Technote # 107
Rev. 12/29/2019

Adding a Simple Temperature Sensor

Rev.2

BRIEF:

Need a simple, calibrated temperature sensor you can monitor on your computer?   Your WN-2(d) system already has auxiliary analog input on the rear panel to interface to an external sensor. The software has a handy display to show you realtime temperature on up to four external temperature monitors.

Uses include:

1. Linear Amplifier Temperature Monitor (Mount in exhaust airflow or adjacent to finals)
2. Heatsink temperature sensor.
3. Room/ Outdoor Temperature.
4. Remote Monitoring of equipment Temperature.

DETAILS:

   You can add up to four temperature sensors to your WN-2(d) system using the four auxiliary analog inputs.   Sensors are available in TO92 package from Digikey or Mouser Electronics.   You will need a +12V supply for your sensor, which can be an unregulated supply between 9 and 20 volts DC. The temperature sensor has it's own internal regulator.
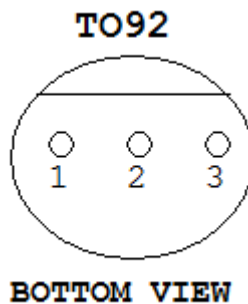

Figure #1. Pinout of temperature sensor

INSTRUCTIONS:

   The   LM34 output is 10 millivolt/ degree Fahrenheit sensor available from Texas Instruments. The LM35 output is 10 millivolt/degree Centigrade.   You can use either sensor for this project, they require no calibration and are accurate +/- 1.5 degree.   Use a 2-conductor shielded cable between the sensor and the WN-2(d) rear auxiliary connector to keep RF out of the system. Solder R1, R2 and C3 directly to the pins of the LM34/35 sensor.
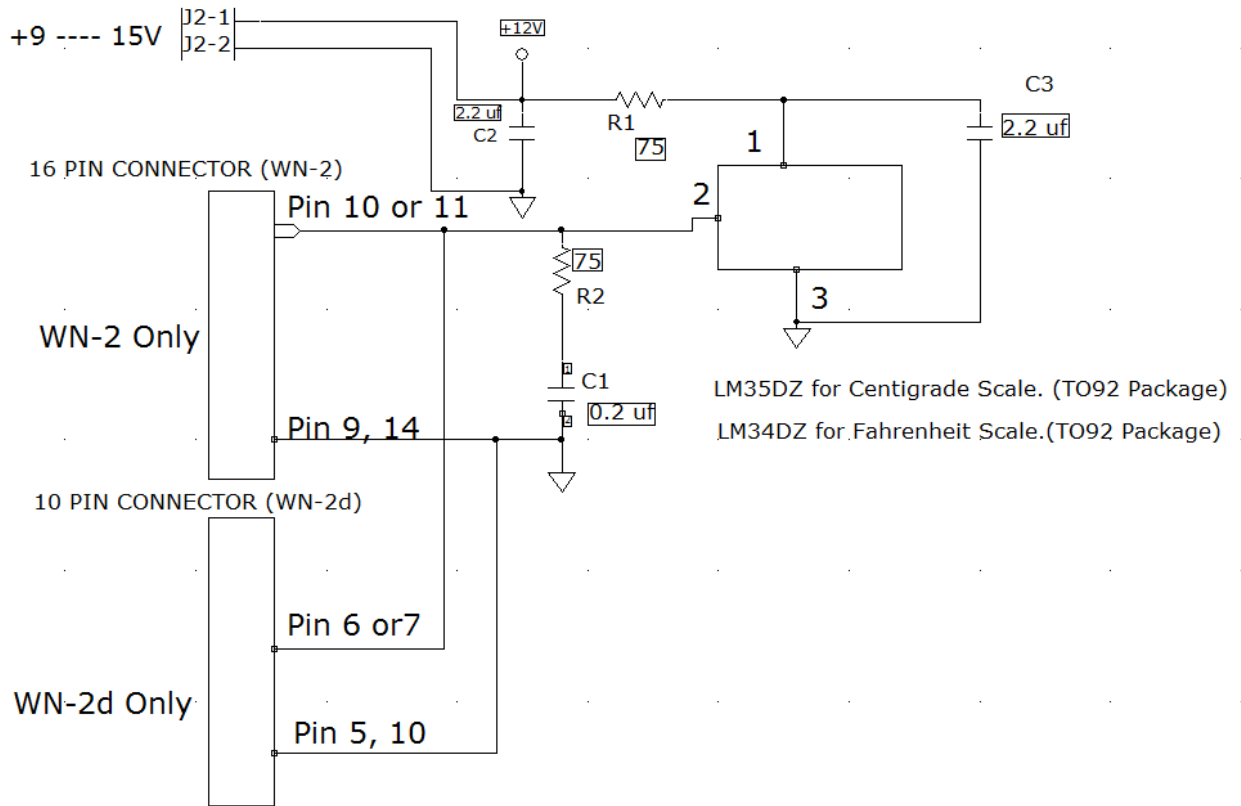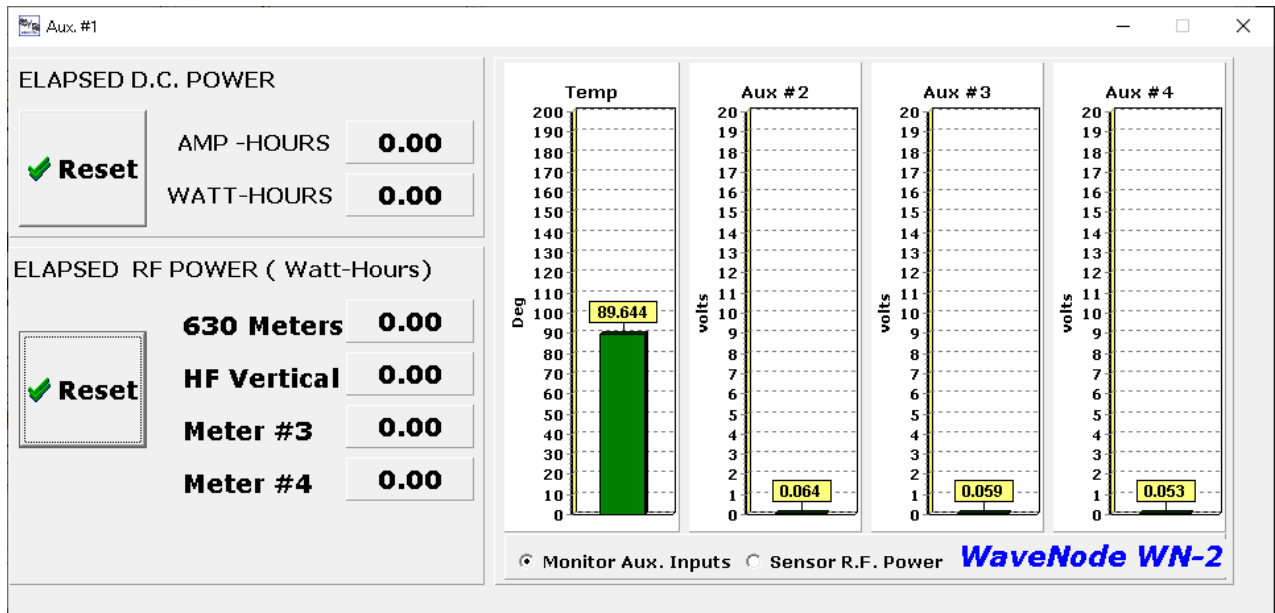
Figure #2

Go to the Configuration software menu on your Wavenode software:

Set the vertical scale on Auxiliary Meter #1 for **200** if using a Fahrenheit sensor. Set it to **100** if using the Centigrade version. Set the Vertical label on this meter to "Degrees". Set the Scale Factor to **100.** You will now have a 0-200 F. meter (or 0-100 degree C). Open the Aux #1 screen. Your thermometer will read out directly in degrees C or degrees F.

If you notice intermittent operation when transmitting, you may have to put a ferrite core at each end of your shielded cable.

. **Figure #3**

Figure #3 above shows the temperature monitor with 0-200 degree scale and measuring 89 degrees F.

ADDENDUM:

You can provide better accuracy and resolution by removing R60 surface mount resistor inside your WN-2 or WN-2d. This removes the 2K resistor internally that provides a 6:1 internal resistor divider on the analog input. The resistor is just below the I/O connector on the PC board. You would then use a scale factor of 17, not 100.

We recommend you not do this unless you are confident about removing a small SO0603 surface mount resistor. The resistor removal for the four analog channels are listed below:

Channel #1 is R60
Channel #2 is R61
Channel #3 is R63
Channel #4 is R72

Removal of the divider resistor will improve the resolution and noise immunity of the temperature sensor circuitry.