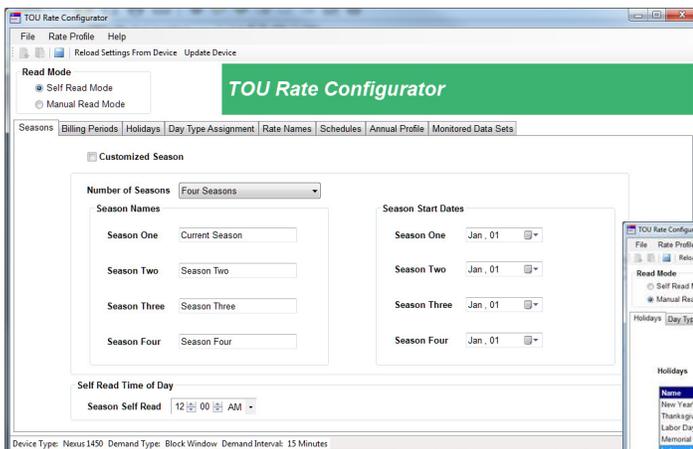
The Nexus® 1450 unit is an electrical energy meter designed to be used for any important application. In addition to highly accurate energy measurement, the meter features:

- Full 4 quadrant metering.
- Max/Min recording with timestamp.
- Extensive logging with 8 logs of programmable historical profiles.
- Built-in CORE™ log for web trending.
- Transformer and Line Loss compensation: for both iron and copper, and total substation losses.
- CT and PT compensation: to correct instrument transformer errors.
- Coincidental readings: e.g., PF or VARs at time of Peak Demand.
- Load aggregation/universal metering: pulse inputs can be used to aggregate or accumulate different loads. Utility commodities such as gas and water can also be accumulated.

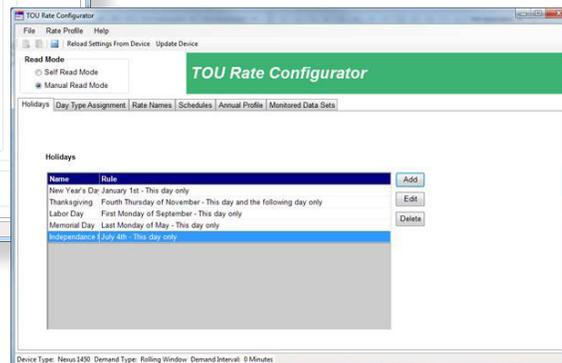
On-board Time of Use Measurements:

The Nexus® 1450 meter uses a perpetual Time of Use (TOU) calendar that only needs to be set up once. The TOU implementation allows the user to set up multiple tariffs to meet any contractual obligations. It also allows the user to customize any energy parameter for TOU. The 16 available TOU registers can be configured not only for TOU built-in energy readings, but also for any stored data from pulses or other readings that need TOU functionality.

- Up to four seasons - seasons can be customized.
- Flexible billing periods/rates/holidays/schedules setup.
- Cumulative and continuous cumulative demand are available.



Easily Configure Almost any Time of Use Usage Profile



Specifications

Voltage Input Range:

- (20 to 720) V AC
- Pickup voltage: 5 V AC

Isolation:

- Voltage Inputs isolated to 2500 V AC

Current Input Range:

- Supports Class 2 and Class 20 in one input configuration
- Programmable to any CT ratio
- Fault current recording to +/- 80 A peak
- Pick-up current: 1 mA

Current Input Withstand Capability (at 23 °C):

- 100 A for 10 seconds
- 300 A for 3 seconds
- 500 A for 1 second

Burden:

- Voltage Inputs: 5 Mohms per voltage input
- Current Inputs: 0.028 VA per phase max at 20 A

Frequency Range:

- (42.5–69.5) Hz

Environmental:

- Operating temp: (-25 to +70) °C
- Storage temp: (-40 to +70) °C
- Humidity: Up to 95% RH non-condensing
- Protection Class: IP30

Measurement Method:

- Up to 1024 samples per cycle (programmable)
- 16 Bit A/D resolution – multiple simultaneous converters
- Multi-Gain™ sensing method

- True RMS

Accuracy Ratings:

- Energy measurement accuracy at 0.06% (0.025 A to 20 A at PF=1)
- Full accuracy specifications available in Nexus® 1450 meter User Manual
- Time clock: 3.5 ppm for (-25 to +70) °C - less than 10 seconds drift per month on crystal sync; 2.0 ppm Typical from 0 to +40 °C - less than 6 seconds per month drift

Update Rate:

- 1 Second - High Accuracy readings
- 1 Cycle - Fast Update readings
- Customizable high-speed readings - update rate from 2 to 20 cycles RMS

Control Power Requirements:

- D2 Option: (96-276) V @ 50/60 Hz or DC
- D Option: (18-60) V DC
- Burden: 20 VA max w/o I/O or display; 40 VA max with I/O and display

Communication:

- Baud rate up to 115200 bps
- Programmable parity and stop bits
- Serial Communication protocols: Modbus ASCII/RTU, DNP 3.0
- Ethernet: Modbus TCP, DNP 3.0, SNMP, HTTP and HTTPS
- RJ45 Ethernet port 10/100BaseT
- Fiber Optic port 100Base FX
- 4 RS485 ports
- RS232 port (shared)
- RS485 Serial ports have 18 V DC output for I/O
- Optional P40N+ display offers USB Type B communication

Shipping:

- Total shipping weight: approx. 5 lbs (2.2 kgs)
- Shipping container dimensions: 14" x10" x6" (35.6cm x 25.4cm x 15.2cm)
- Displays and I/O modules ship in separate containers.

Compliance:

- EU Directive 2014/32/EU (Measuring Instruments Directive)
- EU Directive 2011/65/EU (RoHS 2 Directive)
- REACH Regulation (EC) No 1907/2006
- UL Listed
- ANSI C12.1 Electric Meters Code For Electricity Metering
- ANSI C12.20 Electricity Meters 0.2 and 0.5 Accuracy Classes
- ANSI (IEEE) C37.90.1 (Surge Withstand)
- ANSI C62.41 (Burst)
- IEC 60068-2-1 Environmental Testing: Test A: Cold
- IEC 60068-2-2 Environmental Testing: Test B: Dry Heat
- IEC 60068-2-30 Environmental Testing: Test Db: Damp heat, cycle (12h + 12h cycle)
- IEC 61000-4-2 Electromagnetic compatibility (EMC). Testing and measurement techniques. Electrostatic discharge immunity test
- IEC 61000-4-3 Electromagnetic compatibility (EMC). Radiated, radio-frequency, electromagnetic field immunity test
- IEC 61000-4-4 Electrical fast transient/burst immunity test
- IEC 61000-4-5 Surge immunity test
- IEC 61000-4-6 Immunity to conducted

disturbances, induced by radio-frequency fields

- IEC 61000-4-7 General guide on harmonics and interharmonic measurements and instrumentation
- IEC 61000-4-30 Power quality measurement methods
- IEC 62052-11 General requirements, tests and test conditions - Metering equipment
- IEC 62053-22 Particular Requirements - Static meters for active energy (Classes 0,2 S and 0,5 S)
- IEC 62053-23, Static meters for reactive energy (Classes 2 and 3)
- IEEE 519 Recommended Practices and Requirements for Harmonic Control in Electrical Power Systems

External I/O Modules:

- 1mAON4: 4 Analog Outputs, 0±1 mA
- 1mAON8: 8 Analog Outputs, 0±1 mA
- 20mAON4: 4 Analog Outputs, 4-20 mA
- 20mAON8: 8 Analog Outputs, 4-20 mA
- 8AI1: 8 Analog Inputs, 0±1 mA
- 8AI2: 8 Analog Inputs, 4-20 mA
- 8AI3: 8 Analog Inputs, 0±5 VDC
- 8AI4: 8 Analog Inputs, 0±10 VDC
- 4RO1: 4 Relay Outputs
- 4PO1: 4 Solid State Pulse Outputs
- 8DI1: 8 Digital Status Inputs
- PSIO: Power Supply for up to 4 additional I/O modules
- MBIO: I/O mounting bracket (must be ordered with external I/O module)

Note: Please see the Nexus® 1450 meter Installation and Operation Manual for comprehensive specifications.

Ordering Information

	Nexus® Base Meter	Control Power	Frequency Range	Virtual Switch
Option Numbers:	-	-	-	-
Example:	Nexus 1450	D2	60	V1
	Nexus® 1450 Meter	D2 Universal (96-276) V @ 50/60 Hz or DC	60 60 Hz	V1 Standard Nexus® 1450 Meter 512 MB memory logging / 512 s/c
		D (18-60) V DC	50 50 Hz	V2 V1 + 1200 MB memory logging / 1024 s/c

Accessories

Software	
COMEXT4P1Y	Communicator EXT 4.0 Software for Windows Single-Computer License (One Year)
Displays	
P40N+ P41N+ P43N+	Multifunction LED Display/Master Amp Display Slave Watt/VAR/PF Display Slave
I/O Modules	
1mAON4 1mAON8 20mAON4 20mAON8 8AI1 8AI2 8AI3 8AI4 4RO1 4PO1 8DI1 PSIO	4 Analog Outputs, 0±1 mA 8 Analog Outputs, 0±1 mA 4 Analog Outputs, 4-20 mA 8 Analog Outputs, 4-20 mA 8 Analog Inputs, 0±1 mA 8 Analog Inputs, 4-20 mA 8 Analog Inputs, 0±5 V DC 8 Analog Inputs, 0±10 V DC 4 Relay Outputs 4 Solid State Pulse Outputs 8 Digital Status Inputs Power Supply for Additional I/O Modules
*MBIO E171103	I/O Mounting Bracket DIN Rail Mount Kit for Nexus® 1450 meter

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Nexus® 1450 web page:

Electro Industries/GaugeTech™
The Leader in Power Monitoring and Smart Grid Solutions™

Accessories Note:

* Must be ordered with an external I/O module.