

EML 2020 H Energy Consumption Monitor

SPECIFICATIONS

<u>POWER:</u>	Measures TRUE or REAL Power accounting for the PF (power factor)								
Display:	1 Watt to 65,535 Watts @ 1 Watt Resolution for CH1 or CH2 or CH1+CH2								
Accuracy:	Typically $\pm 1\% \pm 2$ LSD plus CT and PT accuracy								
<u>ENERGY:</u>	The kilowatt-hour value is based on the sampled TRUE Power.								
Display:	0.001 KWh to 16,777 KWh @ .001 KWh (1 Watt-Hour) Resolution								
Accuracy:	Equivalent to the power accuracy.								
<u>VOLTAGE:</u>	Derived from the "mean" of all samples over one second.								
Display:	000.0 Volt to > 600.0 Volt dependant on the wall transformer and PT setting. The supplied wall transformer must NOT be connected to voltages greater than 130V. See manual for monitoring loads connected to voltages greater than 120V.								
Accuracy:	Typically $\pm 1\% \pm 2$ LSD plus PT accuracy.								
<u>CURRENT:</u>	Derived from the "mean" of all samples over one second.								
Display:	00.0 Amps to > 400.0 Amps dependant on the CT used and CT settings.								
Accuracy:	Typically $\pm 1\% \pm 2$ LSD plus CT accuracy.								
<u>ELAPSED MONITORING TIME:</u>	Derived from an internal 32.768 KHz clock crystal. The time is suspended when the ECM-1220 is de-energized. Time is also suspended when the ECM-1220 is powered only via USB port.								
Display:	<table><tr><td> Days:</td><td>0 to 255 Days</td></tr><tr><td> Hours:</td><td>0 to 23 Hrs</td></tr><tr><td> Minutes:</td><td>0 to 59 Min</td></tr><tr><td> Seconds:</td><td>0 to 59 Sec</td></tr></table>	Days:	0 to 255 Days	Hours:	0 to 23 Hrs	Minutes:	0 to 59 Min	Seconds:	0 to 59 Sec
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<u>ELECTRICITY RATE (cost of power):</u>									
User selectable:	\$0.001 to \$0.999 per kilowatt-hour @ \$.001 resolution (0.1 cent)								
<u>DISPLAYED COST OF ENERGY:</u>									
Display:	\$0.001 to \$1200.000 @ \$0.001 (1/10 th of a cent) Resolution								
<u>PROJECTION PERIOD:</u>									
User selectable in 1 Day increments	1 to 255 Days, Typically set to "7 days" or "30 days" (one month)								

DATA LOGGER STORAGE:

The stored data is based on the average of every sample taken during the interval.

The date and time stamps are generated by the software when the data is downloaded and referenced to the “monitoring start time and date” entered by the user after the download is complete. The first field is stamped with this entered time/date and every subsequent field is assigned a time equivalent to the last time stamp + “storage interval” value.

Memory Type: Uses non-volatile EEPROM technology. No batteries required.

Stored Data: CH1 Power, CH2 Power and Line Voltage (1 to 255 Volt)

Storage: Standard units come with storage for 13,080 records.
Memory is **optionally** expandable to:

- 26,187 records
- 29,294 records
- 52,401 records

Memory expansion must be installed at the factory. (Special Order)

CH1 & CH2 CT INPUTS (EML 2020 H-PL plug type only) :

Connection

Type: 3.5mm Stereo Phone Jack

Balanced:

Requires Stereo Plug
Balanced differential mode: Ring (-), Tip (+), Sleeve (N/C).
Input impedance: 20 K Ω
Max Input before error: 1Vp-p

Unbalanced:

Requires Mono Plug
Ring and Sleeve connection are automatically shorted by mono plug barrel.
Connection: Sleeve (-) Tip (+)
Input impedance: 107 Ω
Max Input before error: 9Vp-p

CH1 & CH2 CT INPUTS (EML 2020 H-WR hard wired type only) :

Connection

Type: 6” pigtail leads

Balanced:

CH1: Yellow(+) Green(-)
CH2: Red(+) Blue(-)
Balanced differential mode
Input impedance: 20 K Ω
Max Input before error: 1Vp-p

Unbalanced:

N/A

POWER INPUT (EML 2020 H-PL plug type only) :

Connection
Type: 3.5mm Mono Phone Jack

USE ONLY WITH SUPPLIED WALL TRANSFORMER. If operated with a wall transformer other than the supplied type, a reading error and improper current drain will occur. This may cause the ECM-1220 to overheat and or ECM-1220 failure.

The ECM-1220 is calibrated for use with the supplied wall transformer.

POWER INPUT (EML 2020 H-WR hard wired type only) :

Connection
Type: 6" pigtail leads
Black : White Polarity not important

USE ONLY WITH SUPPLIED WALL TRANSFORMER. If operated with a wall transformer other than the supplied type, a reading error and improper current drain will occur. This may cause the ECM-1220 to overheat and or ECM-1220 failure.

The ECM-1220 is calibrated for use with the supplied wall transformer.

LOAD PHASING:

Phasing is referenced to the wall transformer phasing. For firmware versions earlier than version 2.004 only "Phase A" option as described below applies.

CH2 Setting:

Phase A:
Auto detects and compensates for 180° phase reversal of the CT or PT. Will only generate positive energy values. May be connected to either phase of a standard split phase 120V/240V service.

Phase B or C option selected: (*applies to ECM-1220 with firmware versions 2.004 or greater*)
CH1 reference is 0° or 180° (same phase)
CH2 voltage phase is 120°(phase B) or 240°(phase C) from the reference, for compatibility with 3 phase systems.

LCD DISPLAY: Blue 2 x 16 Character Alpha Numeric Display with Backlight

FIRMWARE: Flash re-programmable by end user. Updates available at www.brultech.com

ZIGBEE IEEE 802.15.4 Wireless Communication Option

Contains FCC ID: OUR-XBEE

The enclosed device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- (i.) this device may not cause harmful interference and
- (ii.) this device must accept any interference received, including interference that may cause undesired operation.



WARNING: To satisfy FCC RF exposure requirements for mobile transmitting devices, a separation distance of 20 cm or more should be maintained between the antenna of this device and persons during device operation. To ensure compliance, operations at closer than this distance is not recommended. The antenna used for this transmitter must not be co-located in conjunction with any other antenna or transmitter.

WIRELESS MODULE:	IEEE 802.15.4 Standard
Frequency:	ISM 2.4 GHz Band
Output Power:	1 mW (0 dBm)
Receiver Sensitivity:	-92 dBm
Range:	Line of Sight: 300 Ft Indoors: Approximately 80Ft depending on wall material and density.
Protocol:	Zigbee
Network Type:	Mesh Network
Node Identifier (NI):	E1 for ECM-1220 C1 for Standard U2Z Dongle R1 for additional dongles or routers
Personal Area Network ID:	13,106 (decimal)
Communication Speed:	19,200 baud