

# 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 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 RoCoil™ Rogowski-style current transformers.
- PhaseChek LED indicators ensure correct CT orientation during installation.
- Line-Powered: 80-600V Phase-Phase Power Supply.\*
- Data updates occur every 0.5 seconds.
- UL and CE Mark (PS3+). ETL and CE Mark (PS18)
- ANSI C12.20-2010 Class 0.2 (PS3+)

## APPLICATIONS

- Tenant Submetering
- Data Center Monitoring
- Commercial
- Retail
- Industrial

# POWERSCOUT™ DETAILS

## 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 RoCoils (for large loads or large cables and bussbars) to monitor current on each phase. All DENT CTs are internally shunted with UL or ETL and CE Mark for intrinsically safe operation on energized conductors. Special high-accuracy CTs are available for existing CT secondary monitoring. The PowerScout 18 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.

## IDEAL FOR FOOL-PROOF INSTALLATION

The PowerScout requires no external power and 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. 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 or RoCoil 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 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.

ETL and CE Mark for safety.



*The Next Generation PowerScout 3 Plus with Full Utility Metering.*



*PowerScout 18 D with NEMA enclosure*

# POWERSCOUT™ FEATURES

## WIDE SELECTION OF CTS

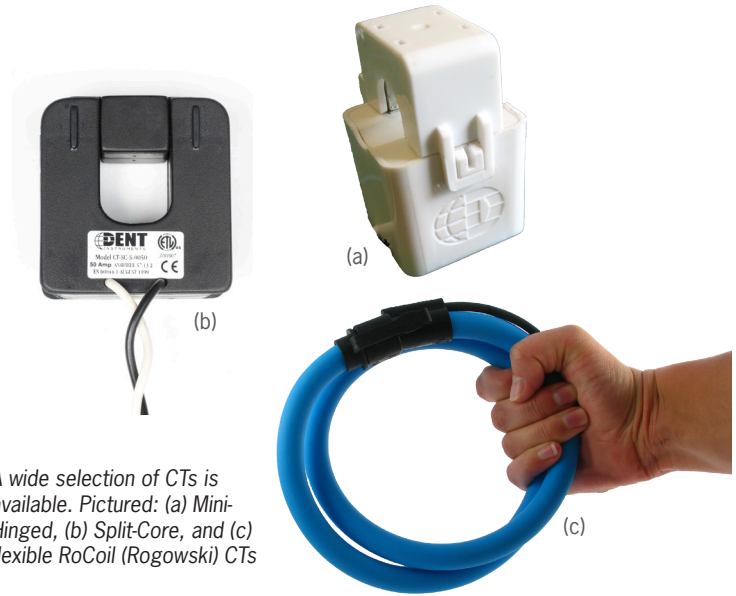
The PowerScout uses interchangeable CT options such as split-core or flexible RoCoil current transformers. With the PowerScout comes embedded Rogowski coil CT amplifier/integrator circuitry—no need to provide external power to the CTs.

All DENT CTs are internally shunted for intrinsically safe operation on energized conductors. Special high-accuracy CTs are available for existing CT secondary monitoring. The PowerScout can monitor single-phase or three-phase loads.

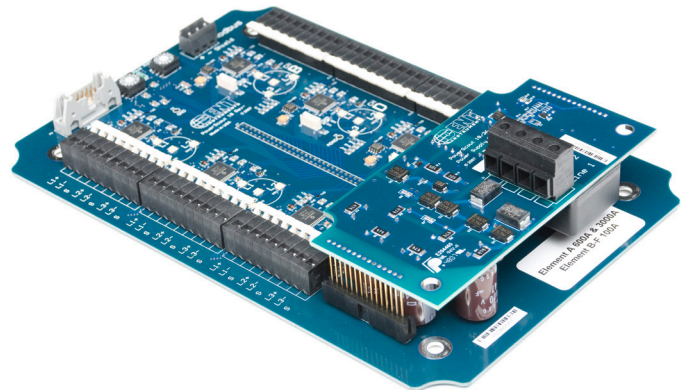
## EQUIPPED WITH INDUSTRY STANDARD MODBUS OR BACNET COMMUNICATIONS

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.



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



PowerScout 18 N: Circuit Board Only Option

# VIEWPOINT™ SOFTWARE UTILITY











## QUICK & EASY DIAGNOSTICS







The Windows-based ViewPoint software utility allows you to easily configure the PowerScout for the connected CTs and to check readings. 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

# 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.

	<b>MINI HINGED</b> HSC-020, -050	<b>MIDI HINGED</b> HMC-100, -200	<b>HIGH ACCURACY</b> SHS-0005, -0015	<b>SMALL SPLIT CORE</b> SCS-0050, -0100
				
KEY SPECIFICATIONS				
<b>WINDOW SIZE</b>	1 cm (0.4")	2.5 cm (1.0")	1.0 cm (0.4")	1.9 cm (.75")
<b>OUTPUT SIGNAL</b>	333 mV at rated current	333 mV at rated current	333 mV at rated current	333 mV at rated current
<b>USEFUL CURRENT RANGE</b>	0.25-40 Amps 0.25-80 Amps	1-200 Amps 1-300 Amps	0.05-7 Amps, 0.15-20 Amps	1-65, 2-130 Amps
ELECTRICAL SPECIFICATIONS				
<b>NOMINAL RATING</b>	20, 50 Amps	100, 200 Amps	5 Amps, 15 Amps	50, 100 Amps
<b>ACCURACY</b>	<0.5% at rated current	<1.0% at rated current	+/- 0.5% at rated current	+/- 1% at 10% to 130% of rated current
<b>PHASE SHIFT</b>	<1.5° at rated current	<0.5° at rated current	<0.5° at rated current	<2° at rated current
<b>FREQUENCY RANGE</b>	50 to 400 Hz	50 to 400 Hz	10 Hz to 10 KHz	50 Hz to 400 Hz
<b>DIELECTRIC STRENGTH</b>	3520 VAC for 1 minute	5200 VAC for 1 minute	5000V around the case 600V rated leads	5000V around the case 600V rated leads
MECHANICAL SPECIFICATIONS				
<b>DIMENSIONS</b>	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")
<b>WEIGHT</b>	91 g (3.2 oz)	221 g (7.8 oz)	136 g (4.8 oz)	136 g (4.8 oz)
<b>POLARITY</b>	White lead is positive	White lead is positive	White lead is positive	White lead is positive
<b>OUTPUT LEAD</b>	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
<b>OPERATING TEMPERATURE</b>	-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)
<b>STORAGE TEMPERATURE</b>	Maximum 105 °C (220 °F)	Maximum 105 °C (220 °F)	Maximum 80 °C (176 °F)	Maximum 80 °C (176 °F)
<b>CASE PROTECTION</b>	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
SAFETY SPECIFICATIONS				
<b>SAFETY REQUIREMENTS</b>	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 
<b>WORKING VOLTAGE</b>	600 VAC Category III	600 VAC Category III	Maximum 600 Vrms UL 506	Maximum 600 Vrms Category III

<b>MED SPLIT CORE</b> SCM-0100, -0200, -0400, -0600	<b>LARGE SPLIT CORE</b> SCL-0600, -1000	<b>ROCOIL</b> R16, R24, R36, R72
		
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")
333 mV at rated current	333 mV at rated current	131 mV/1000A @ 60 Hz 110 mV/1000A @ 50 Hz
5-130, 4-260, 8-520, 12-780 Amps	30-780, 20-1300 Amps	ESP/PS3: 5-5000 Amps* PS18: 50-3500 Amps
100, 200, 400, 600 Amps	600, 1000 Amps	3000 Amps
+/- 1% at 10% to 130% of rated current	+/- 1% at 10% to 130% of rated current	+/- 1% reading
<2° at rated current	<2° at rated current	< 1° at 50/60 Hz
50 Hz to 400 Hz	50 Hz to 400 Hz	40 Hz to 5000 Hz
5000V around the case 600V rated leads	5000V around the case 600V rated leads	7400 VAC around coil 1000 VAC rated leads
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)
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)
White lead is positive	White lead is positive	White lead is positive
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
-20° to 55 °C (-4° to 131 °F)	-20° to 55 °C (-4° to 131 °F)	-10° to +80 °C (+14° to +176 °F)
Maximum 80 °C (176 °F)	Maximum 80 °C (176 °F)	Maximum 80 °C (176 °F)
Epoxy encapsulated housing ABS/PVS UL 94 V-0	Epoxy encapsulated housing ABS/PVS UL 94 V-0	Thermoplastic Rubber UL 94 V-0
Compliant with IEEE C57.13-1993 CE Mark 	Compliant with IEEE C57.13-1993 CE Mark 	CE Mark, Double Insulation, EN-61010 CAN/CSA STD C22.2 No. 61010-1 
Maximum 600 Vrms Category III	Maximum 600 Vrms Category III	Maximum 1000 Vrms Category III

\*Depending on meter compatibility, ELITEpro SP (v.212 or newer firmware) and PowerScout 3 (v3.16 or newer firmware) rated for 5-5000A.

## 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.

# POWERSCOUT™ SPECIFICATIONS

TECHNICAL	
<b>SERVICE TYPE</b>	Single Phase, Three Phase-Four Wire (WYE), Three Phase-Three Wire (Delta)
<b>POWER</b>	From L1 Phase to L2 Phase. 80-600VAC CAT III 50/60Hz, 70mA Max. Non-user replaceable .5 Amp internal fuse protection
<b>VOLTAGE CHANNELS*</b>	80-346 Volts AC Line-to-Neutral, 600V Line-to-Line, CAT III
<b>CURRENT CHANNELS</b>	0-5,000+ Amps depending on CT
<b>MAXIMUM CURRENT INPUT</b>	175% of current transformer rating
<b>MEASUREMENT TYPE</b>	True RMS using high-speed digital signal processing (DSP)
<b>LINE FREQUENCY</b>	50/60 or 400 Hz†
<b>WAVEFORM SAMPLING</b>	12 kHz voltage and current
<b>CHANNEL SAMPLING RATE</b>	500 milliseconds
<b>MEASUREMENTS</b>	Volts, Amps, kW, kWh, kVAR, kVARh, kVA, kVAh, aPF, dPF
<b>ACCURACY</b>	Better than 1% (<0.5% typical) for V, A, kW, kVAR, kVA, PF ANSI C12.20-2010 Class 0.2 (PS3+ only)
<b>RESOLUTION</b>	0.01 Amp, 0.1 Volt, 0.01 watt, 0.01 VAR, 0.01 VA, 0.01 Power Factor depending on scalar setting
<b>LED INDICATORS</b>	Bi-color LEDs (red and green): 1 LED to indicate communication, 3 LEDs for correct
<b>PULSE OUTPUT</b>	Open Collector, 75mA max current, 40V max open voltage
COMMUNICATIONS	
<b>DIRECT</b>	<b>PS3:</b> User selectable Modbus or BACnet Master Slave Token Passing protocol (MS/TP) <b>PS18:</b> Modbus only
<b>MAX DISTANCE</b>	1200 meters with Data Range of 100K bits/second or less
<b>BAUD RATE</b>	9600 (Modbus default, PS18), 19200, 38400, 57600, 76800 (BACnet default), 115200
<b>DATA BITS</b>	8
<b>PARITY</b>	None (PS18), Even, Odd
<b>STOP BIT</b>	1 (PS18), 2, 0
<b>DATA FORMATS</b>	<b>PS3:</b> Modbus or BACnet (MS/TP), <b>PS18:</b> Modbus
MECHANICAL	
<b>OPERATING TEMPERATURE</b>	-7° to 60°C (-20° to 140°F)
<b>HUMIDITY</b>	5% to 95% non-condensing
<b>ENCLOSURE</b>	<b>PS3:</b> ABS Plastic, 94-V0 flammability rating <b>PS18:</b> PC UL 94 5V
<b>WEIGHT</b>	<b>PS3:</b> 357 g (12.6 ounces), exclusive of CTs <b>PS18 Without Enclosure:</b> 454 g (16 oz) <b>PS18 With Enclosure:</b> 1361 g (48 oz)
<b>DIMENSIONS</b>	<b>PS3 Plus:</b> 21.8 x 5.8 x 4.0 cm (8.6" x 5.8" x 1.6") <b>PS18 Without Enclosure:</b> 25.5 x 16.5 x 5.5 cm (10.0" x 6.5" x 2.0") <b>PS18 With Enclosure:</b> 27.79 x 18.80 x 13.00 cm (10.94" x 7.40" x 5.12")

VIEWPOINT SOFTWARE	
<b>OPERATING SYSTEM</b>	Windows® 8, Windows® 7 (32/64 bit), Windows® Vista (32/64 bit), or Windows® XP
<b>COMMUNICATIONS PORT</b>	One USB Port required

POWERSCOUT PART NUMBERS	
<b>PS3P-US</b>	PowerScout™ 3 Plus (indoor enclosure, US Version)
<b>PS3P-I</b>	PowerScout™ 3 Plus (indoor enclosure, Int'l Version)
<b>PS18-N</b>	PowerScout™ 18 (circuit board only)
<b>PS18-D</b>	PowerScout™ 18 (indoor enclosure)

SAFETY	
<b>POWERSCOUT 3</b>	UL and CE Mark Conforms to UL Std 61010-1 Certified to CSA Std C22.2 No. 61010-1
<b>POWERSCOUT 18</b>	ETL and CE Mark Conforms to UL Std 61010-1 Certified to CSA Std C22.2 No. 61010-1

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

† PowerScout 3 Plus feature or specification

\*US/NORTH AMERICAN PowerScout 3 Plus configuration includes 4 color (black, blue, red, white) voltage leads. INTERNATIONAL PowerScout 3 Plus configuration includes 4 labeled black voltage leads. The PowerScout 18 voltage leads are customer-supplied.

PowerScout™, ViewPoint™, PhaseChek™ and RoCoil™ are trademarks of DENT Instruments, Inc.



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