EtherNet/IP Configuration for a Moxa MGate 5105-MB-EIP and an Allen-Bradley CompactLogix L32E

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Moxa manufactures one of the world's leading brands of device networking solutions. Products include serial boards, USB-to-serial hubs, media converters, device servers, embedded computers, Ethernet I/O servers, terminal servers, Modbus gateways, industrial switches, and Ethernet-to-fiber converters. Our products are key components of many networking applications, including industrial automation, manufacturing, POS, and medical treatment facilities.

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1. Introduction

This application note will explain how to configure a Moxa MGate gateway as an
EtherNet/IP Adapter and an Allen-Bradley CompactLogix L32E as an EtherNet/IP
Scanner. On the Modbus RTU side, this note will also explain how to connect a Moxa
ioLogik R2110 as a Modbus RTU slave with 12 digital inputs and 8 digital outputs.

2. Applicable products

Product Line	Model Name
MGate 5000 series	MGate 5105-MB-EIP, MGate 5105-MB-EIP-T

3. System requirements

| Description	Model / File Name	Version
Allen-Bradley 1769-L32E controller	1769-L32E CompactLogix5332E	18.12
Rockwell single control platform	RSLogix 5000	18.02.00
Moxa RS-485 remote I/O with 12 digital inputs and 8 digital outputs	ioLogik R2110	1.2
Moxa EtherNet/IP-to-Modbus gateway	MGate 5105-MB-EIP	1.1
Software utility to configure Moxa devices	MGate Manager	1.8

4. System overview

This application note will use the Moxa MGate 5105-MB-EIP for illustration purposes. The system architecture is shown below.
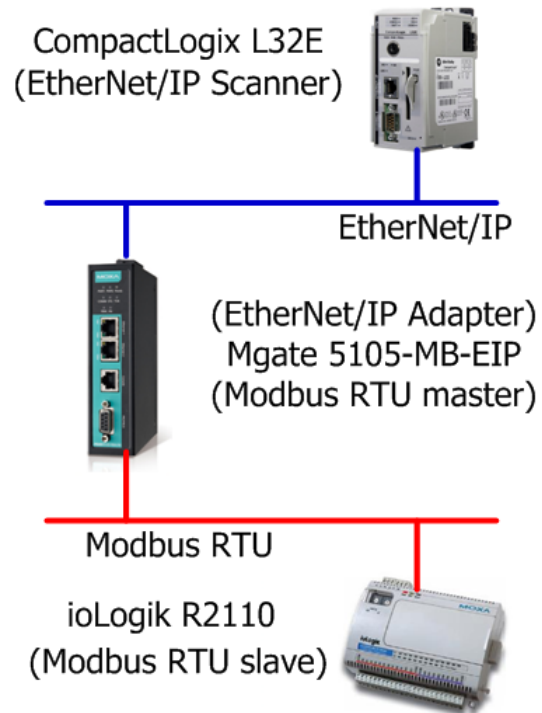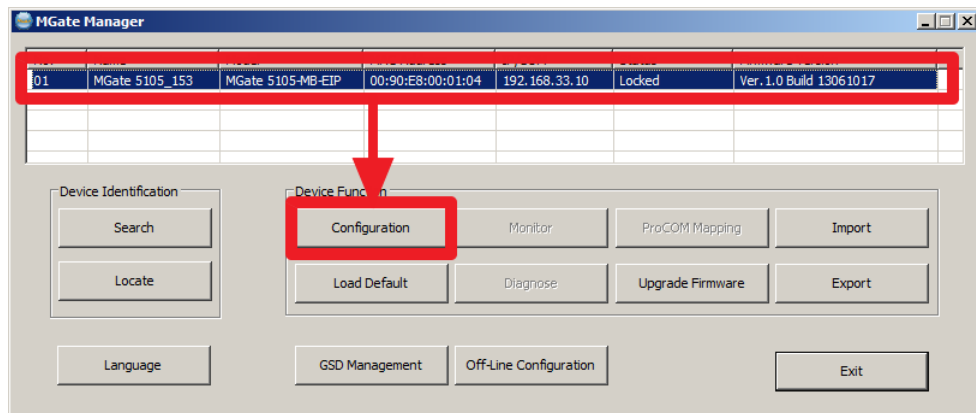

5. MGate 5105-MB-EIP configuration
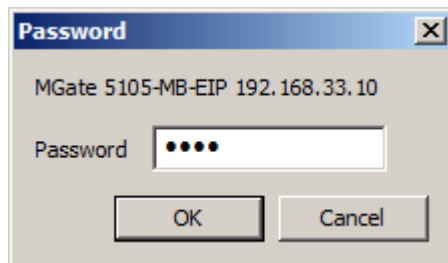
5.1. Device configuration with MGate Manager

5.1.1. Start MGate Manager on your host computer and click the **Search** button to locate the Moxa MGate 5105-MB-EIP gateway on your network.
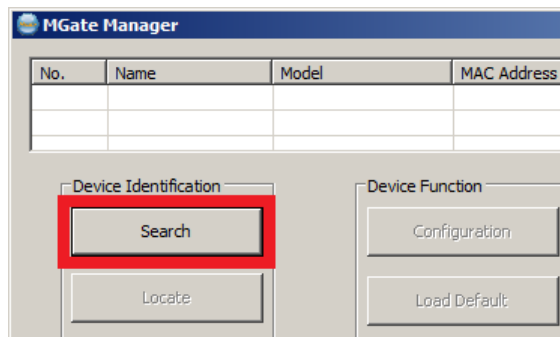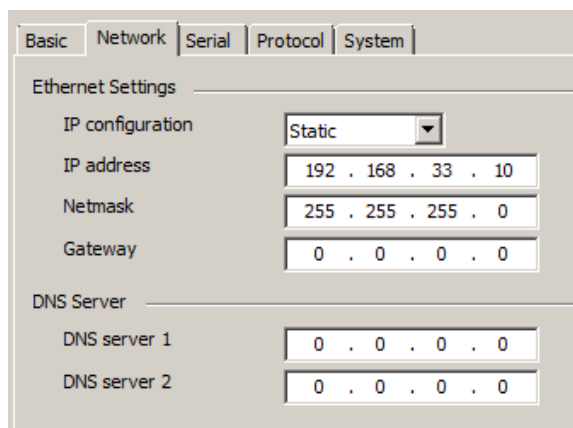
5.1.2. Select the MGate gateway and click the **Configuration** button to configure it.



If MGate Manager requests a password, **moxa** is the default password.

5.1.3. Select the **Network** tab to configure the IP address and netmask of the MGate 5105-MB-EIP gateway. In this example, the IP address is **192.168.33.10** and the default netmask is **255.255.255.0**.

5.1.4.　Select the **Serial** tab to configure the serial parameters to be the same as the parameters on the Modbus device, which is the ioLogik R2110 in this example.
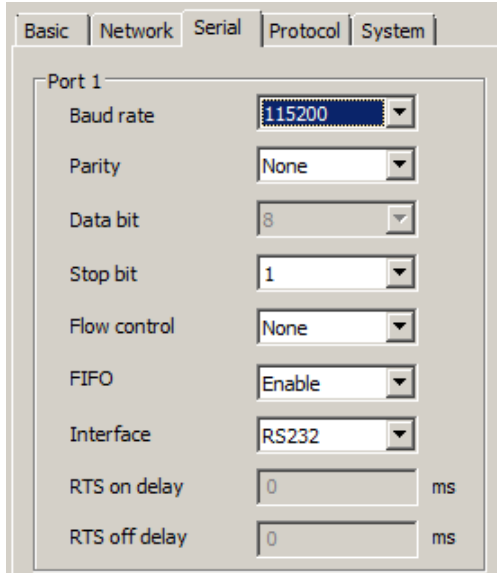

5.1.5.　Select the **Protocol** tab to configure the protocol conversion settings. The first sub-tab is **Protocol Conversion** and shows which protocols are going to be converted. In this demo, select **EtherNet/IP <-> Modbus RTU/ASCII** from the dropdown menu.
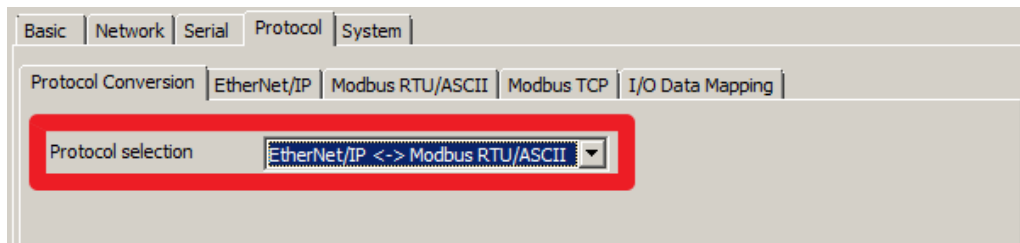

5.1.6.　Select the **EtherNet/IP** tab to configure EtherNet/IP settings.

5.1.7.　Since we will use the Allen-Bradley PLC as the EtherNet/IP Scanner, select **Adapter** for the MGate 5105-MB-EIP's **Mode selection**.

　5.1.7.1.　Then select **Automatic** for **I/O data size configuration** so that the MGate 5105-MB-EIP will automatically map the I/O data.
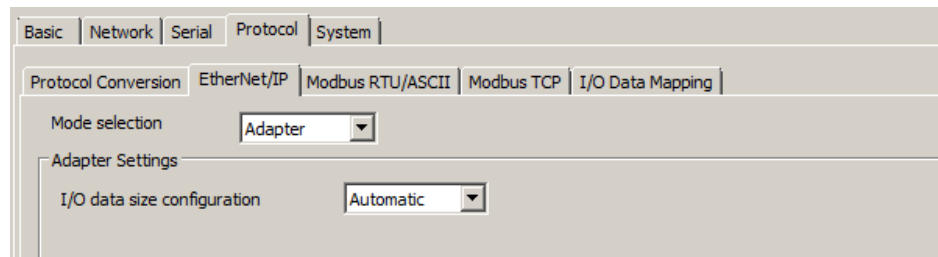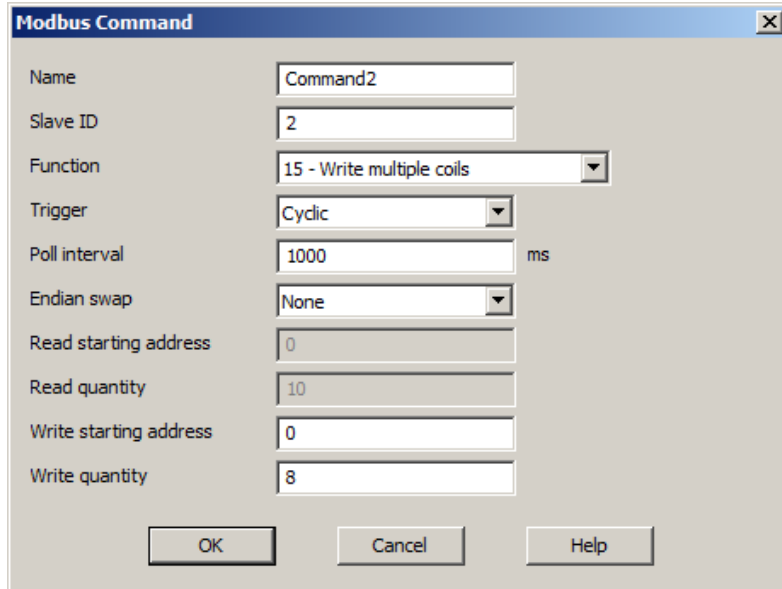
5.1.7.2. Select the **Modbus RTU/ASCII** tab to configure Modbus RTU/ASCII settings and Modbus commands. Refer to the ioLogik R2110 user's manual to understand how to read the DI status information from the ioLogik R2110 and write DO statuses to the ioLogik R2110.

5.1.8. You will need to configure two Modbus commands. Start by clicking the **Add** button to create a new Modbus command.
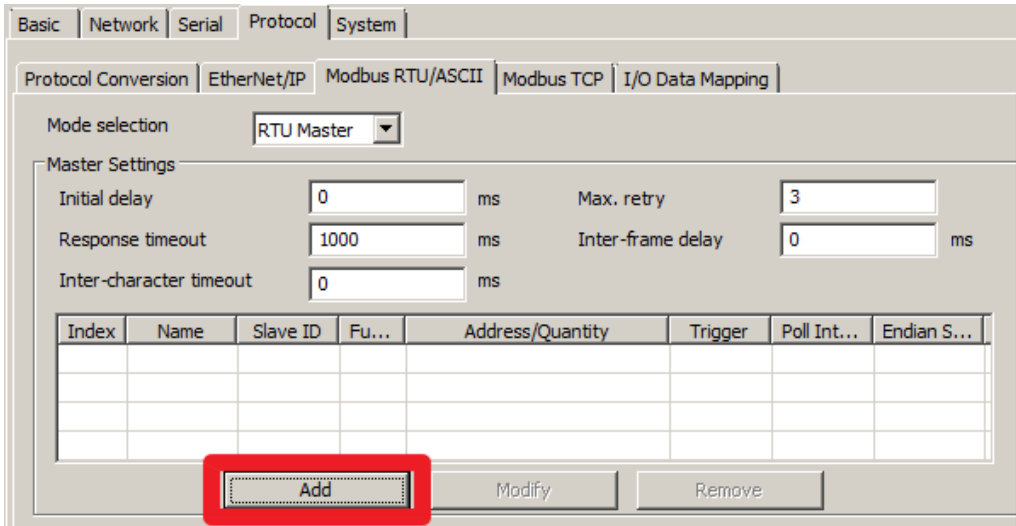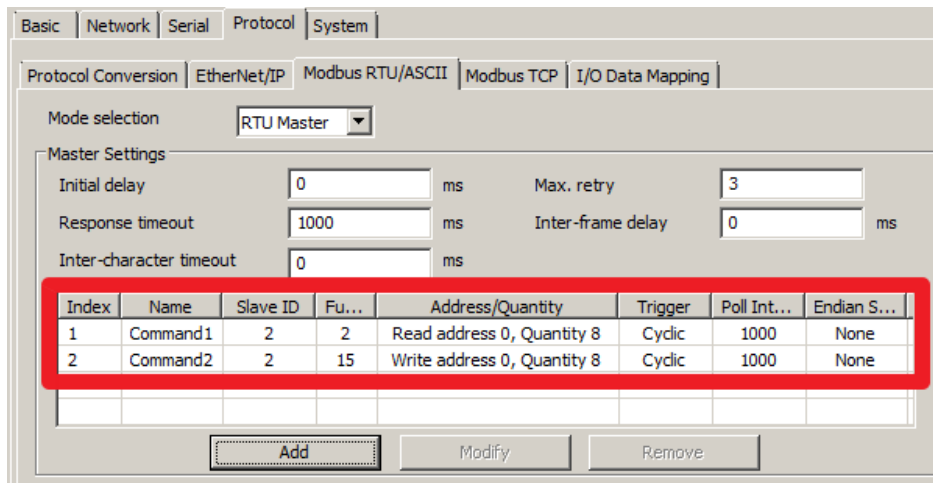

5.1.8.1. Name the new command **Command1** and configure it to read the DI status from the ioLogik R2110. Then click **OK** to add the command.
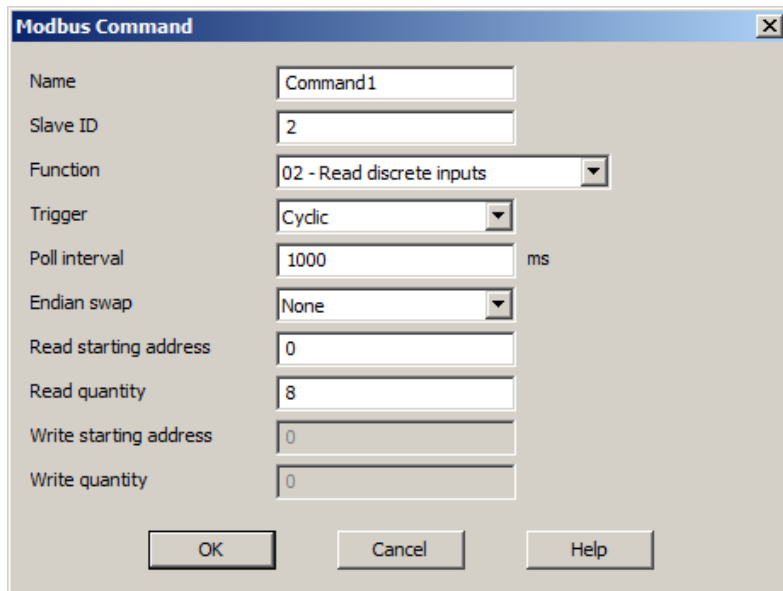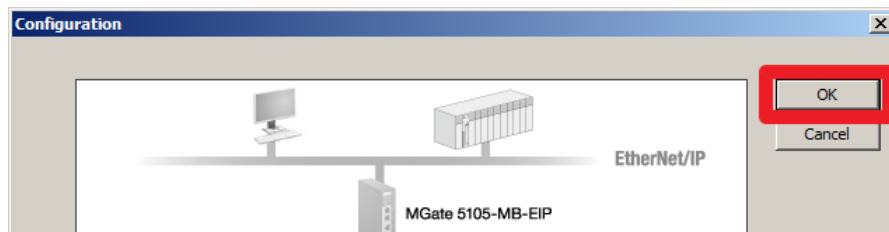
5.1.8.2. Next, configure **Command2** to write the DO status to ioLogik R2110, and then click **OK** to add the command.

5.1.8.3. Return to the **Modbus RTU/ASCII** tab to view a summary of the commands we just added.

5.1.9. Then, click the **OK** button to save all the configurations we just added and the MGate 5105-MB-EIP will restart automatically for the new settings to take effect.

6. PLC configuration

6.1.   Install the EDS file

6.1.1.   Open the EDS hardware Installation Tool to install the EDS files for the MGate 5105-MB-EIP. Click **Add** to choose the folder where the EDS files will be stored.
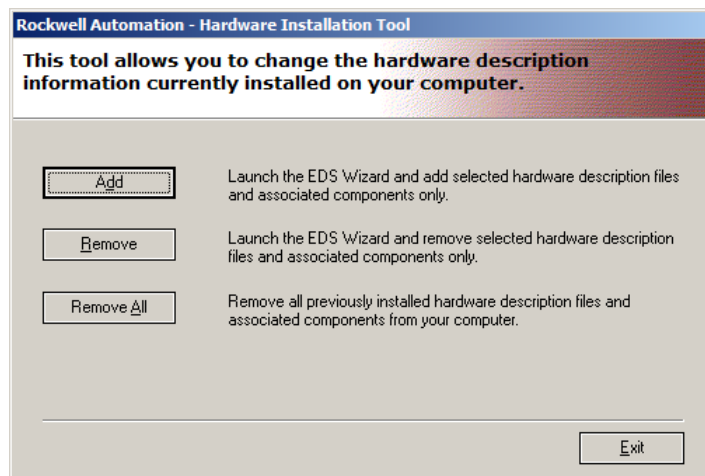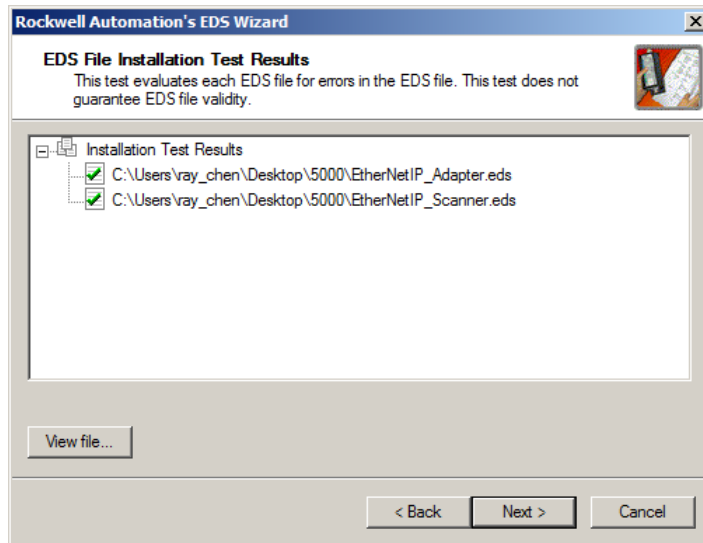
6.1.2.   You will need to install two separate EDS files—one for EtherNet/IP Scanner and another for EtherNet/IP Adapter—in a new directory. Create a new directory by selecting **Register a directory of EDS files** and clicking the **Browse...** button to select the appropriate folder to store the files.
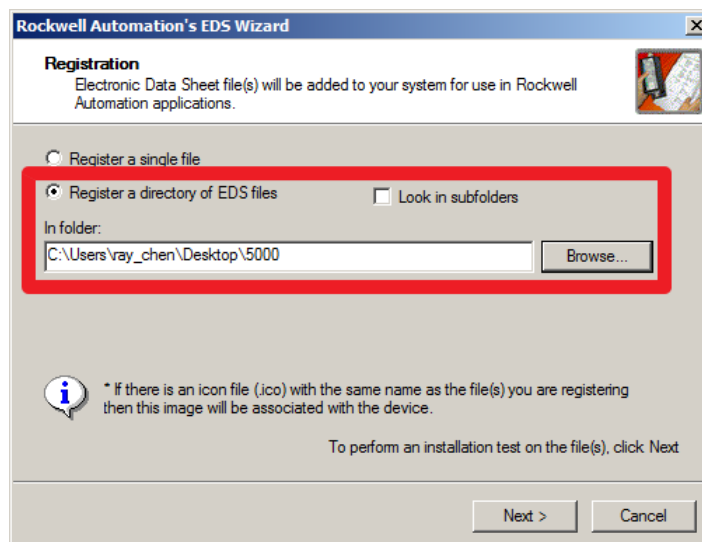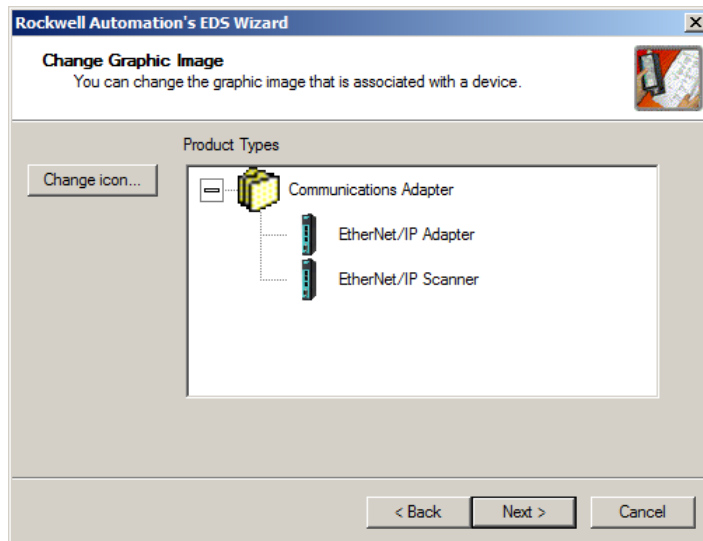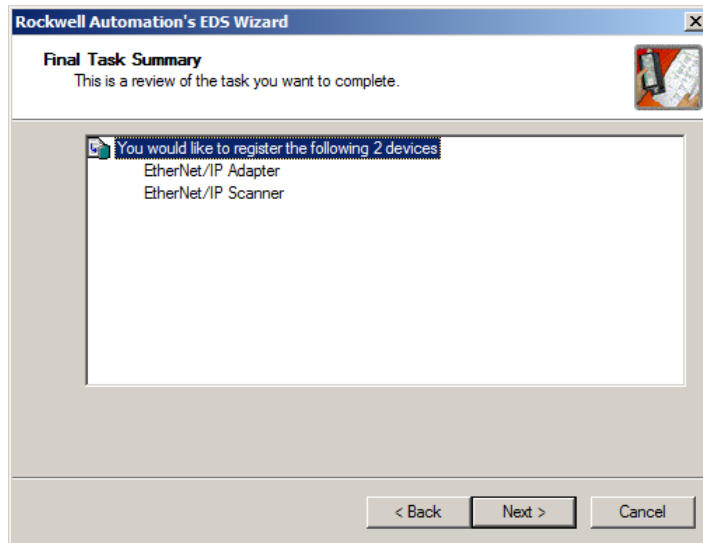
6.1.3. Click **Next >** to view the EDS files that are going to be installed.
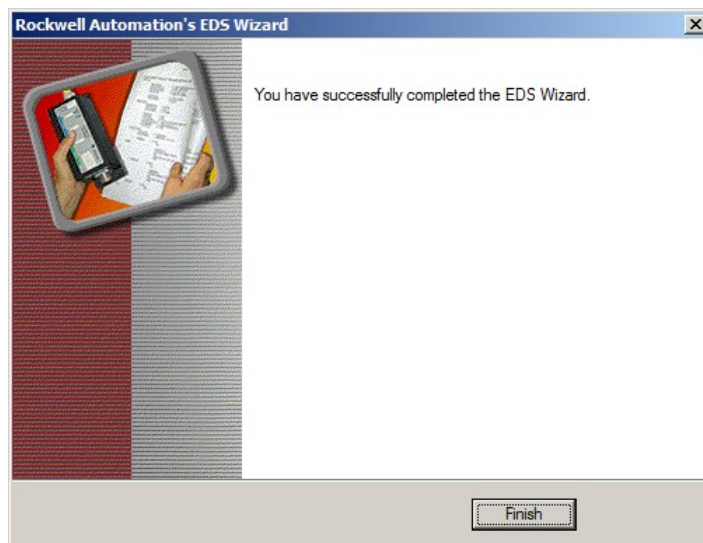

6.1.4. Click **Next >** to view the devices on which the EDS files will be installed.

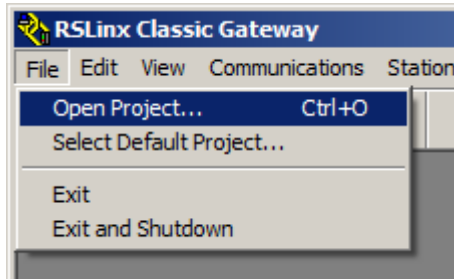6.1.5. Click **Next >** to see a summary of the installation.

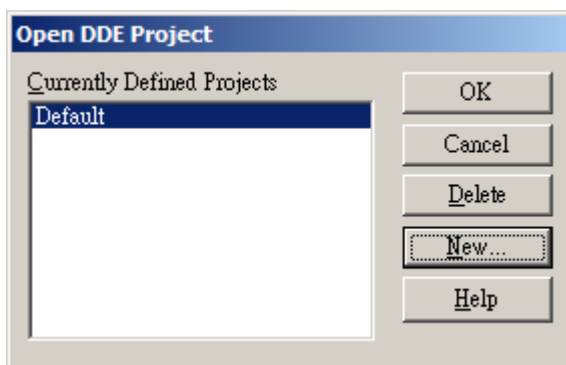6.1.6. Click **Next >** and then **Finish** to complete the installation process.
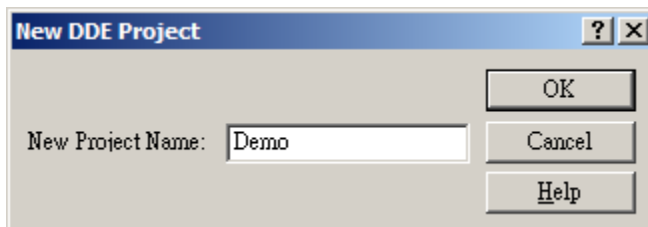
6.2.   Configure the EtherNet/IP network

6.2.1. Start RSLinx Classic and create a new project by selecting **File → Open Project…**
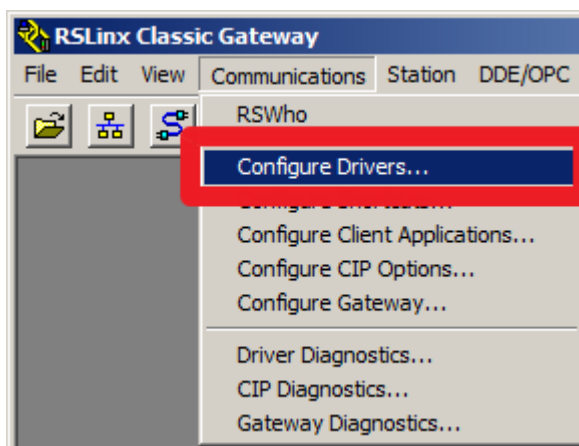

6.2.2. Click the **New…** button to create a new DDE project for this demo.


Enter **Demo** for the **Project Name**.

6.2.3. Select **Communications → Configure Drivers…** to configure the EtherNet/IP network.

6.2.4. There may be a default driver already installed, as shown in the screenshot below. You may configure a new driver or check if the default settings are suitable for the network topology of the application. Select the appropriate driver and click the **Configure…** button.
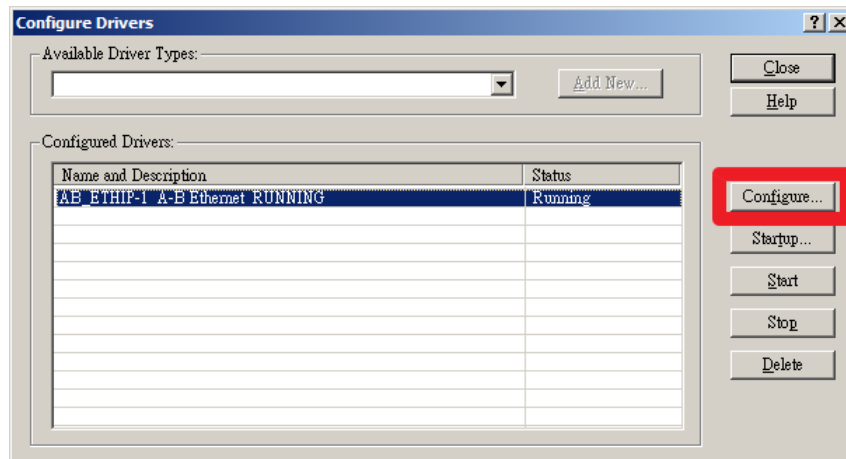

6.2.5. Choose the proper Ethernet interface then click the **OK** button.
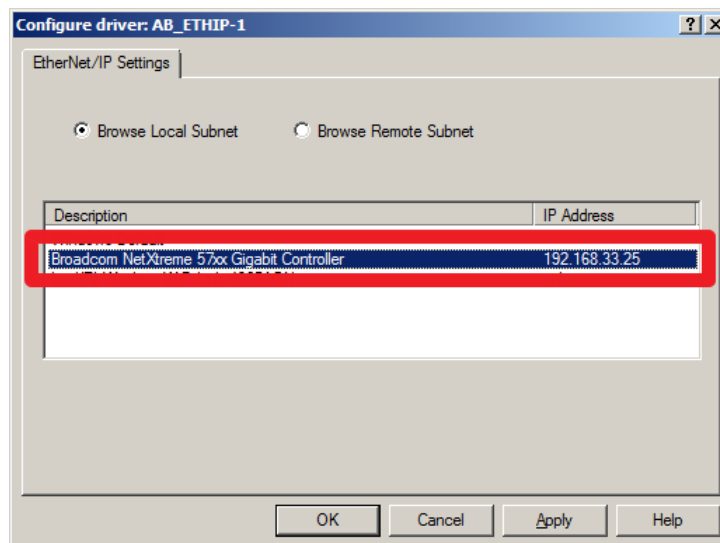
6.2.6. Return to the main window and select **Communications → RSWho** to detect all the EtherNet/IP devices on the network.
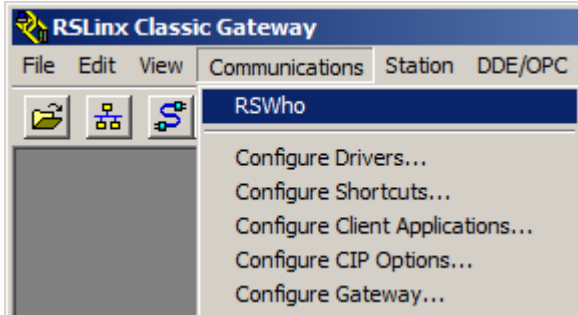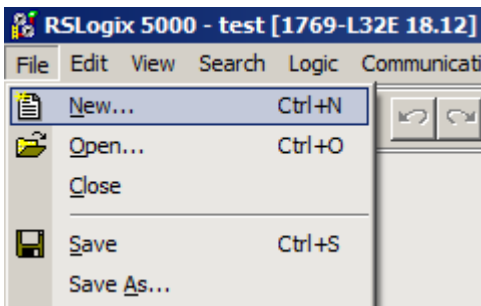

6.2.7. In the left column tree menu, expand the **AB_ETHIP-1, Ethernet** driver to confirm that all the devices were detected. In this example, you should see the Allen-Bradley PLC and Moxa MGate 5105-MB-EIP.
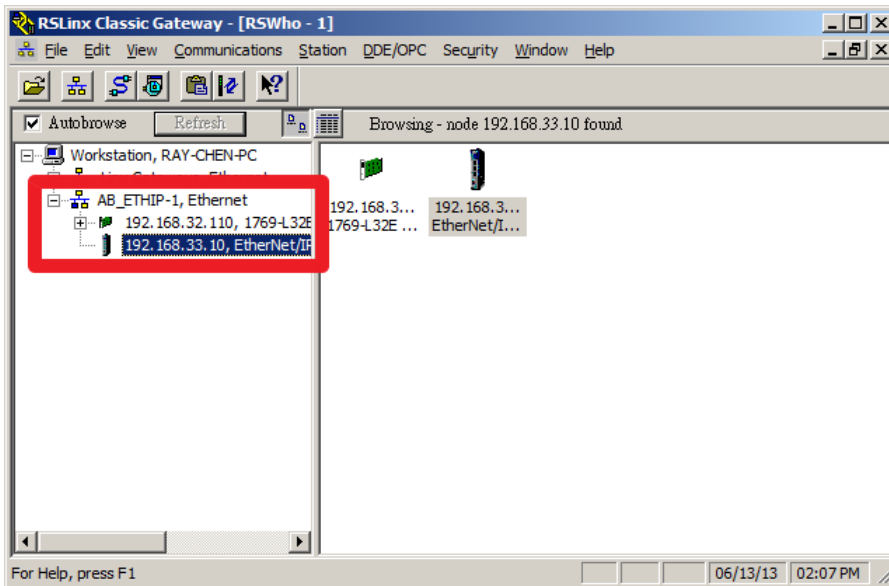

6.3. Create RSLogix 5000 project

6.3.1. Start RSLogix 5000 and create a new project by selecting **File → New**.

6.3.2. You must choose the proper controller type and controller firmware version. In this example, we are using the **1769-L32E   CompactLogix5332E Controller** and Revision **18**. In addition, you should also assign a name for this project. For this example, enter **Demo** as the Project Name.
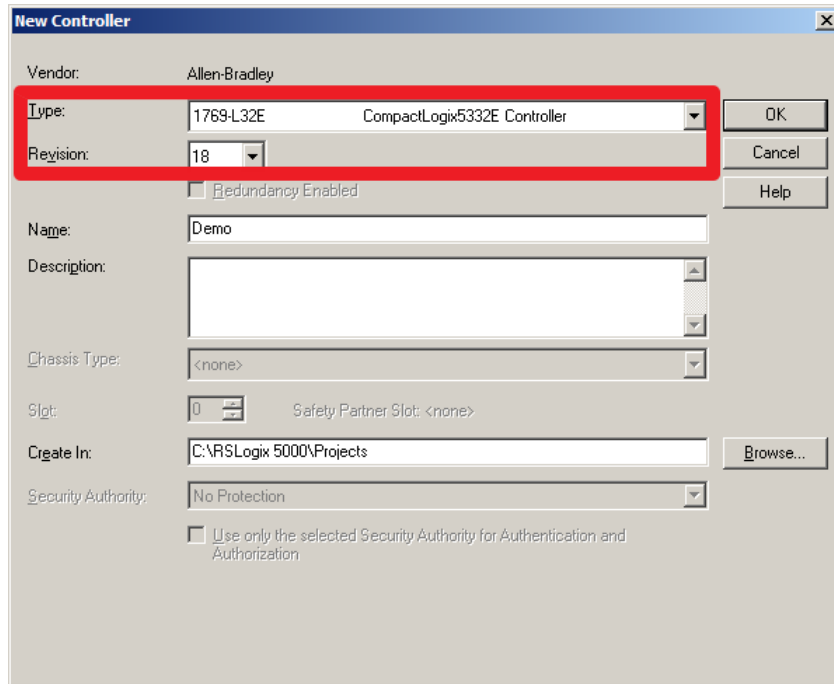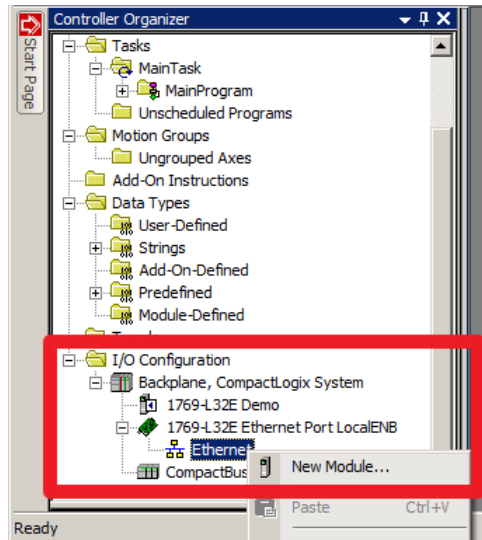

## 6.4. Create an Ethernet Module for the MGate 5105-MB-EIP

6.4.1. When the new project opens, find the **Controller Organizer** window.
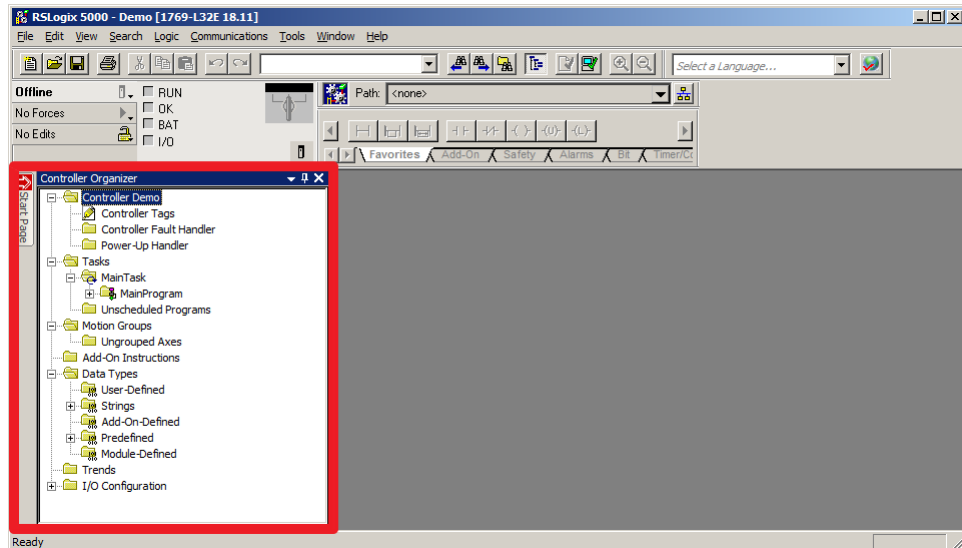
6.4.2. In the **Controller Organizer** tree menu, expand the **I/O configuration** field and right-click on **Ethernet**. Select **New Module** from the pop-up menu to add an Ethernet module to the MGate 5105-MB-EIP.
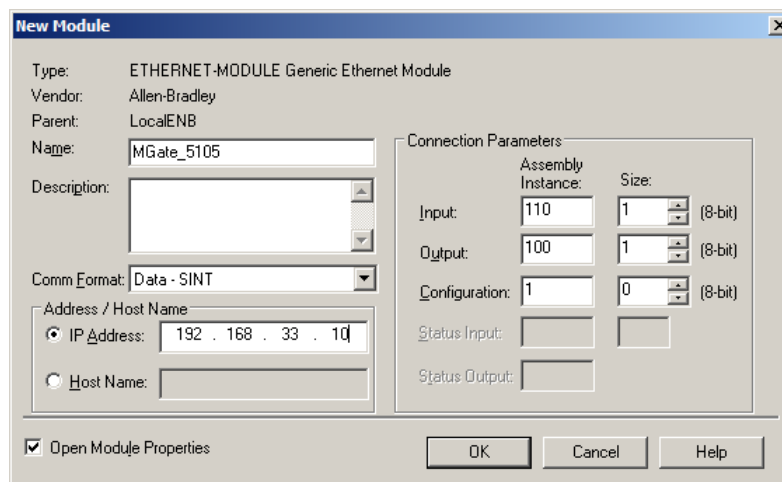

6.4.3. A new dialog box will appear for you to select modules to add. Expand the **Communications** category
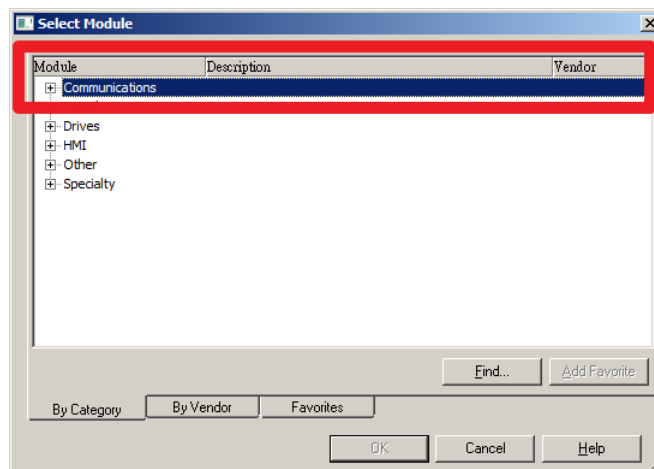
6.4.4. Then select **ETHERNET-MODULE** and click the **OK** button.
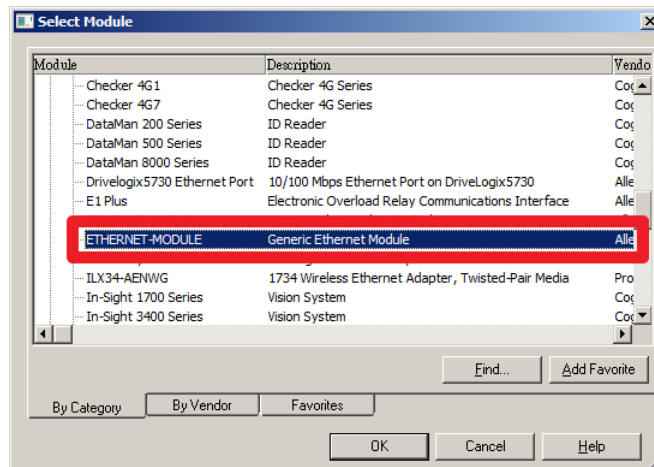
6.4.5. Enter the module's information, including the Name, Comm Format, IP address, and Connection Parameters.


6.4.5.1. For this example, enter **MGate_5105** for the Name, and **192.168.33.10** for the IP address.

6.4.5.2. Since we are simply testing the ioLogic R2110, configure the Comm Format as **Data – SINT**, and the Assembly Instance to only read and write 8 bits. The Assembly Instance Input of **110** and Assembly Instance Output of **100** are fixed by the MGate 5105-MB-EIP.

6.4.5.3. After clicking the **OK** button, you can configure the **Requested Packet Interval** (**RPI**), or keep the default settings on this page.
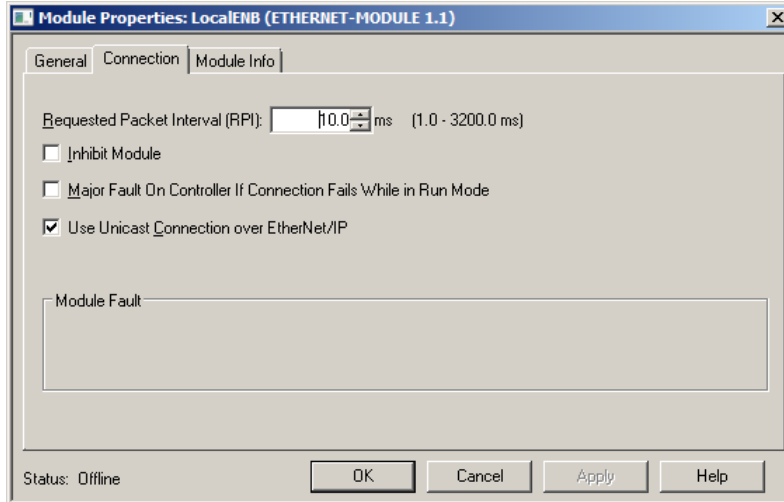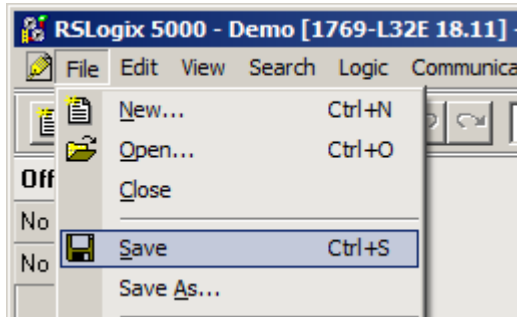

6.4.5.4. Lastly, click the **OK** button to finish the configuration.

6.4.6. Select the **Controller Tags** under Controller Demo to view all the tags you created. Verifying whether all the necessary tags have been created.
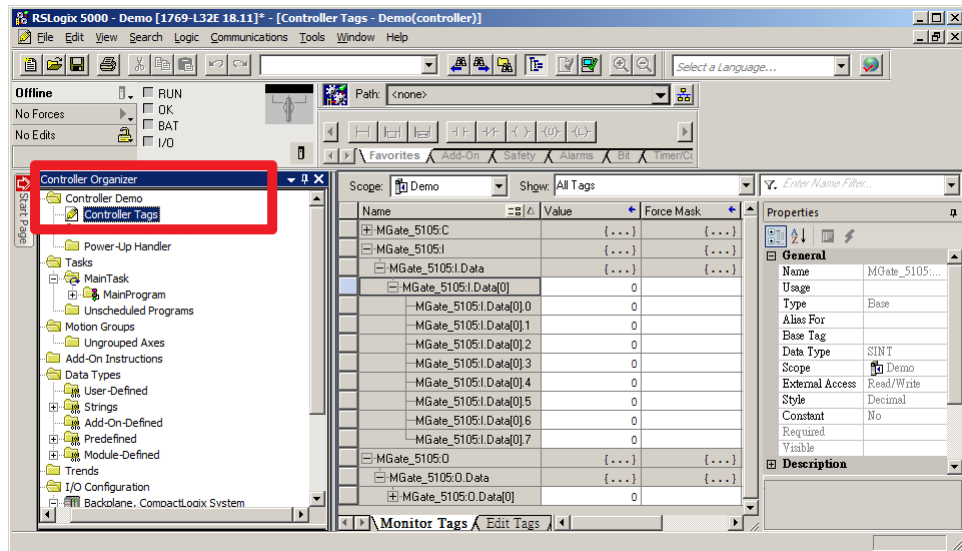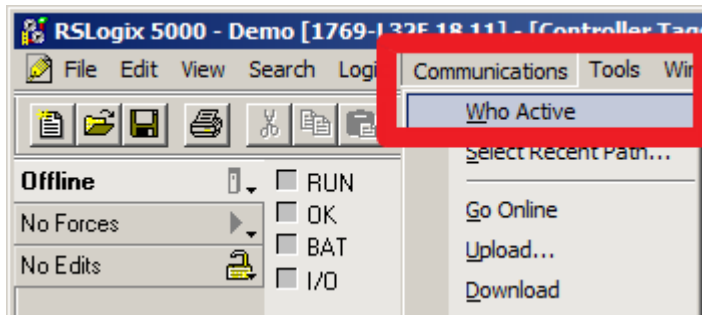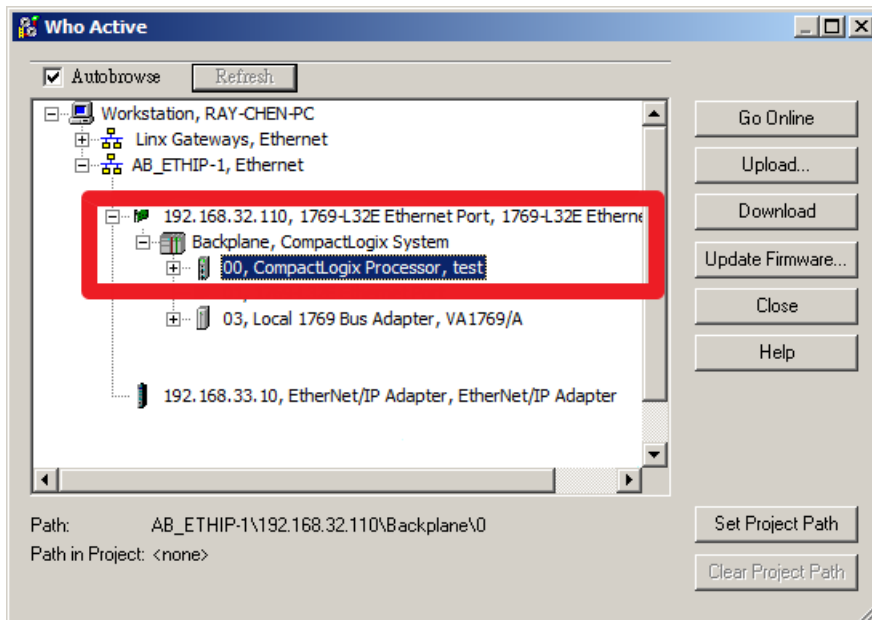
6.5. Download Configuration to PLC

6.5.1. Select **File → Save** to save this project.

6.5.2. Select **Communications → Who Active** to find the target PLC.

6.5.3. In the Who Active tree menu, expand the EtherNet/IP network field and select **Backplane, CompactLogix Processor**. On the right-hand side of the tree menu, click the **Download** button to download the above settings onto the PLC.
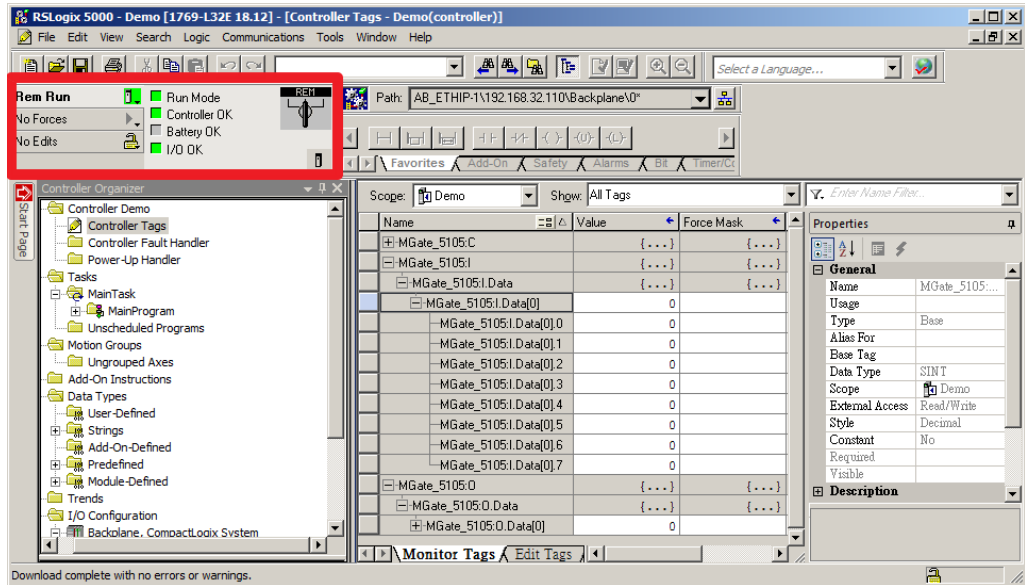
6.5.4. A warning message will pop up to remind you to that you are downloading an offline project onto the PLC. Click the **Download** button to proceed.
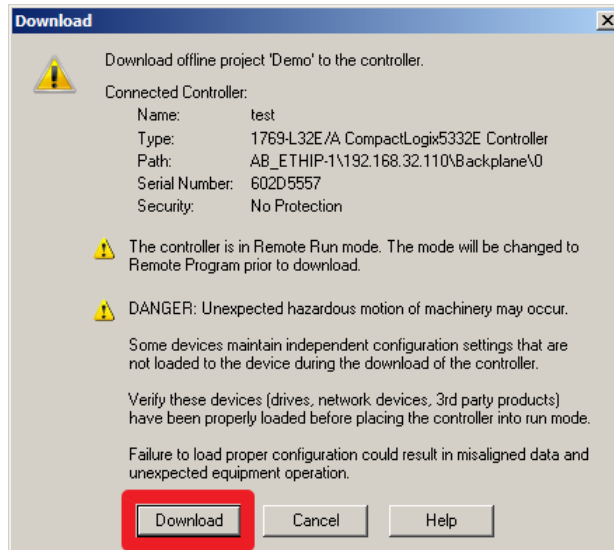
6.5.5. When downloading completes, you will be prompted to change the PLC to **Remote Run** mode. Click **Yes** to continue.
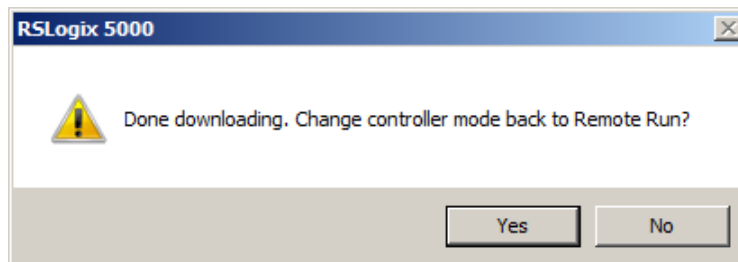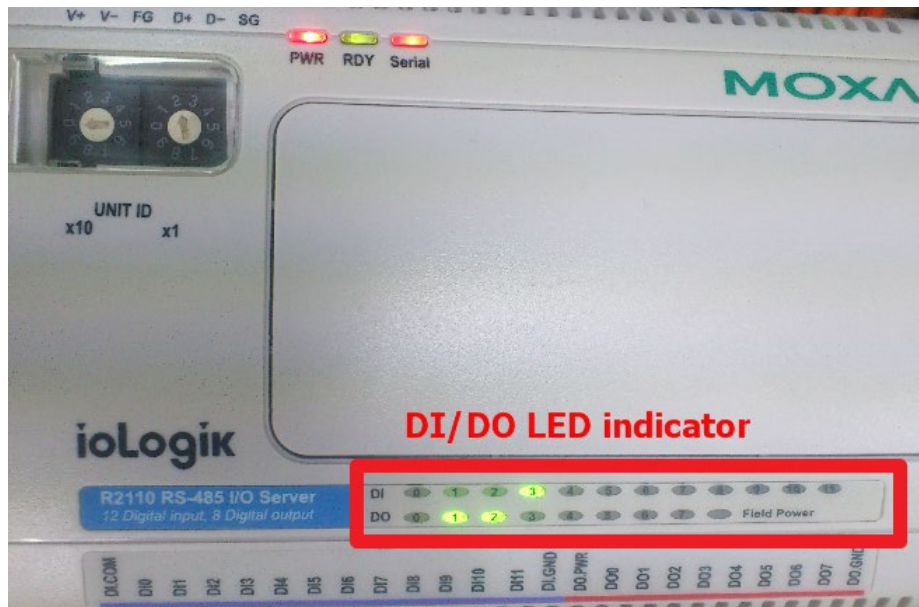
6.5.6. Return to the main window of the RSLogix 5000. The indicators should all be green.

7. Communication Test

7.1.   Monitor / Modify Test

7.1.1. Modify the DO data and check if the LED indicators on the ioLogik R2110 have changed.

7.1.2. Monitor the DI data for changes when you send an input signal from the ioLogik R2110.