PowerScout™ Series
Technical Information

TECHNICAL SPECIFICATIONS	
Service Types	Single Phase, Three Phase-Four Wire (WYE), Three Phase-Three Wire (Delta)
Power	From L1 to L2 Phase. 80-600VAC CAT III 50/60 Hz, 70 mA Max. Non user-replaceable .5 Amp internal fuse protection
3 Voltage Channels	60-600 Volts AC, Higher AC voltages can be measured with a Potential (voltage) Transformer
3 Current Channels	0-5,000+ Amps depending on current transformer
Measurement Type	True RMS using high-speed digital signal processing (DSP)
Line Frequency	50/60Hz or 400Hz†
Waveform Sampling	12 kHz voltage and current
Measurements	Volts, Amps, kW, kWh, kVAR, kVARh, kVA, kVAh Apparent Power Factor (aPF) Displacement Power Factor (dPF) All parameters for each phase and for system total
Accuracy	Better Than 1% (<0.5% typical) for V, A, kW, kVAR, kVA, PF excluding sensor
Resolution	Adjustable, 0.1 Amp, 0.1 Volt, 1 watt, 1 VAR, 1 VA, 0.01 Power Factor typical
Indicators	3 LEDs for setup, 1 per phase: Green when voltage and current on the on the same phase, Red when incorrectly wired (PhaseChek™), a 4th LED for Power On and communication indication
COMMUNICATION SPECIFICATIONS	
Direct	Modbus or BACnet (MS/TP) over RS-485†
Modbus Framing	RTU (binary)
Communication Rate	9600 baud (PS18), 19200†, 38400†, 57600†, 76800†, 115200†
Data Bits	8
Parity	None (PS18), Even†, Odd†
Stop Bit	1 (PS18), 2†, 0†
Data Formats	**PS3 Plus:** Modbus or BACnet (MS/TP) **PS18:** Modbus only
MECHANICAL SPECIFICATIONS	
Operating Temperature	-7 to +60°C (-20 to +140°F)
Humidity	5% to 95% non-condensing
Enclosure	**PS3 Plus:** PC/ABS UL 94 V0 **PS18:** PC UL 94 5V
Weight *(exclusive of CTs)*	**PS3 Plus:** 283 g (10 oz) **PS18 Without Enclosure**: 454 g (16 oz) **PS18 With Enclosure**: 1361 g (48 oz)
Dimensions*	**PS3 Plus:** 21.8 (L) x 5.8 (W) x 4.0 cm (H) (8.6″ x 2.3″ x 1.6″) **PS18 Without Enclosure:** 25.5 (L) x 16.5 (W) x 5.5 cm (H) (10.0″ x 6.5″ x 2.0″) **PS18 With Enclosure:** 27.79 (L) x 18.80 (W) x 13.00 cm (H) (10.94″ x 7.40″ x 5.12″) **Not including mounting brackets.*

POWERSCOUT™ PART NUMBERS (CURRENT TRANSFORMERS ORDERED SEPARATELY)	
PS18-N	PowerScout™ 18 (circuit board only)
PS18-D	PowerScout™ 18 (indoor enclosure)
PS3P-US	PowerScout™ 3*plus* (indoor enclosure, US Version)
PS3P-I	PowerScout™ 3*plus* (indoor enclosure, Int'l Version)

MODBUS REGISTER DESCRIPTIONS (PARTIAL LIST)
Total Net True Energy (kWh)
Instantaneous Total True Power (kW)
Peak Demand (adjustable window) (kW)
Maximum Instantaneous Power (kW)
Minimum Instantaneous Power (kW)
Total Net Reactive Energy (kVARh)
Total Reactive Power (kVAR)
Total Apparent Energy (kVAh)
Total Apparent Power (kVA)
System Displacement Power Factor (dPF)
System Apparent Power Factor (aPF)
Total Current in all phases (Amps)
Average Line—Line Voltage (Volts)
Average Line—Neutral Voltage (Volts)
Individual Phase—Phase Voltages
Line Frequency (Hz)
Individual Phases True Energy (kWh)
Individual Phases True Power (kW)
Individual Phases Reactive Energy (kVARh)
Individual Phases Reactive Power (kVAR)
Individual Phases Apparent Energy (kVAh)
Individual Phases Apparent Power (kVA)
Individual Phases Apparent Power Factor (aPF)
Individual Phases Displacement Power Factor (dPF)
Individual Phases Current (Amps)
Individual Phases Line to Neutral Voltages (Volts)
Individual Phases Line to Line Voltages (Volts)
Multiple Meters External Data Synchronization

†PowerScout 3 Plus only.

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DENT INSTRUMENTS

PowerScout™ Series

NETWORKED POWER METERS

High Performance Instruments for Energy Measurement

Now with NEW BACnet Compatible PowerScout 3plus

- Monitors the voltage, current, power, energy, and many other electrical parameters on single and three-phase electrical systems
- Available in single point 3-phase meter or multi-circuit configuration
- RS-485 serial connection communications interface
- The PowerScout 3 Plus uses either BACnet or Modbus protocol and features two digital pulse output ports
- Mix-and-match a full range of Split-Core or RōCoil™ Rogowski-style current transformers available
- PhaseChek™ LED indicators ensure correct CT orientation during installation
- Line-Powered: 60-600V Phase-Phase Power Supply*
- Data updates occur every 0.5 seconds
- ETL and CE Mark

*Use on 120/240V, 208/120V, 480/277V or 580/335V, 380/220V services; 50 or 60 Hz

2009 DEALER DESIGN AWARDS

Flexible and precise solutions for real-time energy measurement and monitoring applications

PowerScout™ Series

Dependable Instruments for 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 on Single or Three-Phase Electrical Services

The PowerScout™ uses direct connections to each phase of the voltage and various interchangeable CT options such as split-core current transformers or flexible RōCoils™ (for large loads or large cables and busbars) to monitor current on each phase. All DENT CTs are internally shunted with ETL and CE mark for intrinsically safe operation on energized conductors. Special high-accuracy CTs are available for existing CT secondary monitoring. The PowerScout™ is available with or without enclosure, depending on the site environment.

The PowerScout™ makes over 50 total electrical measurements which are derived from the voltage and current inputs. Electrical load diagnostic parameters such as power factor (both Apparent and Displacement) and line frequency are captured in addition to energy and demand values.

Equipped with Industry Standard Modbus or BACnet Communications

Communications interface to the PowerScout™ is through an RS-485 serial connection using the industry standard Modbus protocol. Up to 254 PowerScout™ 3 Plus meters may be connected to a single RTU or datalogger for monitoring and recording power usage at multiple locations within a single site. DENT's proprietary ViewPoint™ software utility allows you to easily configure the PowerScout™ for the connected CTs and to check readings.

The PowerScout 3 Plus can use either the BACnet Master Slave Token Passing (MS/TP) protocol or Modbus protocol for sending commands and retrieving data. Up to 127 PowerScout 3 Plus meter may be connected to a single BACnet client for monitoring and recording power usage at multiple locations within a single site. Up to 254 meters may be connected to Modbus.

Ideal for Fool-Proof Installation

The PowerScout™ requires no external power and its power supply can accommodate service voltages ranging from 60-600V (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. The PowerScout™ automatically adjusts for CT orientation—greatly reducing set-up time and all but eliminating installation errors.

Multi-Circuit or Branch Circuit Monitoring

The PowerScout™ 18 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, RoCoil™, or clamp-on CTs and is equipped with an RS-485 Modbus interface. Monitor up to 6 three-phase electrical devices with the PowerScout™ 18. Available as a bare circuit board (pictured right) or with a convenient rugged enclosure.

Data updates occur every 0.5 seconds and with accuracy better than 1% (depending on CT), the PowerScout™ 18 is well suited for data center monitoring, tenant sub-metering and for accountability metering in commercial, retail and industrial facilities.

*The Next Generation **PowerScout™ 3**plus with Full Utility Metering™.*

PowerScout™ 18 D version with NEMA enclosure.

PowerScout™ 18 N version circuit board.

Current Transformers

PowerScout's™ Flexible Choice of Current Transformers

All DENT current transformers are internally shunted and, therefore, inherently safe compared to other commercially available CTs. Choose from three types: **Split-Core**, **RōCoil™** and **Clamp-On** (not pictured).

Available Current Transformers

	MINI HINGED HSC-020, -050	**MIDI HINGED** HMC-100, -200	**HIGH ACCURACY** SHS-0005	**SM. SPLIT CORE** SCS-0050, -0100	**MED. SPLIT CORE** SCM-0100, -0200, -0400, -0600	**LG. SPLIT CORE** SCL-0600, 1000	**ROCOIL™** R16, R24, R36
							
KEY SPECIFICATIONS							
WINDOW SIZE	10.0 mm (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″: 13 cm (5″) 24″: 19 cm (7″) 36″: 26 cm (10″) 72″: 56 cm (22″)
OUTPUT SIGNAL	333 mV at rated current	333 mV at rated current	333mV at rated current	333mV at rated current	333mV at rated current	333mV at rated current	131mV/1000A @ 60 Hz 110mV/1000A @ 50 Hz
USEFUL CURRENT RANGE	0.25-26A, 0.25-65 Amps	1-200 Amps 1-3000 Amps	0.05-7 Amps	5-65, 10-130 Amps	10-130, 20-260, 40-520, 60-780 Amps	60-780, 100-1200 Amps	PS3: 25-5000A PS18: 25-3500A
ELECTRICAL SPECIFICATIONS							
NOMINAL RATING	20, 50 Amps	100, 200 Amps	5 Amps	50, 100 Amps	100, 200, 400, 600 Amps	600, 1000 Amps	N/A
ACCURACY	<0.5% at rated current	<1.0% at rated current	+/- 1% at 0.5% to 140% of 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	+/- 1% reading
PHASE SHIFT	<1.5° at rated current	<0.5° at rated current	<1° at rated current	<2° at rated current	<2° at rated current	<2° at rated current	< 1° at 50/60 Hz
FREQUENCY RANGE	50 to 400 Hz	50 to 400 Hz	10 Hz to 10 KHz	50 Hz to 400 Hz	50 Hz to 400 Hz	50 Hz to 400 Hz	40 Hz to 5000 Hz
DIELECTRIC STRENGTH	3520 VAC for 1 minute	50 to 400 Hz	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
MECHANICAL SPECIFICATIONS							
DIMENSIONS	26.4 x 29.4 x 41.7 mm (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 72″ (180 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″: 184 g (6 oz) 24″: 216 g (7 oz) 36″: 312 g (11 oz) 72″: 495 g (17 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	Brown lead is positive
OUTPUT LEAD	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, 22 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, 22 AWG	2 m (6 ft) shielded cable
OPERATING TEMPERATURE	-15 to 60° C (5 to 140 °F)	-15 to 60° C (5 to 140 °F)	-20° to 50 °C (-4° to 122 °F)	Maximum 105 °C (220 °F)	Maximum 105 °C (220 °F)	Maximum 105 °C (220 °F)	-10° to +80 °C (+14° to +176 °F)
STORAGE TEMPERATURE	Maximum 105 °C (220 °F)	Maximum 105 °C (220 °F)	Maximum 105 °C (220 °F)	Maximum 105 °C (220 °F)	Maximum 105 °C (220 °F)	Maximum 105 °C (220 °F)	Maximum 80 °C (176 °F)
CASE PROTECTION	White nylon, UL 94 V-0	White nylon, UL 94 V-0	Epoxy encapsulated housing or Plastic ABS/PVS	Epoxy encapsulated housing	Epoxy encapsulated housing	Epoxy encapsulated housing	Thermoplastic Rubber
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	Compliant with IEEE C57.13-1993 CE Mark	Compliant with IEEE C57.13-1993 CE Mark	Compliant with IEEE C57.13-1993 CE Mark	Compliant with IEEE C57.13-1993 CE Mark	CE Mark, Double Insulation, EN-61010 UL 94V0
WORKING VOLTAGE	600 VAC, Category III	600 VAC, Category III	Maximum 600 Vrms	Maximum 600 Vrms	Maximum 600 Vrms	Maximum 600 Vrms	Maximum 1000 Vrms Category III