Using Kollmorgen Visualization Builder's G&L Motion Control driver (Motion Control protocol) for communications to Digital MMC Smart Drive (w/ drive resident control).

Disclaimer: The user must be aware of hardware and software differences between what they have and what is demonstrated in this application note. They must also accept the responsibility of the risks and nuances with any conversion project. All functionality must be tested after implementation to ensure repeatable, reliable, and correct behavior and operation.

My demo used a serial connection from the controller to a Cimrex HMI via a serial connection (which I don't have now).

I found the following G&L application note to be helpful even if some of the screenshots are outdated.

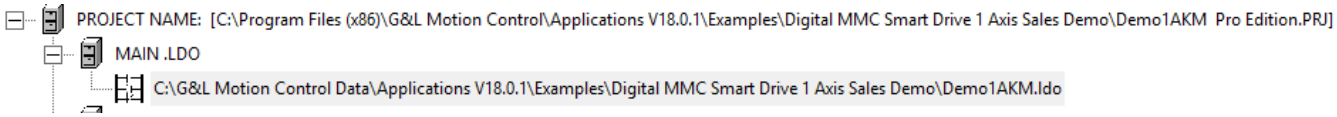
https://www.kollmorgen.com/en-us/developer-network/gl-support-downloads-and-documentation/

G&L Application Notes

G&L Motion Control PiC Application Note Master List

Description	Number/Name	Most Recent Revision
Digital MMC/Exter Application Quick Start Guide	an000055.doc	26-Jan-2007

I used the following sample project. This is based on the hardware/demo I have so another demo program will need to be selected for other hardware, processors, etc.



Once I successfully compiled and downloaded the project (i.e. ladder, etc.) to the controller and was online without errors I looked in the folder of the project and target location for the compiler output.

In my case it is the same file path shown above.

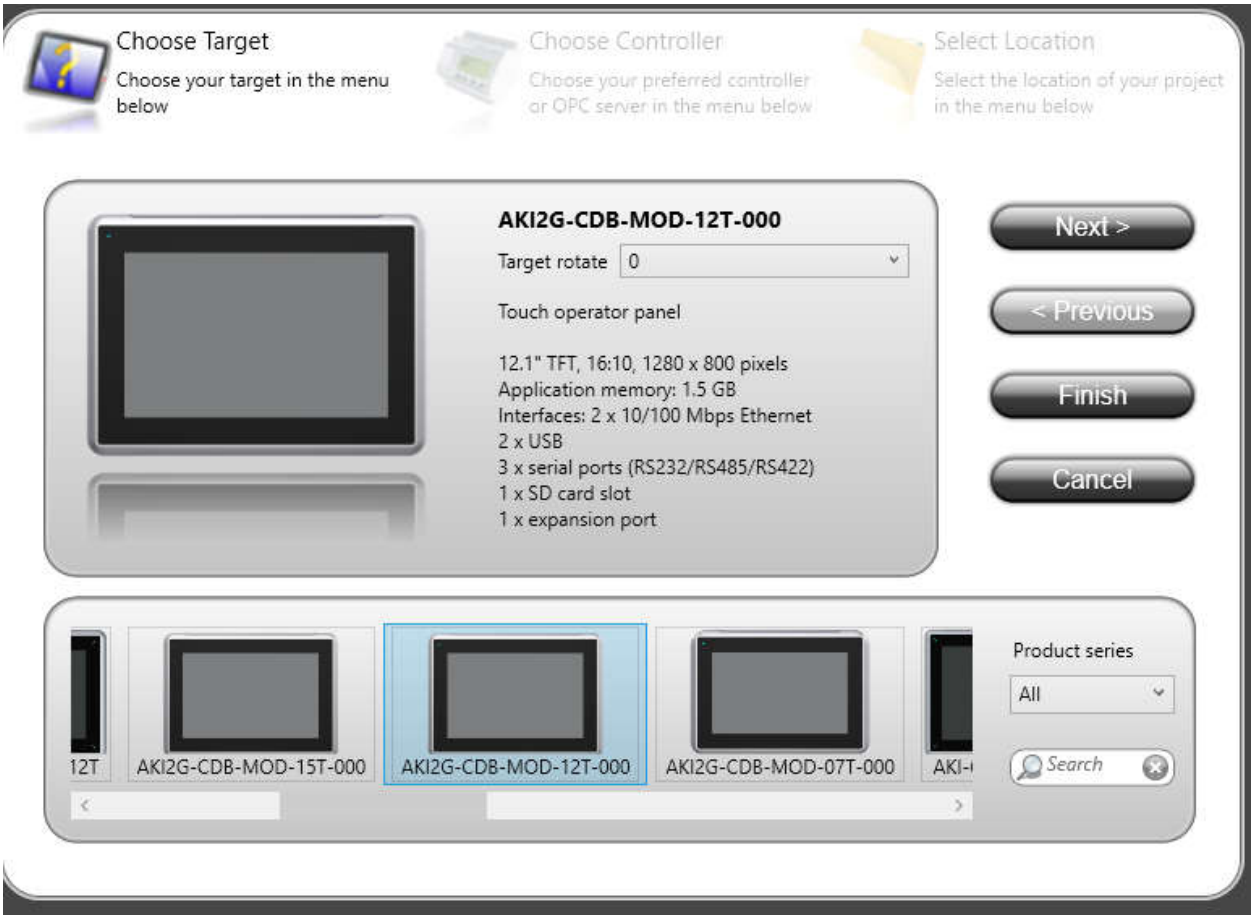
C:\Program Files (x86)\G&L Motion Control\Applications V18.0.1\Examples\Digital MMC Smart Drive 1 Axis Sales Demo

The *.oid file is highlighted below.

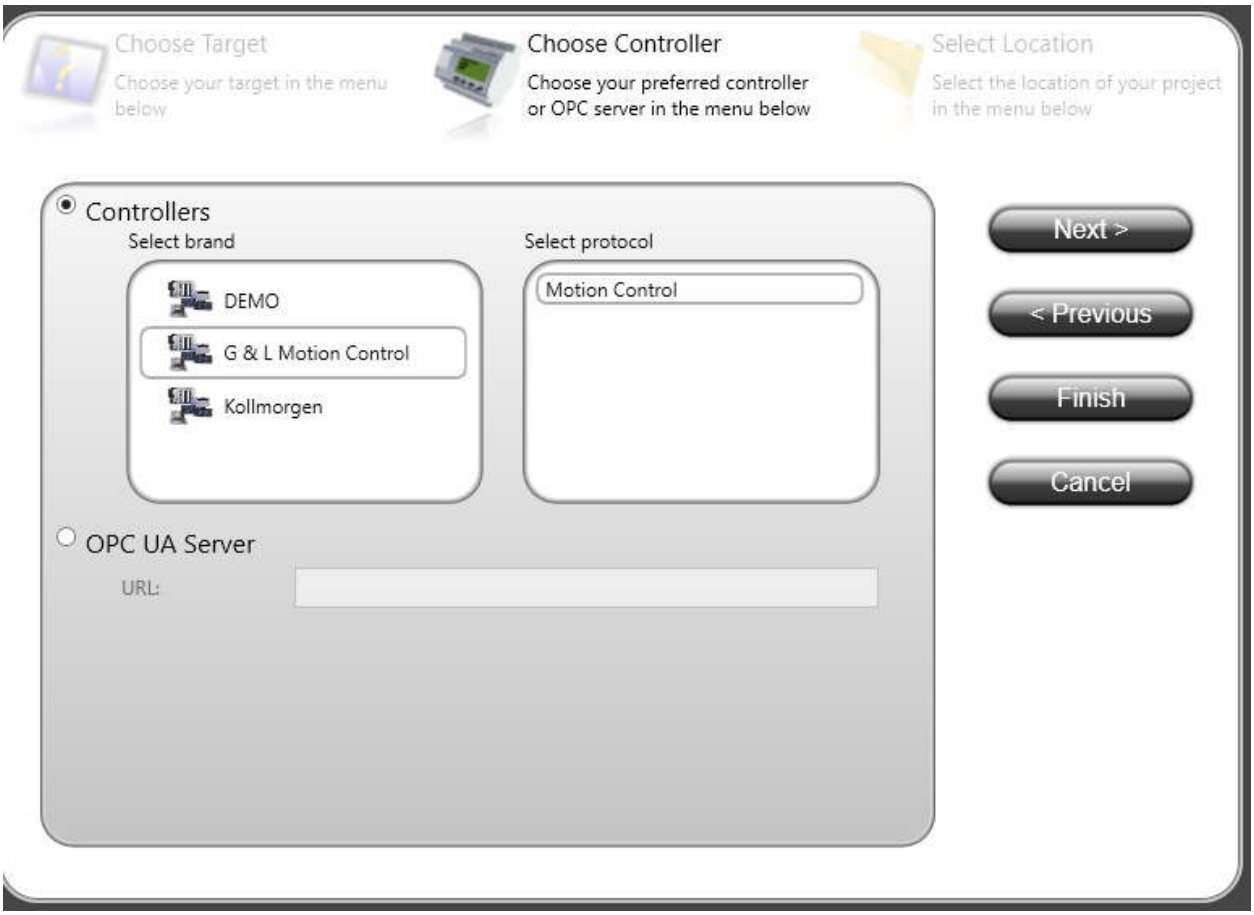
Name	Date modified	Type	Size
DemD1T60c-Files	12/7/2018 3:26 PM	File folder	
D1AKM21E.srv	10/18/2005 10:03 ...	PiCPro Servo File	1 KB
d1akm21e.SVT	10/20/2008 1:39 PM	SVT File	1 KB
DemD1C69.cpa	6/30/2005 11:08 AM	CPA File	1,370 KB
DemD1T60c.cpa	5/15/2007 8:14 AM	CPA File	1,547 KB
DemD1T60c.zip	5/15/2007 8:15 AM	Compressed (zipp...	178 KB
Demo1AKM MMC Edition.PRJ	8/23/2010 10:39 AM	PiCPro Project	3 KB
Demo1AKM Pro Edition.PRJ	3/16/2010 1:42 PM	PiCPro Project	3 KB
Demo1AKM.G&L	8/23/2010 10:39 AM	PiCPro Compress...	521 KB
Demo1AKM.ldo	5/9/2007 11:16 AM	PiCPro Ladder File	30 KB
Demo1AKM.oid	5/9/2007 11:33 AM	OID File	118 KB
Demo1AKM.rem	5/9/2007 11:16 AM	REM File	55 KB
demod1.srv	6/16/2005 12:48 PM	PiCPro Servo File	1 KB
demod1.SVT	10/22/2008 6:17 PM	SVT File	1 KB
DemoD1Ex MMC Edition.PRJ	8/23/2010 10:40 AM	PiCPro Project	3 KB
DemoD1Ex Pro Edition.PRJ	3/16/2010 1:55 PM	PiCPro Project	3 KB
DemoD1Ex.bin	10/22/2008 10:11 ...	BIN File	148 KB
DemoD1Ex.G&L	8/23/2010 10:40 AM	PiCPro Compress...	521 KB
DemoD1Ex.ldo	5/8/2007 12:15 PM	PiCPro Ladder File	30 KB
DemoD1Ex.oid	5/8/2007 12:14 PM	OID File	118 KB
DemoD1Ex.rem	5/8/2007 12:15 PM	REM File	55 KB
MMCD1Demo.DDV	3/9/2007 3:29 PM	PiCPro Digital Driv...	5 KB
MMCD1DemoWithAKM21E-AMN2-00.D...	3/9/2007 3:30 PM	PiCPro Digital Driv...	5 KB
MMCD1YSMscaled4000FUPerRev.DDV	3/9/2007 3:30 PM	PiCPro Digital Driv...	5 KB
Zdemosrv.lib	10/22/2008 10:11 ...	LIB File	1 KB

On the Kollmorgen Visualization Builder side I started by creating a new project.

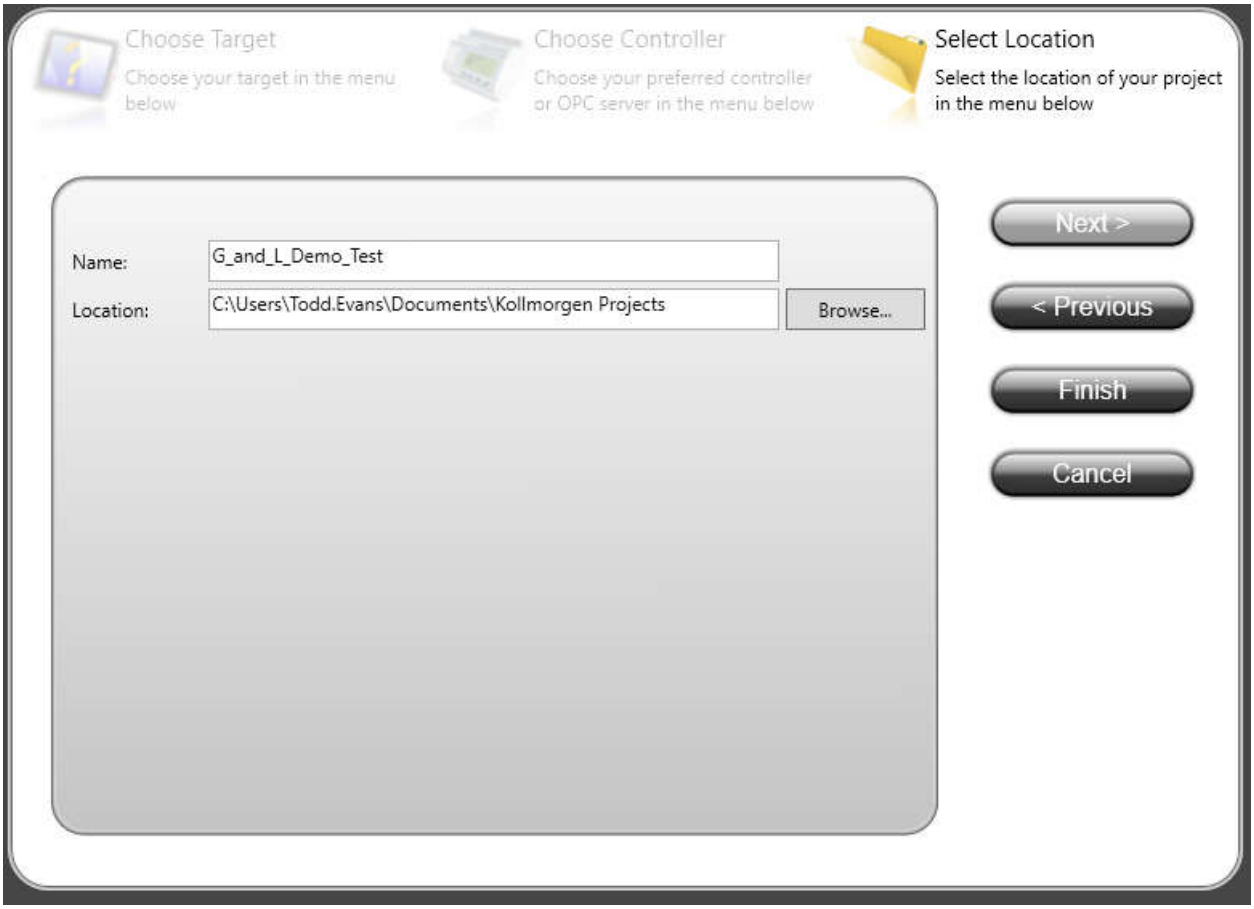
In my test, I did not have a physical hardware device (I simply used my laptop as the HMI in emulation mode; limited demo run-time). Initially I chose a hardware type that had a limitation as to how many tags it could hold thus when I imported the *.oid file into the project's database, I got errors. See your HMI's datasheets/manuals for details on this limitation. In this example KVB allowed me to import but when I Built the project I would get the following error. KVB has a 2000 count tag limitation?



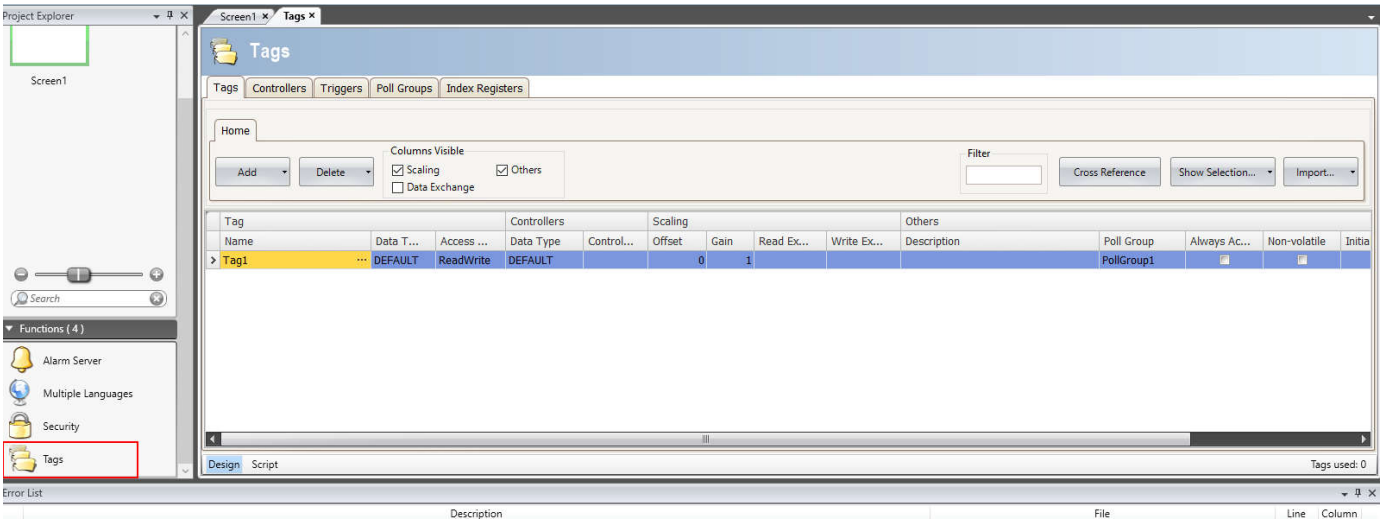
Next I chose the G & L Motion Control (Motion Control protocol) driver in the list. Note that the Kollmorgen (Modbus TCP/IP) driver would also work IF you have the Modbus TCP ASFB library addition to your PicPro function blocks. For this test I want to use the sample project and the G&L driver.



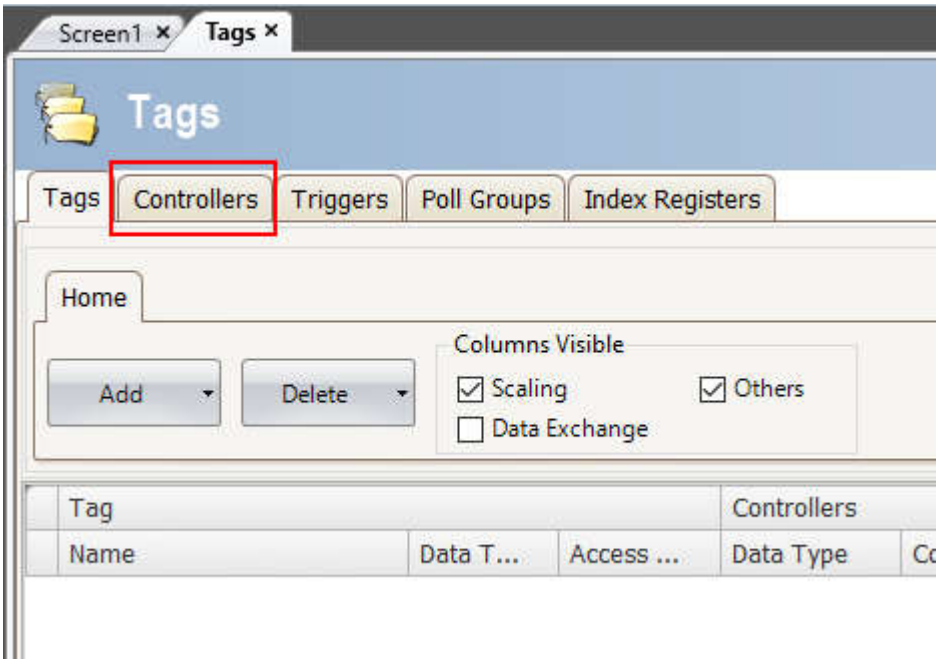
The software prompted me to give the project a name.

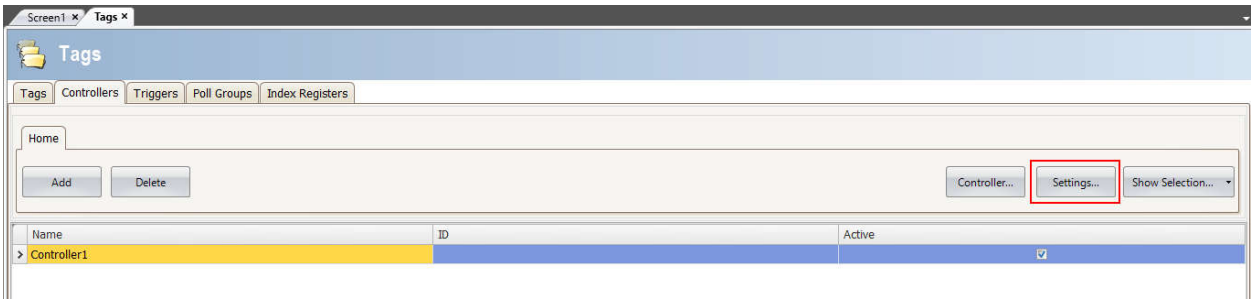


After Finish the project opened and I clicked under Project Explorer->Functions->Tags to open the Tags window.

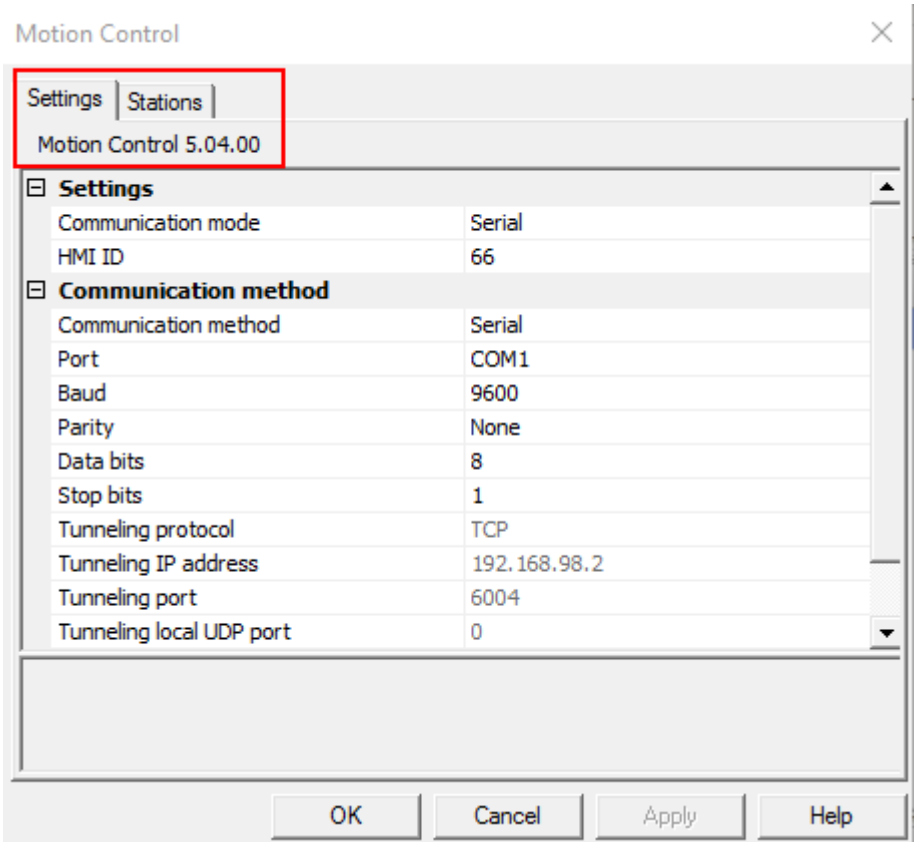


I optionally deleted the Tag1 as I didn't need it. Next, I clicked on the Controllers tab and then selected Settings…

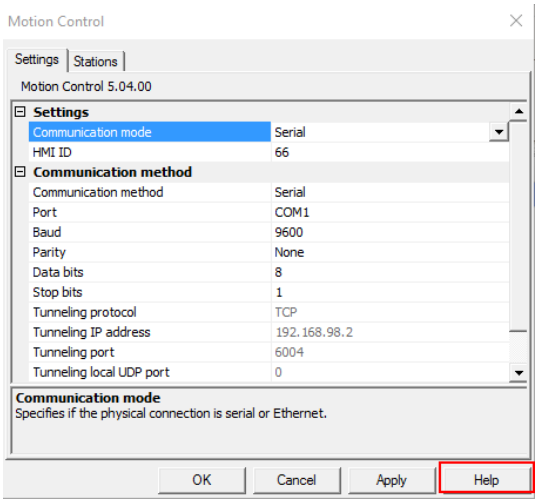




Under the Settings tab note the driver name and version. The default settings and communication method is shown below.



A side note is when the Settings screen is shown, you can click on the Help button in the bottom right hand corner to get more information on the G&L driver.



A portion of the Help details is shown below.

KOLLMORGEN

Because Motion Matters™

G & L Motion Control

Introduction

For information about the controller we refer to the manual for the current system.

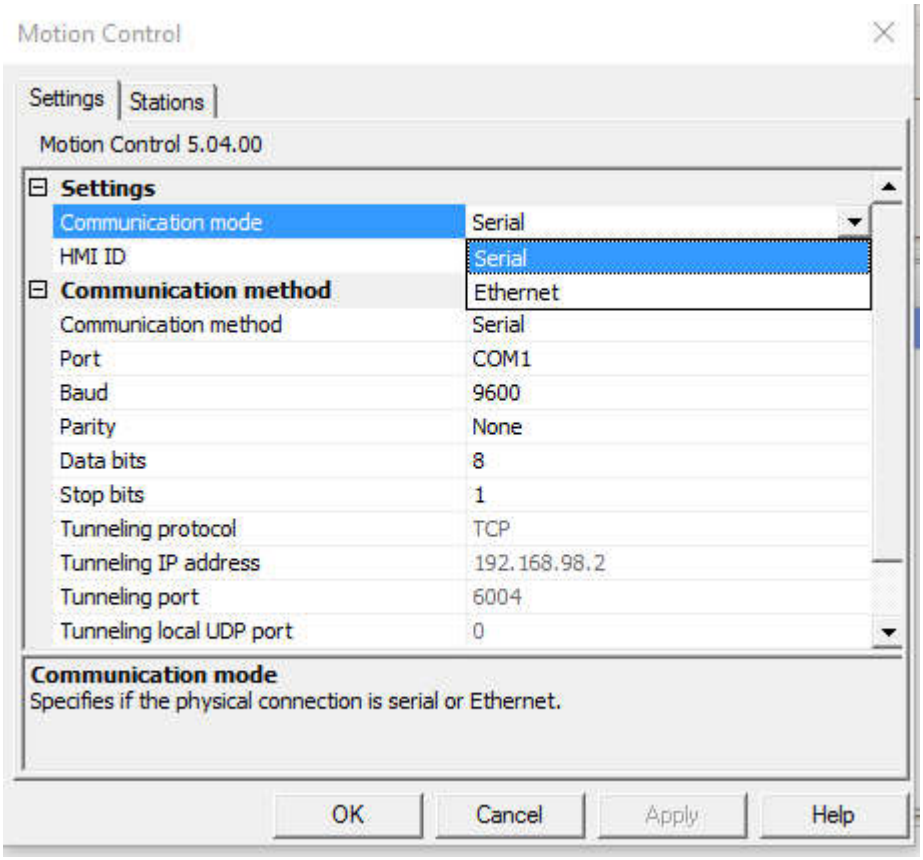
Release Notes

Version	Release	Description
5.04	October 2017	Corrected performance issue.
5.03	June 2017	Added support for new HMI platform.
5.02	June 2016	Added support for new HMI platform.
5.01	April 2011	Support for new HMI models. Corrected problem when communicating with more than one controller. Added unicode string support for certain HMI models. Updated helpfile.
5.00	May 2009	Initial version Note: This version will replace version 4 of the G & L Motion Control drivers for those HMI models that have such drivers. The new driver is based on a new driver platform and may differ slightly and also require a reconfigure of the driver properties.

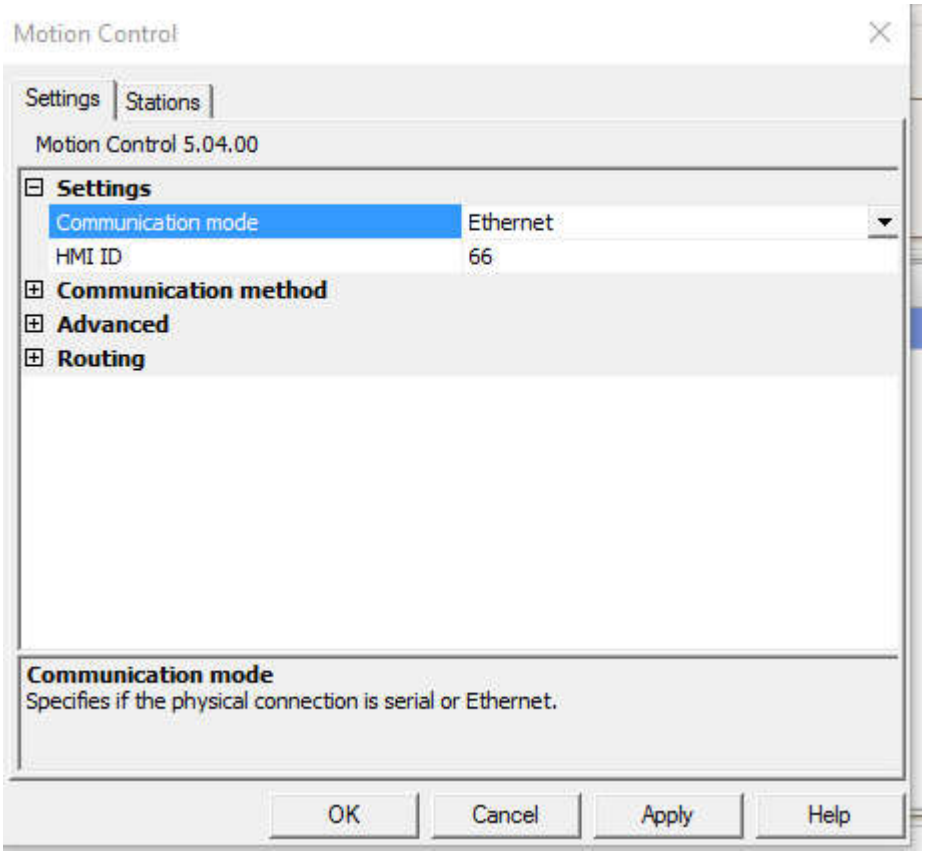
Disclaimer

Please note that changes in the controller protocol or hardware, which may interfere with the functionality of this driver, may have occurred since this documentation was created. Therefore, always test and verify the functionality of the application. To accommodate developments in the controller protocol and hardware, drivers are continuously updated. Accordingly, always ensure that the latest driver is used in the application.

At the time of authoring this application note, I did not have a serial cable to test so I elected to use Ethernet instead.



The HMI ID is only valid at Serial Communication as stated in the Motion Control driver help mentioned above.

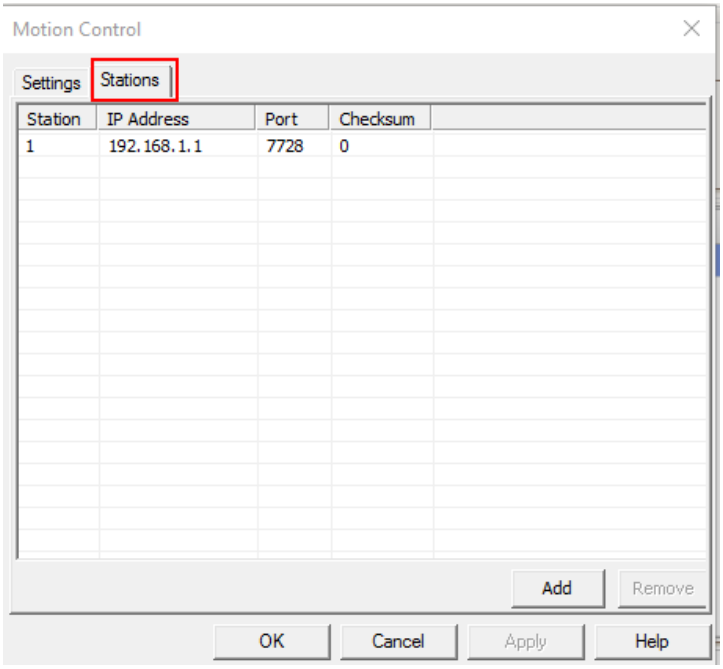


Settings

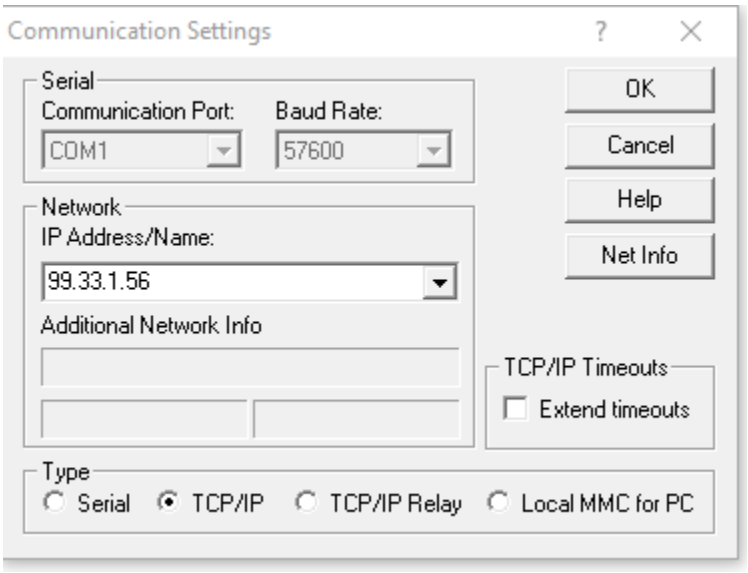
Settings	
Communication mode	Serial
HMI ID	66

Parameter	Description
Communication mode	Specifies if the physical connection is serial or Ethernet.
HMI ID	Sets the ID of the HMI. This property is only valid at serial communication.

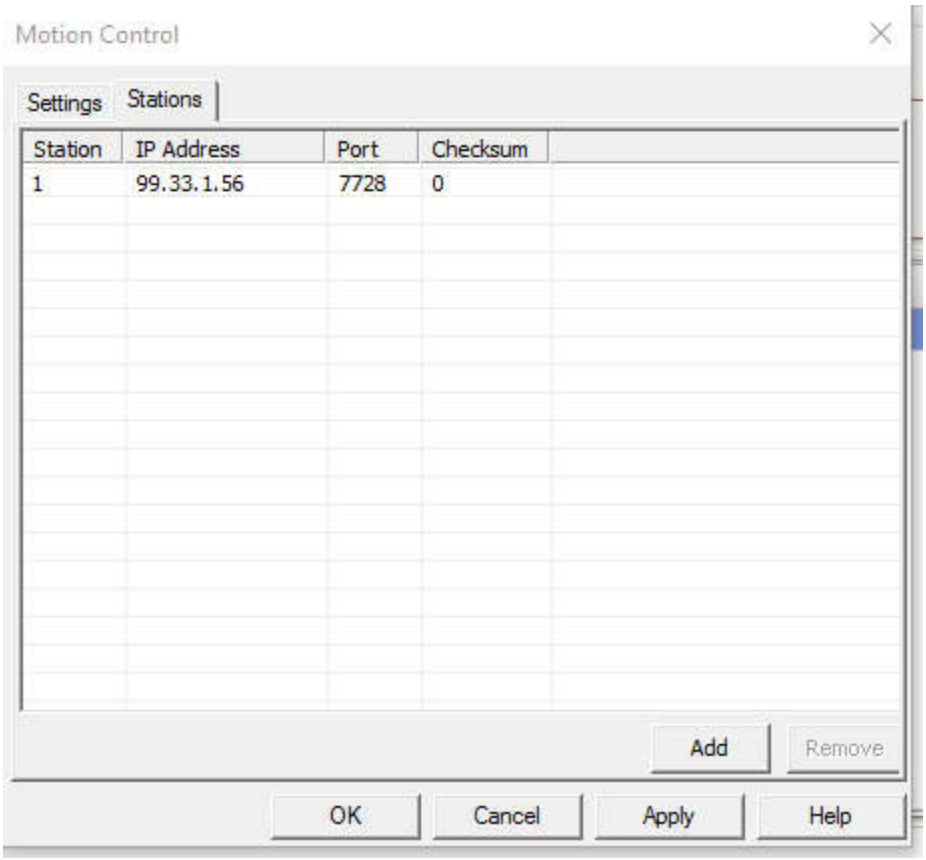
Next click on the Stations tab and change the IP Address to the target G&L Controller.



This is the same IP Address when using TCP/IP to communicate to the G&L Controller with PicPro (check the Online pull-down menu->Comm Settings:

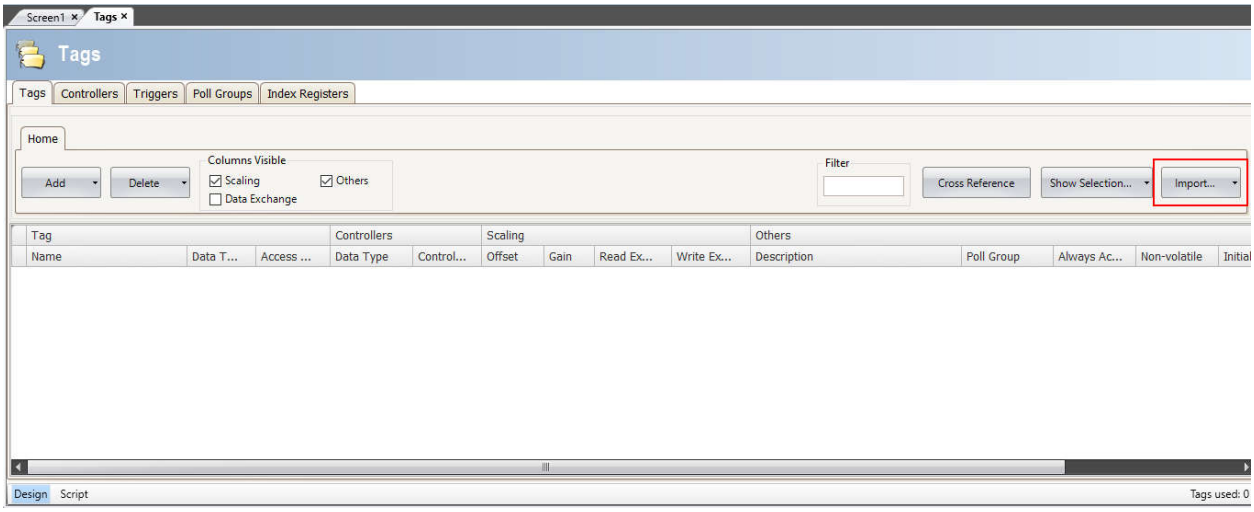


Back to the setting under Stations in KVB, the address is changed. The default station number of 1 and the Port of 7728 was left at default as well as the Checksum (the documentation is unclear on how this is used or what the setting means).

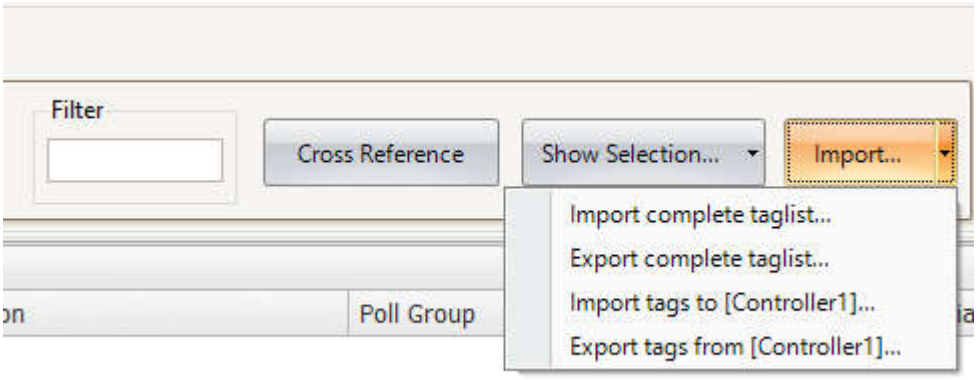


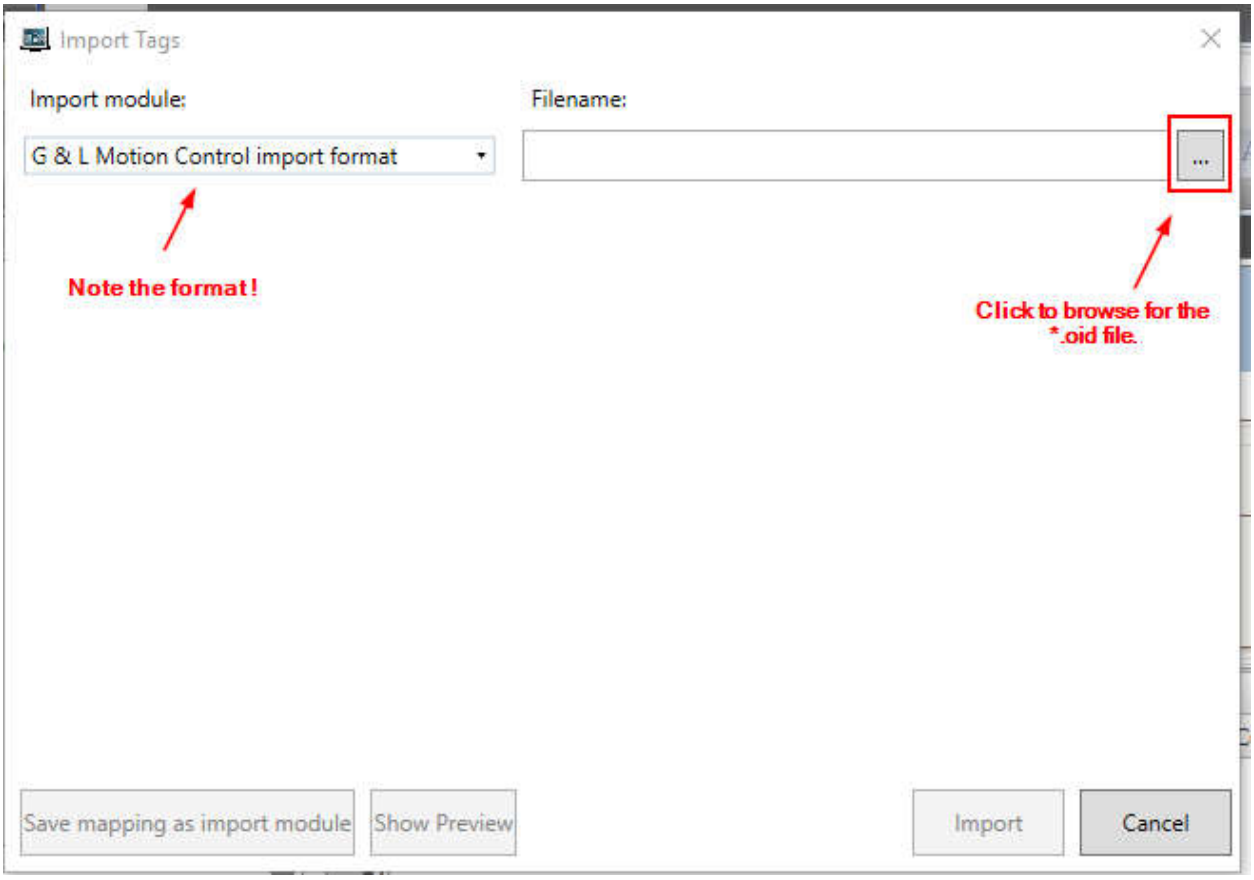
Click Apply and OK.

Now we're ready to import the *.oid file generated by PicPro. Under the Tags tab there is an Import list box on the far right highlighted below.

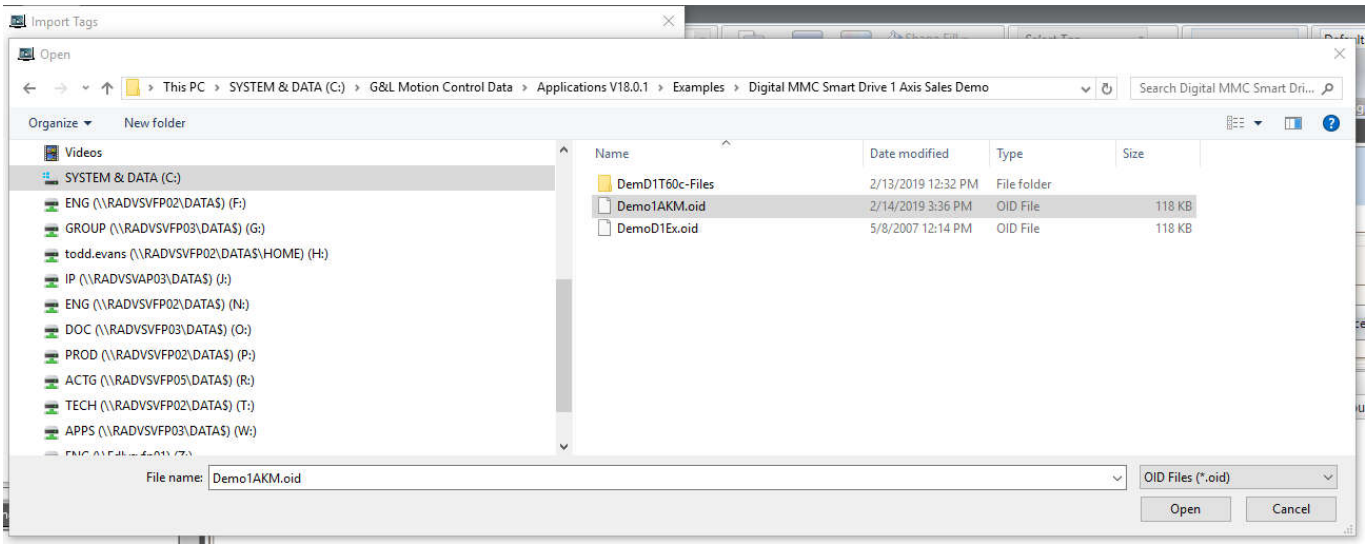


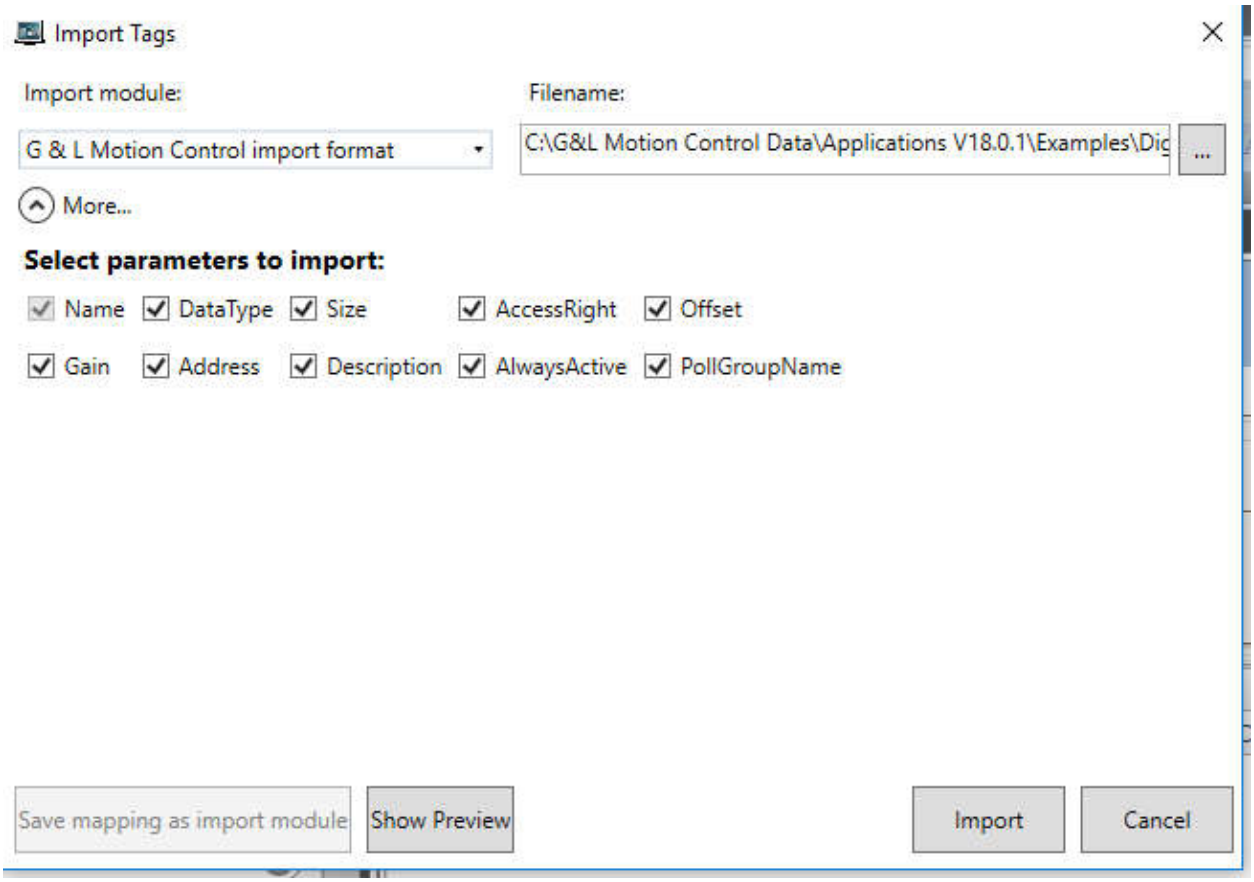
Clicking on the down arrow of the Import listbox, lists the options. The one we want is "Import tags to Controller 1"



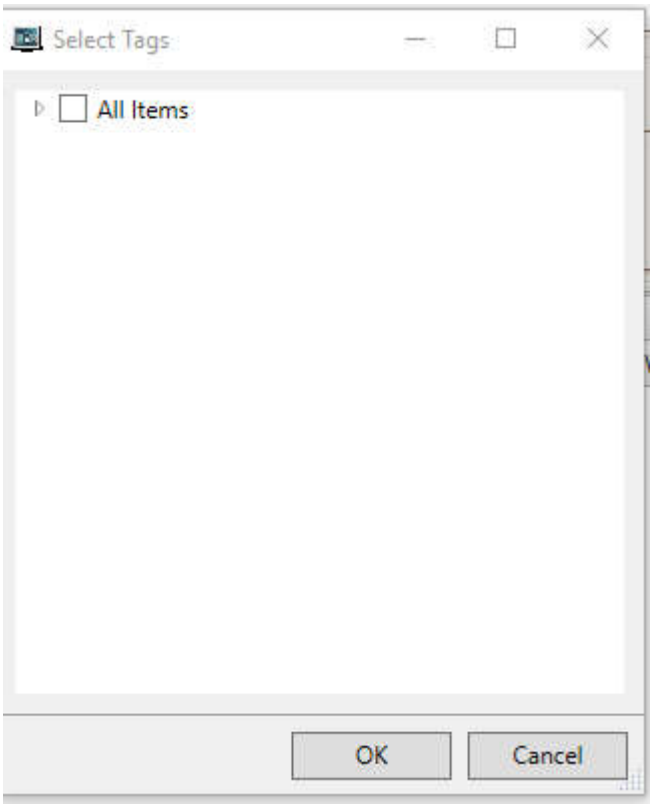


Navigate to the folder and file and select; then click on “Open”.



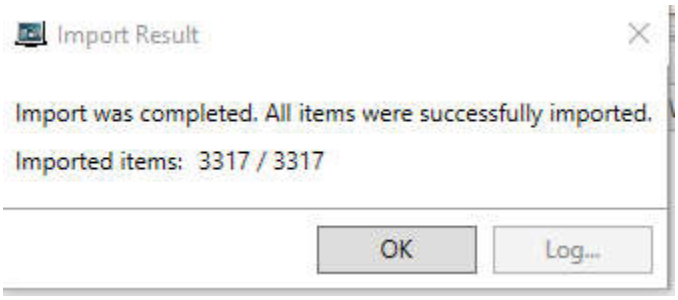


Click on the “Import” button in the bottom right corner of the Import Tags window (see above).



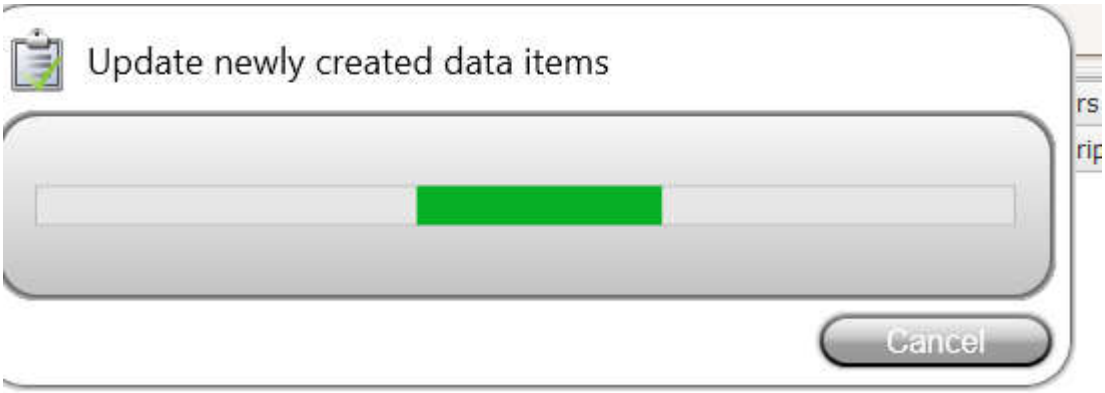
Check the box for All Items and click OK.

If the import was successful the report (result) will be confirmed as follows:

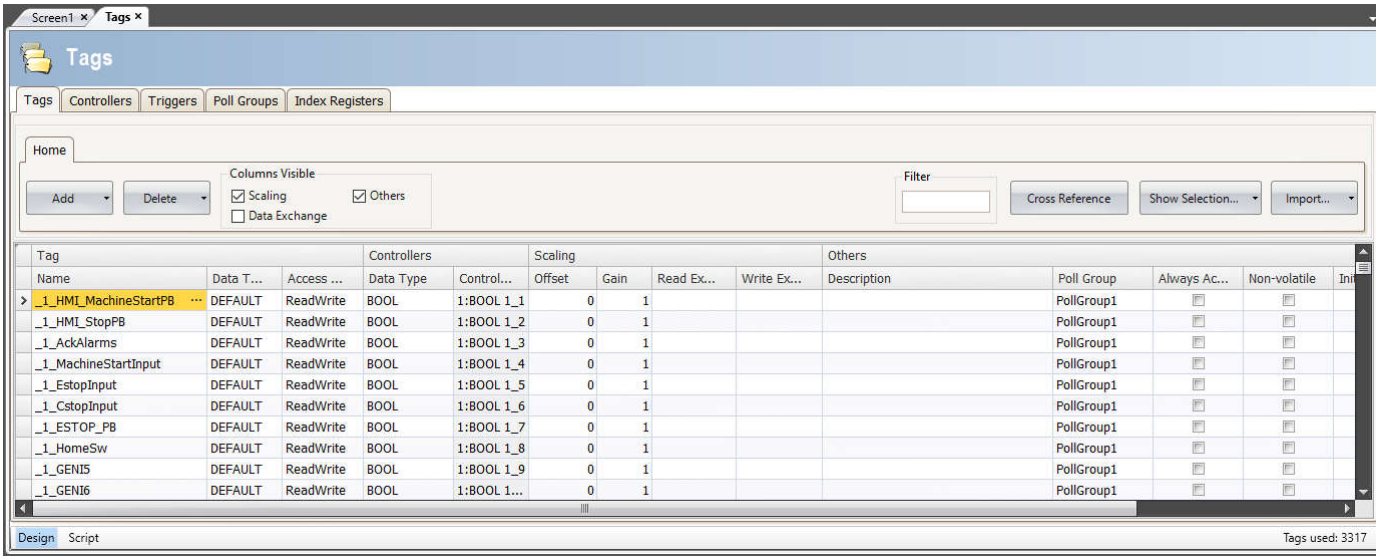


As stated before, I get errors later on build warning me that the number of tags exceed the KVB limitation of 2000.

The following progress status bar appears.

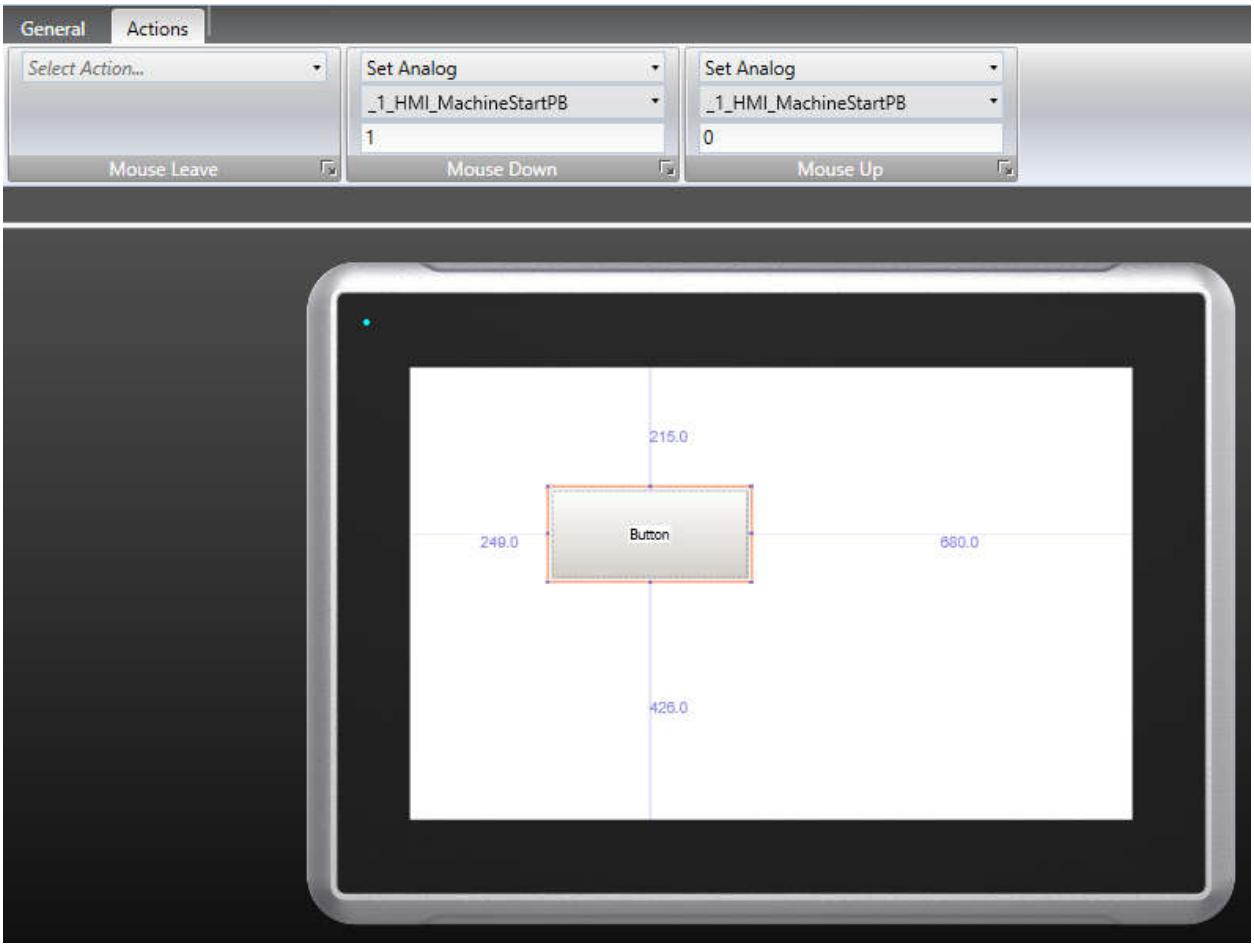


When it is finished the tags will appear in the Tags list (columns and rows).



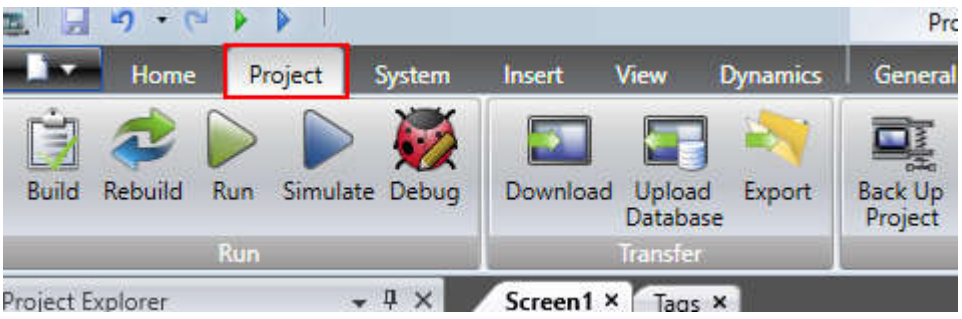
Now that the tags have been added. First we want to verify communications by working with only one tag. I chose the _1_HMI_MachineStartPB. This application note assumes if this is not a bench test that the machine is in a state that toggling the value/state of this tag will not result in any action on the machine!!! The objective here is to test communications between the HMI and the G&L Controller. They user may choose a different Boolean tag to test if desired.

I added a button on the screen and with the button highlighted selected the Actions pull-down menu and configured for the tag value to be 1 on Mouse Down and 0 on Mouse Up.

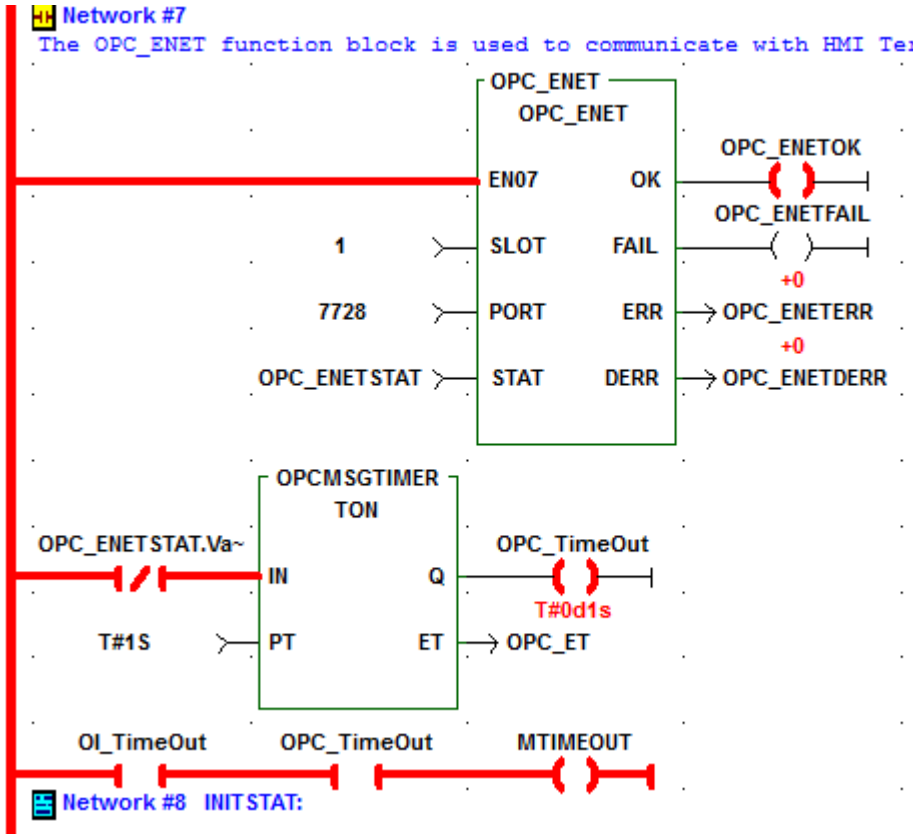


Next I saved the project.

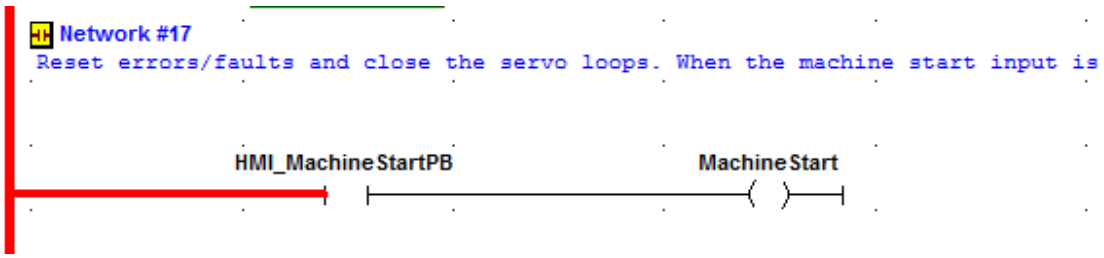
Since I used the PC as the HMI, I selected Build and then Run from the Project pull-down menu.



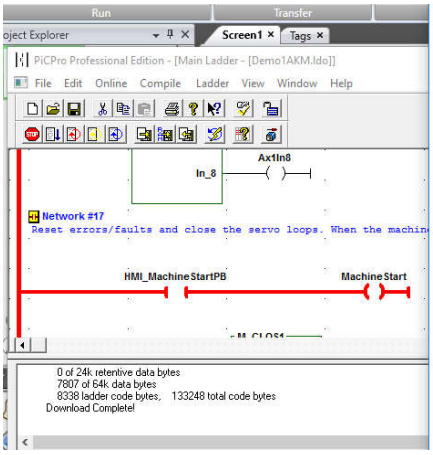
The sample project has the following code in the ladder for Ethernet communications. The Slot number may vary depending on your hardware. Note the Port number 7728 was the default in KVB when we set the IP address under Controller->Settings->Stations.

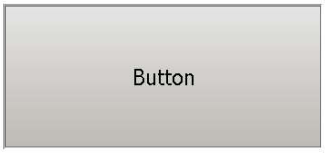


Next I went to network 17 in the ladder to monitor the state of the Boolean tag.

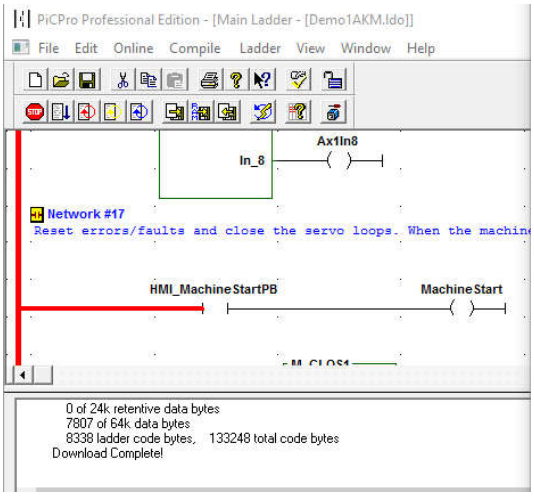


On pressing down of the button the contact is closed.

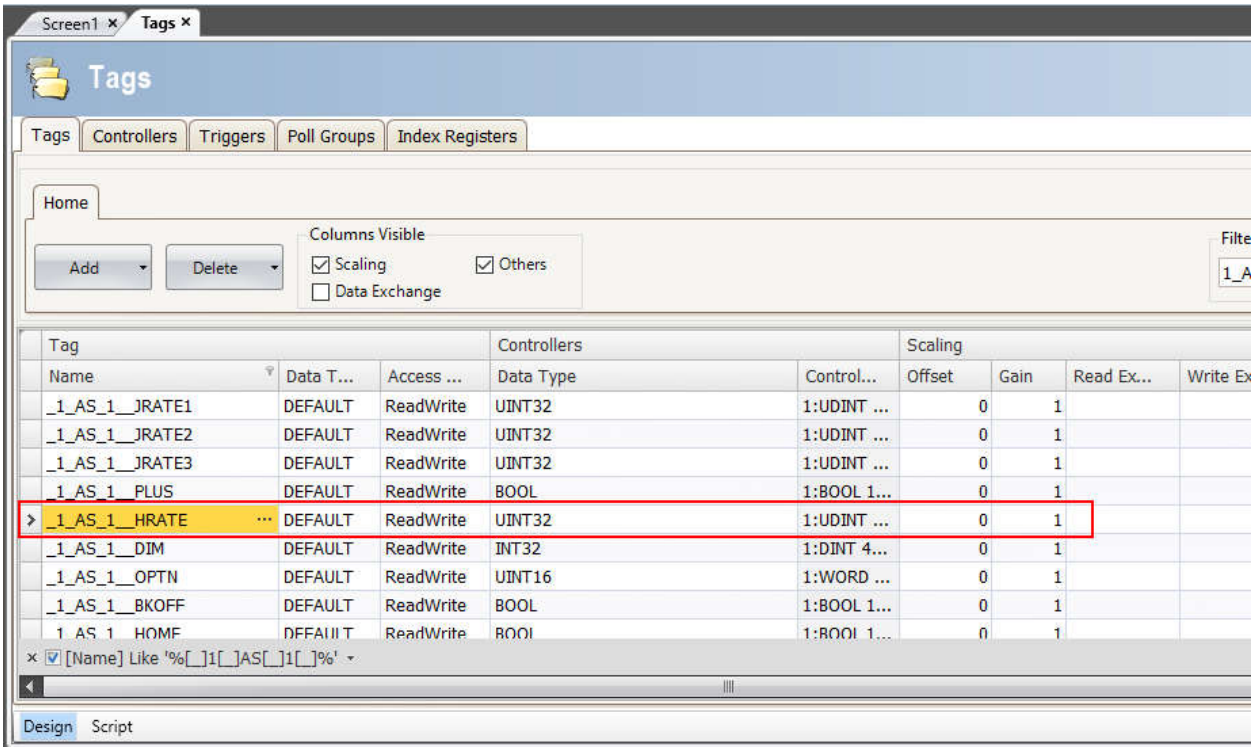




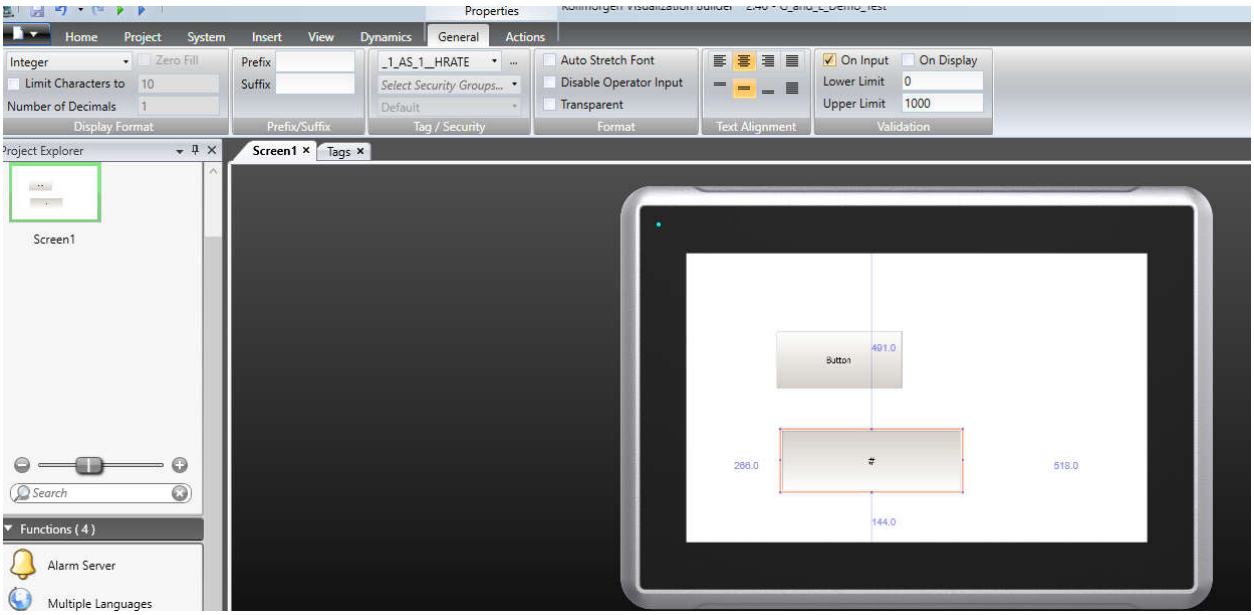
On release the contact is opened.



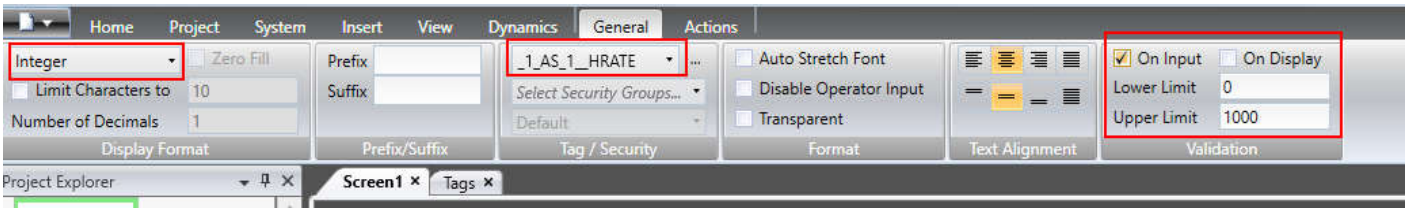
Lastly I tested a non-Boolean and arbitrarily selected the Home Rate.



With an Analog Numeric added to the screen I clicked on General to format it.



Here is a closer look at the setup:



I saved, built, and ran the project again and then monitored rung 26: Home 1. Note the RATE input tag AS[1].HRATE changed to the value of 555 as set by the data input field on the HMI screen.