# Mapping Many Inputs to One Output Using the DXM Controller and **Action** Rules

Mapping Many Inputs to One Output Using **Action** Rules

Use Action Rules to read multiple inputs, logically OR the values, then write the result to an output or outputs.

In this example application, we read four toggle switch inputs connected to DX80 Nodes in various locations. When any switch is activated, we want to turn on two different Wireless TL70 Stack Light Node outputs.

The toggle switch inputs are connected to the DX80 Node Input 1 (register 1). The Wireless TL70 Node outputs are Output 1 (register 9).
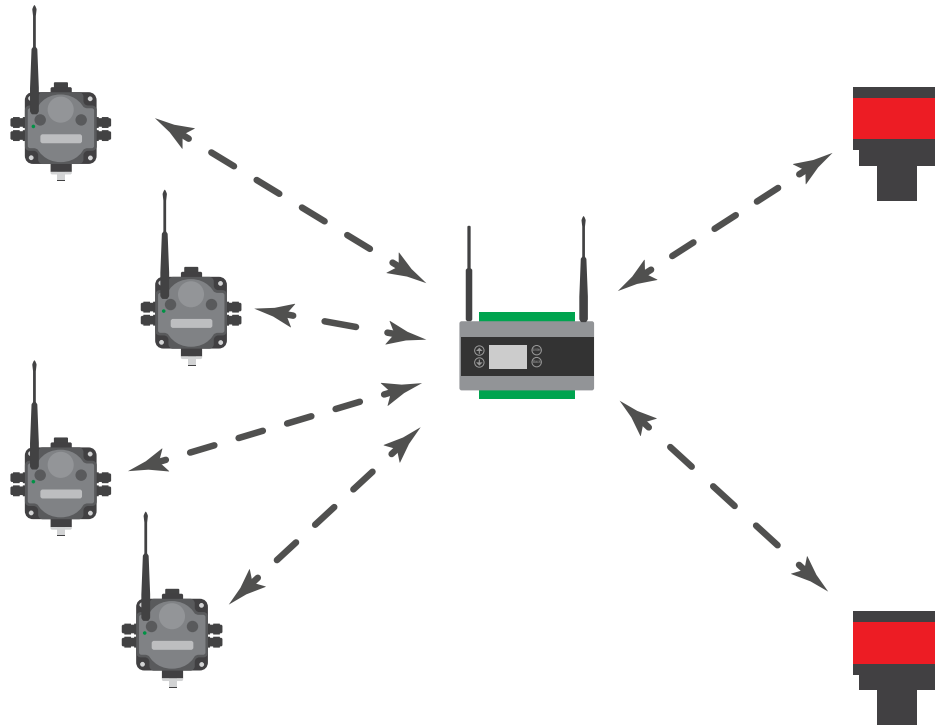

1. Define all DXM Controller local registers.
2. Define the DXM Controller's Action Rules.
3. Create the register Read and Write Rules.
4. Save the configuration file and upload the file to the DXM Controller.

Define the Local Registers

1. Go to the Local Registers > Local Register **Configuration** screen.
2. Define the first four local registers as the Node 1 through 4 switch registers by naming them and setting LCD permissions to Read.
3. Define local register 5 to be the output data transmitted to the Wireless TL70 Nodes by naming it and setting LCD permissions to Read.

The local registers are set up for the Action Rules and Read/Write Rules.
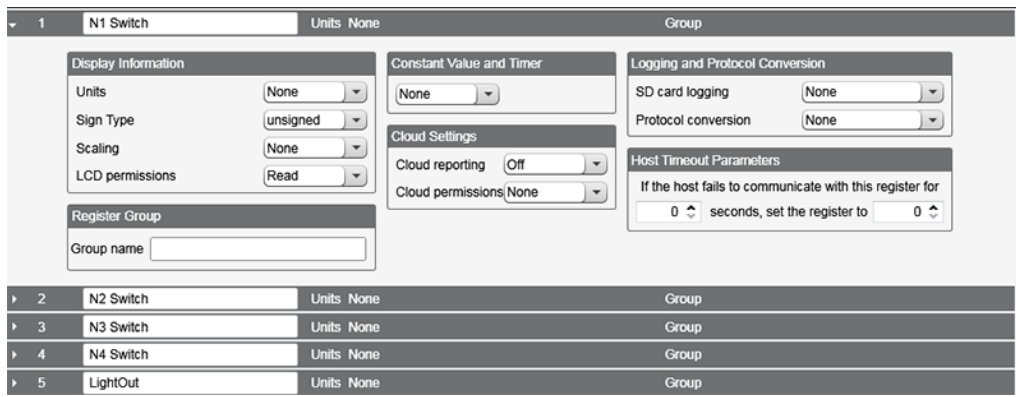
Create the **Action** Rule

Create an Action Rule that logically ORs local registers 1 through 4 and writes the ORed value to local register 5, the light output.

1. Go to the **Action** Rules > Math/Logic screen and click Add Math Rule.
2. Name the math rule.
3. From the drop-down lists, select Logical OR (**Operation**), local registers 1 through 4, and store the result in local register 5.
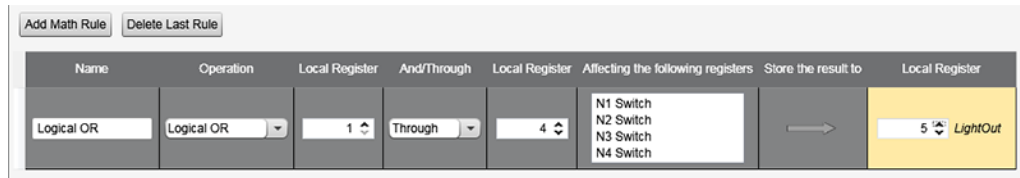

Create the Read and Write Rules

Define the rules to read the switch input values from the internal DX80 Gateway (Modbus Slave 1) and write the values to local registers.

The DXM Controller's internal ISM radio is Modbus Slave ID 1.

The four DX80 Gateway registers to read for Nodes 1 through 4, input 1, are 6800 through 6803. This register location organizes the Modbus registers by each input. See *Alternate Modbus Register Organization in the DX80 Host Controller Systems Manual* (p/n *132114*) for more information about alternate Modbus registers.

Define the Write Rule to write values to the Wireless TL70 Node registers. For this example application, the two Wireless TL70s are Nodes 5 and 6. Because the DX80 Gateway handles all Modbus registers, write to the Gateway Modbus registers for Nodes 5 and 6 register 9 (16 + Node# × 16 + 9), or Gateway registers 105 and 121.

1. Go to the Register Mapping > Read Rules screen and click Add Read Rule.
2. Click the arrow to display the read rule parameters.
3. Name your new rule.
   We have named our example read rule ReadDX80.
4. From the drop-down lists, read From slave ID 1, read 4 registers **starting** at 6800 to local registers **starting** at 1.
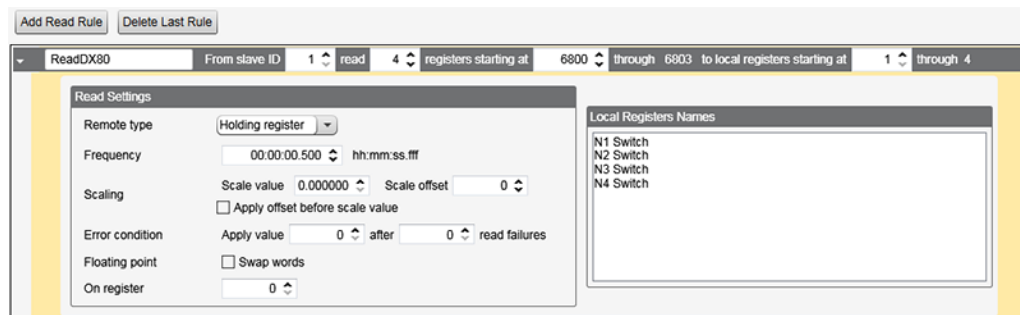
5. Set the Frequency to 0.50 seconds.
6. Go to the Register Mapping > Write Rules screen and click Add Write Rule.
7. Click the arrow to display the write rule parameters.
8. Name the write rule and select the following parameters. Select a write Frequency of On change of local register data.
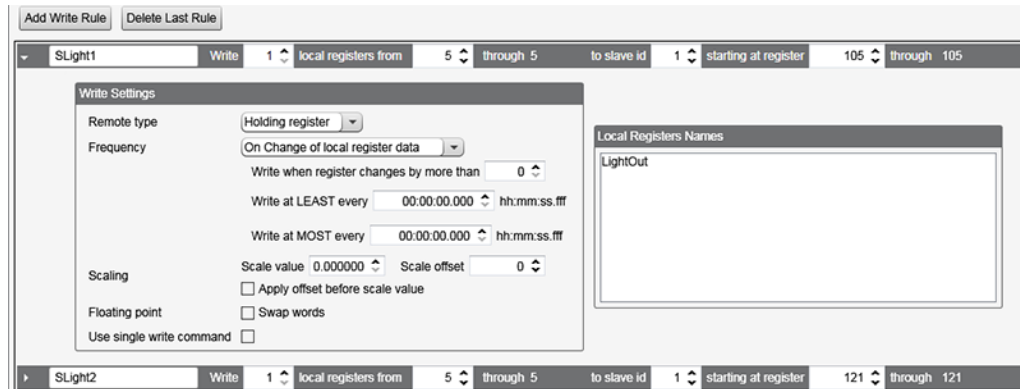
9. Create a second write rule, similar to the first one, but writing to register 121.

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.

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

   The DXM Controller reboots and begins running the new configuration.