SINGLE AND POLY-PHASE ENERGY DATA ACQUISITION SYSTEM USING THE IL-MINI™

The IL-Mini™ coupled with a WNB pulse output power meter results in a flexible, stand-alone energy (kWh) data acquisition system.

Voltage and sensed Current feed into the WNB meter.

Phase A

Phase B

Neutral

Four additional Analog inputs available for pressure, temperature 4-20mA loop or other signal/sensor inputs.

Pulse output to the IL-Mini™ Digital (Counter) input. Pulses correspond to measured energy

Note: Wiring shown for concept ONLY . Refer to instructions for wiring details.
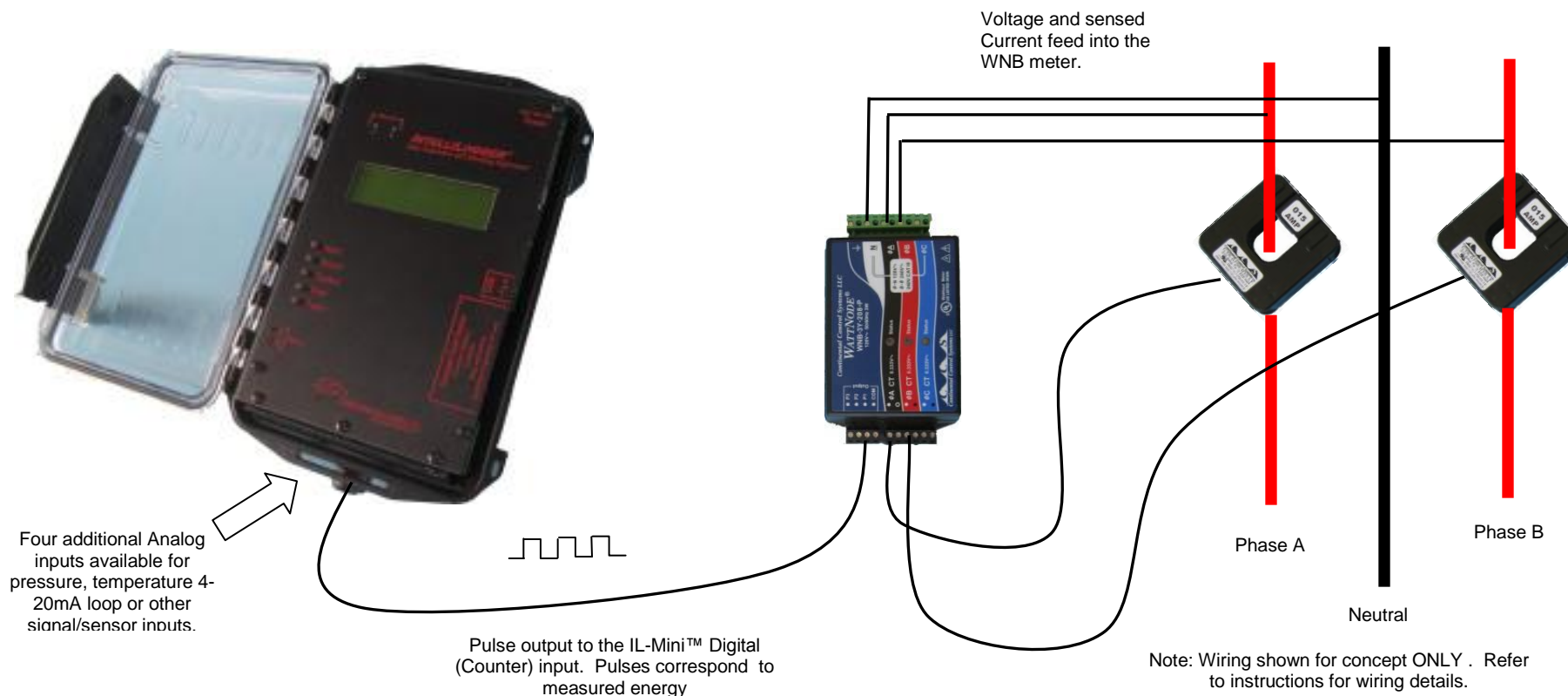
SYSTEM EXPLANATION:

The WNB electrical meter is connected to the high-voltage electrical service to be measured and outputs a contact closure pulse for every unit of energy (eg Watt-hour) that flows through the electrical service. The relationship of pulses and Watt-hours (Wh) depends on the model of WNB meter as well as the full-scale CT's used. For example, the WNB might be configured to output a pulse for every 100Wh measured.

The WNB requires electrical voltage sensing connections to each of the phases as well as current transformers (CT's) for current measurement on each of the phase conductors. The power meter runs autonomously

sampling the phase voltages and currents very quickly, calculating instantaneous power and totalizing electrical energy (power over time). The WNB then outputs a pulse after a defined amount of energy has been measured. By totalizing these pulses and scaling for the relationship between pulses and energy, the amount of energy measured is known. This scaling and totalization is simply performed by the connected IL-Mini™ data logging instrument.

The WNB meter output is connected via a pair of wires to the digital input channel on the IL-Mini™ which in turn is configured as a Counter input.
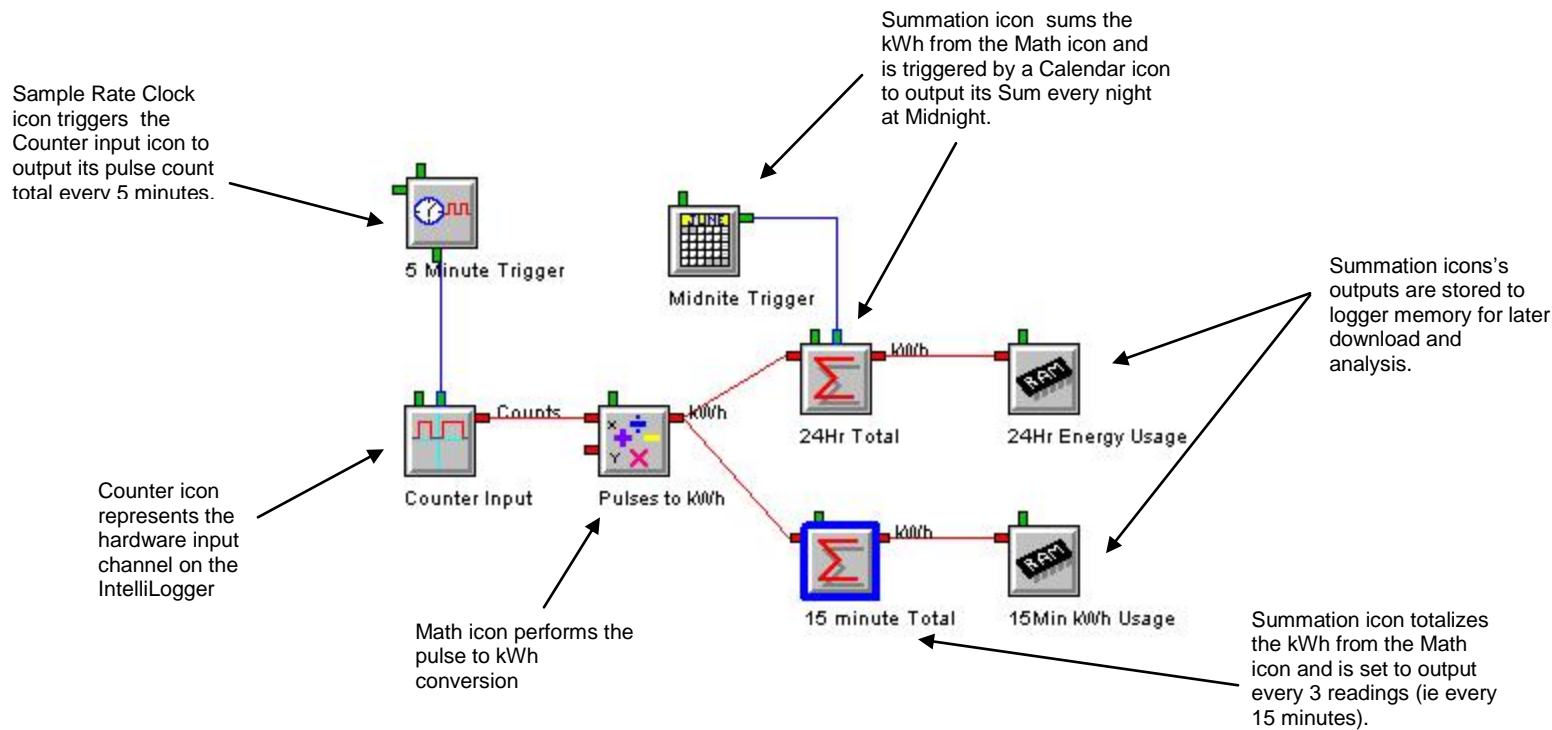
IL-MINI™ PROGRAMMING

To configure the IL-Mini™ for the scaling, counting and other desired data acquisition functions, a program is built within the Logic Beach HyperWare-II

software. This program is called a "Program Net" as it consists of a number of icons all visually connected together with a mouse to make a "network". The Program Net is then uploaded to the IL-Mini™ memory where it executes. Due to the intuitive flexibility of the HyperWare-II software, there are unlimited data acquisition schemes that can be implemented with the Program Net. Below is a simple Program Net that samples reads the accumulated pulse totals received on the Counter input every 5 minutes, converts the pulses to kWh then sums them for 15 minute and 24 hour intervals and stores the totals to memory accordingly.

Sample Rate Clock icon triggers the Counter input icon to output its pulse count total every 5 minutes.

Summation icon sums the kWh from the Math icon and is triggered by a Calendar icon to output its Sum every night at Midnight.

Summation icons's outputs are stored to logger memory for later download and analysis.

Counter icon represents the hardware input channel on the IntelliLogger

Math icon performs the pulse to kWh conversion

Summation icon totalizes the kWh from the Math icon and is set to output every 3 readings (ie every 15 minutes).

SYSTEM COMPONENTS

The following components make up this energy logging system. Links to the Logic Beach Website for further details are provided. Component costs are on the Logic Beach price schedules. Additionally, comments are included

Part Number	Description	Qty	Comment
IL-Mini-LCD-Dbatt	IntelliLogger IL-Mini™ with the LCD display and D-cell battery pack options.	1	The display is not required but provides a great on-site display of actual readings during operation. Battery pack is specified such that installation is simplified and the unit will run unattended for months if desired.
3539.22000	IL-Mini™ Surface/wall mounting bracket	1	If desired
WNB-3Y-208-P	Electrical Meter; pulse output for 120/240Vac service with neutral	1	Other models are available for other service configurations.
CTS-750-100	Split-Core Curernt Transformer. 0.75" aperture (opening), 100Aac full scale.	2	CT's with other apertures and full scale current ratings are available
HW2M	HyperWare-II for IL-Mini™ Single User License	1	If not already owned.
USB Cable	USB Cable; Type A to Mini-B	1	If not already owned. This is a common cable used with cameras and other USB devices.

OTHER CONSIDERATIONS

Un-Used Analog Input Channels

➤ In this configuration, the IL-Mini™ has four un-used analog inputs. These inputs can readily be utilized for temperature, pressure, flow, or other inputs from various analog transducers and sensors.

Poly-Phase Applications

➤ For 3-phase applications, the WNB meter can be equipped with an additional CT and voltage sense input.

Monitoring Multiple Services Simultaneously; Method 1:

➤ Utilize the IntelliLogger IL-10, IL-20, IL-80 or IL-90. Each of these models have four or more Counter inputs. The IL-90 can monitor up to 16 pulse output meters simultaneously

Monitoring Multiple Services Simultaneously; Method 2:

➤ The IL-Mini™ can be provided with a Modbus RTU option. This allows the IL-Mini™ to communicate serially with one or more Modbus enabled power meters (WNC model) on a single Modbus RS-485 network