

# Display a Scaled Value on a Direct Select Node



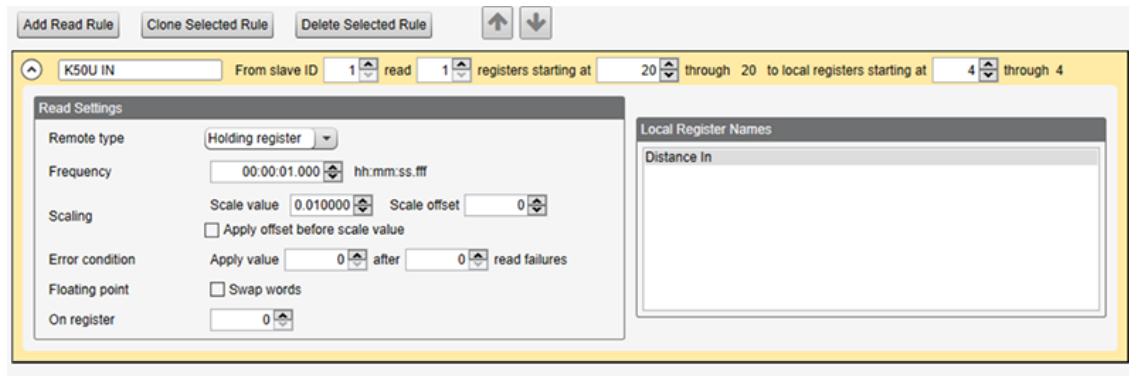
## Display a Scaled Value on a Direct Select Node

Follow these steps to display a scaled ultrasonic measurement, a 4-20 mA sensor reading, or an all-in-one pressure sensor reading on a Direct Select Node's LCD.

### Display a Scaled Ultrasonic Measurement

The ultrasonic sensor measures the distance in inches. The value is read, scaled, and then written to the display on the Direct Select Node. This example uses the following hardware:

- K50UX1ARA Ultrasonic sensor connected to a DX80N9Q45U Wireless Q45 as Node 1
- DX80N9DSTS Direct Select as Node 2
- DXM700-B1R1 DXM Wireless Controller as the master radio



1. Connect your DXM to the computer and launch the latest version of the DXM Configuration Software.
2. On the opening screen, select **Traditional Setup** from the **Configuration Mode** drop-down list. Select the correct DXM model from the models drop-down list.  
This example is using the DXM700.
3. Go to the **Register Mapping > RTU > RTU Read** screen.
4. Click **Add Read Rule** and configure the read rule to read in the desired input(s) (this example is reading in the distance value in inches measured by the K50UX1ARA).  
According to the datasheets for the K50U sensor and Q45U Node, register 20 on the Gateway holds the measured value in inches.
5. Enter the local register to store the calculate value.  
This example reads the value into local register 4.
6. Click the arrow to the left of the Read Rule name to view all the parameters.
7. Enter 0.01 in the **Scaled value** field.  
According to the datasheet of the K50UX1ARA, divide the register value by 100 (multiple by 0.01) to calculate the measurement in inches.
8. Go to the **Register Mapping > RTU > RTU Write** screen.
9. Click **Add Write Rule** and configure the write rule to write the scaled value to the DX80N9DSTS.  
In this example, the DSTS is Node 2, so the display uses is register 46. Consult the datasheet of the DX80N9DSTS to find the how this register is determined.
10. Change the **Frequency** of the write rule to **On Change of local register data**.  
If you are using single register control mode and the lights on the Direct Select Node, additional steps still need to be taken before creating this write rule.

### Save and Upload the Configuration File

After making any changes to the DXM configuration, you must save the configuration files to your computer, then upload it to the DXM.

Changes to the XML file are not automatically saved. Any adjustments require that the file be manually saved before exiting the tool and/or before sending the XML file to the DXM.

1. Save the XML configuration file to your hard drive by going to the **File > Save As** menu.
  2. Go to the **Device > Send XML Configuration to DXM** menu.
    - If the Application Status indicator is red, close and restart the DXM Configuration Tool, unplug and re-plug in the USB cable and reconnect the DXM to the software.
    - If the Application Status indicator is green, the file upload is complete.
    - If the Application Status indicator is yellow, the file transfer is in progress.
- The DXM reboots and begins running the new configuration.

## Display a Scaled mA Value

The following steps explain how to display a scaled 4-20 mA reading on a Direct Select's display. The 4-20 mA output from the Q4XTILAF300-Q8 is read into the DXM700-B1R1, scaled, and then written to the display on the DX80N9DSTS Direct Select Node. This example uses the following hardware:

- Q4XTILAF300-Q8 Q4X sensor connected to a DX80N9X6S-P2 as Node 1
  - DX80N9DSTS Direct Select Node as Node 2
  - DXM700-B1R1 DXM Controller as the master radio
1. Connect your DXM to the computer and launch the latest version of the DXM Configuration Software.
  2. On the opening screen, select **Traditional Setup** from the **Configuration Mode** drop-down list. Select the correct DXM model from the models drop-down list.

This example is using the DXM700.

3. Go to the **Register Mapping > RTU > RTU Read** screen.
4. Click **Add Read Rule** and configure the read rule to read in the desired input(s).

This example is reading analog input 1, or I/O 5, of the DX80N9X6S-P2. According to the datasheet of the DX80N9X6S-P2, I/O 5 of Node 1 is stored in register 20 of the Gateway.

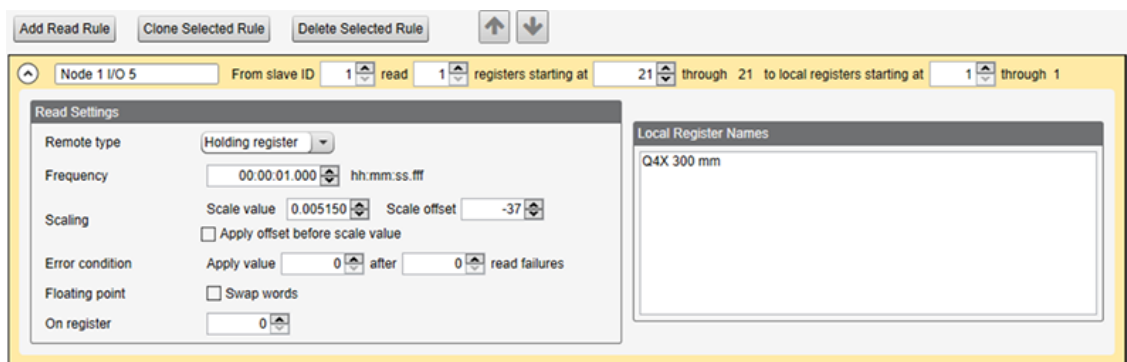
5. Calculate the **Scale value (m)** and **Scale offset (b)**.

From the factory, the Q4XTILAF300-Q8 is scaled so that 4 mA is 30 mm (y1), and 20 mA is 300 mm (y2). The DX80N9X6S-P2 will give values of 13107 at 4 mA (x1) and 65535 at 20 mA (x2).

- To find the scalar values for a 4–20 mA sensor: **Scale offset** =  $(5y1 - y2) \div 4$  and **Scale value** =  $(y1 - \text{Scale offset}) \div 13107$ .
- To find the scalar values for a 0–10 V sensor, the DX80 radios give values of 0 at 0 V and 65535 at 10 V. Use these equations instead: **Scale offset** = y1 and **Scale value** =  $(y2 - y1) \div 65535$ .

For the Q4XTILAF300-Q8, the **Scale value** 0.00515 and the **Scale offset** is -37.

6. Click the arrow to the left of the Read Rule name to view all the parameters.
7. Enter the calculated **Scale value** and **Scale offset**. For this example, the value is stored in local register 1.



8. Go to the **Register Mapping > RTU > RTU Write** screen.
9. Click **Add Write Rule** and configure the write rule to write the scaled value to the DX80N9DSTS. For this example, the Direct Select Node is Node 2, so the display is register 46. Consult the datasheet of the DX80N9DSTS to find the how this register is determined.
10. Change the **Frequency** of the write rule to **On Change of local register data**.  
If you are using single register control mode and the lights on the Direct Select Node, additional steps still need to be taken before creating this write rule.

## Save and Upload the Configuration File

After making any changes to the DXM configuration, you must save the configuration files to your computer, then upload it to the DXM.

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  - If the Application Status indicator is green, the file upload is complete.
  - If the Application Status indicator is yellow, the file transfer is in progress.

The DXM reboots and begins running the new configuration.

## Display a Scaled Pressure Reading

The pressure sensor value is read into the DXM700-B1R1, scaled, and then written to the display on the DX80N9DSTS. This example uses the following hardware:

- DX80N9X1W-PS50G (0-50 psi) as Node 1
  - DX80N9DSTS Direct Select Node as Node 2
  - DXM700-B1R1 DXM Wireless Controller as the master radio
1. Connect your DXM to the computer and launch the latest version of the DXM Configuration Software.
  2. On the opening screen, select **Traditional Setup** from the **Configuration Mode** drop-down list. Select the correct DXM model from the models drop-down list.

This example is using the DXM700.

3. Go to the **Register Mapping > RTU > RTU Read** screen.
4. Click **Add Read Rule** and configure the read rule to read in the desired input(s). This example is reading in the analog input register (I/O 2)
5. Calculate the **Scale offset** (b) and **Scale value** (m).

The minimum pressure (0 psi) is y1 and the maximum pressure (50 psi in this example) is y2. The Pressure Node will give values of 0 at 0 psi (x1) and 32767 at the max psi (x2). To find the scalar values: **Scale offset** = y1 and **Scale value** =  $2((y2 - y1) \div 65535)$ .

For this example, **Scale offset** is 0 and **Scale value** is 0.00153.

6. Click the arrow to the left of the Read Rule name to view all the parameters.
7. Enter the calculated **Scale value** and **Scale offset**. For this example, the value is stored in local register 1.
8. Go to the **Register Mapping > RTU > RTU Write** screen.
9. Click **Add Write Rule** and configure the write rule to write the scaled value to the DX80N9DSTS. For this example, the Direct Select Node is Node 2, so the display is register 46. Consult the datasheet of the DX80N9DSTS to find the how this register is determined.
10. Change the **Frequency** of the write rule to **On Change of local register data**.

If you are using single register control mode and the lights on the Direct Select Node, additional steps still need to be taken before creating this write rule.

## Save and Upload the Configuration File

After making any changes to the DXM configuration, you must save the configuration files to your computer, then upload it to the DXM.

Changes to the XML file are not automatically saved. Any adjustments require that the file be manually saved before exiting the tool and/or before sending the XML file to the DXM.

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  - If the Application Status indicator is green, the file upload is complete.
  - If the Application Status indicator is yellow, the file transfer is in progress.

The DXM reboots and begins running the new configuration.