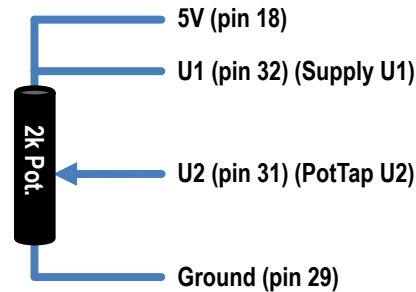


## Using Universal Inputs to Read a Potentiometer

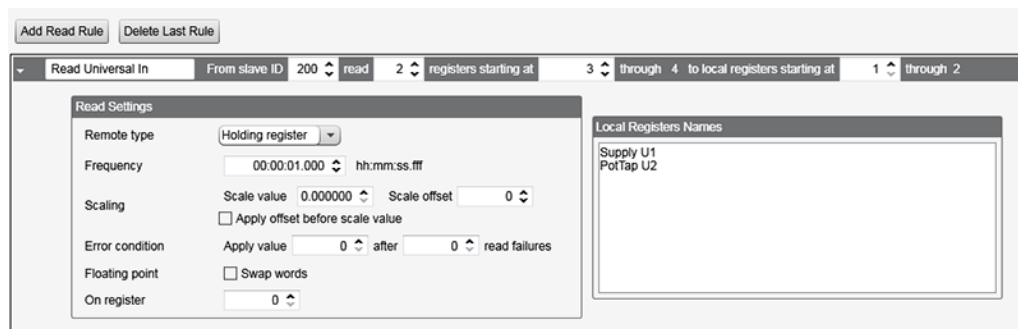
The DXM Controllers can be configured to read a potentiometer resistance using two universal inputs set to read voltage. Apply action rules and math to the voltage readings to obtain the resistance of the potentiometer.

This procedure assumes you have basic knowledge of your DXM Controller and the DXM Configuration Tool.

To read a potentiometer, set two universal inputs as voltage types. The first input reads the voltage of the power supply; the second input reads the voltage of the potentiometer tap point. The DXM100 connection diagram is shown below with labels defined in the configuration tool.



1. Launch the DXM Configuration Tool. Connect to the DXM Controller using the USB port or an TCP/IP address.
2. Go to the Local Registers > Local Registers **Configuration** screen.
3. For each of the first five Local Registers, name the register.
  - Local Register 1: Supply U1
  - Local Register 2: PotTap U2
  - Local Register 3: TapV x ResTotal
  - Local Register 4: Pot Resist Total
  - Local Register 5: Tap Resistance
4. Click the arrow next to the register name to display the parameters.
5. Set the LCD Permissions to Read for each local register to display the register values on the DXM Controller's LCD under the Registers menu.
6. Go to the Register Mapping > Read Rules screen and click Add Read Rule.
7. Click the arrow next to the new rule to display the parameters. Name your rule.
8. Enter the parameters into the read rule to read Modbus holding registers 3 and 4 from the I/O board (slave ID 200) and write those into local registers 1 and 2. The registers are read once a second.



9. Go to the **Action** Rules > Math/Logic screen and click Add Math Rule. A new math rule is created and is ready to be configured.

10. Define the two rules to calculate the resistance of the potentiometer tap. The basic formula is:  $(\text{Pot Total Resistance} \times \text{Pot Tap voltage}) \div \text{Supply voltage}$ . (The voltage readings are in millivolts.) Since only one math operation can be performed at a time, we need to create two math rules: one to multiply and one to divide.

Name	Operation	Local Register	And/Through	Local Register	Affecting the following registers	Store the result to	Local Register
Multiple	Multiply	2	And	4	PotTap U2 Pot Resist Total	→	3 <i>TapV x ResTotal</i>
Divide	Divide	3	And	1	Supply U1 TapV x ResTotal	→	5 <i>Tap Resistance</i>

11. Configure the I/O board universal inputs 1 and 2 to be type voltage.
- Go to the Register View > Register View screen.
  - To set universal input 1 as a voltage type, write Modbus register 3306 (universal input 1, input type) with a 3.
  - To set universal input 2 as a voltage type, write Modbus register 3326 (universal input 2, input type) with a 3.

Read Registers			Write Registers		
Starting Register	ID	Value	Starting Register	ID	Value
3306	3306	0	3306	3306	3
Number of registers: 1			Number of registers: 1		
<input type="button" value="Read registers"/>			<input type="button" value="Write registers"/>		
<input type="checkbox"/> Enable Polling					
1 s					

After this configuration file is uploaded to the DXM Controller, the DXM's LCD shows all the local register values.

## Save and Upload the **Configuration** File

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

- Save the XML configuration file to your hard drive by going to the File > Save As menu.
- Upload the configuration file to your DXM Controller.
  - Verify your DXM Controller is connected to the Windows-based PC running the DXM Configuration Tool.
  - Go to the Device > Send XML **Configuration** to DXM menu.

The DXM Controller reboots and begins running the new configuration.