

## LCDA-P Power Display

### Overview

The power display has eight digits with an adjustable scale factor and decimal point position, to allow for the accurate display of power levels from tenths of a watt to megawatts. The power display is self-powered for use with the Advanced Pulse WattNode models with an output frequency up to 20Hz. For Advanced Pulse WattNode models with an output frequency greater than 20Hz an external DC power supply and pull-up resistor are required.

### Wiring

#### Low Pulse Frequency (up to 20Hz)

Connect the WattNode's 'P1' terminal of the output to the IN B (Terminal 2) on the LCD display. Connect the WattNode's 'COM' terminal of the output to the GND (Terminal 1) on the LCD display.

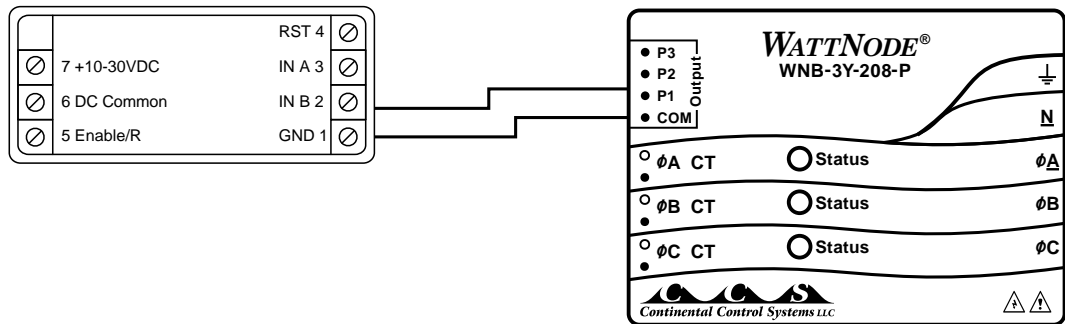


Figure 1: LCDA-P Low Pulse Frequency Wiring Diagram

#### High Pulse Frequency (greater than 20Hz)

Connect the WattNode's 'P1' terminal of the output to the IN A (Terminal 3) on the LCD display. Connect the WattNode's 'COM' terminal of the output to the GND (Terminal 1) on the LCD display. Add a pull-up resistor on the P1 line as shown below. See **Table 1** below for recommended pull-up resistor values.

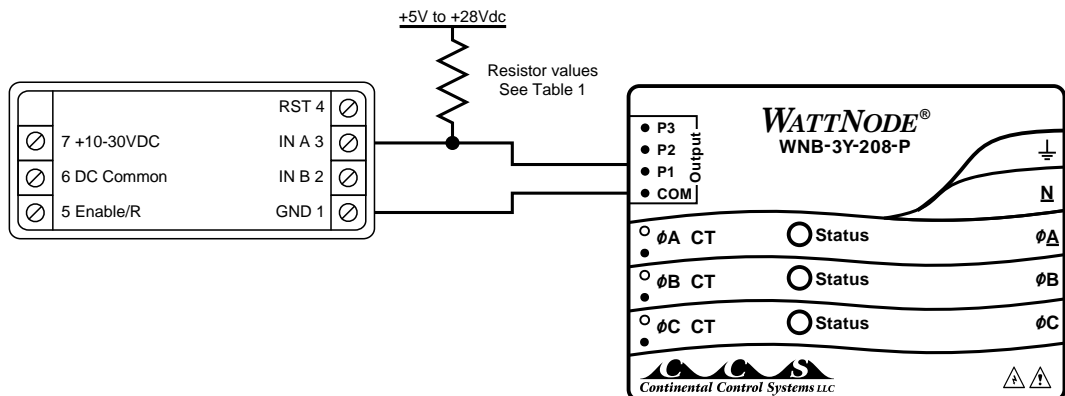


Figure 2: LCDA-P High Pulse Frequency Wiring Diagram

Full-Scale Pulse Frequency	Pull-up to 5.0V Recd (Min-Max)	Pull-up to 12V Recd (Min-Max)	Pull-up to 24V Recd (Min-Max)
20 Hz	20kΩ (1.0k-300k)	47kΩ (2.4k-470k)	100kΩ (4.7k-540k)
50 Hz	10kΩ (1.0k-130k)	20kΩ (2.4k-200k)	47kΩ (4.7k-270k)
100 Hz	4.7kΩ (1.0k-62k)	10kΩ (2.4k-100k)	20kΩ (4.7k-130k)
200 Hz	2.0kΩ (1.0k-33k)	4.7kΩ (2.4k-47k)	10kΩ (4.7k-68k)
600 Hz	2.0kΩ (1.0k-12k)	4.7kΩ (2.4k-16k)	10kΩ (4.7k-22k)

**Table 1: Recommended Pull-up Resistors**

## Programming the Power Display

The LCDA-P is shipped pre-programmed if ordered with an Advanced Pulse WattNode and current transformers. To make changes to the original program, follow the steps below.

Refer to the Durant Ratemeter Installation manual for details on programming the scale factors and installing the LCD display.

- 1) For the power display, the LCD will display the input pulse frequency times the scale factor. The decimal point is then superimposed on the resulting number. Start by selecting the WattNode model from the table below.

Model	Number of CTs	Vc
WNB-3Y-208-P	1, 2, or 3	120
WNB-3Y-400-P	1, 2, or 3	230
WNB-3Y-480-P	1, 2, or 3	277
WNB-3Y-600-P	1, 2, or 3	347
WNB-3D-240-P	1, 2, or 3	120
WNB-3D-400-P	1, 2, or 3	230
WNB-3D-480-P	1, 2, or 3	277

- 2) Compute maximum measured power:

$$Pm(\text{watts}) = Vc \cdot CT\text{Amps} \cdot NumOfCTs$$

Where  $Vc$  comes from the above table,  $CT\text{Amps}$  is the rated current of the current transformers being used, and  $NumOfCTs$  is the number of CTs being used with the WattNode. The WattNode can measure power levels up to 50% over the rated limits, so you may want to increase  $Pm$  by up to 50% if you wish to allow some overhead. If the WattNode outputs a power greater than the display can handle, then the display will show '----'.

- 3) Choose a row from the following table so that  $P_m$  is less than Expected Maximum Power with the Desired Display Format.

Expected Maximum Power	Desired Display Format <sup>1</sup>	Display Resolution	Scale Factor Equation (20Hz Output) <sup>2</sup>	Rate Multiplier
999.9 W	000.0 W	0.1 W	$V_c \cdot CT_{Amps} \cdot 3 / 2$	1
9999 W	0000 W	1 W	$V_c \cdot CT_{Amps} \cdot 3 / 20$	1
9.999 kW	0.000 kW	1 W (0.001 kW)	$V_c \cdot CT_{Amps} \cdot 3 / 20$	1
99990 W	00000 W	10 W	$V_c \cdot CT_{Amps} \cdot 3 / 200$	10
99.99 kW	00.00 kW	10 W (0.01 kW)	$V_c \cdot CT_{Amps} \cdot 3 / 200$	1
999.9 kW	000.0 kW	100 W (0.1 kW)	$V_c \cdot CT_{Amps} \cdot 3 / 2000$	1
9999 kW	0000 kW	1 kW	$V_c \cdot CT_{Amps} \cdot 3 / 20000$	1
9.999 MW	0.000 MW	1 kW (0.001 MW)	$V_c \cdot CT_{Amps} \cdot 3 / 20000$	1

<sup>1</sup> W, kW, or MW will not appear on the LCD display.

<sup>2</sup> The scale factors are valid only with a WattNode with a 20Hz full-scale pulse frequency.

- 4) Compute the scale factor. On program mode screen 1 enter your computed scale factor. Example: if your computed scale factor is 12.4137, round to 12.41, enter the four digits 1241, and then move the decimal point so that 12.41 is displayed.
- 5) On program mode screen 2 adjust the decimal point location to match the Desired Display Format.
- 6) On program mode screen 3 set the Rate Multiplier to 1 or 10 as shown in the table above.