Monitoring Tank Levels with a QT50U and P14 Performance Node

Technical Note

Monitoring Tank Levels

This technical note describes how to monitor tank levels using a QT50U Ultrasonic sensor and a P14 Performance Node.

This example application uses the following equipment:

Model Number	Description
QT50ULBQ6	U-GAGE QT50U Ultrasonic Sensor with Analog Output
DX80N9X1S-P14	Performance Node with customizable I/O options and powered by an internal battery
MQDC1-501.5	Cordset with a 5-pin M12/Euro-style quick disconnect

Configure the P14 Node Hardware

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 the V (voltage) position.
2. Verify the P14 Node is set to use its Analog Configuration. DIP Switch 2 on the radio base board must be in the off position (default setting).

Connect the U-GAGE Ultrasonic Sensor to the P14 Node

1. Wire the U-GAGE's blue wire (pin 3, ground) into the P14's terminal pin 2.
2. Wire the U-GAGE's brown wire (pin 1, 12–30 V dc) into the P14's terminal pin 3.
3. Wire the U-GAGE's white wire (pin 2, analog out) into the P14's terminal pin 4.
4. Wire the U-GAGE's black wire (pin 4, analog out) into the P14's terminal pin 5.
5. Cut or tape the U-GAGE's gray wire.

Define the Analog Input Parameters

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

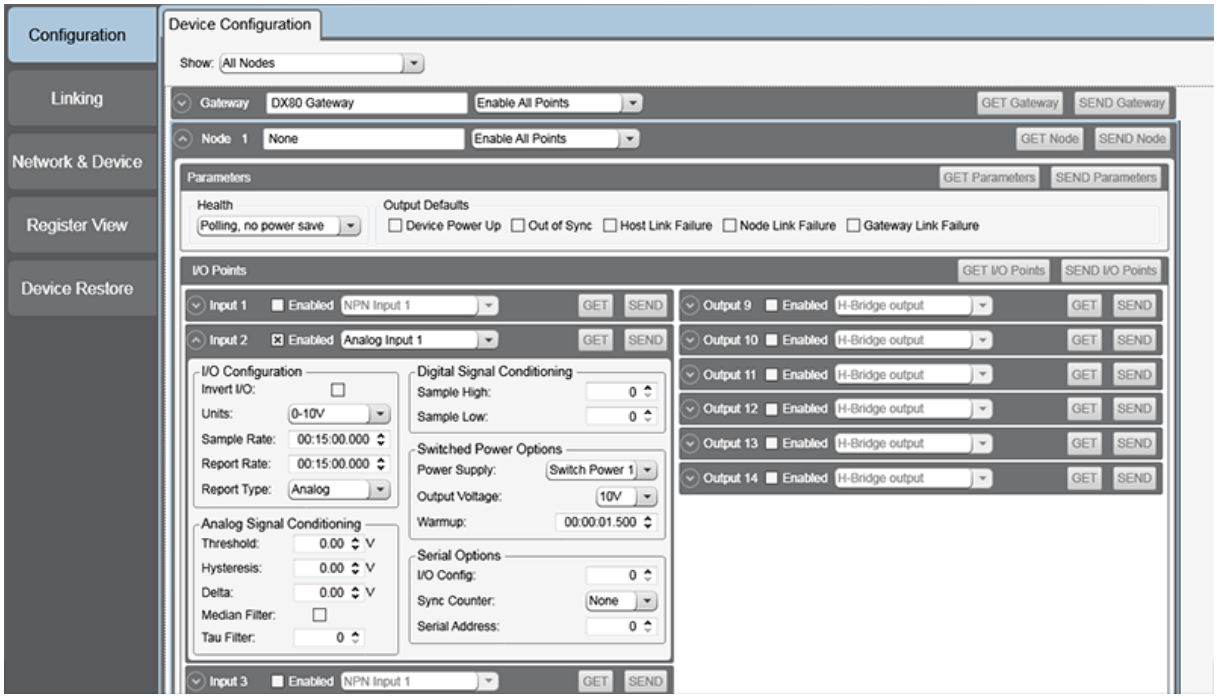
The P14 Node requires some basic parameter changes to read the ultrasonic sensor data and to properly operate the sensor. The following step-by-step instructions outline the parameter settings for:

1. Setting the input to 0–10 volts.
2. Setting Switch Power Voltage to power the U-GAGE sensor.
3. Adjust the warm-up time for the U-GAGE sensor (how long power is applied before taking a reading).
4. Select the switched power supply to use to power the U-GAGE.
5. Setting the Sample Rate for the U-GAGE sensor input.
6. Setting the Report Rate for the U-GAGE sensor 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. Enter the desired Sample Rate in hours:minutes:seconds. For our example, we want to sample the Ultrasonic sensor every 15 minutes.
7. Enter the desired Report Rate in hours:minutes:seconds. For our example, we want to report the sensor data every 15 minutes.
8. Under Switched Power Options, select Switch Power 1 from the Power Supply drop-down list.
9. Select 10V from the Output Voltage drop-down list.
10. Enter the Warmup time in hours:minutes:seconds.
11. 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 default scale for the QT50 is:

- 0 V = 200 mm
- 10 V = 8 m

See the QT50 datasheet to set an alternative scale.

The formula to convert the register value of the U-GAGE into % full is: (Reg. Value ÷ 65535) × 100.

The formula to convert the register value of the U-GAGE into distance to target is: (Reg. Value ÷ 65535) × Max distance of the set scale. For this example, this is: (Reg. Value ÷ 65535) × 8 m.

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