CH 4   CH 3   CH 2   CH 1

DENT INSTRUMENTS

ELITEpro SP™ POWER METER

DIGITAL   LOGGING ON

1   2   COMM

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).
- 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.
- Standard Ethernet port.
- ELITEpro SP may be configured with optional *Bluetooth*® wireless technology.
- Optional Wi-Fi interface allows for remote data collection over wireless networks and check real-time values using a wifi-enabled laptop, tablet, or smartphone via a web browser.
- 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

For more information on this product, please contact:
PC&S, Inc. at +1 (800) 523-9194 or +1 (973) 448-9400
www.pc-s.com

PC&S

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

PhaseChek™ LEDs to ensure proper CT phasing

Mounting Tab

Mounting magnets (not pictured)

Standard Ethernet port

Logging On/Comm Indicator LED

Optional Wi-Fi Interface may be ordered with external 3 dbi antenna

Standard USB Port: Download full 8MB data file in less than 5 minutes.

Power In/Out

Standard Ethernet Port

Terminal Block for Current Transformer (CT) Connections

Voltage Lead Connections

Mounting Tab

A drop-in, NEMA 4X rated enclosure is available for harsh environments.

The new **ELITEpro SP™** includes ...

8 MB of memory
ELOG software
Line Power
(no need for batteries or external power source)
USB Cable
Carrying Case

,,, making it an exceptional value!

■

View real-time voltage, current and power waveforms and calculate harmonics to the 63rd order!

■

Record intervals as short as every second!

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 80-600V 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.

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

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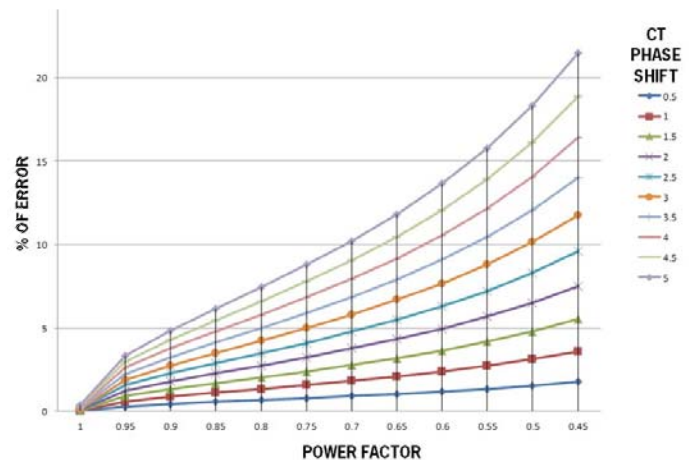
For example, with an uncorrected 3° phase angle error and reported power factor of 0.5, there is a corresponding kW error of >10%.

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

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®.
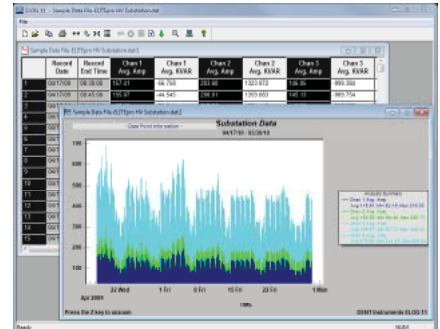

In-Depth Data Analysis: Display your data graphically.

ELOG™ SIMPLE DATA ANALYSIS

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.
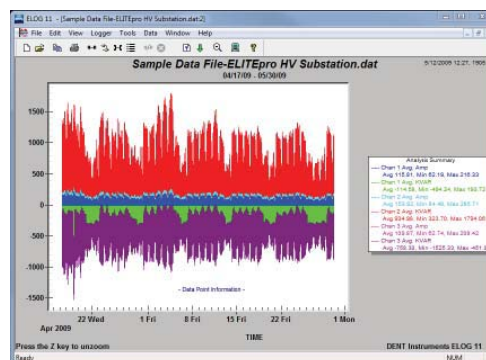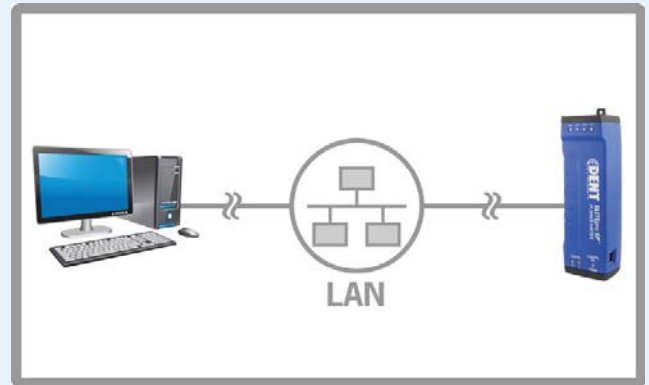
COMMUNICATION OPTIONS

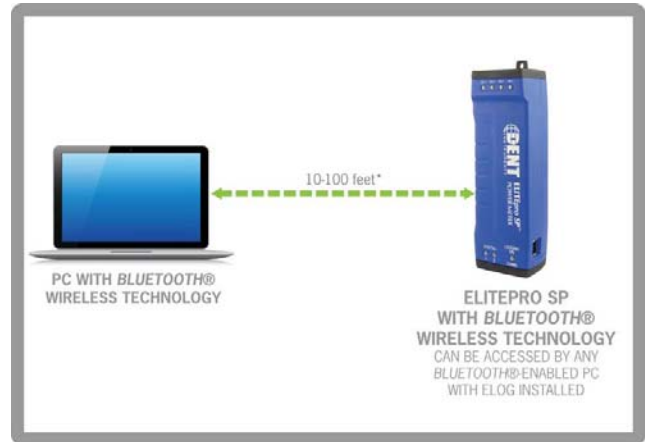## CONNECT TO THE ELITEPRO SP FOUR WAYS

STANDARD USB AND ETHERNET CONNECTIONS

Every ELITEpro SP includes a USB and Ethernet (RJ-45) port. Connect directly to the ELITEpro SP via the included A-to-B USB cable. Or, have the ELITEpro SP on your local area network for convenient remote data download. Supports 10/100 MB Ethernet over Cat 5 or better and can be configured for DHCP or static IP. Schedule automatic data downloads from the logger using AutoPoll software (included with ELOG). Reconfigure the ELITEpro SP for a new project without leaving your workstation.

LAN

OPTIONAL *BLUETOOTH*® WIRELESS TECHNOLOGY

Save time and meet safety requirements by communicating with an ELITEpro SP without removing the electrical panel door. In addition to the standard USB and Ethernet ports, ELITEpro SP instruments may be equipped with an optional *Bluetooth*® wireless technology interface, which will allow a PC with a *Bluetooth*® wireless technology adapter running ELOG to connect to the ELITEpro SP over short distances (10-100 feet typical) to send setup tables or download data. PC must support Serial Port Profile (SPP).

10-100 feet*

PC WITH *BLUETOOTH*®
WIRELESS TECHNOLOGY

ELITEPRO SP
WITH *BLUETOOTH*®
WIRELESS TECHNOLOGY
CAN BE ACCESSED BY ANY
BLUETOOTH®-ENABLED PC
WITH ELOG INSTALLED

OPTIONAL WI-FI INTERFACE

Need a meter on your local area network but do not have a network connection near by? The ELITEpro SP's optional Wi-Fi interface allows the meter to be connected to a wi-fi network and accessed from any PC on the network using ELOG software. Or, configure the ELITEpro SP as its own wi-fi hotspot and view real-time data using a wi-fi enabled PC, tablet, or smart phone via a web browser from up to 300 ft away. Two antenna options available: internal antenna (75-300 ft) or external 3 dbi antenna (150-300 ft). Use ELOG to switch between WiFi and QuickView™ access point mode.

INTERNET

FIREWALL / ROUTER

LAN

75-300 feet*

PC
ON NETWORK

WIRELESS
ACCESS POINT

PC
WITH WIFI

PC OR MAC®
WITH WIFI

75-300 feet*

TABLET PC OR iPAD®
WITH WIFI

75-300 feet*

75-300 feet*

SMARTPHONE
WITH WIFI

QuickView™ mode sets the ELITEpro SP as an access point. View real-time data on a wifi-enabled laptop, tablet, or smartphone.
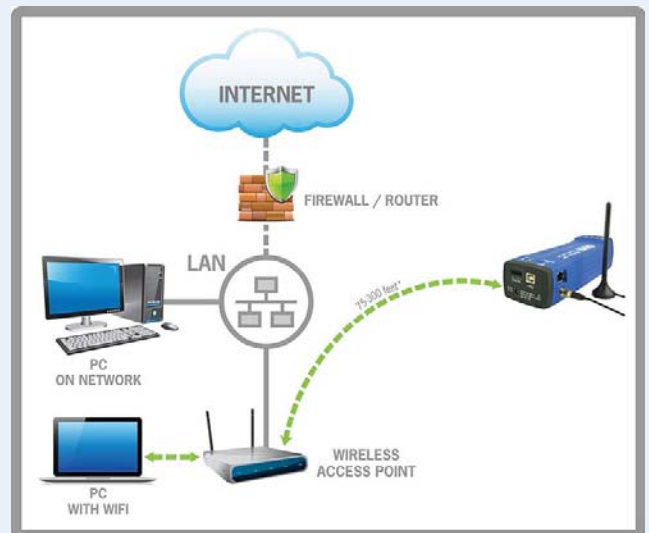
ELITEPRO SP™ TRANSFORMERS

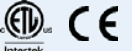|	MINI HINGED HSC-020, -050	MIDI HINGED HMC-100, -200	HIGH ACCURACY SHS-0005, -0015	SMALL SPLIT CORE SCS-0050, -0100	MED SPLIT CORE SCM-0100, -0200, -0400, -0600
KEY SPECIFICATIONS					
WINDOW SIZE	1 cm (0.4")	2.5 cm (1.0")	1.0 cm (0.4")	1.9 cm (.75")	3.2 cm (1.25")
OUTPUT SIGNAL	333 mV at rated current	333 mV at rated current	333 mV at rated current	333 mV at rated current	333 mV at rated current
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, 2-130 Amps	5-130, 4-260, 8-520, 12-780 Amps
ELECTRICAL SPECIFICATIONS					
NOMINAL RATING	20, 50 Amps	100, 200 Amps	5 Amps, 15 Amps	50, 100 Amps	100, 200, 400, 600 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
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
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
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
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")
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)
POLARITY	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
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)
STORAGE TEMPERATURE	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)
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
SAFETY SPECIFICATIONS					
SAFETY REQUIREMENTS	UL Recognized: UL STD 61010-1 Certified to: CAN/CSA STD C22.2 No. 61010-1 c**UL**us CE	UL Recognized: UL STD 61010-1 Certified to: CAN/CSA STD C22.2 No. 61010-1 c**UL**us CE	Compliant with IEEE C57.13-1993 CE Mark c**UL**us CE	Compliant with IEEE C57.13-1993 CE Mark ETL Intertek CE	Compliant with IEEE C57.13-1993 CE Mark ETL Intertek CE
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

LARGE SPLIT CORE SCL-0600, -1000	150A CLAMP-ON CON-0150EZ	500A CLAMP-ON CON-0500	1000A CLAMP-ON CON-1000	ROCOIL R16, R24, R36, R72
5.1 cm (2.0")	5.2 cm (1.0")	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")
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
30-780, 20-1300 Amps	.5 to 300 Amps	20 to 600 Amps	20 to 1200 Amps	ESP/PS3: 50-5000 Amps PS18: 50-3500 Amps
600, 1000 Amps	150 Amps	500 Amps	1000 Amps	3000 Amps
+/- 1% at 10% to 130% of rated current	<1% at rated current	±2.5% for 20 to 600 Amps 48-440 Hz ±3.5% for 20 to 600 Amps 440-1000Hz	+/- < 1%	+/- 1% reading
<2° at rated current	< 1° from 5 to 25A 1° from 25 to 150A < 1.5° from 150 to 300A	< 3° for 20 to 600 Amps 50/60 Hz	+/- < 1°	< 1° at 50/60 Hz
50 Hz to 400 Hz	50 Hz to 400 Hz	48 Hz to 1000 Hz	30 Hz to 5 kHz	40 Hz to 5000 Hz
5000V around the case 600V rated leads	5200 VAC, CAT III	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
12.07 x 12.70 x 3.05 cm (4.8 x 5.0 x 1.2")	8.7 x 5.0 x 1.9 cm (3.4 x 1.9 x 0.8")	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)
748 g (26 oz)	136 g (4.8 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)
White lead is positive	Red lead is positive	Red lead is positive	Red lead is positive	Brown lead is positive
Leads 2.7 m (8 ft) twisted pair, 20 AWG	2.4 m (8') 22 gage, 600V	3 m (118") Double insulated	3 m (118") Double insulated	2 m (79") shielded cable
-20° to 55 °C (-4° to 131 °F)	-20° to 70 °C (-4° to 158 °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)
Maximum 80 °C (176 °F)	-25° to 70 °C (-13° to 158 °F)	-40 to 80 °C (40 to 176 °F)	-20 to 70 °C (-4 to 160 °F)	Maximum 80 °C (176 °F)
Epoxy encapsulated housing ABS/PVS UL 94 V-0	White ABS, 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
Compliant with IEEE C57.13-1993 CE Mark	UL Recognized: UL STD 61010-1 Certified to: CAN/CSA STD C22.2 No. 61010-1	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
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 (two wire or three wire), 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% (<0.5% 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. 80-600VAC 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 (STANDARD)	USB standard. 1.8 M (6 FT) A-to-B USB Cable (included)
ETHERNET (STANDARD)	Standard RJ-45 Connector supports 10/100 MB Ethernet over Cat 5 or better. Configure for DHCP or Static IP address.
BLUETOOTH® WIRELESS TECHNOLOGY (OPTIONAL)	Internal antenna with 10-100 ft range (typical). Requires Bluetooth® wireless technology adapter on Windows PC. Adapter must support the Serial Port Profile (SPP).
WI-FI ADAPTER (OPTIONAL)	Internal Wi-Fi adapter with two separate configurations: • Internal antenna: typical range 75-300 ft. • External 3 dbi antenna: typical range 150-300 ft.

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)
DIMENSIONS	21.6 x 6.3 x 4.7 cm (8.5" x 2.5" x 1.9")

*Performance varies at 400 Hz operation. Contact the factory for details.

ORDERING INFORMATION

ESP ORDER STRING

ESP ☐ - ☐ - ☐

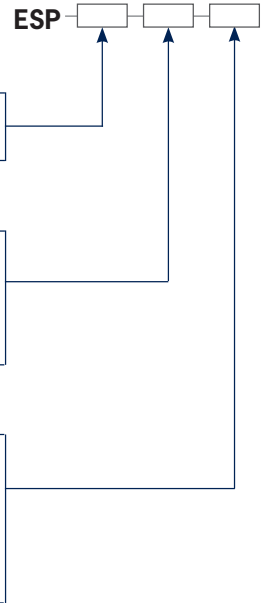**VOLTAGE LEAD COLORS** (CHOOSE ONE)

U	=	US/NORTH AMERICAN*
I	=	INTERNATIONAL*

ADDITIONAL COMMUNICATION OPTIONS (CHOOSE ONE)

N	=	NONE (ETHERNET & USB ONLY)
B	=	BLUETOOTH® WIRELESS TECHNOLOGY
WI	=	WI-FI WITH INTERNAL ANTENNA
WE	=	WI-FI WITH EXTERNAL 3 DBI ANTENNA

VOLTAGE CLIPS (CHOOSE ONE)

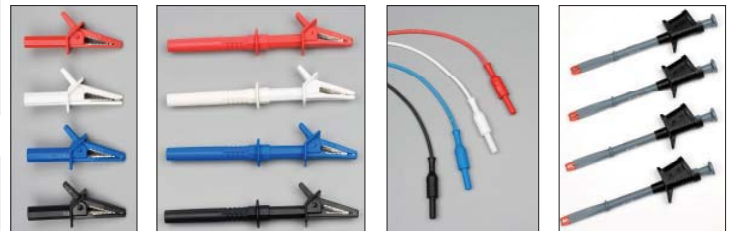|		
C	=	CROC CLIPS
F	=	FUSED CROC CLIPS
S	=	SHARK CLIPS
L	=	UNTERMINATED LEADSET
N	=	NONE

INCLUDED

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

A VARIETY OF VOLTAGE CLIPS

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

Croc Clips   *Fused Croc Clips*   *Colored Leads*   *Shark Clips*

*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.