



# ELITEPRO SP™

PORTABLE RECORDING POWER METER

THE NEXT GENERATION ENERGY LOGGER  
FROM DENT INSTRUMENTS

## FEATURES

- Works on single or 3-phase loads on 0-600V (AC or DC) voltage services. Measures up to four channels of current from 0-6,000 amps (AC current only).
- Line-powered – no need for batteries or external power source.
- User-selectable recording intervals as short as every 1 second.
- 8MB non-volatile memory standard for up to months of recording time.
- Better than 1% accuracy (<0.2% typical).
- Fast USB connection.
- Simple yet powerful Windows-based ELOG™ software package for setup, data retrieval, and analysis. Easy data exporting to almost any analysis program such as Excel® and Access®.
- Easy setup and installs in minutes. Patented PhaseChek LED indicators ensure correct CT orientation at installation.
- Rugged and compact—easily fits inside breaker panels and switch gear.

## APPLICATIONS

- Measurement and Verification (M&V) Studies
- Electrical Load Profiling
- Energy Audits
- New Technology Assessment Studies

# ELITEPRO SP™ DETAILS

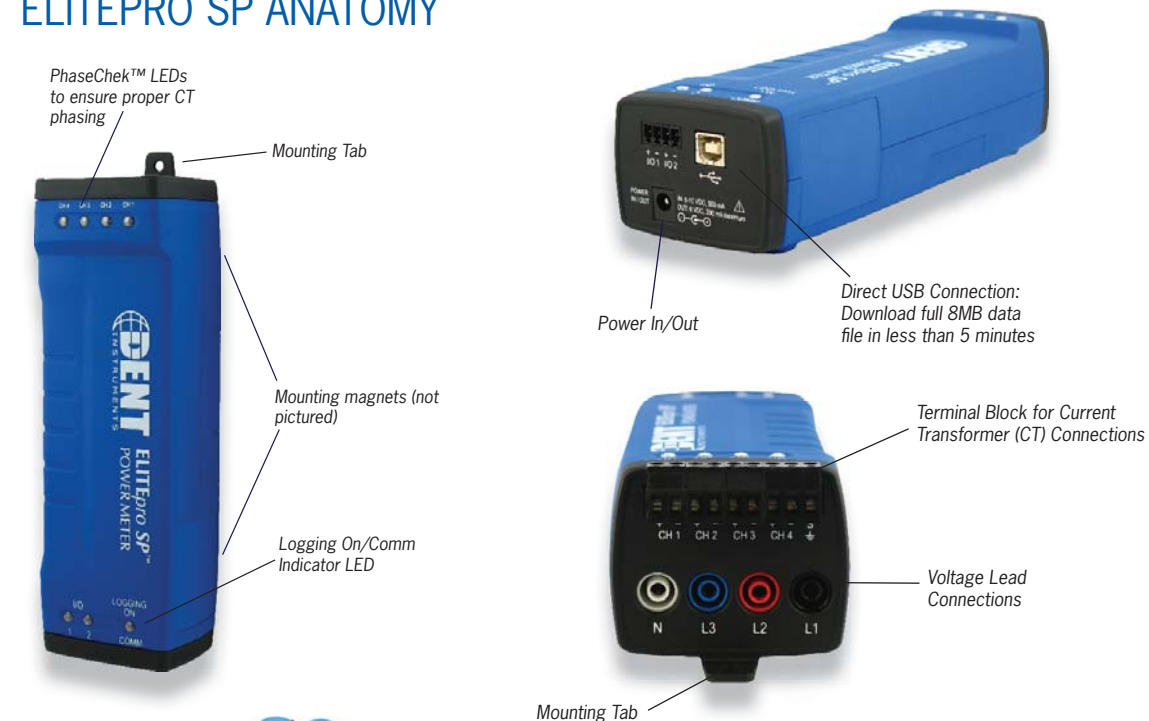
## A DEPENDABLE AND VERSATILE TOOL TO MEASURE YOUR ENERGY USAGE

The ELITEpro SP is a complete solution for pinpointing electric usage and quantifying energy usage. It is capable of measuring, storing, and analyzing electrical consumption data which is derived from the voltage and current inputs. The ELITEpro SP 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.

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. Electrical load diagnostic parameters such as power factor (both Apparent and Displacement) are captured in addition to energy and demand values.

The ELITEpro SP flexibility, size, and ease-of-use make them ideal tools for gathering detailed consumption information in commercial, industrial, government and retail environments.

## ELITEPRO SP ANATOMY



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.



## FIELD-PROVEN: RUGGED & COMPACT

Measuring in at only 21.6 x 6.3 x 4.7 cm (8.5" x 2.5" x 1.9") and weighing 340 grams (12 ounces), the ELITEpro SP was designed to fit inside panels for safety and convenience. Its rugged plastic housing is even supplied with magnets on the housing to facilitate mounting.

Our optional NEMA 4 rated weathertight drop-in enclosure delivers stronger environmental integrity, separate voltage plugs, water-tight connectors for both the current leads and the power and communication cables. This option for the ELITEpro SP will meet the stringent requirements of remote data logging.

# ELITEPRO SP™ FEATURES

## LINE POWERED WITH REDUCED IMPACT ON THE ENVIRONMENT

The ELITEpro SP is powered directly from the phases of the service being measured. It incorporates a broadband power supply which operates on virtually any 60-600V service. You will not have to worry about constantly changing or recharging batteries, nor finding an external power source at the job site. And you will avoid the negative environmental impact of disposing of batteries containing rare earth materials that are difficult to recycle or reclaim.

## MEMORY FOR EXTENDED RECORDING

Measurements are stored in on-board memory at recording intervals selected by the user, which can be as short as one second or as long as once every 24 hours. The ELITEpro SP has 8MB of internal non-volatile memory, which allows for long-term logging sessions. For example, with a WYE setup and recording all available system measurements ON with 2 minute integration interval, the ELITEpro SP can log for over 80 days!

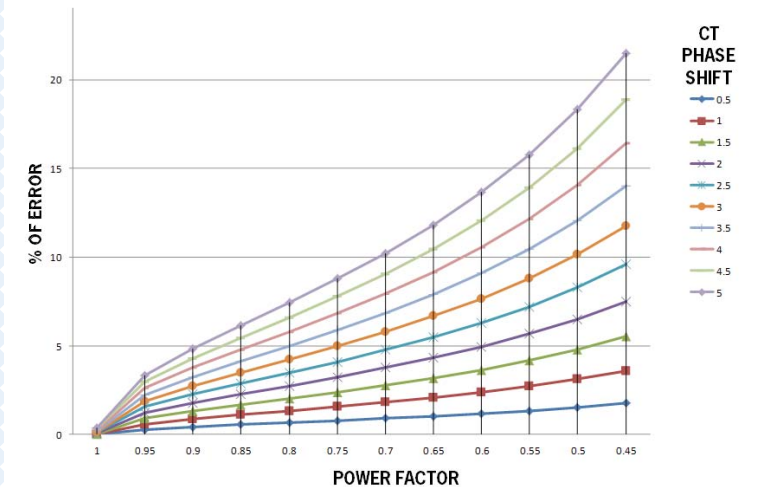
## FAST SAMPLING RATE CAPTURES POWER QUALITY DATA

Regardless of the user-selectable recording interval, the ELITEpro SP has a waveform sampling frequency of 12 kHz. This is the number of data points the logger samples on each AC waveform (200 points per cycle at 60 Hz; 240 points per cycle at 50 Hz). The channel sampling rate is 8 Hz or every 125 mSec. This fast sampling rate allows for real-time display of voltage and current waveforms and harmonics.

## EXCLUSIVE CT PHASE ERROR CORRECTION

All CTs exhibit both a ratio error and phase shift error. The CT phase error results from the phase relationship of the input versus output signal difference. This inherent phase angle error affects power readings if left uncorrected. When using CTs with a known phase angle error, the ELITEpro SP can correct for this error—making your calculations more accurate, particularly on loads with low power factor.

EFFECT OF CT PHASE ANGLE ERROR ON POWER MEASUREMENTS



For example, with an uncorrected 3° phase angle error and reported power factor of 0.5, there is a corresponding kW error of >10%.

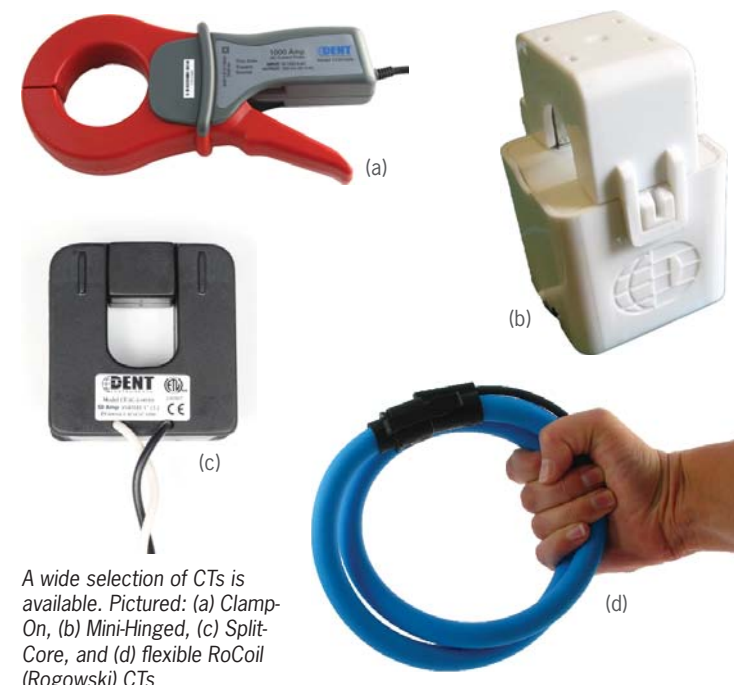
## BI-DIRECTIONAL METERING FOR RENEWABLES STUDIES

The ELITEpro SP design delivers bi-directional metering, which is capable of monitoring power generated by a renewable energy source versus power imported from the grid—ideal for solar power measurements.

## WIDE SELECTION OF CTS

The ELITEpro SP uses various interchangeable CT options such as split-core, clamp-on, or flexible RoCoil™ current transformers. With the ELITEpro SP 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 ELITEpro SP can monitor up to four single-phase loads, two three-phase (3-wire) Delta loads or one three-phase (4-wire) WYE load.



# ELITEPRO SP™ START TO FINISH

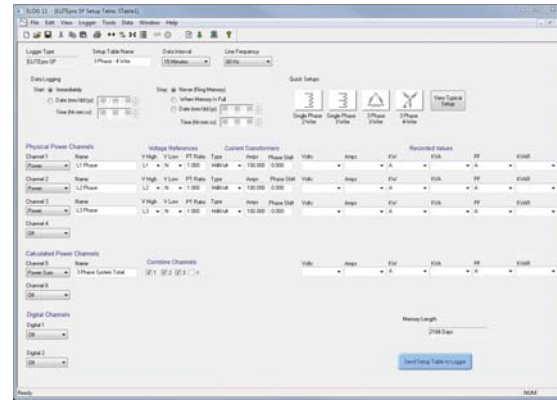
# ELOG™ SIMPLE DATA ANALYSIS

## EASY SETUP, INSTALLATION, AND DATA RETRIEVAL

Using the ELITEpro SP on your next project is as easy as 1, 2, 3.

### 1 INSTALL ELOG AND SEND A SETUP TABLE TO THE ELITEPRO SP

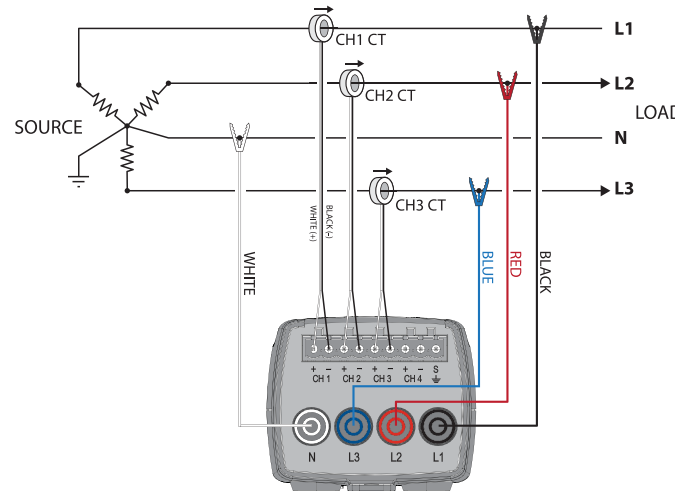
The ELITEpro SP is configured using ELOG software. A Setup Table is the file that programs the logger for an upcoming project. Set parameters such as sampling rate and type of service then send the file to the logger. The ELITEpro SP is now ready for deployment.



A simple one-page Setup Table guides you through the ELITEpro SP's flexible metering options.

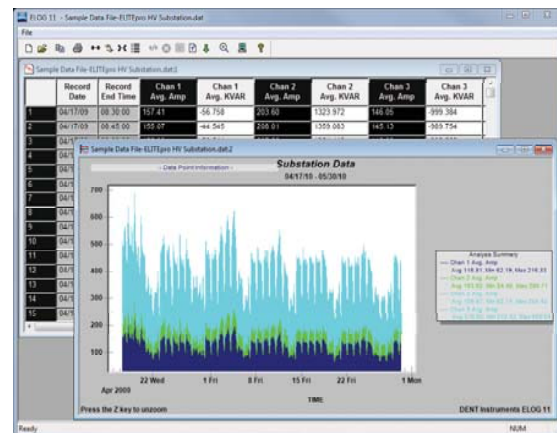
### 2 CONNECT THE ELITEPRO SP TO THE PANEL YOU NEED TO MEASURE

Installation and connection of the ELITEpro SP is both simple and straightforward. Magnets on the housing facilitate mounting inside electrical cabinets. A variety of internally-shunted, snap-on CTs and clip-on voltage leads connect to almost any panel load without turning power off.



### 3 DOWNLOAD THE DATA FROM THE ELITEPRO SP

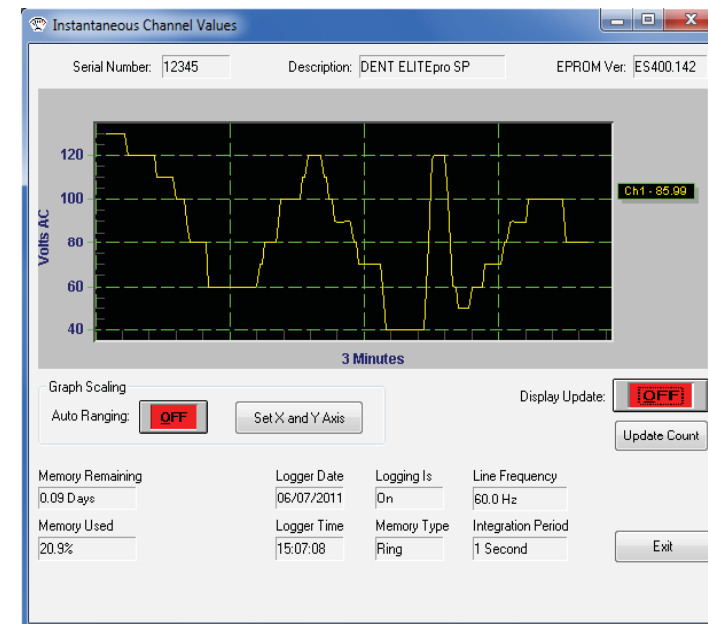
At the end of the project, simply connect the ELITEpro SP to a computer with ELOG and download the data file. Analyze the data and create graphs in ELOG or export the data as a .csv file to popular spreadsheet programs, such as Microsoft Excel®.



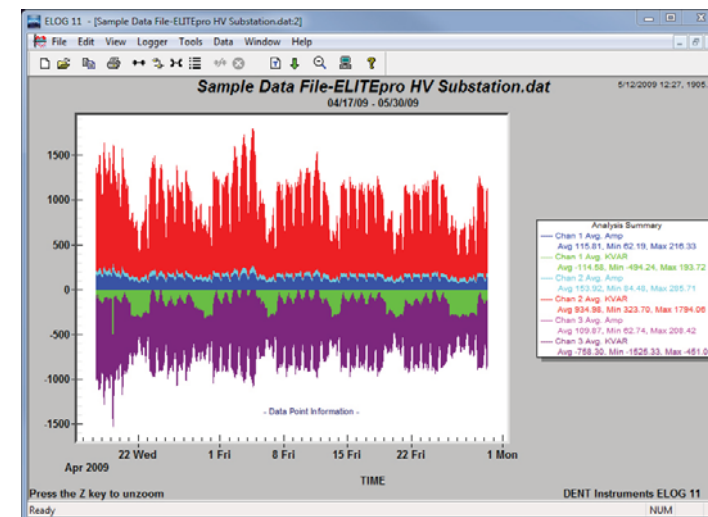
In-Depth Data Analysis: Display your data graphically.

## POWERFUL SOFTWARE

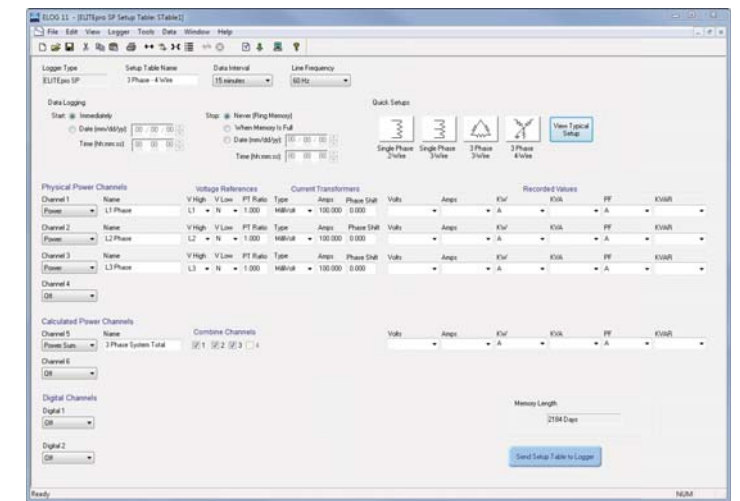
The Windows-based ELOG software package is used to program the meter, display metered values, and retrieve and analyze the collected data. ELOG graphically displays recorded data, performs analysis, and facilitates automatic remote data collection. Data is also easily exported to popular spreadsheet and database programs for additional analysis. You are provided with an unlimited site license to the software with purchase.



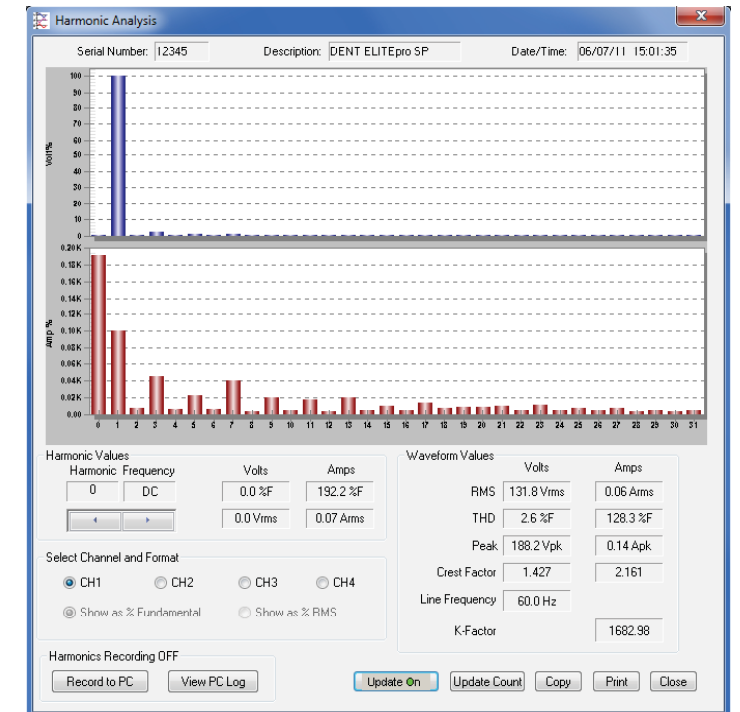
Instantaneous Channel Values: See information about your logger and what your logger is recording in real time.



Create many types of graphs within ELOG.














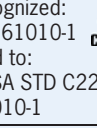



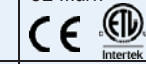




Flexible Options: Configure the ELITEpro SP for a variety of measurement projects with a few mouse clicks.



Perform Harmonic Analysis on a connected load. View harmonic and waveform values in real time. Line frequency is also displayed as a real-time value.

# ELITEPRO SP™ TRANSFORMERS

The ELITEpro SP can be equipped with a wide selection of current transformers. Choose from compact and economical Split-Core CTs, convenient Clamp-On style 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 	150A CLAMP-ON CON-0150 	500A CLAMP-ON CON-0500 	1000A CLAMP-ON CON-1000 	ROCOIL R16, R24, R36, R72 
<b>KEY SPECIFICATIONS</b>										
<b>WINDOW SIZE</b>	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")	2.0 cm (0.8")	3.3 cm (1.2")	5.2 cm (2.0")	16": 13 cm (5") 24": 19 cm (7") 36": 26 cm (10") 72": 56 cm (22")
<b>OUTPUT SIGNAL</b>	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	333 mV @ 150 Amps AC	333 mV @ 500 Amps AC	333 mV/A @ 1000 Amps AC	131 mV/1000A @ 60 Hz 110 mV/1000A @ 50 Hz
<b>USEFUL CURRENT RANGE</b>	0.25-26 Amps 0.25-65 Amps	1-200 Amps 1-300 Amps	0.05-7.5 Amps, 0.15-22.5 Amps	5-65, 10-130 Amps	10-130, 20-260, 40-520, 60-780 Amps	60-780, 100-1200 Amps	2 to 150 Amps	10 to 600 Amps	10 to 1200 Amps	ESP/PS3: 50-5000 Amps PS18: 50-3500 Amps
<b>ELECTRICAL SPECIFICATIONS</b>										
<b>NOMINAL RATING</b>	20, 50 Amps	100, 200 Amps	5 Amps, 15 Amps	50, 100 Amps	100, 200, 400, 600 Amps	600, 1000 Amps	150 Amps	500 Amps	1000 Amps	3000 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	+/- 1% at 10% to 130% of rated current	+/- 1% at 10% to 130% of rated current	±1% for 2 to 80 Amps ±1.5% for 80 to 150 Amps	±2.5% for 10 to 600 Amps 48-440 Hz ±3.5% for 10 to 600 Amps 440-1000Hz	+/- < 1%	+/- 1% reading
<b>PHASE SHIFT</b>	<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	≤ 3° for 2 to 20 Amps ≤ 2° for 20 to 80 Amps ≤ 2.5° for 80 to 150 Amps, 50/60 Hz	< 3° for 10 to 600 Amps 50/60 Hz	+/- < 1°	< 1° at 50/60 Hz
<b>FREQUENCY RANGE</b>	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 10 kHz	48 Hz to 1000 Hz	30 Hz to 5 kHz	40 Hz to 5000 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	5000V around the case 600V rated leads	5000V around the case 600V rated leads	5550V, 50/60 Hz between primary, secondary and the outer case of the handle	6000V, 50/60 Hz between primary, secondary and outer case of the handle, 3000V 50/60 Hz between primary and secondary	5200 VAC, 50/60 Hz between primary, secondary and the outer case of the handle	7400 VAC around coil 1000 VAC rated leads
<b>MECHANICAL SPECIFICATIONS</b>										
<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")	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")	14 x 5 x 3 cm (5.5 x 2.0 x 1.2")	19.5 x 6.6 x 3.4 cm (7.7 x 2.6 x 1.3")	21.6 x 11.1 x 4.5 cm (8.5 x 4.4 x 1.8")	Length 16" (40 cm) Length 24" (60 cm) Length 36" (90 cm) Length 72" (180 cm)
<b>WEIGHT</b>	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)	180 g (6.5 oz)	350 g (12 oz)	500 g (19 oz)	16": 184 g (6 oz) 24": 216 g (7 oz) 36": 312 g (11 oz) 72": 495 g (17 oz)
<b>POLARITY</b>	White lead is positive	White lead is positive	White lead is positive	White lead is positive	White lead is positive	White lead is positive	Red lead is positive	Red lead is positive	Red lead is positive	Brown 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	Leads 2.7 m (8 ft) twisted pair, 20 AWG	Leads 2.7 m (8 ft) twisted pair, 20 AWG	3 m (118") Double insulated	3 m (118") Double insulated	3 m (118") Double insulated	2 m (79") shielded cable
<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)	-20° to 55° C (-4° to 131 °F)	-20° to 55° C (-4° to 131 °F)	-10 to 55° C (14 to 130 °F)	-15 to 50° C (5 to 122 °F)	-10 to 50° C (14 to 120 °F)	-10° to +80° C (+14° to +176 °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)	Maximum 80 °C (176 °F)	Maximum 80 °C (176 °F)	-40 to 70 °C (-40 to 160 °F)	-40 to 80 °C (40 to 176 °F)	-20 to 70 °C (-4 to 160 °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	Epoxy encapsulated housing ABS/PVS UL 94 V-0	Epoxy encapsulated housing ABS/PVS UL 94 V-0	IP 40 (IEC 529) UL 94 V-0	IP 40 (IEC 529) UL 94 V-0	IP 40 (IEC 529) UL 94 V-0	Thermoplastic Rubber UL 94 V-0
<b>SAFETY SPECIFICATIONS</b>										
<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 	Compliant with IEEE C57.13-1993 CE Mark 	Compliant with IEEE C57.13-1993 CE Mark 	CE Mark, Compliant with IEC 1010-2-032 	CE Mark, Compliant with IEC 1010-2-032 	CAN/CSA STD C22.2 No. 61010-1 	CE Mark, Double Insulation, EN-61010 CAN/CSA STD C22.2 No. 61010-1 
<b>WORKING VOLTAGE</b>	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 600 Vrms Category III	Maximum 600 Vrms Category III	Maximum 600 Vrms Category III	Maximum 1000 Vrms Category III

# ELITEPRO SP™ SPECIFICATIONS

TECHNICAL	
SERVICE TYPE	Single Phase, Three Phase-Four Wire (WYE), Three Phase-Three Wire (Delta)
VOLTAGE CHANNELS	3 channels, CAT III, 0-600 VAC or 850 VDC (line-to-line)
CURRENT CHANNELS	4 channels, .67 VAC max, 333 mV full scale CTs
MAXIMUM CURRENT INPUT	200% of current transducer rating
MEASUREMENT TYPE	True RMS using high-speed digital signal processing (DSP)
LINE FREQUENCY	50/60/400 Hz
WAVEFORM SAMPLING	12 kHz
CHANNEL SAMPLING RATE	.125 seconds
MEASUREMENTS	Volts, Amps, Amp-Hrs (Ah), kW, kWh, kVAR, kVARh, kVA, kVAh, Displacement Power Factor (dPF). All parameters for each phase and for system total.
ACCURACY	Better than 1% (<0.2% typical) for V, A, kW, kVAR, kVA, PF
RESOLUTION	0.01 Amp, 0.1 Volt, 1 Watt, 1 VAR, 1 VA, 0.01 PF
LED INDICATORS	Bi-colors (red and green): 1 LED to indicate communication, 4 LEDs for correct phasing (PhaseChek™: green when voltage and current on the same phase; red when incorrectly wired.) 2 LED Output indicators.
PULSE OUTPUT	Open collector with 10K ohm pull up to 5V, 75 mA max current

POWER	
LINE-POWER	From L1 Phase to L2 Phase. 60-600VAC CAT III 50/60 Hz, 70 mA max. Non-user replaceable .5 Amp internal fuse protection
POWER IN	6-10 VDC, 500 mA
POWER OUT	6 VDC, 200 mA max
COMMUNICATIONS	
USB DIRECT CONNECTION	1.8 M (6 FT) A-TO-B USB Cable (included)
MECHANICAL	
OPERATING TEMPERATURE	-7 to + 60 °C (20 to 140 °F)
OPERATING HUMIDITY	5% to 95% non-condensing
ENCLOSURE TYPE	ABS plastic, 94-V0 flammability rating
WEIGHT	340 g (12 ounces)

## ORDERING INFORMATION

Use the following Order String to configure an ELITEpro SP for your next project.

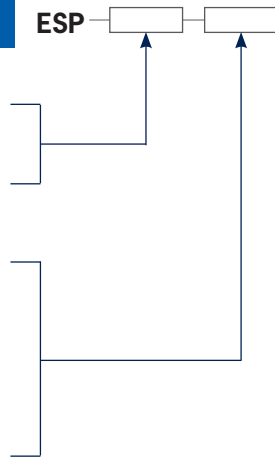
### ESP ORDER STRING

#### VOLTAGE LEAD COLORS

- U = US/NORTH AMERICAN\*
- I = INTERNATIONAL\*

#### VOLTAGE CLIPS

- C = CROC CLIPS
- F = FUSED CROC CLIPS
- S = SHARK CLIPS
- L = UNTERMINATED LEADSET
- N = NONE



\*US/NORTH AMERICAN ELITEpro SP configuration includes 4 color (black, blue, red, white) voltage leads and croc clips. INTERNATIONAL ELITEpro SP configuration includes 3 black voltage lead connections, 1 white connection (neutral) and 5 color (black, blue, red, white, yellow) voltage leads and croc clips.

INCLUDED

- 8 MB Memory
- ELOG Software
- Line Power
- USB Cable
- Carrying Case



## A VARIETY OF COMPATIBLE VOLTAGE CLIPS

Several voltage clips options are available to meet your project needs. Choose from Shark Clips, Colored Leads, "Croc" Clips or Fused Croc Clips.



Shark Clips



Colored Leads



Croc Clips



Fused Croc Clips



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