

POWERSCOUT™

COMMUNICATIONS: INDUSTRY-STANDARD MODBUS OR BACNET

PowerScout 3 Plus: Communications interface to the PowerScout 3 Plus is through either an RS-485 serial connection or over Ethernet. The PowerScout 3 Plus can use either the BACnet IP or MS/TP protocol or Modbus TCP or RS-485 protocol for sending commands and retrieving data.

PowerScout 24: Communications interface to the PowerScout 24 Plus is through either an RS-485 serial connection or over Ethernet. The PowerScout 3 Plus can use either the BACnet IP or MS/TP protocol or Modbus TCP or RS-485 protocol for sending commands and retrieving data.

MULTI-CIRCUIT OR BRANCH CIRCUIT MONITORING

The PowerScout 24 is a versatile, multi-channel (CT) instrument. The modular design allows it to be configured for monitoring multiple electrical circuits (sharing a common voltage source) or for current-only monitoring of branch circuits. It can be supplied with virtually any combination of DENT's internally-shunted split-core or RoCoil CTs and is equipped with either an RS-485 Serial or Ethernet interface. Monitor up to 8 three-phase or 24 single-phase electrical devices with the PowerScout 24.

With data updates every 1 second and accuracy better than 1% (depending on CT), the PowerScout 24 is well-suited for data center monitoring, tenant sub-metering, and for accountability metering in commercial, retail, and industrial facilities.

The PowerScout 24 is available as a bare circuit board (UL Recognized) or with a convenient rugged enclosure (UL Listed).

VIEWPOINT SOFTWARE: QUICK & EASY DIAGNOSTICS

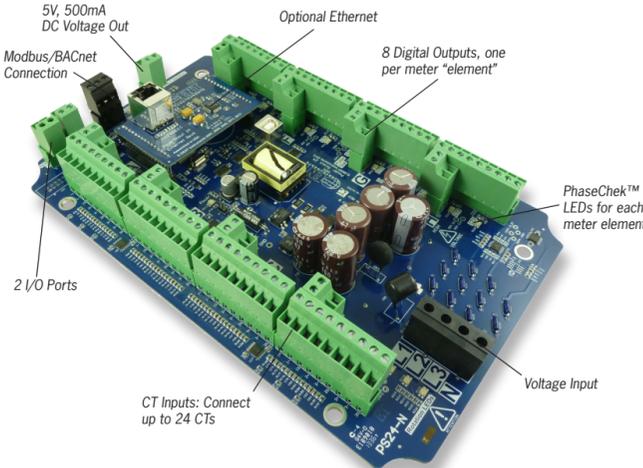
DENT's ViewPoint™ software utility allows you to easily configure the PowerScout for the connected CTs and to check real-time values to ensure that the meter is properly configured. ViewPoint is the quick and easy way to:

- Verify meter installation
- Check real-time values before leaving the job site
- Read and write to specific Modbus registers
- Set the data scalar setting
- Update PowerScout firmware



DETAILS

POWERSCOUT 24 ANATOMY



POWERSCOUT 3 PLUS SERIAL ANATOMY



POWERSCOUT 3 ETHERNET



POWERSCOUT™ SPECIFICATIONS

TECHNICAL

SERVICE TYPE	Single Phase, Three Phase-Four Wire (WYE), Three Phase-Three Wire (Delta)
POWER	From L1 Phase to L2 Phase. 80-600VAC CAT III 50/60Hz, 70mA Max. Non-user replaceable .5 Amp internal fuse protection
POWER OUT	PS24: Unregulated 5VDC output, 500 mA Max
VOLTAGE CHANNELS*	80-346 Volts AC Line-to-Neutral, 600V Phase-to-Phase, CAT III
CURRENT CHANNELS	3 or 24 channels, 0.67 VAC max, 333 mV CTs, 0-5,000 Amps depending on CT
MAXIMUM CURRENT INPUT	200% of current transducer rating (mV CTs) Measure up to 5000A with RoCoil CTs
MEASUREMENT TYPE	True RMS using high-speed digital signal processing (DSP)
LINE FREQUENCY	50/60 Hz
WAVEFORM SAMPLING	12 kHz
PARAMETER UPDATE RATE	PS3: .5 seconds, PS24: 1 second
MEASUREMENTS	Volts, Amps, kW, kWh, kVAR, kVARh, kVA, kVAh, aPF, dPF.
ACCURACY	PS3: 0.2% (<0.1% typical) ANSI C12.20-2010 Class 0.2 PS24: 1% (<0.5% typical) for V, A, kW, kVAR, kVA, PF.
RESOLUTION	0.01 Amp, 0.1 Volt, 0.01 watt, 0.01 VAR, 0.01 VA, 0.01 Power Factor depending on scalar setting
LED INDICATORS	Bi-color LEDs (red and green): 1 LED to indicate communication, 3 LEDs for correct CT-to-phase installation (per meter element).
PULSE OUTPUT	Open Collector, 75mA max current, 40V max open voltage

COMMUNICATIONS

DIRECT	PS3: User selectable Modbus/BACnet Master Slave Token Passing protocol (MS/TP) or BACnet IP/Modbus TCP over Ethernet PS24: User selectable Modbus/BACnet Master Slave Token Passing protocol (MS/TP) or BACnet IP/Modbus TCP over Ethernet
MAX DISTANCE	1200 meters with Data Range of 100K bits/second or less
BAUD RATE	9600 (Modbus default), 19200, 38400, 57600, 76800 (BACnet default), 115200
DATA BITS	8
PARITY	None, Even, Odd
STOP BIT	2, 1
DATA FORMATS	Modbus or BACnet

MECHANICAL

OPERATING TEMPERATURE	-7° to 60°C (-20° to 140°F)
HUMIDITY	5% to 95% non-condensing
ENCLOSURE	PS3: ABS Plastic, 94-V0 flammability rating PS24 (optional): PC UL 94 5V
WEIGHT	PS3: 357 g (12.6 ounces), exclusive of CTs PS24 Without Enclosure: 369 g (13 oz) PS24 With Enclosure: 610 g (21.5 oz)
DIMENSIONS	PS3: 21.8 x 5.8 x 4.0 cm (8.6" x 2.3" x 1.6") PS24 Without Enclosure: 25.5 x 16.5 x 3.2 cm (10.0" x 6.5" x 1.3") PS24 With Enclosure: 27.8 x 18.8 x 13.0 cm (10.9" x 7.4" x 5.1")

*US/NORTH AMERICAN PowerScout 3 Plus configuration includes 4 color (black, blue, red, white) voltage wires. INTERNATIONAL PowerScout 3 Plus configuration includes 4 labeled black voltage leads. The PowerScout 24 voltage leads are customer-supplied.

VIEWPOINT SOFTWARE

OPERATING SYSTEM	Windows® 8, Windows® 7 (32/64 bit), Windows® Vista (32/64 bit), or Windows® XP
COMMUNICATIONS	USB to RS485 Adapter (serial). Ethernet available on PS3 and PS24. One USB Port required on PC.

POWERSCOUT PART NUMBERS

PS3P-US	PowerScout™ 3 Plus (indoor enclosure, US Version)
PS3P-I	PowerScout™ 3 Plus (indoor enclosure, Int'l Version)
PS3E-US	PowerScout™ 3 Plus Ethernet (indoor, US Version)
PS3E-I	PowerScout™ 3 Plus Ethernet (indoor, Int'l Version)
PS24-N-S	PowerScout™ 24 Serial (circuit board only)
PS24-D-S	PowerScout™ 24 Serial (indoor enclosure)
PS24-N-E	PowerScout™ 24 Ethernet (circuit board only)
PS24-D-E	PowerScout™ 24 Ethernet (indoor enclosure)

SAFETY

POWERSCOUT 3 PLUS POWERSCOUT 3 ETHERNET	UL Listed and CE Mark Conforms to UL Std 61010-1 Certified to CSA Std C22.2 No. 61010-1
POWERSCOUT 24 N Serial (circuit board only)	UL Recognized, CE Mark Conforms to UL Std 61010-1 Certified to CSA Std C22.2 No. 61010-1
POWERSCOUT 24 D Serial (with indoor enclosure)	UL Listed, CE Mark Conforms to UL Std 61010-1 Certified to CSA Std C22.2 No. 61010-1
POWERSCOUT 24 N Ethernet (circuit board only)	UL Recognized Conforms to UL Std 61010-1 Certified to CSA Std C22.2 No. 61010-1
POWERSCOUT 24 D Ethernet (with indoor enclosure)	UL Listed Conforms to UL Std 61010-1 Certified to CSA Std C22.2 No. 61010-1

MODBUS REGISTER/BACNET OBJECT DESCRIPTIONS (PARTIAL LIST)

System True Energy +/- (kWh)	Individual Phase to Phase Voltages
Instantaneous Total True Power +/- (kW)	Individual Phases True Energy +/- (kWh)
Peak Demand (Adjustable Window) (kW)	Individual Phases True Power +/- (kW)
Maximum Instantaneous Power +/- (kW)	Individual Phases Reactive Energy +/- (kVARh)
Minimum Instantaneous Power +/- (kW)	Individual Phases Reactive Power +/- (kVAR)
System Reactive Energy +/- (kVARh)	Individual Phases Apparent Energy kWh
System Apparent Energy (kVAh)	Individual Phases Apparent Power (kVA)
System Apparent Power (kVA)	Individual Phases Apparent Power Factor (aPF)
System Displacement Power Factor (dPF)	Individual Phases Displacement Power Factor (dPF)
System Apparent Power Factor (aPF)	Individual Phases Line to Neutral Voltages (Volts)
Average Line to Line Voltage (Volts)	Individual Phases Line to Line Voltages (Volts)
Average Line to Neutral Voltage (Volts)	



DENT Instruments, Inc.
Energy & Power Measurement Solutions

An ISO 9001:2008 Certified Company
925 SW EMKAY DRIVE
BEND, OREGON 97702 USA
541.388.4774 | 800.388.0770
www.DENTInstruments.com

DISTRIBUTOR:
PLACE CONTACT INFO HERE



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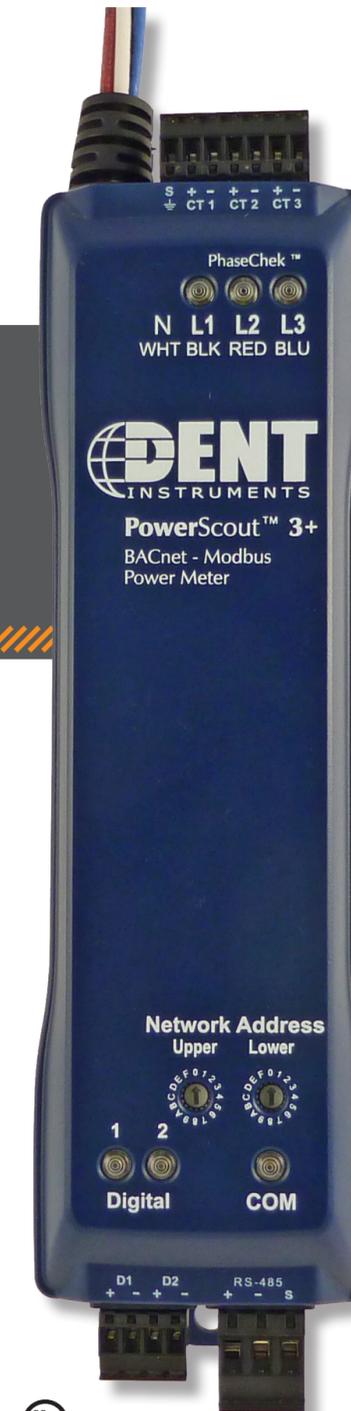
POWERSCOUT™ SERIES

NETWORKED POWER METERS

HIGH PERFORMANCE INSTRUMENTS FOR ENERGY MEASUREMENT

FEATURES

- Monitors voltage, current, power, energy, and many other electrical parameters on single and three-phase electrical systems.
- Available in single point 3-phase meter (PowerScout 3 Plus) or multi-circuit configuration (PowerScout 24).
- The PowerScout Series uses either BACnet or Modbus protocol and features digital pulse output ports. Available as a Serial or Ethernet device.
- Positive and negative Modbus registers/BACnet objects allow for the PowerScout to be used on net metering projects.
- Mix-and-match a full range of Split Core or RoCoil™ Rogowski-style current transformers.
- PhaseChek™ LED indicators confirm proper CT orientation.
- Line-Powered: 80-600V Phase-to-Phase Power Supply.*
- PS3+: Data updates occur every 0.5 seconds. PS24: Data updates every 1 second.
- UL† and CE Mark**
- ANSI C12.20-2010 Class 0.2 (PowerScout 3 Plus)



† PS3+ and PS24D (with enclosure) are UL Listed. PS24N (without enclosure) is UL Recognized.

*Use on 120/240V, 480/277V, 580/355V, or 380/220V services. 50 or 60 Hz.

**CE Mark on PS3+ and PS24 Serial models.



POWERSCOUT™ FEATURES

DEPENDABLE & PRECISE ENERGY MEASUREMENT

DENT's PowerScout series networked power meters are submetering devices designed to provide timely and accurate consumption data necessary to gain the upper hand on electrical costs in today's escalating energy market. These meters can capture kWh/kW energy and demand data as well as virtually all relevant energy parameters for diagnostics and monitoring on three-phase or single-phase circuit installations. The PowerScout's flexibility, size, and ease-of-use make them ideal tools for gathering detailed consumption information in commercial, industrial, government, and retail environments.

VERSATILE PERFORMANCE

The PowerScout uses direct connections to each phase of the voltage and various interchangeable CT options such as split-core current transformers or flexible RoCoils (for large loads or large cables and bussbars) to monitor current on each phase. Every PowerScout has embedded Rogowski coil CT amplifier/integrator circuitry—no need to provide external power to the CTs.

All DENT CTs are internally shunted and carry UL or ETL certification and CE Mark for intrinsically safe operation on energized conductors. Special high-accuracy CTs are available for existing CT secondary monitoring.

The PowerScout makes over 50 total electrical measurements which are derived from the voltage and current inputs, including energy and demand values.

FOOL-PROOF INSTALLATION

The PowerScout series instruments are line powered and do not require external power. Its power supply can accommodate service voltages ranging from 80-600V (phase-to-phase). The simple installation is accomplished by connecting the color-coded voltage leads and clearly labeled CTs. DENT's patented PhaseChek™ circuitry includes a 3 LED indicator display that confirms proper CT-to-phase installation.

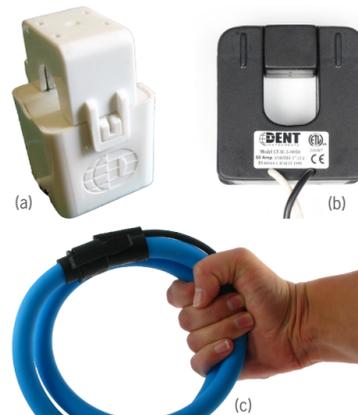
FLEXIBLE CONFIGURATION

The PowerScout 24 (far right, pictured in optional NEMA-rated enclosure) can utilize up to 24 current transformers and monitor a combination of three-phase and single-phase loads simultaneously. The meter also provides eight digital outputs, two digital inputs, and a 5V 500mA power output.

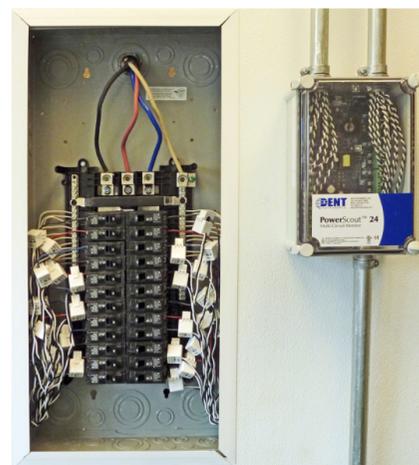
The PowerScout can accommodate a wide range of voltage services (80-600V phase-to-phase).



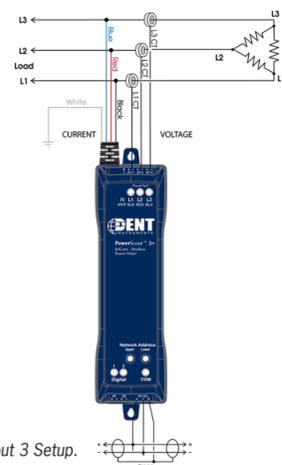
The Next Generation PowerScout 3 Plus with flexible Rogowski coils CTs minimize installation effort and cost.



A wide selection of CTs are available. Pictured: (a) Mini-Hinged, (b) Split-Core, and (c) flexible RoCoil (Rogowski) CTs



Typical PowerScout 3 Setup.



POWERSCOUT™ TRANSFORMERS

PowerScout instruments can be equipped with a wide selection of current transformers. Choose from compact and economical Split-Core CTs or the versatile Rogowski Flex CTs. Each type offers its own particular advantages depending on your application. DENT CTs are interchangeable to meet your varying project requirements.

	MINI HINGED HSC-020, -050	MIDI HINGED HMC-100, -200	HIGH ACCURACY SHS-0005, -0015	SMALL SPLIT CORE SCS-0050, -0100	MED SPLIT CORE SCM-0100, -0200, -0400, -0600	LARGE SPLIT CORE SCL-0600, -1000	ROCOIL R16, R24, R36, R47	ROCOIL R72
KEY SPECIFICATIONS								
WINDOW SIZE	1 cm (0.4")	2.5 cm (1.0")	1.0 cm (0.4")	1.9 cm (.75")	3.2 cm (1.25")	5.1 cm (2.0")	16": 11.5 cm (4.5") 24": 17.9 cm (7.0") 36": 27.5 cm (10.8") 47": 37.0 cm (14.6")	72": 56.0 cm (22.0")
OUTPUT SIGNAL	333 mV at rated current	333 mV at rated current	333 mV at rated current	333 mV at rated current	333 mV at rated current	333 mV at rated current	131 mV/1000A @ 60 Hz 110 mV/1000A @ 50 Hz	131 mV/1000A @ 60 Hz 110 mV/1000A @ 50 Hz
USEFUL CURRENT RANGE	0.25-40 Amps 0.25-80 Amps	1-200 Amps 1-300 Amps	0.05-7 Amps, 0.15-20 Amps	1-65 Amps 2-130 Amps	5-130, 4-260, 8-520, 12-780 Amps	30-780 Amps 20-1300 Amps	PS3/PS24: 5-5000 Amps	PS3/PS24: 5-5000 Amps
ELECTRICAL SPECIFICATIONS								
NOMINAL RATING	20, 50 Amps	100, 200 Amps	5 Amps, 15 Amps	50, 100 Amps	100, 200, 400, 600 Amps	600, 1000 Amps	5000 Amps	5000 Amps
ACCURACY	<0.5% at rated current	<1.0% at rated current	+/- 0.5% at rated current	+/- 1% at 10% to 130% of rated current	+/- 1% at 10% to 130% of rated current	+/- 1% at 10% to 130% of rated current	<0.6% **	<1%
PHASE SHIFT	<1.5° at rated current	<0.5° at rated current	<0.5° at rated current	<2° at rated current	<2° at rated current	<2° at rated current	< 0.2° at 50/60 Hz	<1° at 50/60 Hz
FREQUENCY RANGE	50 Hz to 400 Hz	50 Hz to 400 Hz	40 Hz to 1 kHz	50 Hz to 400 Hz	50 Hz to 400 Hz	50 Hz to 400 Hz	20 Hz to 5 kHz	40 Hz to 5 kHz
DIELECTRIC STRENGTH	3520 VAC for 1 minute	5200 VAC for 1 minute	5000V around the case 600V rated leads	5000V around the case 600V rated leads	5000V around the case 600V rated leads	5000V around the case 600V rated leads	7400 VAC around coil 1000 VAC rated leads	7400 VAC around coil 1000 VAC rated leads
MECHANICAL SPECIFICATIONS								
DIMENSIONS	2.6 x 2.9 x 4.2 cm (1.04 x 1.16" x 1.64")	4.7 x 4.7 x 7.0 cm (1.85 x 1.85 x 2.76")	6.4 x 2.5 x 5.1 cm (2.5 x 1.0 x 2.0")	5.08 x 5.34 x 1.55 cm (2.0 x 2.1 x 0.6")	8.26 x 8.6 x 2.54 cm (3.3 x 3.4 x 1.0")	12.07 x 12.70 x 3.05 cm (4.8 x 5.0 x 1.2")	Length 16" (40 cm) Length 24" (60 cm) Length 36" (90 cm) Length 47" (120 cm)	Length 72" (183 cm)
WEIGHT	91 g (3.2 oz)	221 g (7.8 oz)	136 g (4.8 oz)	136 g (4.8 oz)	340 g (12 oz)	748 g (26 oz)	16": 136 g (5 oz) 24": 181 g (6 oz) 36": 227 g (8 oz) 47": 272 g (10 oz)	544 g (19 oz)
POLARITY	White lead is positive	White lead is positive	White lead is positive	White lead is positive	White lead is positive	White lead is positive	White lead is positive	White lead is positive
OUTPUT LEAD	Leads 2.7 m (8 ft) twisted pair, 20 AWG	Leads 2.7 m (8 ft) twisted pair, 22 AWG	Leads 2.7 m (8 ft) twisted pair, 22 AWG	Leads 2.7 m (8 ft) twisted pair, 20 AWG	Leads 2.7 m (8 ft) twisted pair, 20 AWG	Leads 2.7 m (8 ft) twisted pair, 20 AWG	2 m (79") shielded cable	2 m (79") shielded cable
OPERATING TEMPERATURE	-15° to 60° C (5° to 140° F)	-15° to 60° C (5° to 140° F)	-20° to 55° C (-4° to 131° F)	-20° to 55° C (-4° to 131° F)	-20° to 55° C (-4° to 131° F)	-20° to 55° C (-4° to 131° F)	-20° to +70° C (-4° to +158° F)	-20° to +80° C (-4° to +176° F)
STORAGE TEMPERATURE	Maximum 105° C (220° F)	Maximum 105° C (220° F)	Maximum 105° C (220° F)	Maximum 80° C (176° F)	Maximum 80° C (176° F)	Maximum 80° C (176° F)	Maximum 80° C (176° F)	Maximum 80° C (176° F)
CASE PROTECTION	White nylon, UL 94 V-0	White nylon, UL 94 V-0	Epoxy encapsulated housing ABS/PVS UL 94 V-0	Epoxy encapsulated housing ABS/PVS UL 94 V-0	Epoxy encapsulated housing ABS/PVS UL 94 V-0	Epoxy encapsulated housing ABS/PVS UL 94 V-0	PA6 UL 94 V-0	Polypropylene UL 94 V-0 rated
SAFETY SPECIFICATIONS								
SAFETY REQUIREMENTS	UL Recognized: UL STD 61010-1 Certified to: CAN/CSA STD C22.2 No. 61010-1	UL Recognized: UL STD 61010-1 Certified to: CAN/CSA STD C22.2 No. 61010-1	CAN/CSA-C60044-1-2007 pts 1 & 2 ANSI/IEEE C57.13, IEEE C57.13.2	Compliant with IEEE C57.13-1993 CE Mark	Compliant with IEEE C57.13-1993 CE Mark	Compliant with IEEE C57.13-1993 CE Mark	Conforms to UL STD 61010-1 Certified to CAN/CSA STD C22.2 No. 61010	Conforms to UL STD 61010-1 Certified to CAN/CSA STD C22.2 No. 61010
WORKING VOLTAGE	600 VAC Category III	600 VAC Category III	Maximum 600 Vrms UL 506	Maximum 600 Vrms Category III	Maximum 600 Vrms Category III	Maximum 600 Vrms Category III	Maximum 1000 Vrms Category III	Maximum 1000 Vrms Category III

** Installed using best practices with conductor centered in the CT window and ensure any external conductors are a minimum distance of > 2X the diameter of the RoCoil. Accuracy below 20A rated at 1.5% +/- 0.5A when used with DENT ELITEpro/PowerScout meters.

FOCUSED ON ENERGY MEASUREMENT

DENT Instruments designs and manufactures data loggers and energy recorders for today's energy professionals. Our products are often the first step in developing strong energy strategies, for maintaining peak operations, and for lowering operating costs. Our company has built a reputation for providing instruments of the highest quality whose robust design, small size and remote data acquisition make them the loggers of choice for companies large and small.

Since the company's emergence in 1988, we have performed energy measurement studies for a wide range of utility, government, and private clients. This unique customer perspective has strongly influenced the design of our products, reflected in their ease of installation and use.

DENT products provide meaningful energy data that is used to accurately allocate energy costs, identify energy cost-savings opportunities and lower utility bills. Our versatile instruments help pinpoint electrical usage and quantify consumption.