

# AV6A PROFINET® using RX3i Controller Installation Instructions



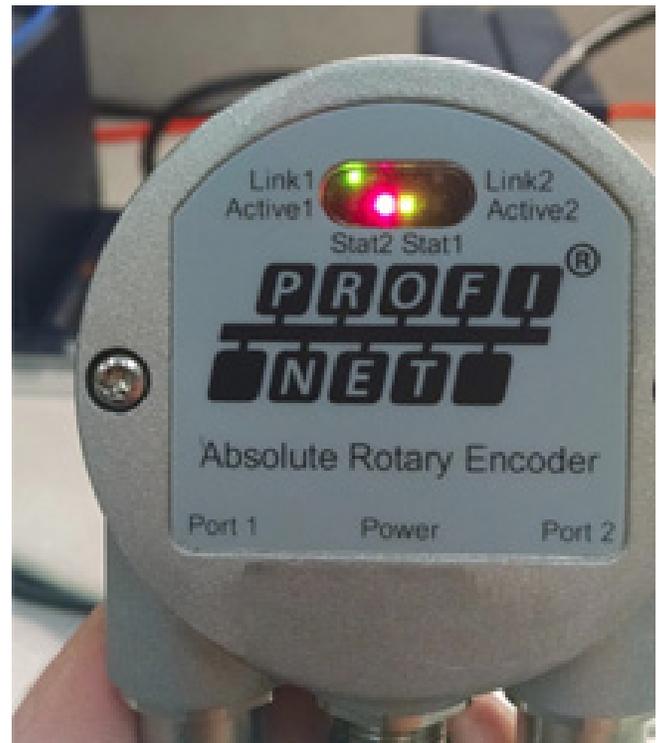
## Install AV6A GSDML File

1. Make sure you are running GE Proficy version 8.5 or later.
2. Download the GSDML file for the AV6A Encoder.
3. <http://www.nidec-avtron.com/encoders/family/light-mill-duty/av6a>
4. Click on “Documents” and then click on “GSDML PROFINET Configuration AV6A HS6A”
5. The GSDML file is a zip file and will need to be “extracted” see lower left hand corner.



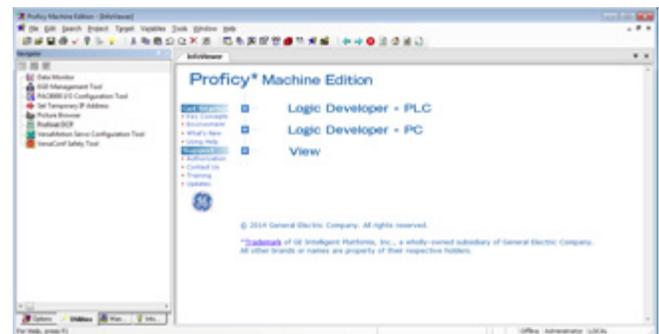
## Configure New Encoder's IP Address

1. Make sure your encoder is powered up and plugged into your Ethernet network switch.
2. An unconfigured Profinet Encoder hooked up to the network will look like this.



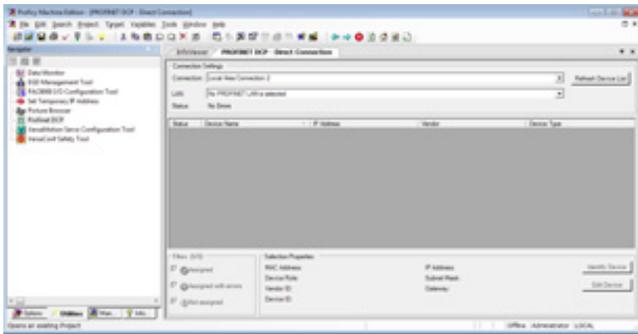
6. Make note which directory the zip file is “extracted”. You will need this in GE Proficy.

3. In Proficy, go to the Utilities Tab and run the “Profinet DCP” tool.

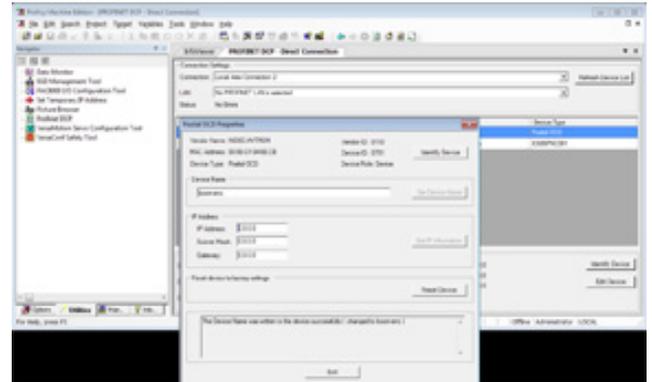


Configure New Encoder's IP Address *continued*

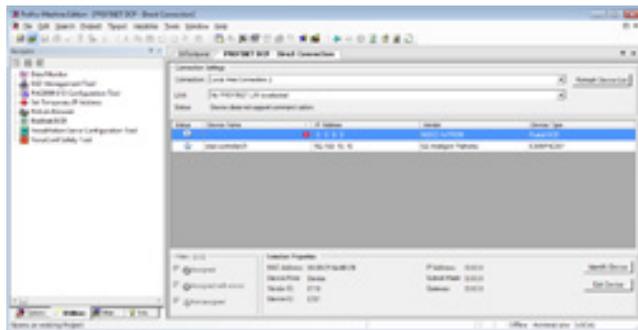
- In the Profinet DCP tool – Click on the “Refresh Device List” button.



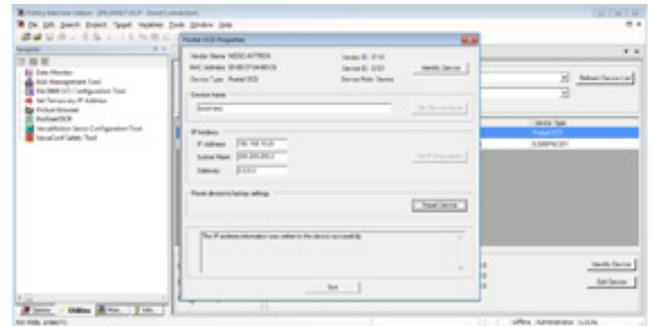
- Make sure the Device Name was set successfully.



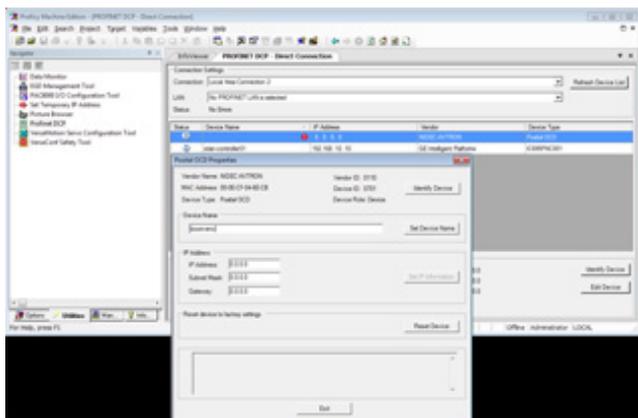
- The new encoder will appear. Verify that the MAC address on the encoder matches the device.



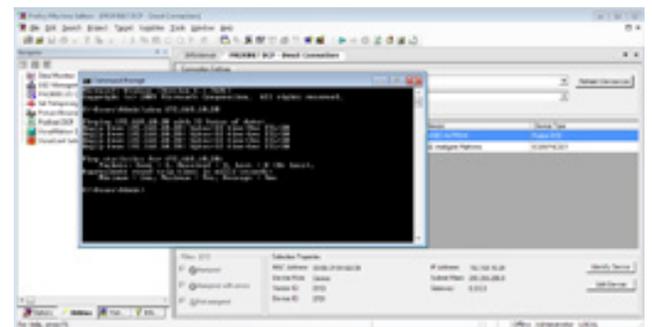
- Set the IP address and subnet mask (and gateway address if applicable) and then press “Set IP Information”. The message at the bottom of the Posital OCD Properties will indicate successful write to the encoder.



- Double click on the NIDEC-AVTRON encoder. Enter a “Device Name”. Make note that this name needs to match the configuration in the Proficy project. In order to communicate with the PLC. Press “Set Device Name”.

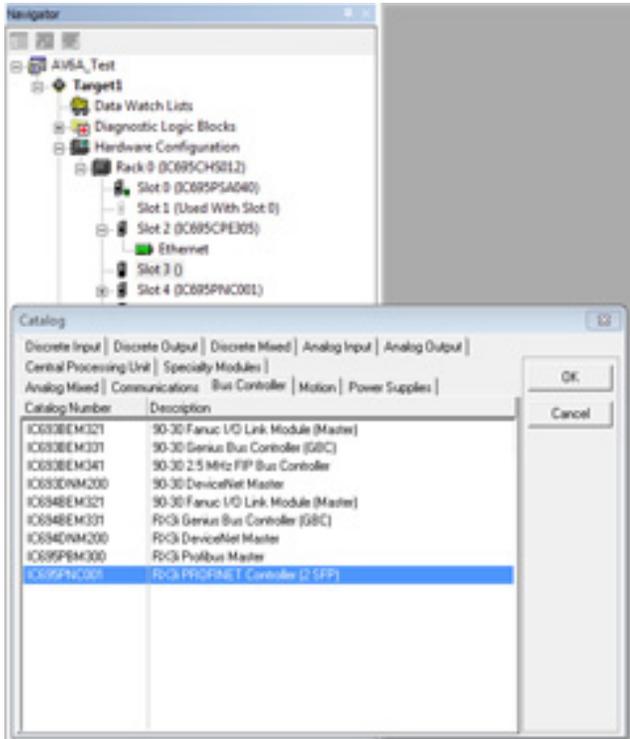


- Ping the encoder to test if the new IP address is working on the network.

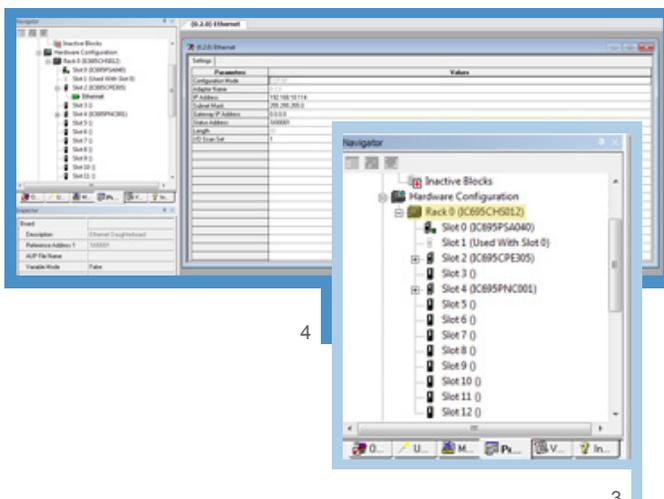


## Add Hardware To Proficy Project

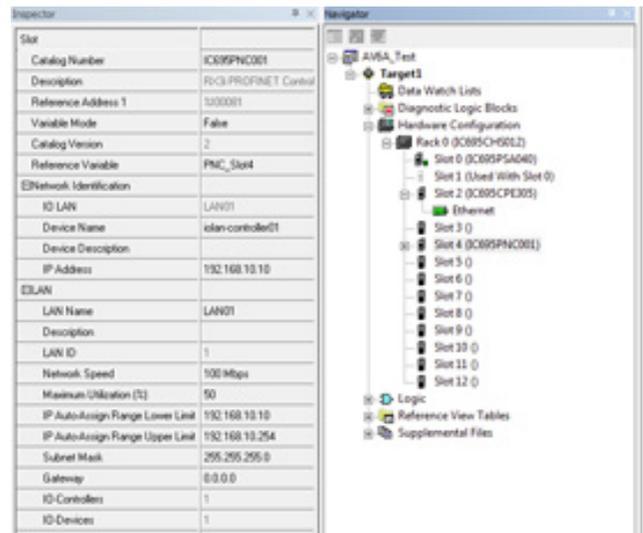
1. In the Hardware Configuration, right click on the slot that the IC695PNC001 was put in.
2. On the “Bus Controller Tab” Insert the IC695PNC001 Controller Card.



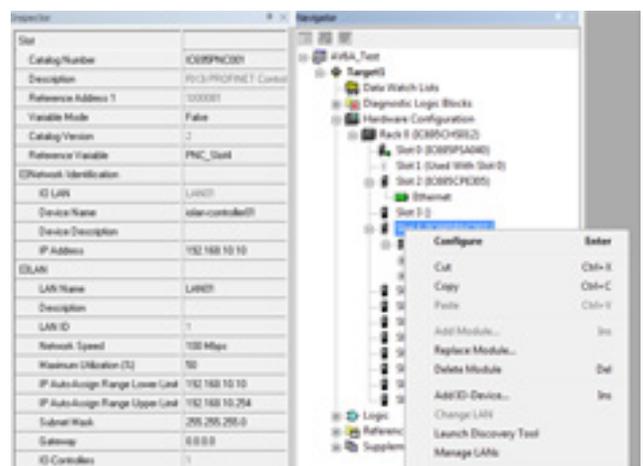
3. In the Hardware Configuration, you should now see an IC695PNC001 Profinet Controller Card. (example in light blue outline)
4. If your CPU and Profinet will be on the same IP Subnet, Make sure the CPU Ethernet and the Profinet Card addresses are unique. (example in medium blue outline)



5. In the navigator window, Go back to the Utilities tab and run the “Profinet DCP” tool again. Make note of the Profinet Controller card name.
6. In the Hardware Configuration, click on the Profinet card open the “Inspector” window. Make sure the “Device Name” matches the name found on the Profinet DCP tool. Set an IP address that matches the subnet of the encoder. Make note of the “LAN Name”. This LAN name will be used on any future use of the Profinet DCP tool. Set the IP upper and lower limits as well as the same subnet mask and Gateway address that the encoder was given.

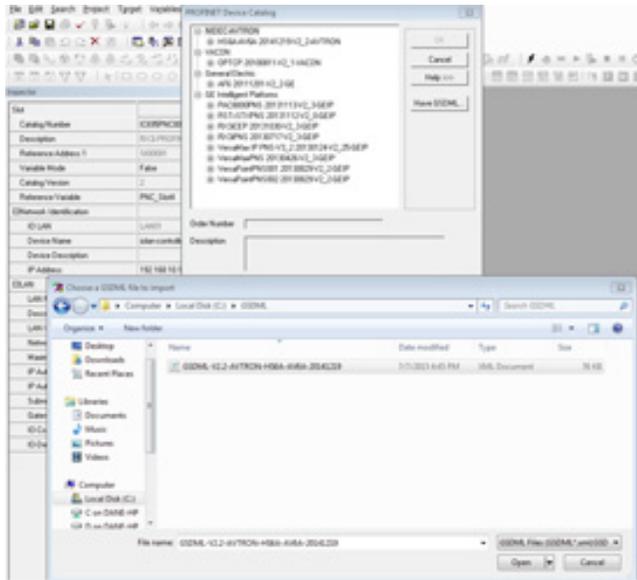


7. In the Navigator, right click on the Profinet Controller card and “Add IO Device”.

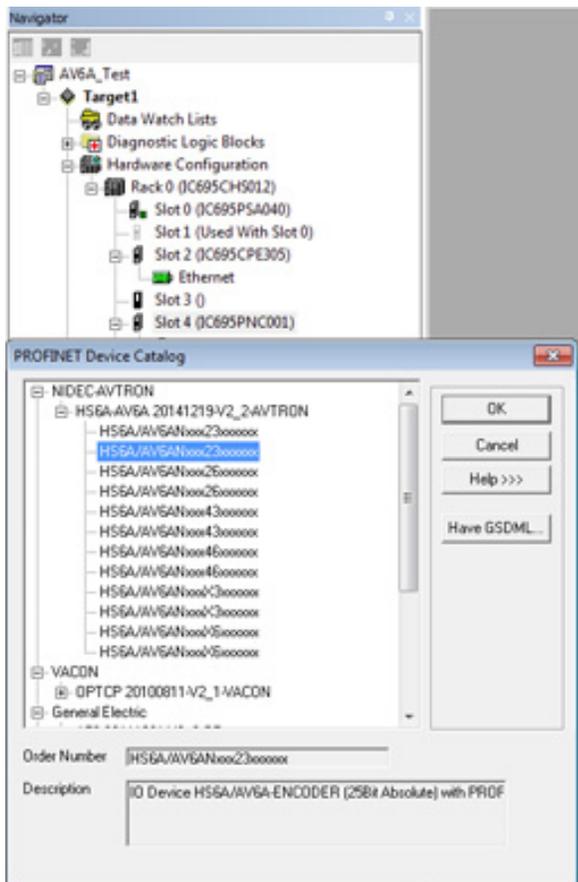


Add Hardware To Proficy Project *continued*

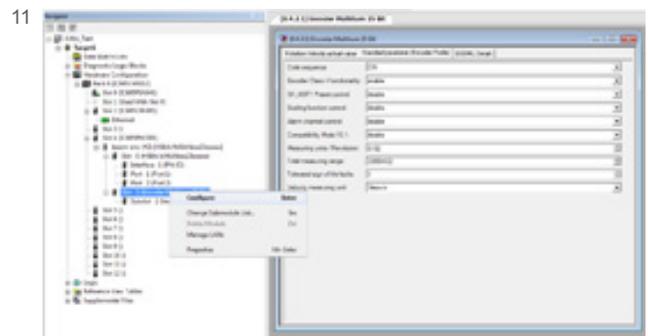
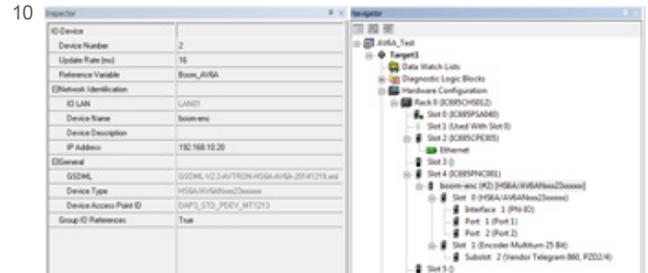
- When the PROFINET Device Catalog window pops up, click on the “Have GSDML” button. Find the directory where the GSDML was download from the AVTRON website above. Select the GSDML file and click “Open”



- This example is what needs selected from the AVTRON GSDML list.

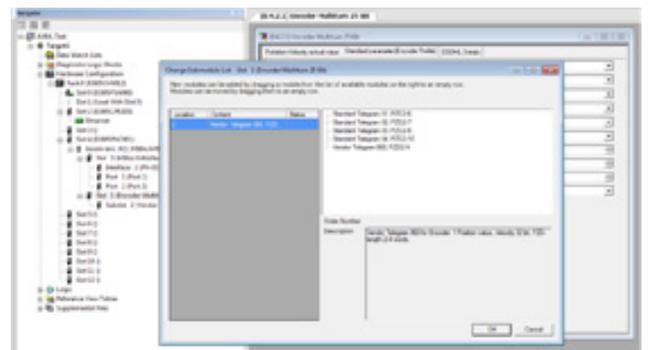


- After the AVTRON encoder is inserted in the Profinet controller hardware, click on the encoder and open the “Inspector” window. Give the encoder a unique “Device Number”, set the “Update Rate (ms)”, click on the “Reference Variable” and create a new variable, give this encoder the same “Device Name” that was given when setting it up with the Profinet DCP tool. Give it the same IP address that was given using the Profinet DCP tool. (example below)
- Open the encoder in the configuration and right click on “Slot 1” → Press Configure → Go to the “Standard Parameter (Encoder Profile) tab. (example below)



If the encoder needs to count up with clockwise rotation, enter CW in the “Code Sequence”. If the encoder needs to count up with counter clockwise rotation, enter CCW in the “Code Sequence”. Enter “33554432” for the measuring range. This is the 25 bit maximum number ( $2^{25}$ ).

- Again, open the encoder and right click on “Slot 1” → Press “Change Submodule List” → Click on the “Vendor Telegram 860, PZD2/4” and drag and drop it into the “Content” window → Click OK. This will give both position and speed for the encoder in a 32 bit format.



## Add Hardware To Proficy Project *continued*

**13.** Double Click On “Subslot 2” to bring up the encoder address window. In the Inspector window, make sure the “Variable Mode” is False. Give the Vendor Telegram 860 Input and Output the desired addresses.

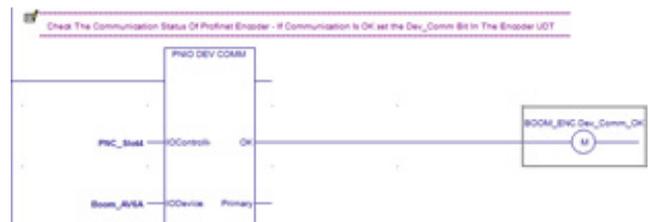
The encoder is configured and is now ready for programming.

## Programming The AV6A Encoder In A Proficy Project

- The following UDT’s (User Defined Types) and UDFB’s (User Defined Function Blocks) need to be imported : (example in light blue)
- The AV6A UDT has the following members: (example in medium blue)
- Rename the default AV6A UDT variable: This example gives the name BOOM\_ENC

- Create a Variable using the AV6A UDT: (below on left)
- Select AV6A from the list: (below on right)

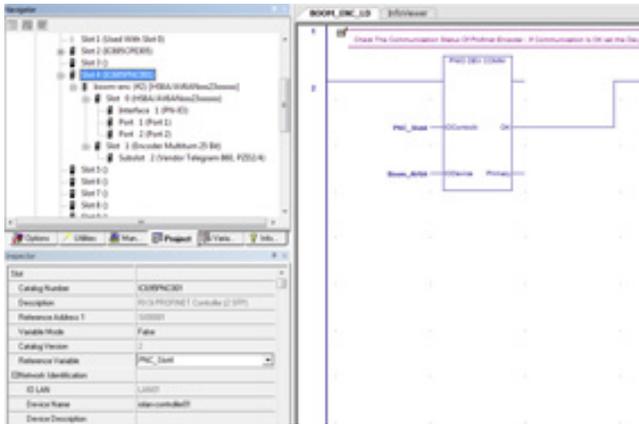
- Program the following run to check the communication status of the encoder:



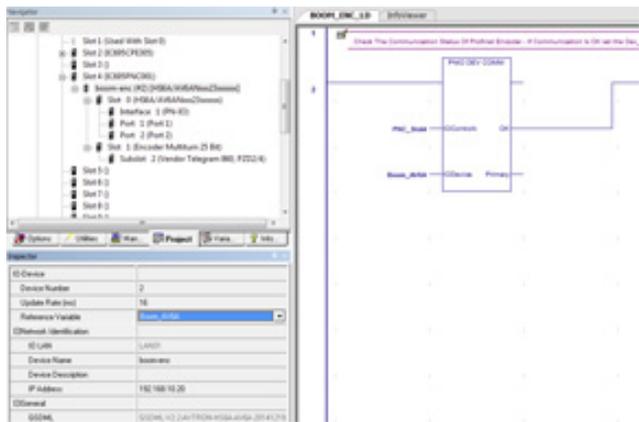
Programming The AV6A Encoder In A Proficy Project *continued*

6. *continued*

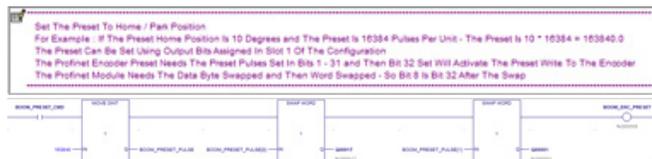
For the IO Controller Input, use the same "Reference Variable" name for the IC695PNC01. If no reference variable has been created click on the window and press <create>.



For the IO Device Input, use the same "Reference Variable" name for the AV6A. If no reference variable has been created click on the window and press <create>..

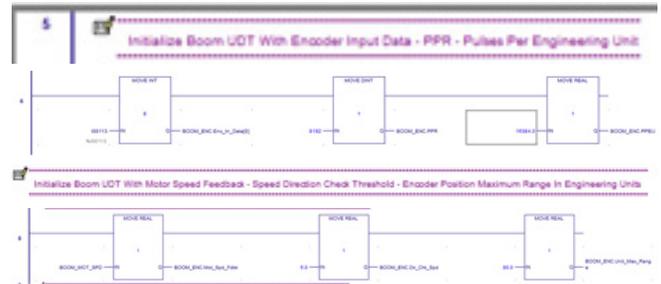


7. To program the encoder preset, insert a new routine with the following rung:



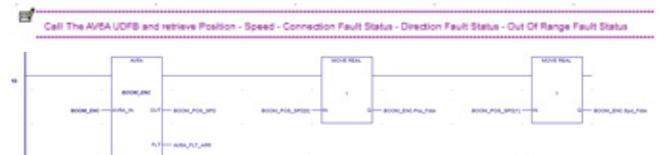
This example for step 7 needs 2 rotations of the encoder for every output unit and the home is at "10" units. The BOOM\_PRESET\_PULSE is an array of 2 integers used as a "DINT" so byte swapping can be done. Move the corresponding integers into the Output table that was configured above. Set the "BOOM\_PRESET\_CMD" and then reset it. The encoder has now been calibrated.

8. The following rungs will need to be set up to initialize the AV6A UDT:



The UDFB Instruction will need the encoder input data from the inputs table. It will also need the pulses per revolution, pulses per engineering unit, Maximum position for range checking, motor speed feedback and speed check threshold for direction checking.

9. The following rung calls the AV6A UDFB which will feed back the encoder position with offset in engineering units, speed in units / min, communication status, out of range status, and direction fault status. Double click on the ????? and give the AV6A instance a name:



The fault array output is a boolean array and contains the encoder status outputs.

10. The output booleans will need to be latched with separate variables:

