ADAM 6050 Series

Digital Output Follows Digital Input State Change

Manufacturer: Advantech

Technical Note Date: 01/05/2023

Hardware Platform: ADAM 6050 Series Digital I/O

Firmware Version(s): Tested with 6.11 B35

Prerequisite Downloads:

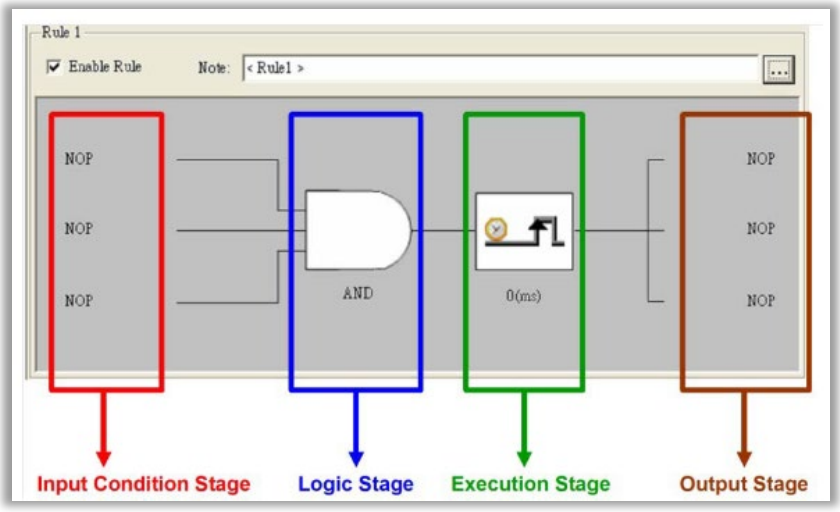
Firmware can be found here: https://www.advantech.com/en/support/details/firmware?id=1-1XJRP1
Advantech ADAM/APAX Utility: https://www.advantech.com/en-us/support/details/utility?id=1-2AKUDB

Overview:
There are occasions when sites using the ADAM 6050 Digital I/O devices need to have an output that follows an input state change on the same unit. This guide will walk through the steps of how to accomplish that locally on the ADAM 6050 instead of having to do it via other methods (i.e. BVMS scripting). The way this is done is through the ADAM's Graphic Condition Logic (GCL). This allows the output state changes to work locally on the ADAM unit and will work regardless of network connection to the ADAM module. However, functions **WILL STOP** if the ADAM unit loses power and has no network connection. Once network connectivity is reestablished then rule will work again. It would be a good idea to keep the ADAM/APAX utility running on a workstation or server that will have communication to the unit(s) and can easily download the configuration in the event of a power loss.

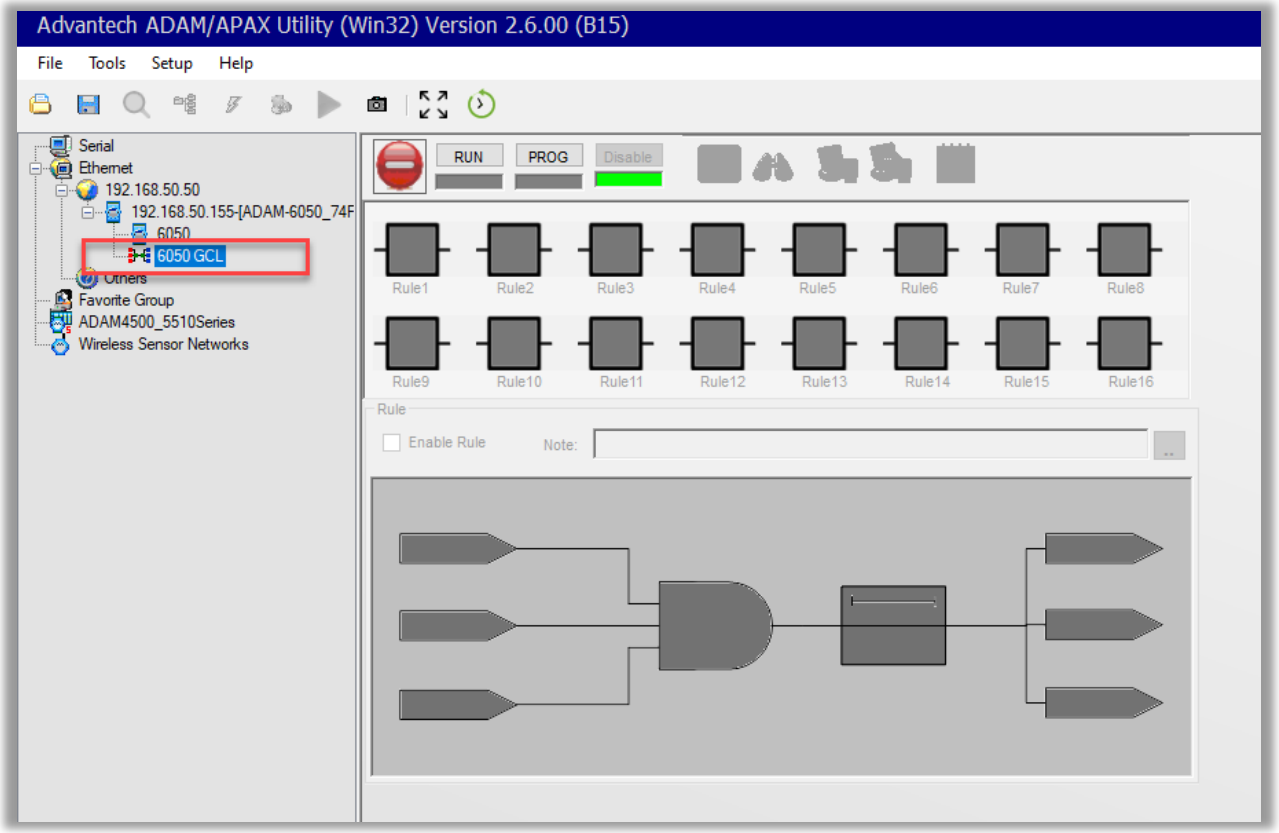
You will need the ADAM/APAX Utility to configure the ADAM 6050 and this guide assumes the module has already been assigned an IP address. For reference, the default IP address for configuring any part of the ADAM 6050 is **00000000**.

The ADAM 6050 comes with twelve Digital Inputs (DI's) and six Digital Ouputs (DO's). The DI's are all out of the box defaulted to Normally Closed (N/C) operation. The DO's are all out of the box defaulted to Normally Open (N/O). This guide assumes that the DI states have not been inverted and are default. However, there will be a section at the end to show you how to invert the DI default state to N/O and what you must change with the GCL rule if you do invert it.

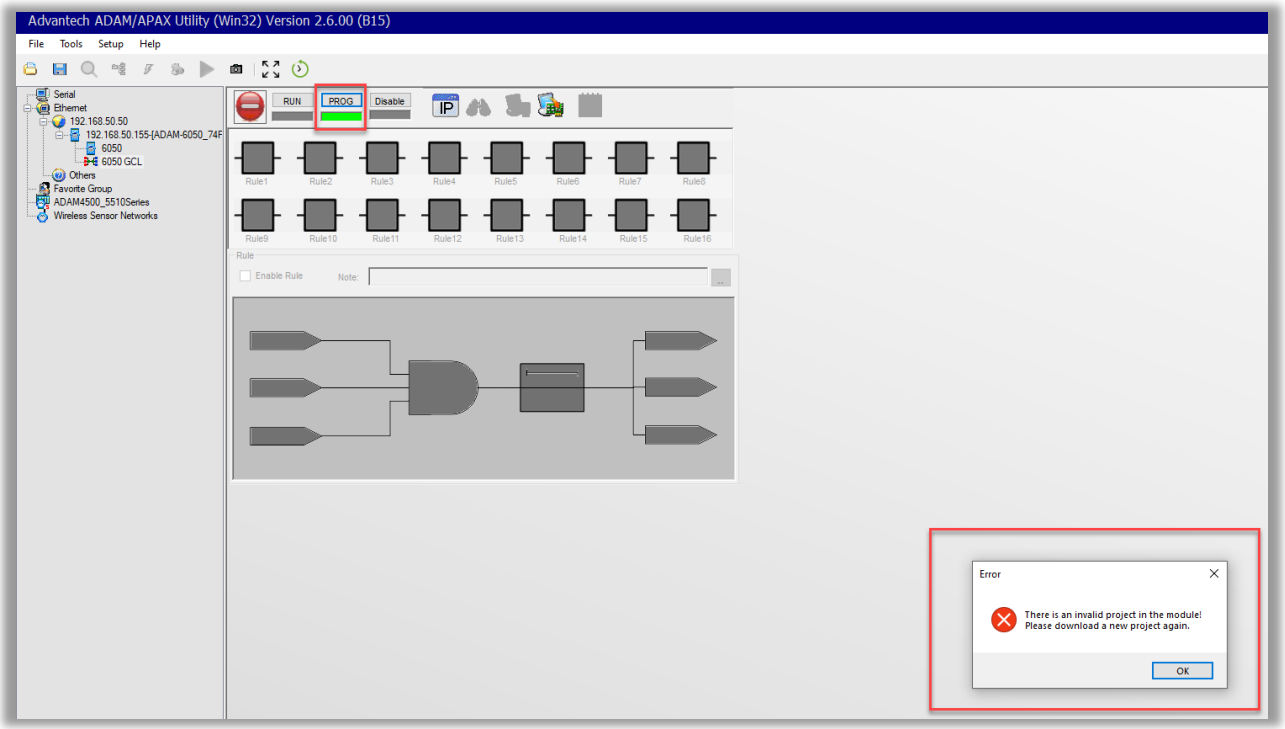
Here are the logic stages that will be configured during this guide:



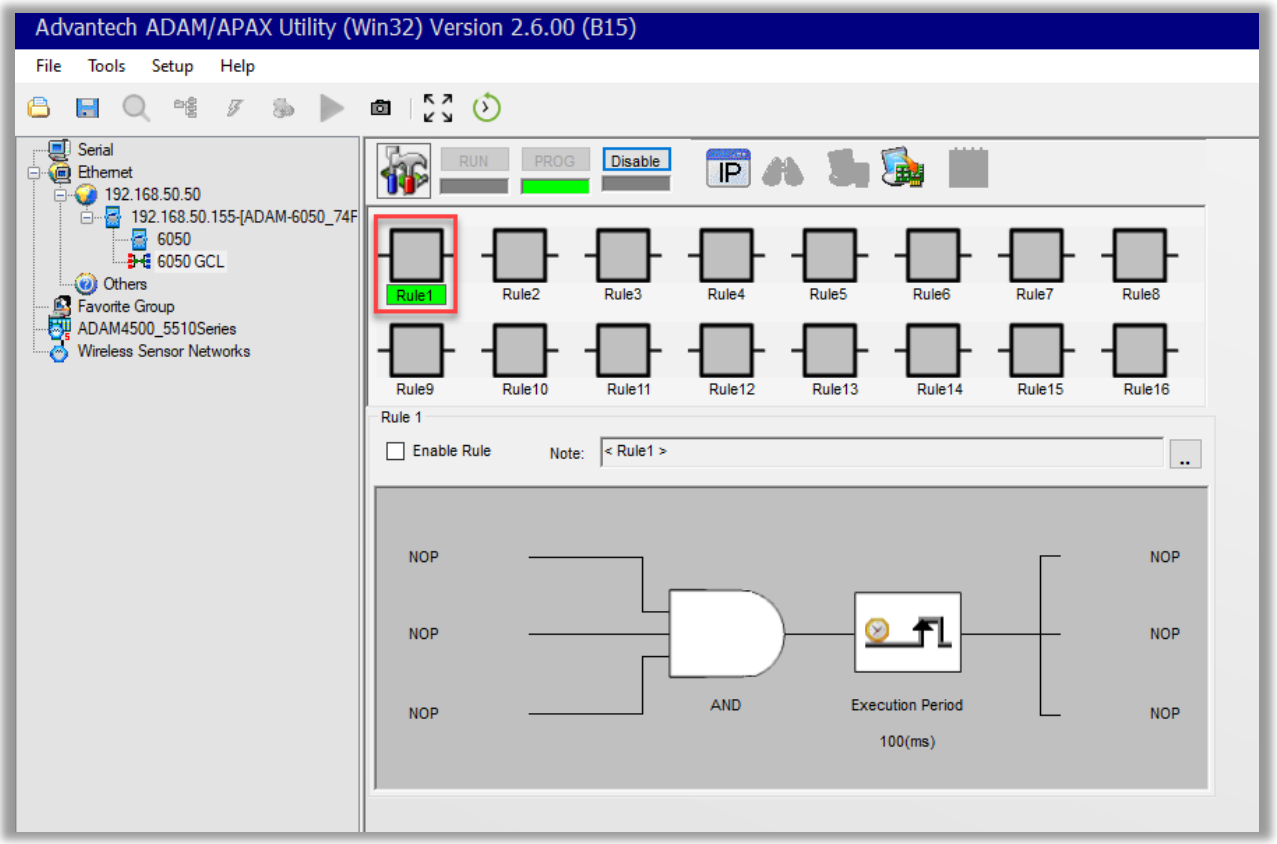
Process:
When you launch the ADAM/APAX Utility, select the GCL option that will be a subcategory under the ADAM 6050 module. By default, GCL is not running and you will notice that it is disabled.



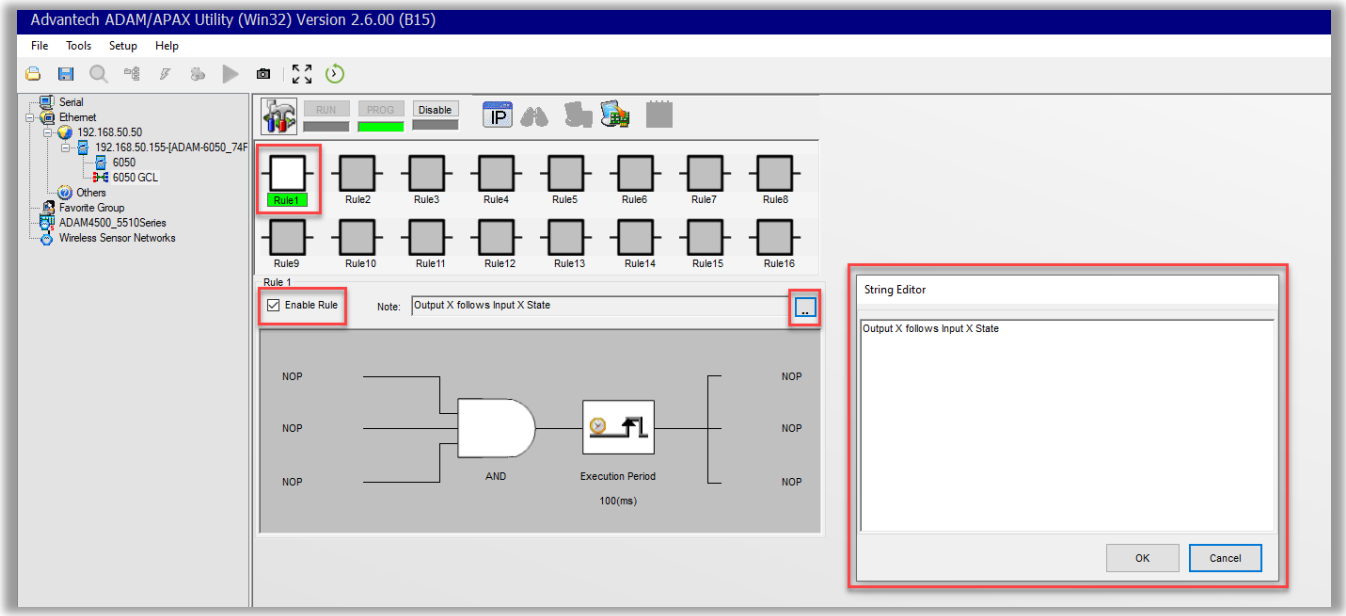
Step 1: Click on PROG and acknowledge the alert that you get when it pops up.



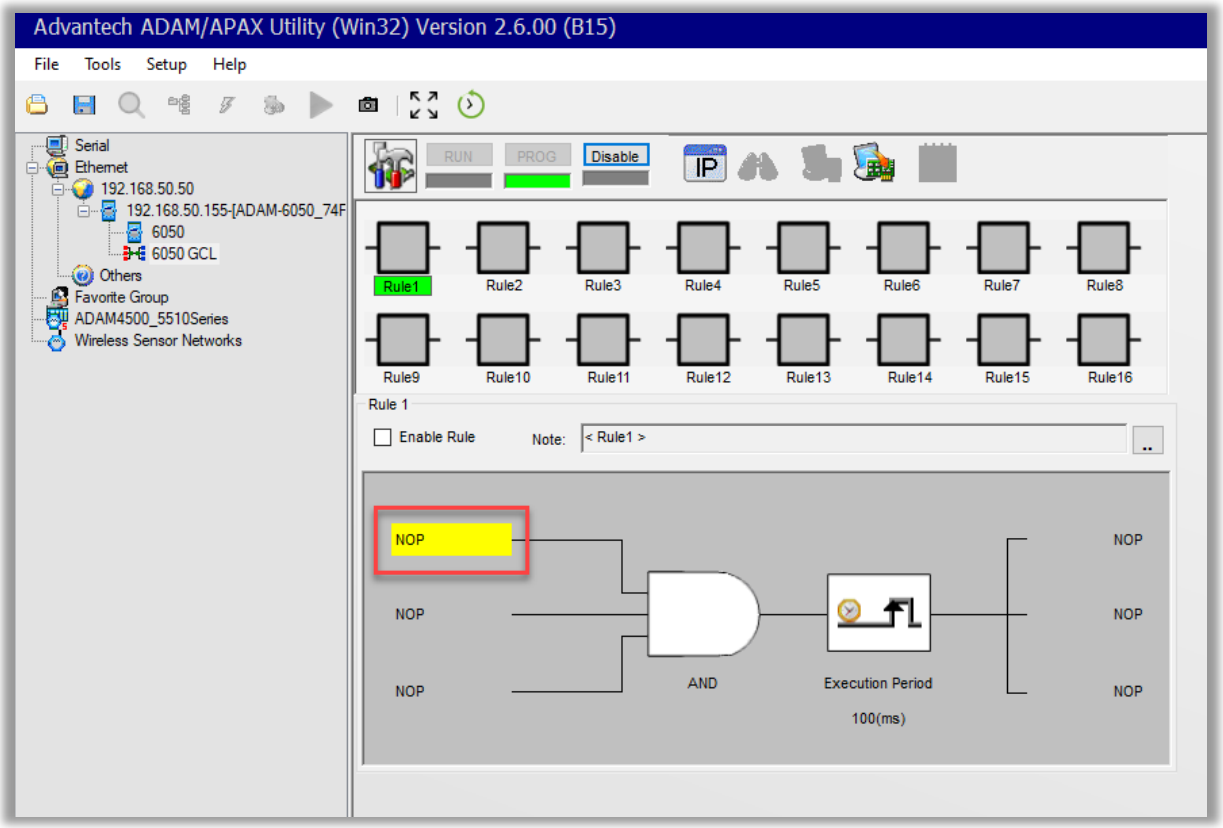
Step 2: Click on Rule 1.



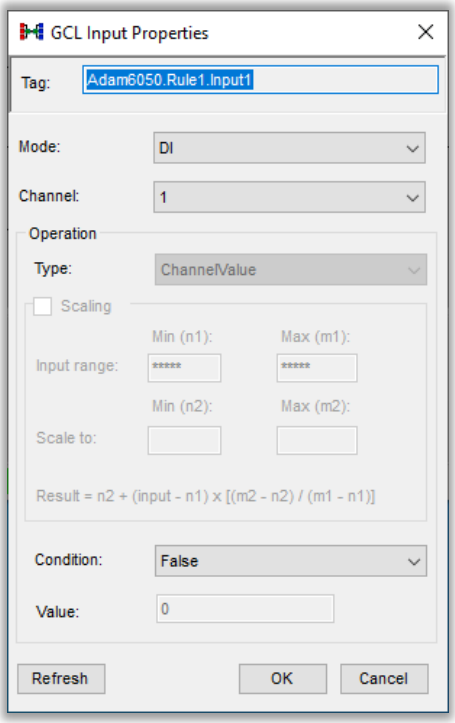
Step 3: Enable the rule, and then click on the button to the right to edit the description of the rule. Once you have a description, click OK. The description is optional and does not affect the rule.



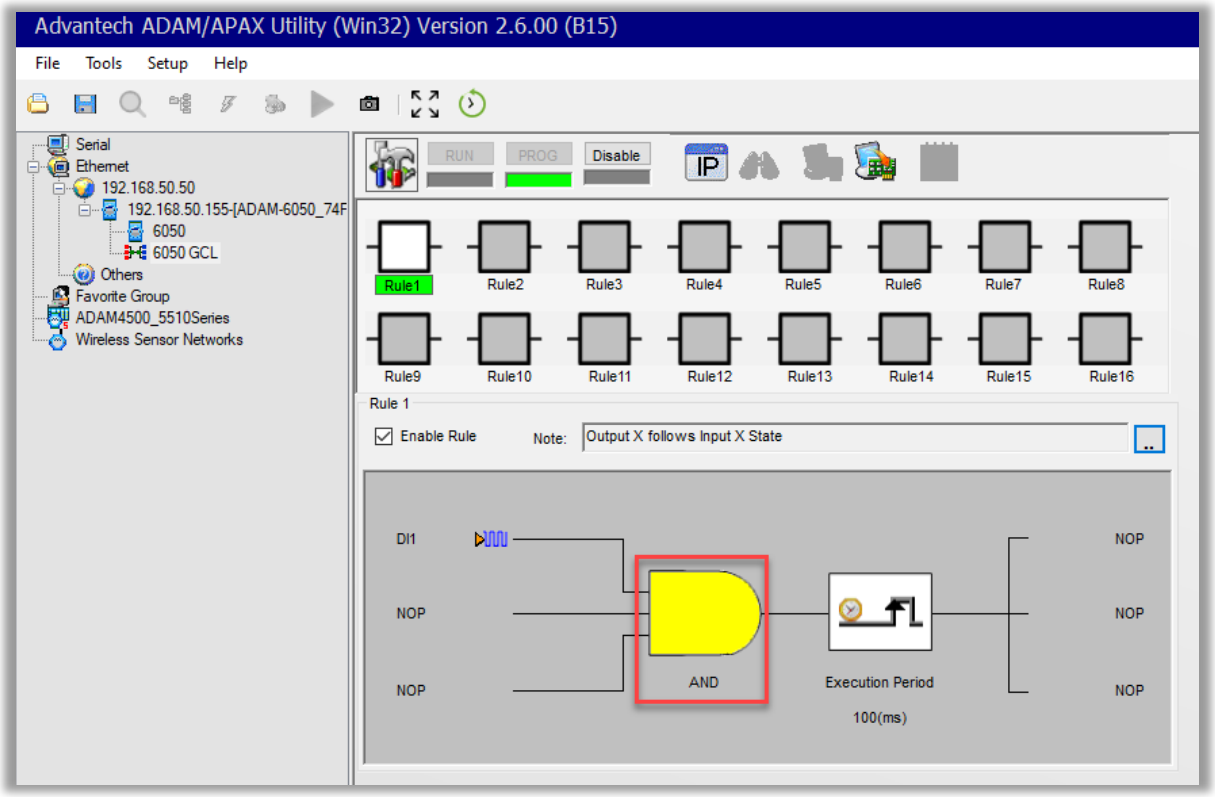
Step 4: Highlight the top “NOP” option in the Input Condition Stage area.



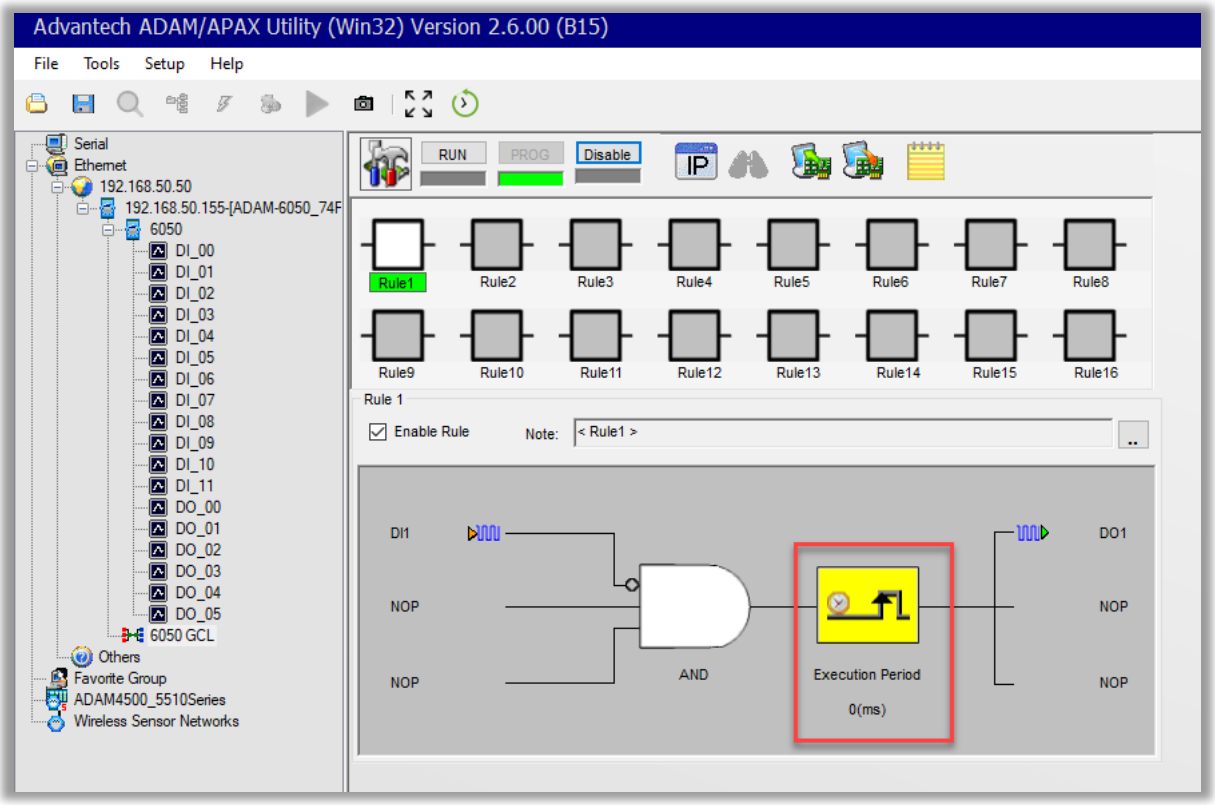
Step 6: In the pop-up window, set the Mode to “DI”, set the input channel you want the rule to apply to, and set the Condition to “False”. Remember, DI’s are numbered 0-11. In this example we are using DI 1. Click OK.



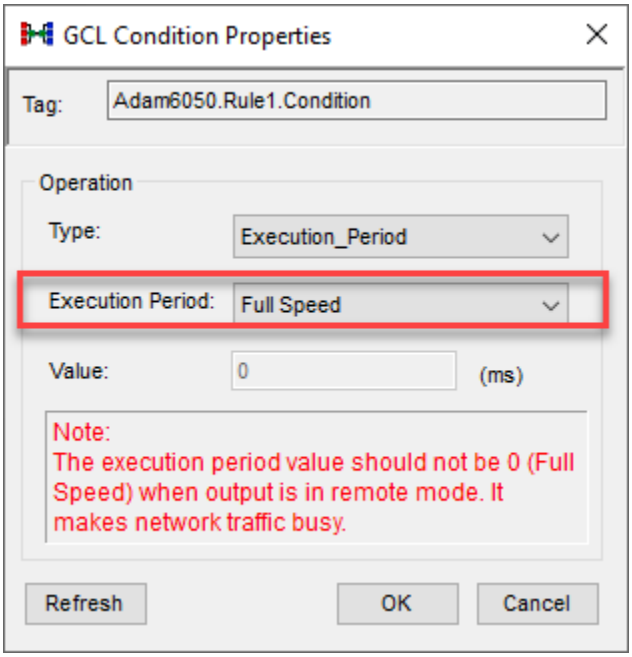
Step 7: Verify that the default logic state is set for AND. If it is not, please change it to AND.



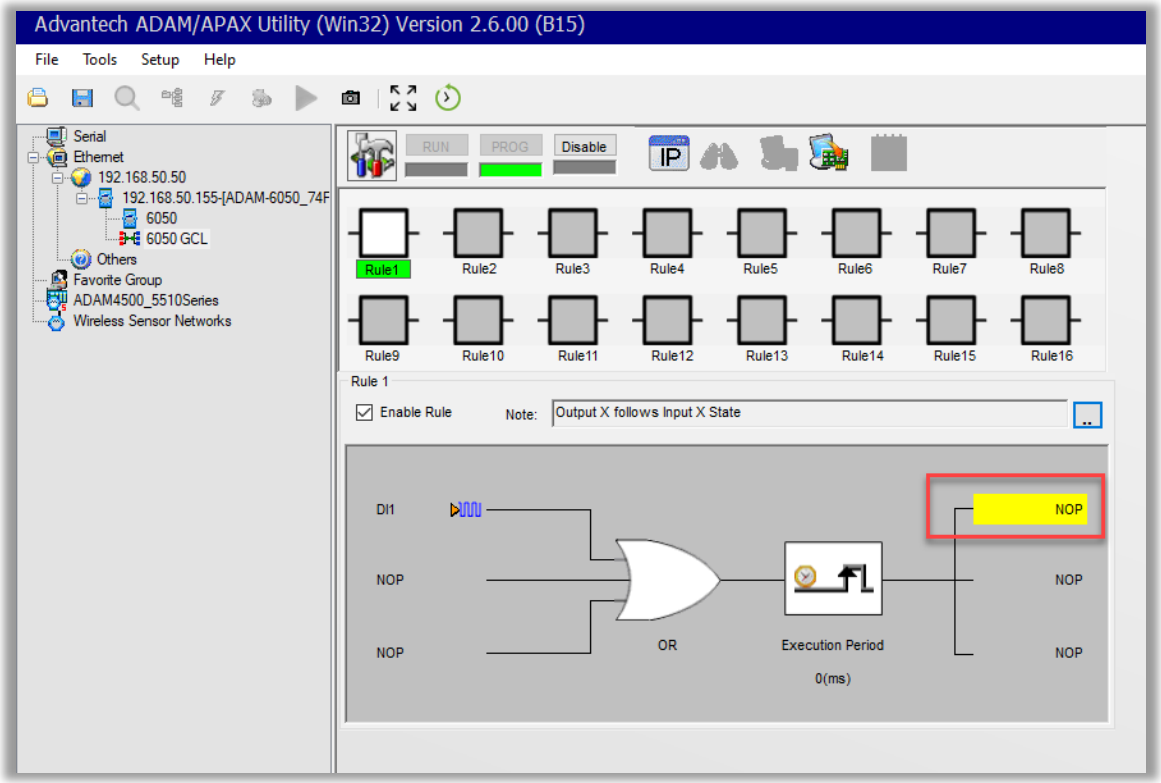
Step 8: Click on the Execution Period object in the Execution Stage.



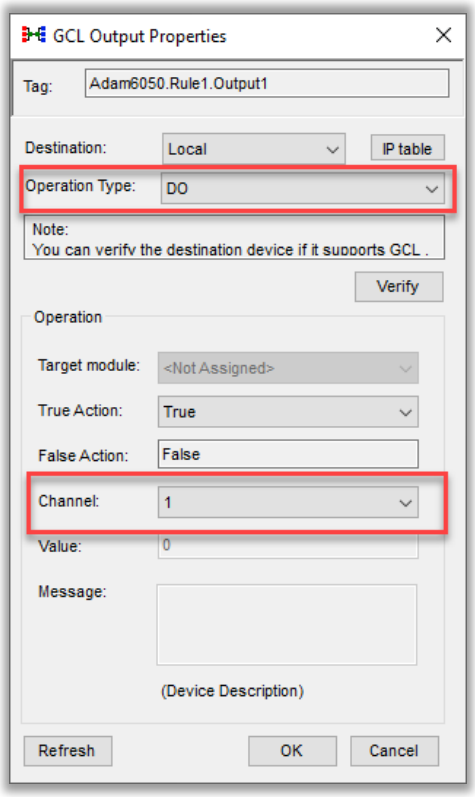
Step 9: Verify the Type is set for “Execution_Period” and set the Execution Period to “Full Speed”. Click OK.



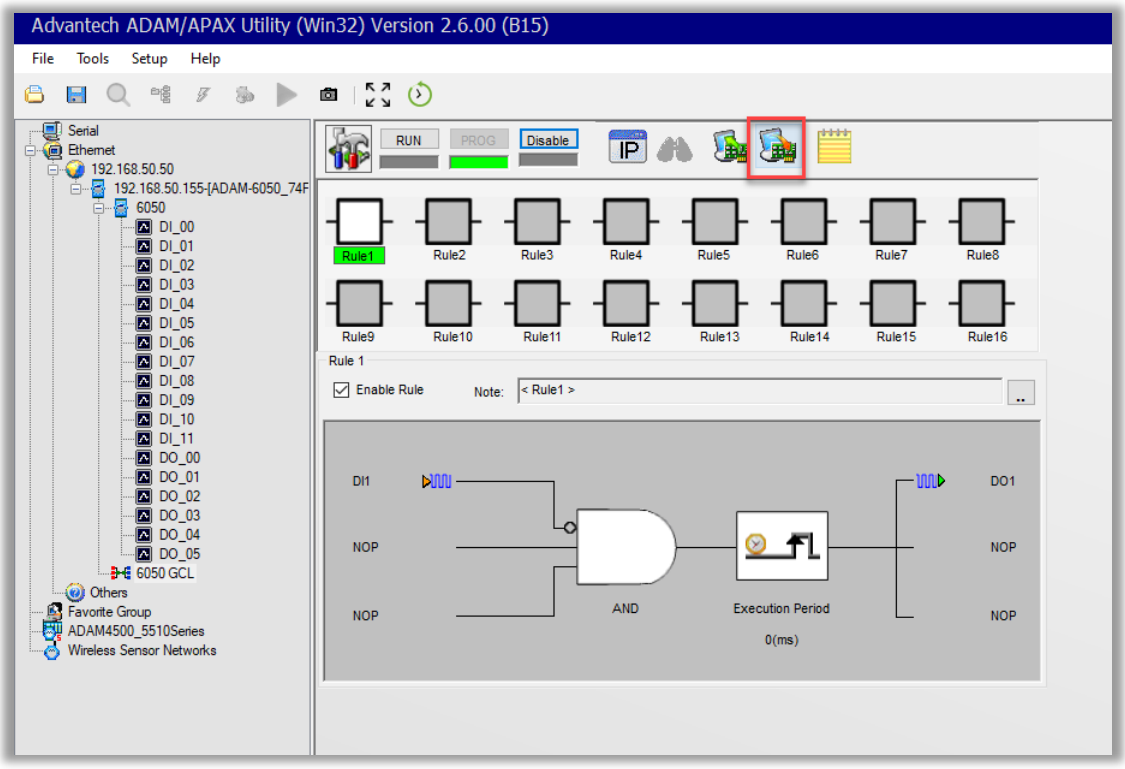
Step 10: Click on the top “NOP” object in the Output Stage.



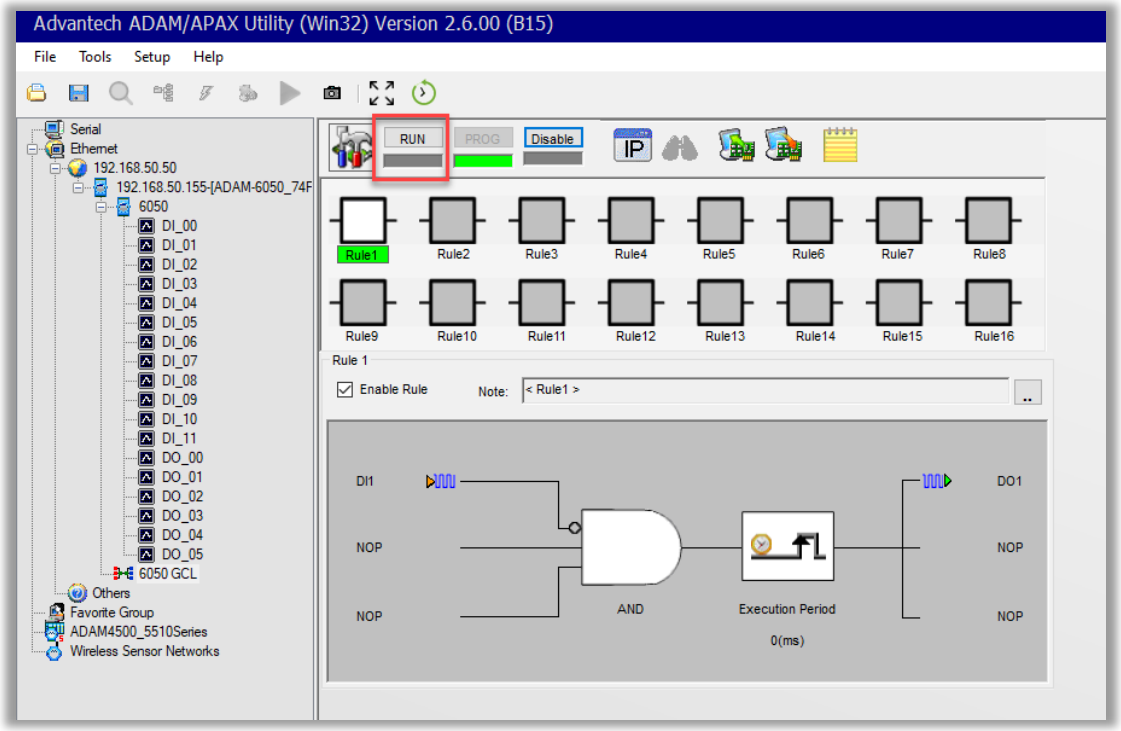
Step 11: Set the Operation Type to DO (Digital Output), and assign the channel (output) that you want the rule associated to. Remember, the ADAM 6050 has six Digital Outputs that are numbered 0-5. In this example we are using DO 1.



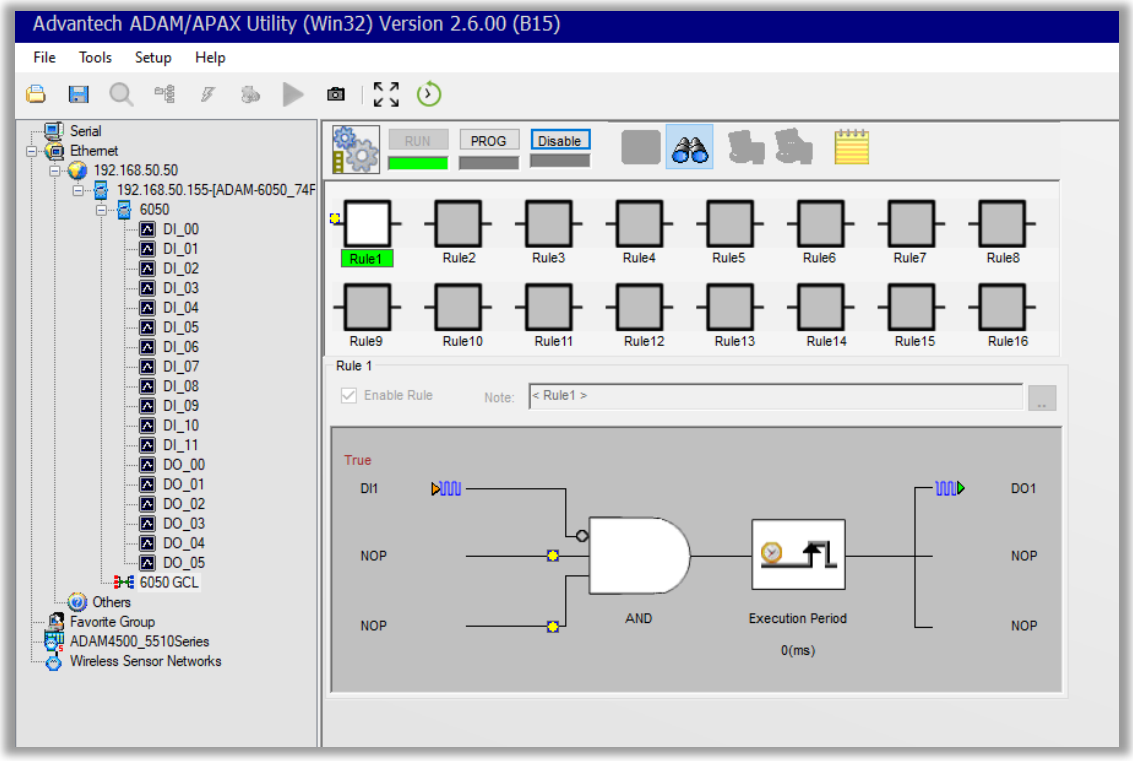
Step 12: Click on the Download Project icon to save the configuration to the ADAM 6050. A progress window will be displayed.



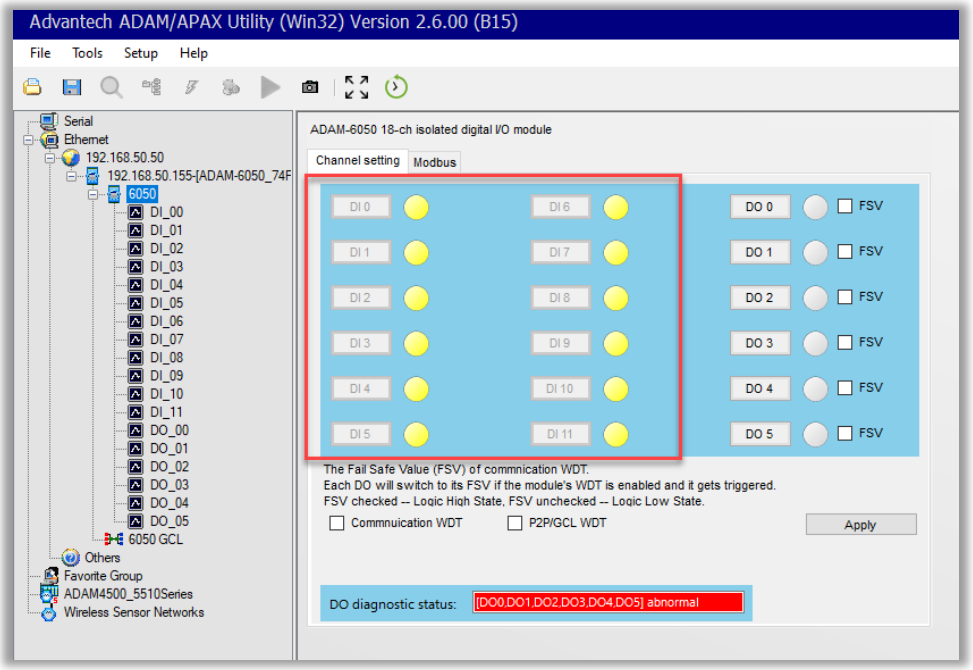
Step 13: Click on RUN to have the rule start and continuously run.



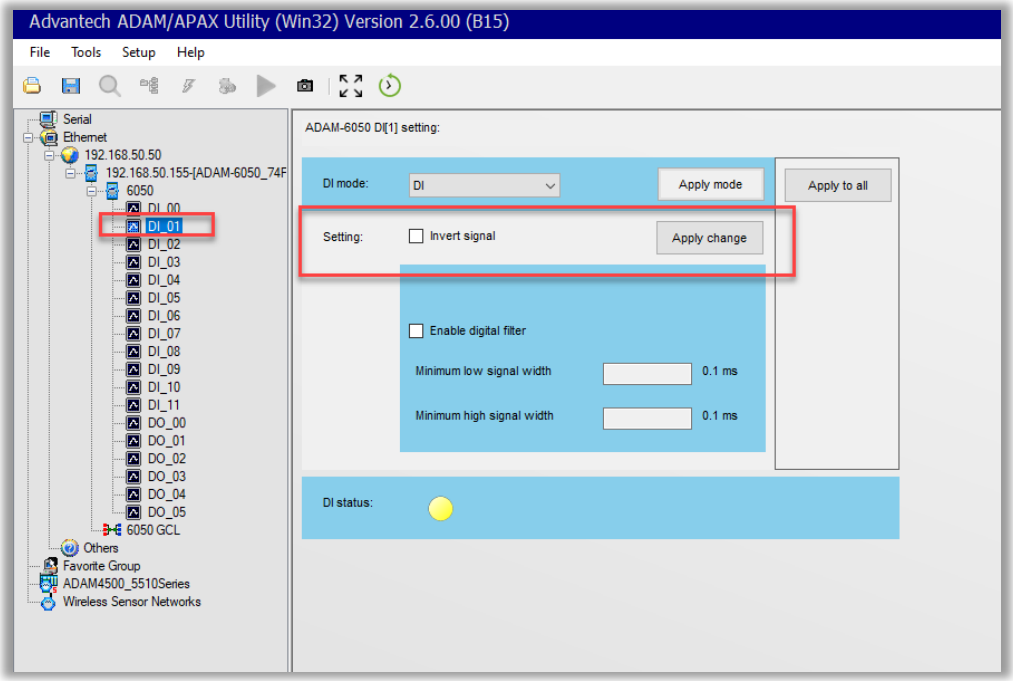
Step 14: Verify running state. By default, monitoring will be enabled which is represented by yellow circles. When you short the associated Digital Input, you will see the yellow circles progress to the right. You should check continuity with a multi-meter on the Digital Output you associated to make sure you are getting a closer before you connect to the endpoint device. This completes the configuration to have the output follow the input state. No further action required.



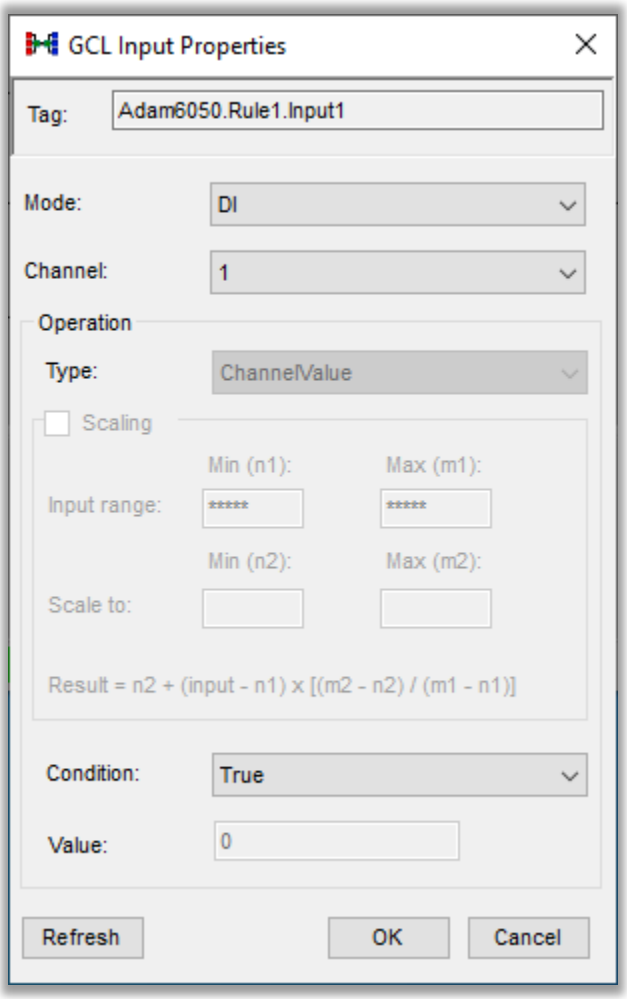
Default Input Status (out of box) Normally Closed:
As mentioned in the beginning of this guide, the Digital Inputs for the ADAM 6050 are in a Normally Closed (N/C) state. Steps 1-14 are assuming the DI's are staying in this N/C state.



Inverting Digital Input State to be Normally Open:
Should you want to change the Digital Input to be Normally Open, you can invert the state by selecting the DI on the left side of the ADAM/APAX Utility and selecting "Invert signal" then clicking "Apply Change". Remember, if you rule is already configured with Steps 1-14, then inverting the signal afterwards will cause the rule to be true and will fire the output.



Updating Rule after Inverting Digital Input Signal to Normally Open:
Should you invert the Digital Input signal, and make it Normally Open, then you must update your GCl rule to reflect the change. You will need to go back to the GCL, click on PROG (see Step 2) to edit the rule, edit the input object (see Step 4) and change the condition from False to True. Then click OK, download the project (see Step 12), and click RUN (see Step 13) to start the rule engine again.



NOTE: Solutions to any technical problem should be thoroughly discussed prior to implementation. User interface, storage, device functionality, integration of third-party systems, and other software or hardware may be impacted by making changes to a system. Chesapeake and Midlantic Marketing is not responsible for and assumes no liability for loss of functionality, technical complications, loss of data, or any other expected or unforeseen circumstance related to use of this document or its content.

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