Monitoring Temperatures Using a T-GAGE and P14

Technical Note

Monitoring Temperatures

This technical note describes how to monitor temperatures using a T-GAGE temperature sensor, a thermistor and a P14 Performance Node.

This example application uses the following equipment.

Model Number	Description
M18TUP14	T-GAGE M18T Series Infrared Temperature Sensors, 0–10 V output
DX80N9X1S-P14	Performance Node with multiple I/O options & internal battery
Thermistor	10k Thermistor; G-Curve or J-Curve

Configure the Performance P14 Node

For details about the P14 Performance Node, refer to datasheet *194838*.

1. Set jumper J2 on the battery base board from the C position (current) to V (voltage).
2. Set jumper J3 on the battery base board to position 4 for the thermistor input.
3. Verify the P14 Node is set to use its Analog Configuration. DIP switch 2 must be in the off position (default setting).

Connect the T-GAGE M18T Sensor to the P14 Node

Refer to the datasheet for T-GAGE M18T Series (p/n *123698*) for more information.

1. Wire the M18T Sensor's brown wire (pin 1, 12–30 V dc) into the P14's pin 3.
2. Wire the M18T Sensor's white wire (pin 2, analog out) into the P14's pin 4.
3. Wire the M18T Sensor's blue wire (pin 3, ground) into the P14's pin 2.

Connect the Thermistor to the P14 Node

Wire the thermistor wires between P14 terminal pins 5 and 6.

Define the Analog Input Parameters

Before configuring the Node using the UCT, verify the P14 has been bound to a Gateway and the Gateway is connected to a computer with the UCT software.

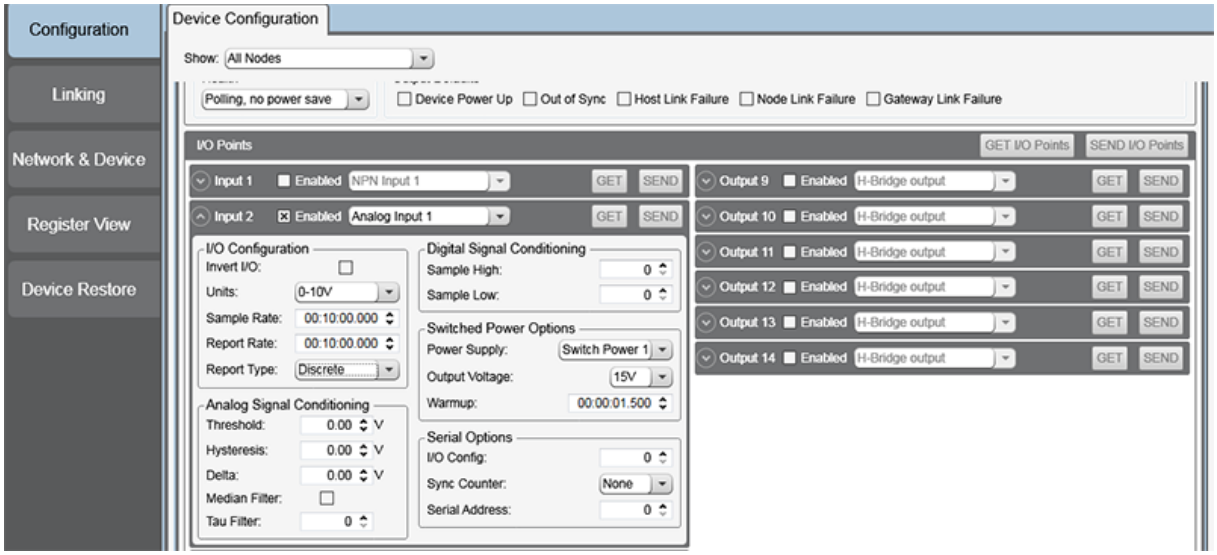
The P14 Node requires some basic parameter changes to read the temperature data and to properly operate the T-GAGE sensor. These step-by-step instructions outline the parameter settings for:

1. Setting the input to 0–10 volts.
2. Setting Switch Power Voltage to power the T-GAGE sensor.
3. Adjust warm-up time for the T-GAGE sensor (how long power is applied before taking a reading).
4. Select the Switched power supply to use to power the T-GAGE.
5. Setting the Sample Rate for the T-GAGE sensor and the thermistor input.
6. Setting the Report Rate for the T-GAGE sensor and the thermistor input.

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1. Go to the Configuration > Device Configuration screen.
2. Click the arrow next to Node 1. For this example, Node 1 is the P14 Node.
3. Enable Input 2.
4. From the drop-down list, select Analog Input 1.
5. Under I/O Configuration, select 0-10V from the Units drop-down list.
6. Under Switched Power Options, select Switch Power 1 from the Power Supply drop-down list.
7. Select a value between 12 V dc and 30 V dc (the power needed by the T-GAGE) from the Output Voltage drop-down list. For this example, we have selected 15 V.
8. Enter the Warmup time in hours:minutes:seconds. For this example, we are using 1.5 seconds.
9. Enter the desired Sample Rate in hours:minutes:seconds. For our example, we want to sample the sensor every 10 minutes.
10. Enter the desired Report Rate in hours:minutes:seconds. For our example, we want to report the sensor data every 10 minutes.
11. Click Send I/O Points to send the parameter changes to the network.
12. Enable the input point for the thermistor input and select the thermistor input (1 through 4) from the drop-down list.
13. Enter the same Sample Rate as you set for the T-GAGE sensor.
14. Enter the same Report Rate as you set for the T-GAGE sensor.
15. Click Send I/O Points to send the parameter changes to the network.

Test the Configuration

Read the sensor data to test your network configuration. To read your register data,

1. Go to the Register View screen.
2. Select the device from the drop-down list. For our example, we are reading Node 1's registers.
3. Click Read Registers to retrieve the data from the device.

The formula to convert the register value of the T-GAGE into °C is: ((Register Value ÷ 65535) × 300) - 20.

The formula to convert the register value of the thermistor into °C is: Register Value ÷ 20.

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