Communicating Between Janus Processors and Rockwell Processors using Ethernet/IP Tag Server

Janus Processors (JPLC) and Coprocessors (JACP) include many industrial protocols “built-in” to allow communication with other equipment on the plant floor. Among those is Ethernet/IP (EIP) which can be used to communicate with other EIP enabled devices, including Rockwell PLCs. Janus products feature the following capabilities on EIP.

- **Ethernet/IP Tag Client** – enables Janus products to read tags directly from Rockwell PLCs
- **Ethernet/IP Tag Server** – enables Rockwell PLCs to read tags directly from Janus products
- **Ethernet/IP I/O Scanner** – enables Janus products to communicate with EIP devices like drives and I/O blocks
- **Ethernet/IP Adapter** – enables Janus products to appear as an adapter to other EIP I/O Scanners
- **Ethernet/IP Flex I/O** Scanner – enables Janus product to communicate with Flex I/O devices using EIP

In this Tech Tip we will show how to set up communications using Ethernet/IP Tag Client to a Rockwell Compact Logix PLC.

1.1 Overview

This Tech Tip assumes you are familiar with programming using CTI Workbench and Rockwell Studio 5000, so we do not detail every step and menu click to construct the configuration. Instead, we show the finished configuration screens with comments. Here are the steps involved:

In CTI Workbench:

- Create a new project and set up IP address and other parameters in Project Settings
- Create variables for the items written to and read from the Rockwell PLC
- Use the Fieldbus Configurator to Add the Ethernet/IP Tag Server
- Use “Insert Master/Port” in the Fieldbus configuration to add a list of Served Tags.
- Use “Insert Slave/Data Block in the Fieldbus configuration to add the tags you want to READ and WRITE from the Rockwell PLC
- Add the corresponding variables to each of the Served Tags

In Rockwell Studio 5000:

Create a new project and set up the Controller Properties – description, IP address, Ethernet port setup. The IP address must match the one entered for the Rockwell PLC in the Workbench Fieldbus configuration.

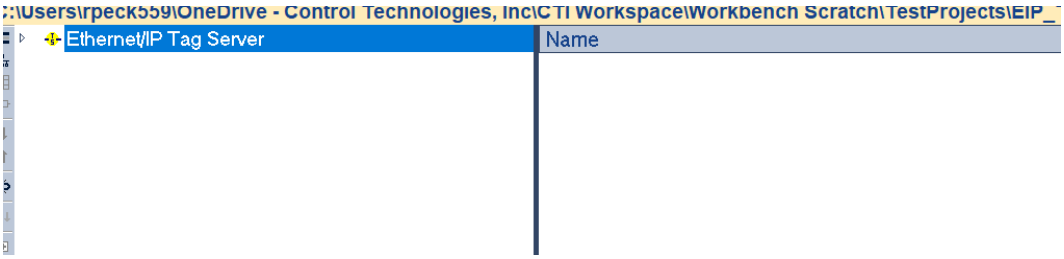
Create tags which match the names used in the Workbench

Create RLL rungs using MSG instructions to CIP Data Table Read and CIP Data Table Write to read and write tagnames from the Janus product.

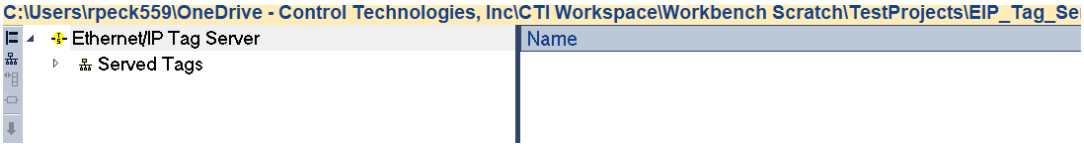
1.2 Workbench Setup

First create a new project (if you don't have one already) and set up the IP address in Project Settings.

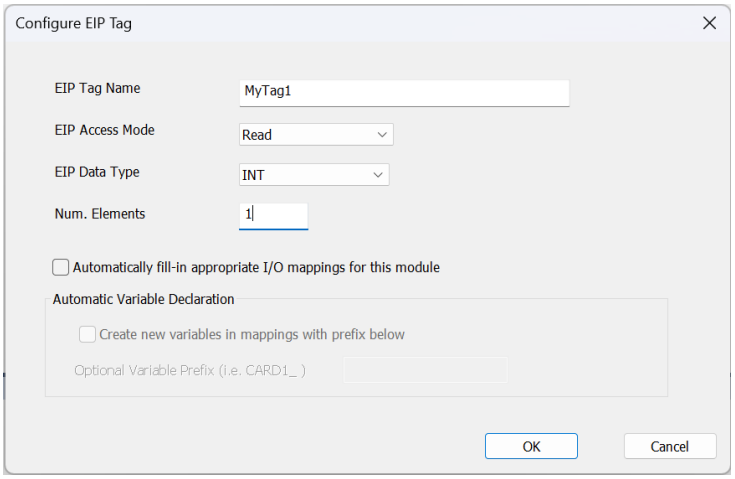
Next, go to the Fieldbus configuration and add-in the "Ethernet/IP Tag Server" Protocol. Once added, it will show up in the Fieldbus configuration pane.



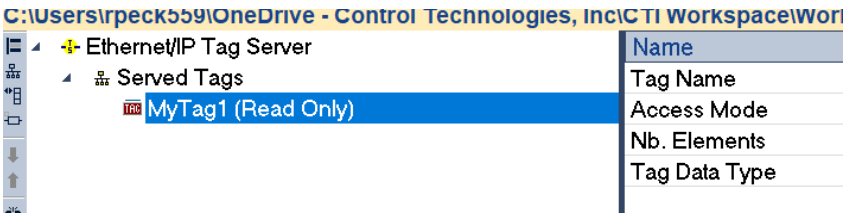
Next, use the "Insert Master/Port" icon to add a "Served Tags" item to the configuration,



Use the "Insert Slave/Data Block" icon to insert a Tag. The "Configure EIP Tag" dialog will come up. Complete the fields as shown.

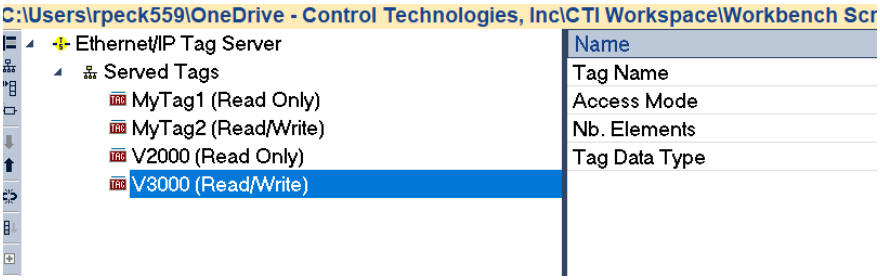


Click OK and the tag will be added.



Now repeat this process for the other tags: MyTag2 (Write1 element), V2000 (Read 4 elements), and V3000 (Write 4 elements). All tags should be INT data type.

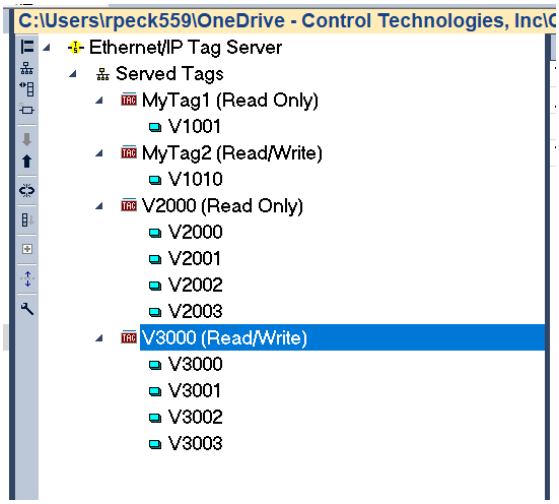
Here is the finished tag configuration.



Now we need to create and map variables. Create the following global variables in Workbench:

- V1001, V1010 INT
- V2000 through V2003 INT
- V3000 through V3003 INT

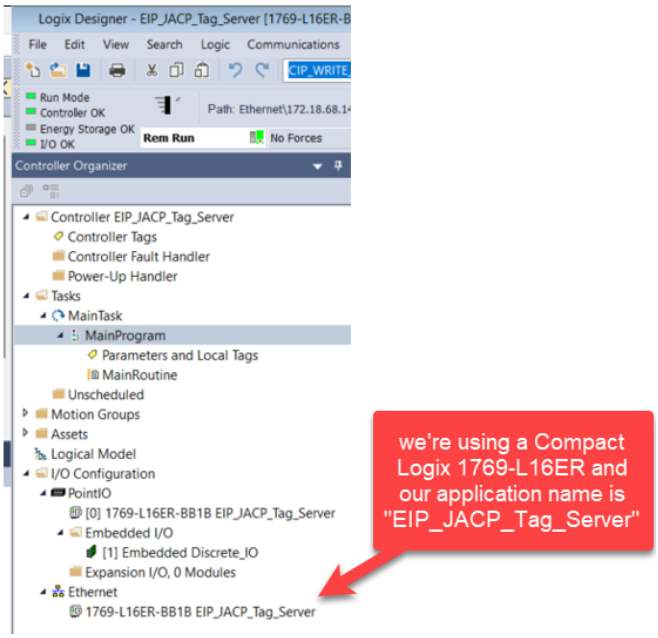
Now map the variables as shown below. Don't forget to use the "Renumber Offsets" command for V2000 and V3000 so the offsets are correctly numbered. When complete, your configuration should look like this:



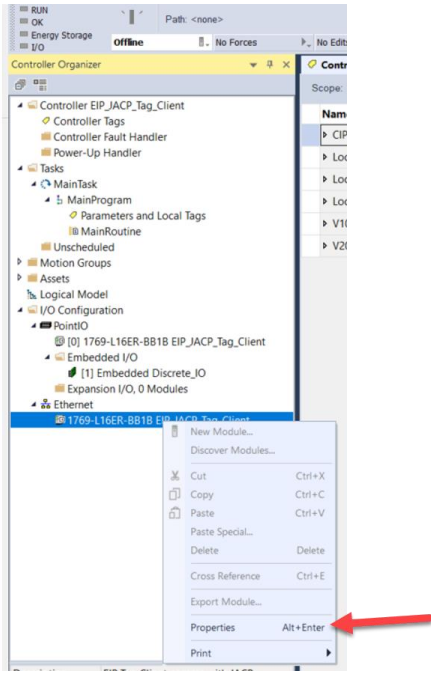
Now compile your application (correcting any problems) and download to the target. Next, we'll set up the Rockwell side.

1.3 Studio 5000 Setup

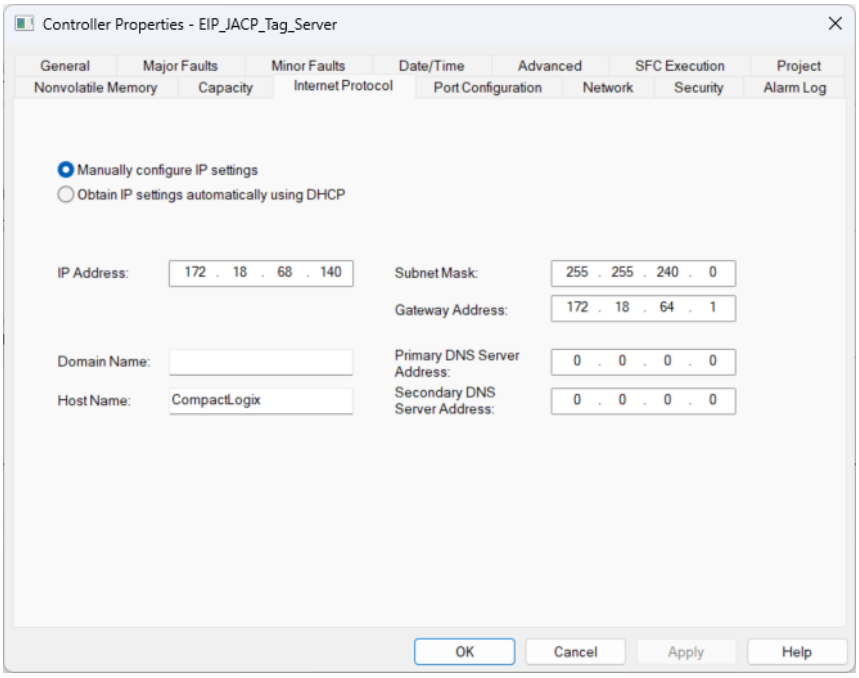
After creating your project click on your Rockwell controller in the main navigation tree under I/O Configuration – Ethernet.



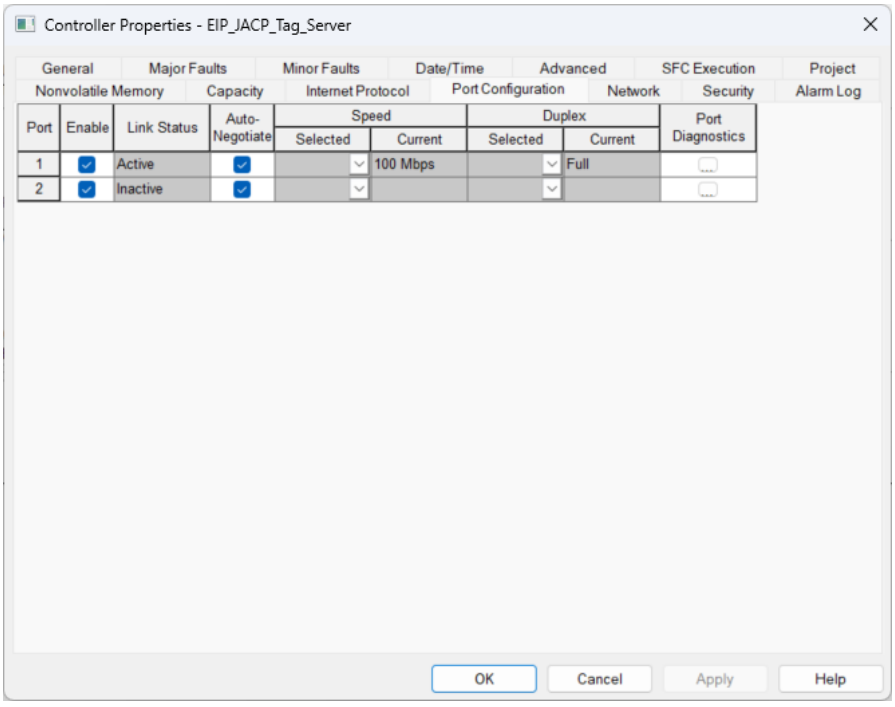
Then right-click and click on "Properties".



This brings up the “Controller Properties” dialog. On the “Internet Protocol” tab, configure the IP settings of your Rockwell PLC. This must match the setting made in the Workbench fieldbus configuration for this Rockwell PLC.



On the “Port Configurations” tab, be sure you have one or more Ethernet ports enabled and set up.

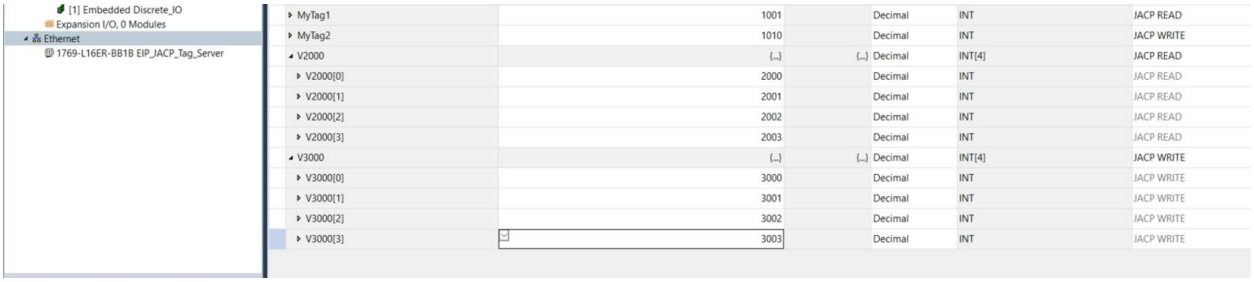


Now we need to create tagnames matching the ones we created in Workbench. Go back to the main navigation tree and expand your main project item, and click “Controller Tags”

Add tags to this configuration. The names and structures of the tags must match the tags you configured in the Workbench fieldbus configuration. Here, we’ve added 4 tags:

- MyTag1 INT, 1 element
- MyTag2 INT, 1 element
- V2000 INT, 4 elements
- V3000 INT, 4 elements

Here are the finished tags:

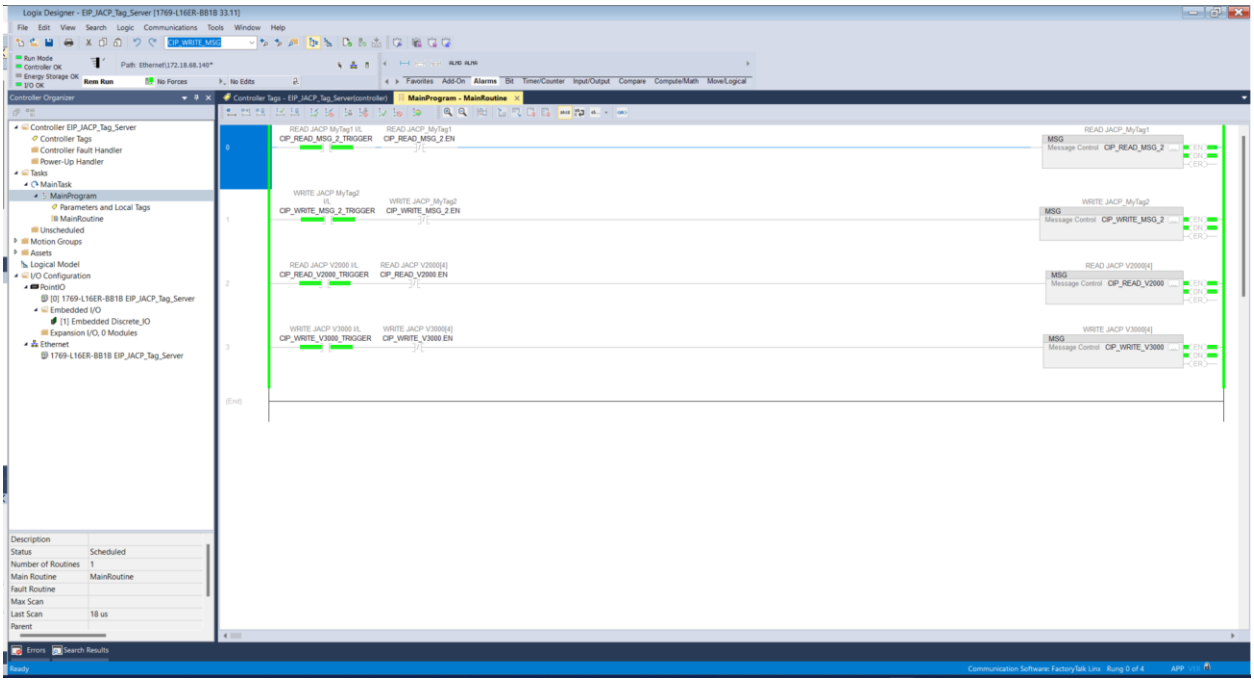


Now, we’ll create 4 rungs of RLL using 4 different MSG instructions to do the following:

- Read MyTag1 from Janus
- Write MyTag2 to Janus
- Read V2000 (4 elements) from Janus
- Write V3000 (4 elements) to Janus

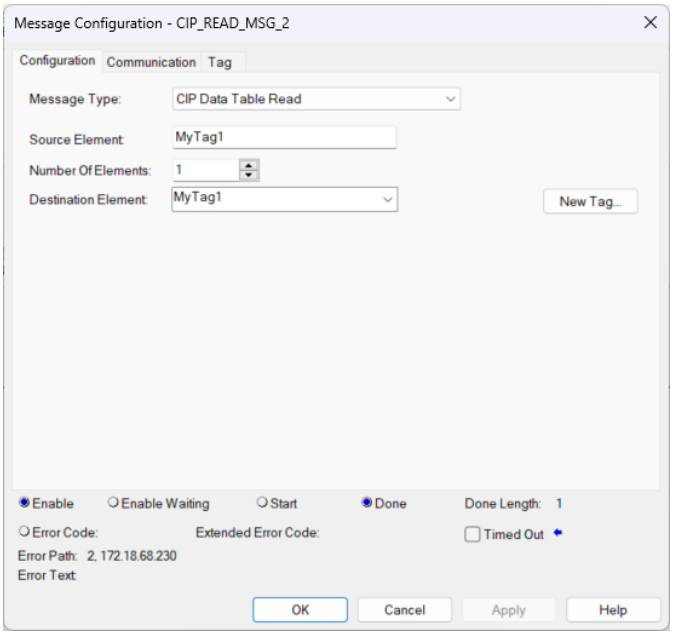
We latch the rungs using the “EN” output of the MSG instructions in a NC contact. This keeps the instruction activated until it completes.

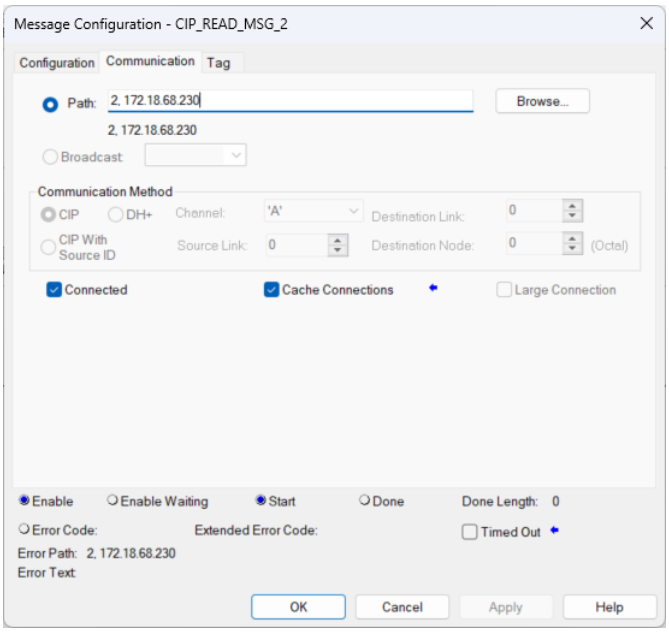
Here is the finished program:



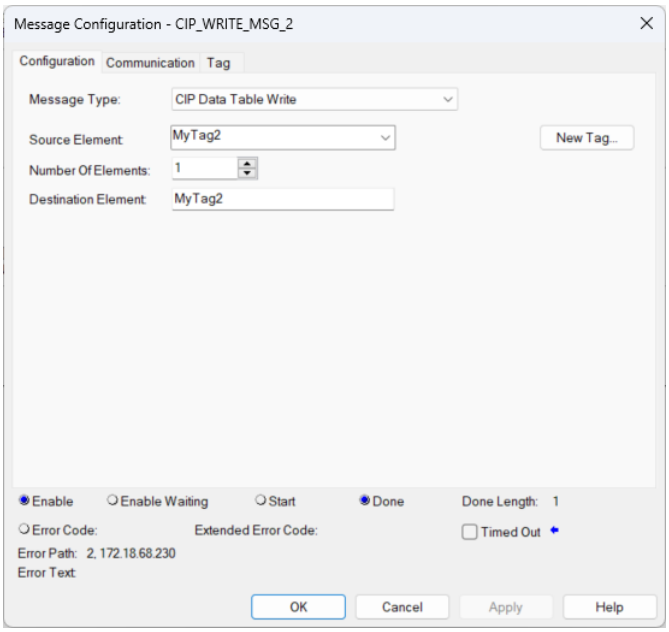
The following screen captures show the setup of the MSG instructions.

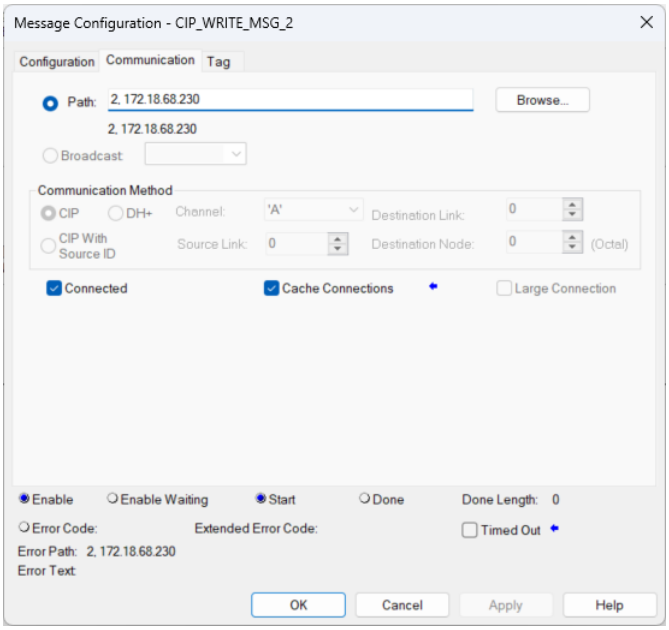
CIP_READ_MSG2 – reads MyTag1



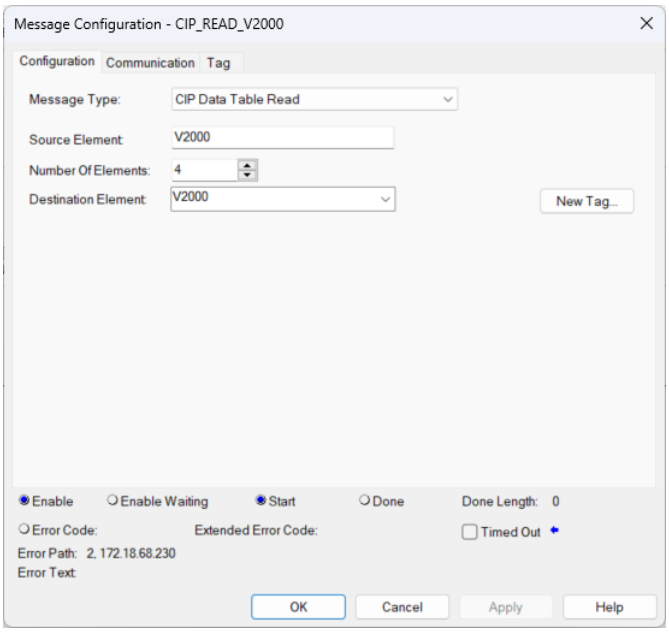


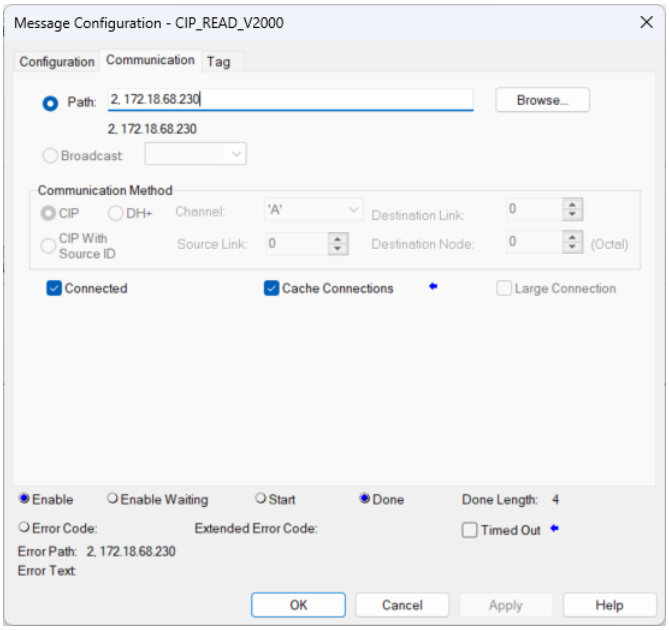
CIP_WRITE_MSG_2 – writes MyTag2



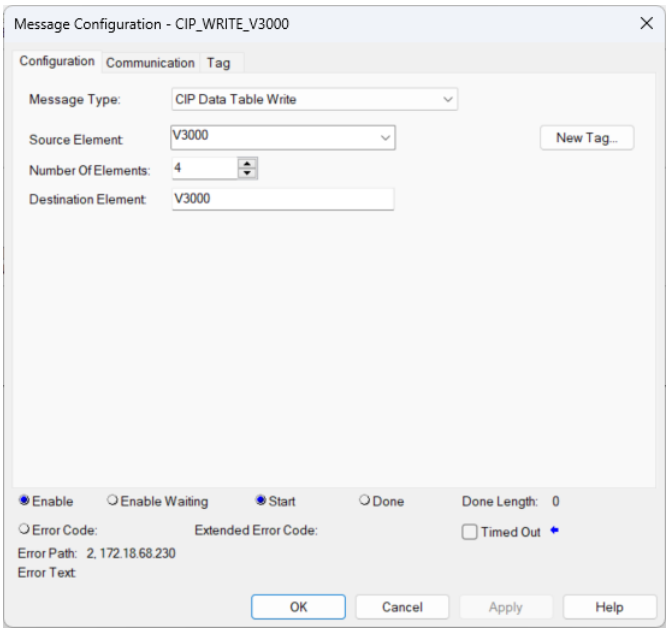


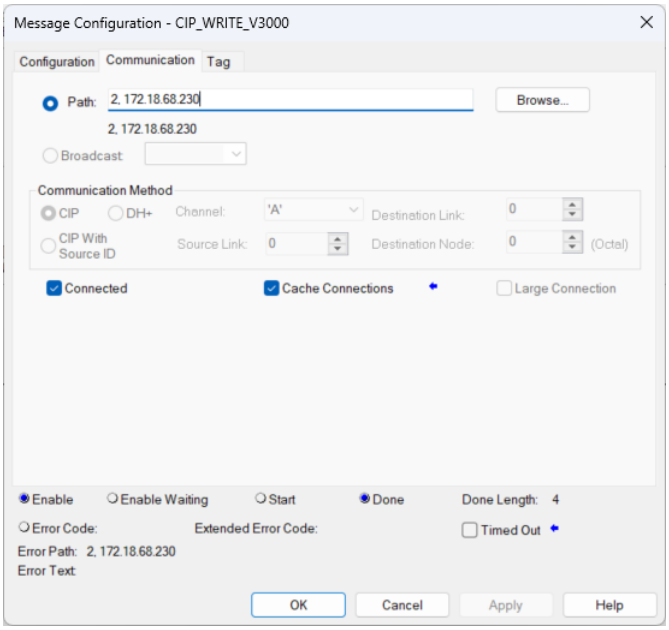
CIP_READ_V2000 – reads V2000 (4 elements)



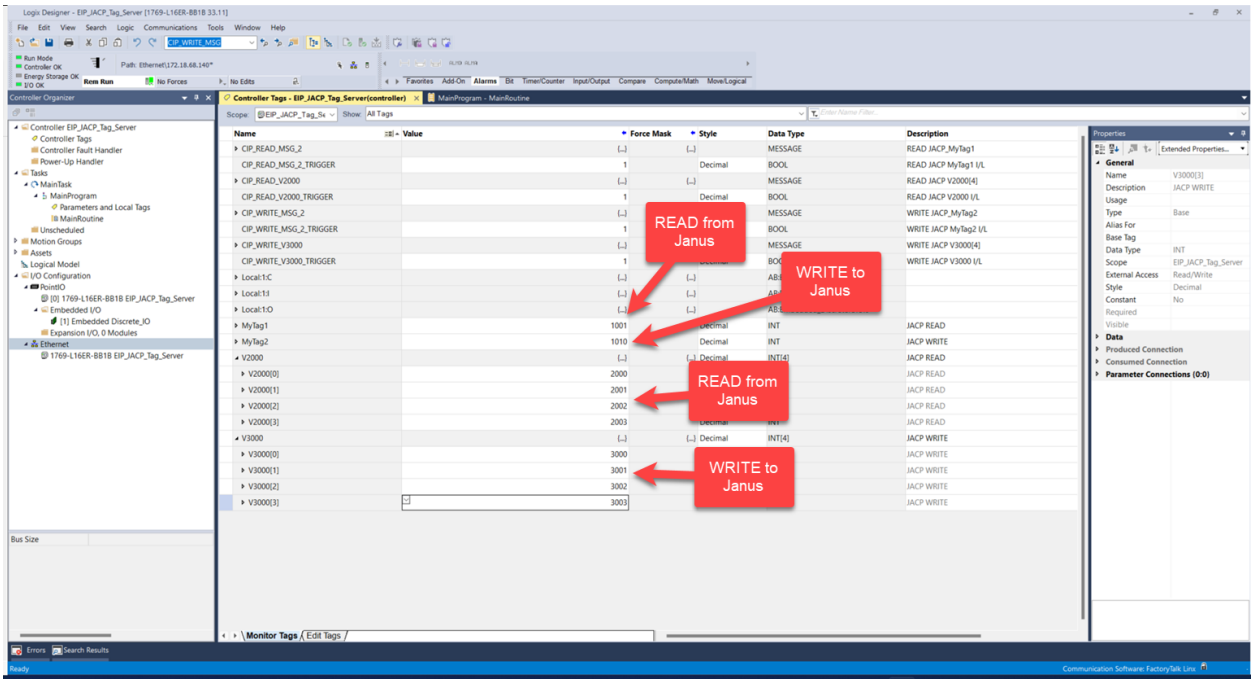


CIP_WRITE_V3000 – writes V3000 (4 elements)

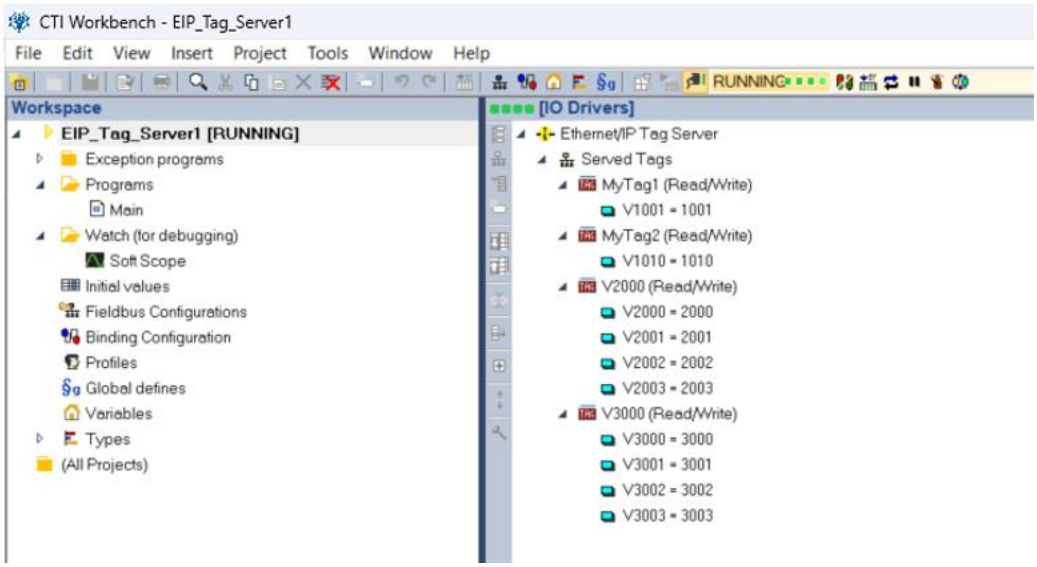




Now we compile, download and run the Studio 5000 application. On the Controller Tags tab, we can see the communications working.



And in Workbench, we can see the same results.



The transaction counter and other status variables can be used to diagnose errors and monitor operation. In addition, you can view the “EIP Tag Server Statistics” in the “Statistics” section of the Janus web page: