Smart Wireless Gateway to Allen-Bradley® Integration Manual

1.1 Introduction

EtherNet/IP™ is the most commonly used industrial communication protocol managed by Open DeviceNet Vendors Association (ODVA). EtherNet/IP is an application layer protocol that is transferred inside a TCP/IP Packet. That means that EtherNet/IP is simply the way data is organized in a TCP or UDP packet. EtherNet/IP is part of CIP, the Common Industrial Protocol. CIP defines the Object structure and specifies the message transfer. CIP protocol over Ethernet is EtherNet/IP.

This document describes how to enable EtherNet/IP protocol support in Smart Wireless Gateway (Gateway). This document also explains the procedure to import Order Options, enable protocol support, and establish various types of connections with Rockwell ControlLogix® PLC using Class1, UCMM, and Class3 connections.

The document also explains about understanding different user interface pages within the Smart Wireless Gateway. These pages include, EtherNet/IP statistics, the communication page, and how to map device variables in the EtherNet/IP mapping page. It is assumed that there is general knowledge of how to establish connections using the Rockwell ControlLogix PLC. Consult the manual for the specific PLC. This document is just aimed at users looking to incorporate data values from the Smart Wireless Gateway. For assistance, contact your local wireless specialist.

EMERSON
Process Management

## 1.2 Preparing the Gateway for EtherNet/IP connection

1.2.1 Importing EtherNet/IP Order Option

Before importing the order option

Note

If the Gateway was pre ordered with the EtherNet/IP option, skip to "Enable EtherNet/IP Protocol" on page 4. If this is a field upgrade, follow these directions. An option file will need to be purchased for all field upgrades. Contact your local Emerson representative or contact information at the end of this manual.

Figure 1-1. Smart Wireless Gateway
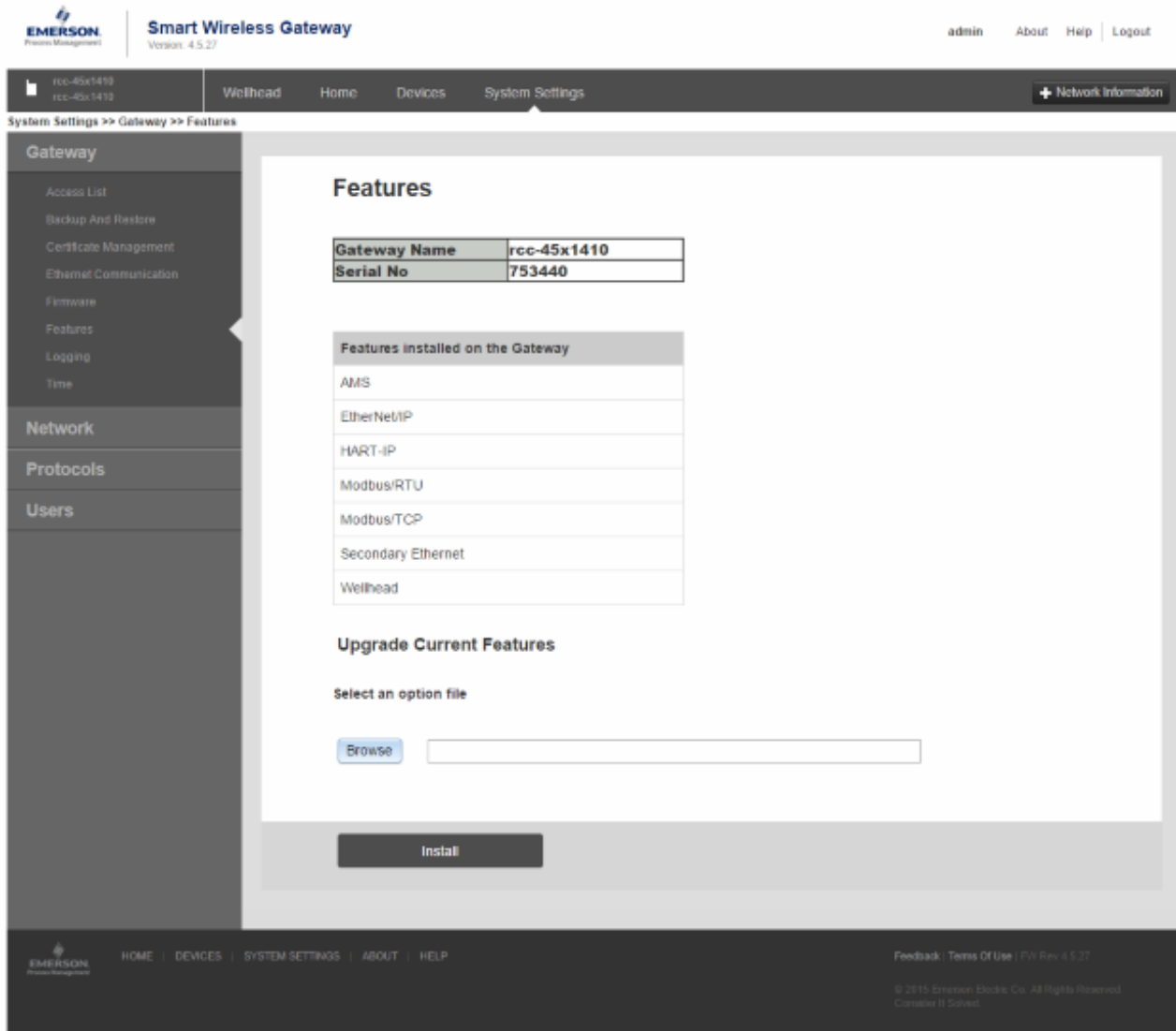
Once an option file has been obtained navigate to **Setup>Firmware** options. Under *Select a Gateway option file*, browse to the option file. See Figure 1-1 on page 2.
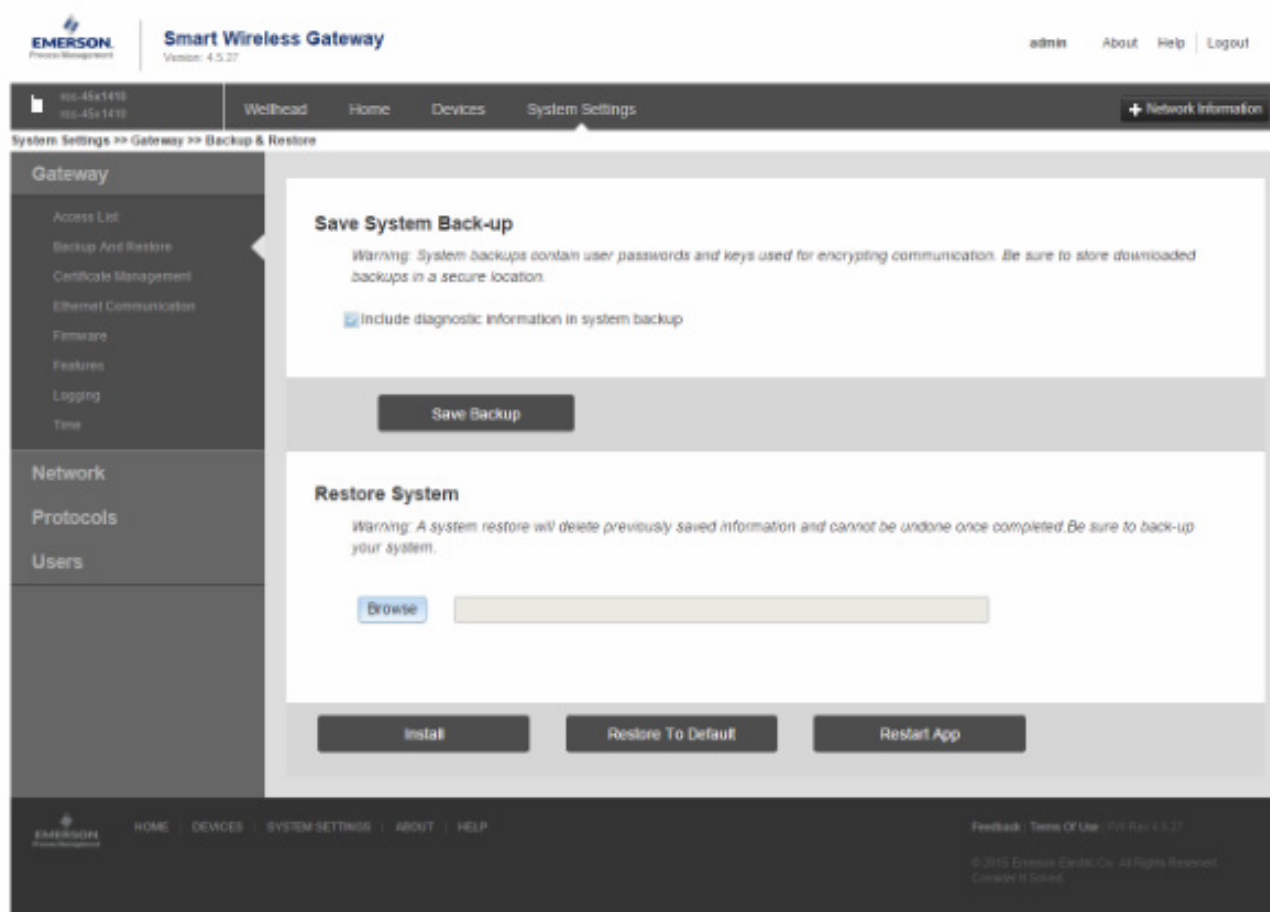
After selecting the EtherNet/IP order option file associated with the correct Gateways HG serial number, select the **Submit** button to apply the changes and proceed to Restart the Applications as seen below in Figure 1-2.

An application restart is necessary for the installation to be complete. Navigate to **Setup>Restart Applications** if not prompted.

Note

This will result in a temporary loss in communications with the network and will require a network rebuild. The mesh network is maintained, however, the devices will need to establish a connection to the Gateway. WARNING - All communications back to the host will be lost.
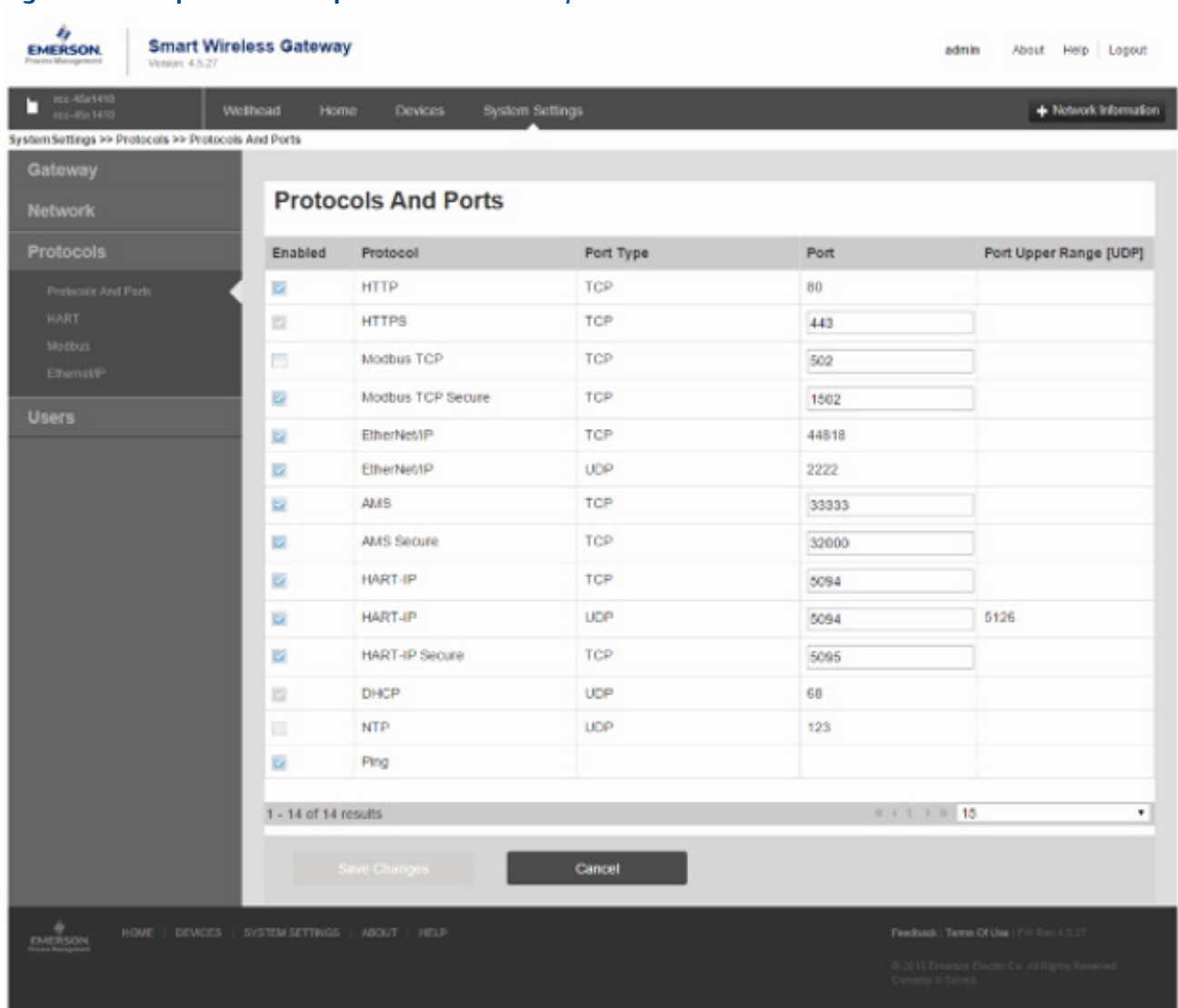
Figure 1-2. Setup Restart Applications

After importing the order option

After restarting the Gateway, navigate to the **Setup>Firmware Options** page. The check mark should be seen as shown to ensure that the EtherNet/IP Order Options imported successfully in the Smart Wireless Gateway.

Figure 1-3. Setup >Firmware options after EtherNet/IP Install

1.2.2   Enable EtherNet/IP Protocol

Navigate to the **Setup>Security>Protocols** page to enable the EtherNet/IP Protocol. The Gateway needs to restart in order to apply the changes.

Select the **Enable** checkbox and press the **Submit** button to enable the EtherNet/IP Protocol in the Gateway as shown below. Restart the application to apply the changes.

Navigate to **Setup>Security>Protocols** page. Ensure that the EtherNet/IP Protocol checkbox is enabled as shown in the below screenshot and that there are no error messages on the Protocol Page. A browser reset/cache clear may be required for the option to fully display.

1.2.3   EtherNet/IP Web Pages
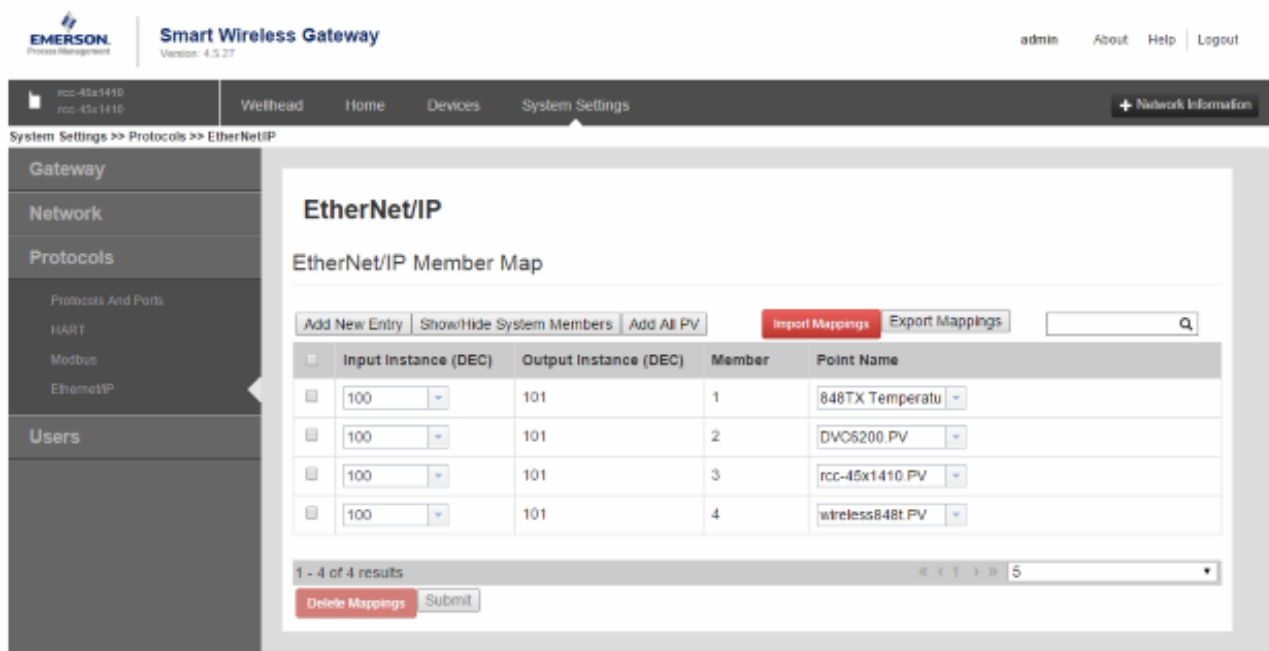
EtherNet/IP mapping page

Navigate to the **Setup**>**EtherNet/IP**>**EtherNet/IP Mapping** page to map various device variables in Instance Pairs (100-101 or 102-103 or 104-105).

> **Note**
> If no devices are configured with the Gateway or if all devices are offline, enable the *Include Gateways* option from the **HART**>**Hierarchy** page for initial EtherNet/IP communication with the Smart Wireless Gateway. In that case, the user can map *wihartgw.PV*, *wihartgw.QV*, etc. This web page is also useful while reading values from ControlLogix to understand in which pair and as which member user has mapped his particular device variable.

Below represents the EtherNet/IP mapping page of the Gateway. See for detailed explanations of the available options.

Figure 1-4. Setup>EtherNet/IP>EtherNet/IP Mapping

Table 1-1. Summary of Terms used for the EtherNet/IP Mapping Page

Terms	Description
Input Instance	EtherNet/IP Input Static Assembly Instance - 496 bytes.
Output Instance	EtherNet/IP Output Static Assembly Instance - 496 bytes.
Member	EtherNet/IP Instance Member in which data will get produced or consumed.
Point Name	Assigned data point in the format HARTtag.parameter.
New entry	Creates a new entry in this table.

Table 1-1. Summary of Terms used for the EtherNet/IP Mapping Page

Terms	Description
<<First	Navigates to the first page of this table.
<<Previous	Navigates to the previous page of this table.
Search	Finds the next occurrence of the characters entered into this field.
Next>>	Navigates to the next page of this table.
Last>>	Navigates to the last page of this table.
Delete Selected	Removes the selected entry from this table.
Select All	Selects all table entries.
Select None	De-selects all table entries.
Select Errors	Selects all table entries that have an error message.
Submit	Accepts all changes (highlighted in yellow).

EtherNet/IP communication page

This section contains basic information about EtherNet/IP Protocol and error value representation. See Table 1-2 on page 1-6 for details on each section.

Table 1-2. Setup>EtherNet/IP>EtherNet/IP Communication

Terms	Description
Assembly Object Type	EtherNet/IP use Static assembly object.
EtherNet/IP TCP Port	The TCP Port used to access EtherNet/IP TCP data directly from the Gateway.
EtherNet/IP UDP Ports	The UDP Ports used to access EtherNet/IP UDP data directly from the Gateway.
Incorporate value's associated status as error?	If the HART® variable status indicates a critical failure or if there is a loss of communications, it will be reported through the EtherNet/IP member.
Value reported for error (floating point)	Chooses what value is reported if the value's associated status indicates a critical failure. Only used if the Gateway is using float representation
NaN	Not a number is reported if the value's associated status indicates a critical failure.
+Inf	Positive infinity is reported if the value's associated status indicates a critical failure.
-Inf	Negative infinity is reported if the value's associated status indicates a critical failure.
Other	User defined value is reported if the value's associated status indicates a critical failure.
Value reported for error (native integer)	User defined value is reported if the value's associated status indicates a critical failure. Only used if the Gateway is using integer representation.

Import/export page

shows the *Import/Export Mapping* page. The Import/Export of mapped entries can be saved for later use or they can import settings that have already been created in the.CSV file format.

Table 1-3. Setup>EtherNet/IP> Import/Export

Terms	Description
CSV file	Comma delimited or comma separated file format.
Browse...	Opens a navigation window to locate a EtherNet/IP mapping backup file (CSV file) on the PC client.
Upload Configuration	Restores the select EtherNet/IP mapping backup file to the Gateway.
Download Configuration	Collects the Gateway EtherNet/IP mapping data and creates a backup file. This EtherNet/IP mapping backup file is saved on the PC client as a CSV file (*.csv).

EtherNet/IP stats page

The EtherNet/IP Stats Page shows the Communication/Connection Statistics. Navigate to **Diagnostics**>**Advanced**>**EtherNet/IP Stats** page.

Table 1-4. Diagnostics > Advanced > EtherNet/IP Stats

Terms	Description
Message Received	Total number of class 3 Received messages.
Message Sent	Total number of class 3 Sent messages.
UCMM Received	Total number of UCMM Received messages.
UCMM Sent	Total number of UCMM Sent messages.
UCMM Error Response	Total number of failed UCMM Read/Write Request.
I/O Packets Received	Total number of received class 1 packets.
I/O Packets Sent	Total number of sent class 1 packets.
I/O Packets Failed to Sent	Number of packets that have failed to send.
I/O Packets Received Error	Number of packets that have failed to be received.
Active connections	Total number of connections established with EtherNet/IP Adapter (Smart Wireless Gateway).
Current I/O Message Connections	Shows total number of active Class 1 connections.
Current CIP Message Connections	Shows total number of active Class 3 connections.
Reset Counts	Clicking this button will reset all EtherNet/IP Statistics counts to zero.

1.3   Connecting to the ControlLogix PLC

This section assumes knowledge of Allen-Bradley software. The IO Module is configured with a valid IP address on the same subnet as the Gateway and the PC.

A basic knowledge of the Emerson Smart Wireless Gateway is required. The Gateway will need to be configured with a valid IP address on the same subnet as the Allen-Bradley control system and the PC.

The Emerson 1420 device uses multiple Class 1 CIP connections within a Generic Profile. The latest version of RSLogix5000 is required for you to use this capability. This requires V19 and higher of RSLogix5000. V20 of RSLogix5000 includes features that automatically populate parameters such as for input/output instances for the Generic CIP Module making some of the steps in this manual unnecessary.

Note

■   The PLC processor has to be taken offline to be configured, then downloaded to accept the EtherNet/IP setup. This means the protocol can't be implemented when the process is running.

■   EtherNet/IP can only be implemented on ControlLogix processor firmware revision 17 and up.

■   EtherNet/IP will only work on the Ethernet 1 connection on the Gateway.

■   When mapping data, only use one input "instance" and one output "instance". An Allen-Bradley Ethernet card can only handle one instance per setup in the PLC.

■   EtherNet/IP can only be implemented on redundant ControlLogix processors starting with firmware revision 20 and above.

■   See "Other information" on page 36 for limitations with explicit messaging before proceeding.

Section 1.3.2, 1.3.4, 1.3.5 and 1.3.6 detail connecting to the ControlLogix PLC using four separate methods, Class 1 Connections: CIP BUS Module, UCMM Connection, Class 3 Connections and Generic Gateway Module respectively. The methods are defined below. Use only one of these methods to connect to the PLC.

Class 1 Connections (I/O): CIP BUS Module - Establishes a periodic exchange of data between a scanner and an adapter. Messages are sent as connected messages which utilize resources within each node that are dedicated in advance to a particular purpose. The messaging is implicit and is time-critical in nature. Implicit messaging (or I/O) is typically used for real-time data exchange when speed and low latency is important. They include very little information about their meaning so its transmission is more efficient, but less flexible than explicit.

UCMM Connection (explicit messaging - unconnected) - Commands or data requests sent from the scanner to individual target nodes (Class 3 messages). Unconnected messaging is used during connection establishment and for infrequent, low-priority messages. The Unconnected Message Manager, or UCMM, refers to the unconnected resources in a device. Explicit messaging connections in general are request-response transactions between two nodes typically used for non-real time data, normally for information. They include a description of their meaning so the transmission is very flexible but less efficient.

Class 3 Connection - Similar to UCMM connection Class 3 connection is used for individual request/response transactions. A request from a scanner always results in a response from the adapter indicating the success or failure of the request. Messaging is explicit and connected rather than unconnected.

Generic Gateway Module - Similar to CIP BUS Module the Generic Gateway Module is established to move application specific I/O data at regular intervals. The Generic Gateway Module however establishes class 1 connection to a single pair at a time whereas the Ethernet CIP BUS Method allows connection to multiple pairs.

For status and output capability, the use of the CIP Bus method is recommended. It should be noted that the CIP Bus method does require more memory than the generic Gateway method.

These are just examples of ways to bring in the data from the network. There are many possible configurations.

Note
For instructions on how to first establish a connection to the Gateway, see either the Quick Start Guide (document number 00825-0200-4420) or the Smart Wireless Gateway manual (document number 00809-0200-4420).

1.3.1 Importing Smart Wireless Gateway EDS file using EDS hardware installation tool

Note
Before doing connections with the controller, the user should import the EDS file of the Smart Wireless Gateway in RSLogix. Navigate to **Start>Programs>Rockwell Software>Version 2.56 >RSLinx>Tools>EDS Hardware Installation Tool**. The .eds file can be obtained by contacting Specialist-Wireless.EPM-RTC@EmersonProcess.com with *Allen-Bradley EDS file* in the subject line.

Equipment used

- Emerson 1420 Gateway with firmware 4.4 or higher and EtherNet/IP enabled (**Gateway Page>Setup>Security>Protocols**)

- 1 or more *Wireless*HART® devices connected to the Emerson 1420 Gateway

1. After Launching the EDS Hardware installation tool, select **Add**.

2. Make sure that *Register a single file* is selected by default. If not, select it.

3. Browse for the Smart Wireless Gateway EDS file and select **Next** until there is successful installation of Smart Wireless Gateway's EDS file. Select **Finish** after installation of the EDS file.

If your EDS installation wizard is successful, in *RSLinx Utility* you can see Smart Wireless Gateway as a recognized device with the name *Wireless Gateway - EtherNet/IP* and device logo.

1.3.2 Establishing a Class 1 connection (I/O): CIP BUS Module

1. Power **ON** the PLC.

2. Run the RSLogix application and create a new configuration. (Navigate to **File>New**)

3. Enter the appropriate controller information and Name. Select **OK**.

    a. Choose the controller model from the drop down list. (This is the specific controller model that you are using and may be different than the one used in the image below).
    b. Set the proper revision for the controller.
    c. Give the Project a name.
    d. Choose the chassis type used from the dropdown list.
    e. Select the slot that the controller occupies.

4. Choose where to save the project and select **OK**.

Note
When using Compactlogix you don't need to select a slot.

5. Add 1756-ENET/B to RSLogix I/O configuration

a. Right click on the **I/O Configuration** node in the *Controller Organizer* view and select **New/Add Module**.
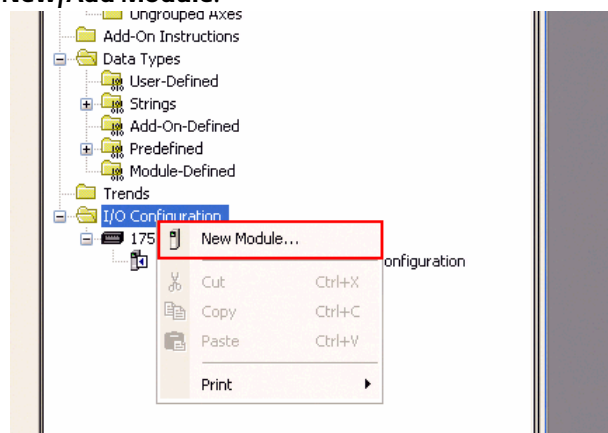
b. In the *Select Module Type* dialog select **1756-ENET/B entry**.
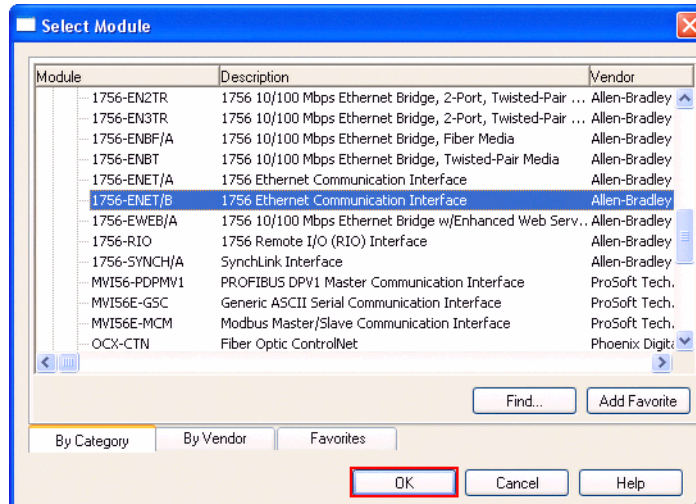
c. RSLogix will open the *Module Properties* dialog box. Enter the IP address of the 1756-ENET/B bridge and select **OK**. This is user determined. In this example, the PLC address was *192.168.1.21*.

   You may download the configuration to make sure the operation was successful.
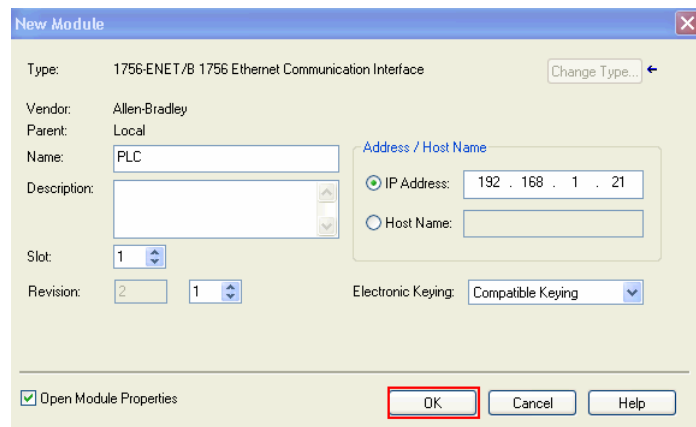
Add the Gateway as a module in RSLogix

2.   Right click on the **Ethernet** section, under the *1756-ENET/B EnetBridge* node, under *I/O Configuration*, in the *Controller Organizer* view and select **New Module**.
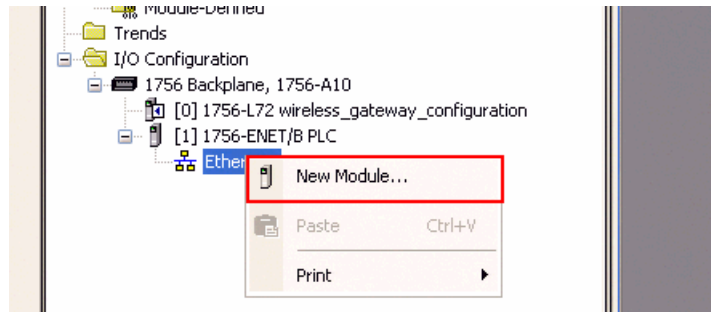
3.   Under *Communication,* choose **Generic EtherNet/IP CIP Bridge**.
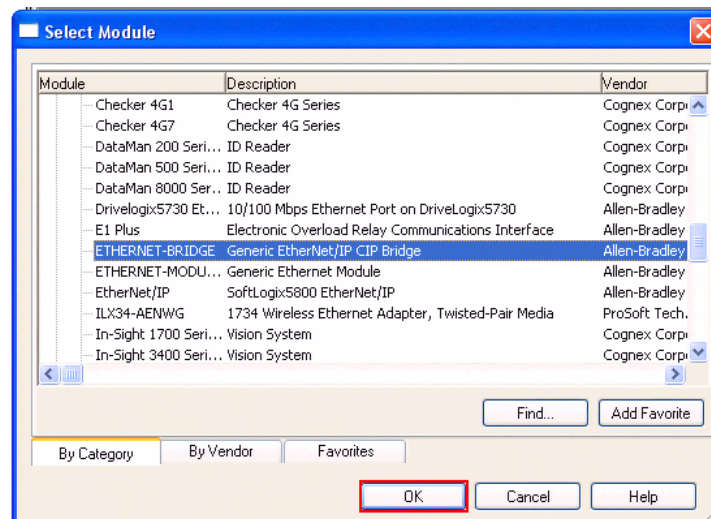
4.   Enter the Name and IP Address of the Emerson Smart Wireless Gateway and select **OK**.
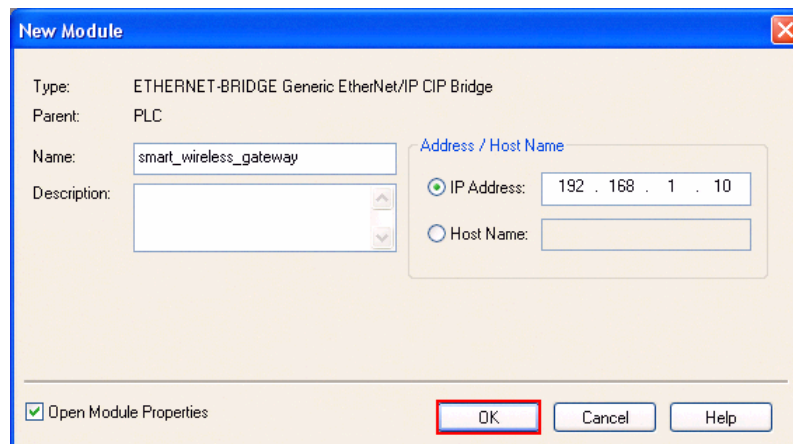
5.　　　　Right click on the **CIP Bus** tab and select **New Module**.

6.　　　　Choose **Generic CIP** module and select **OK**.
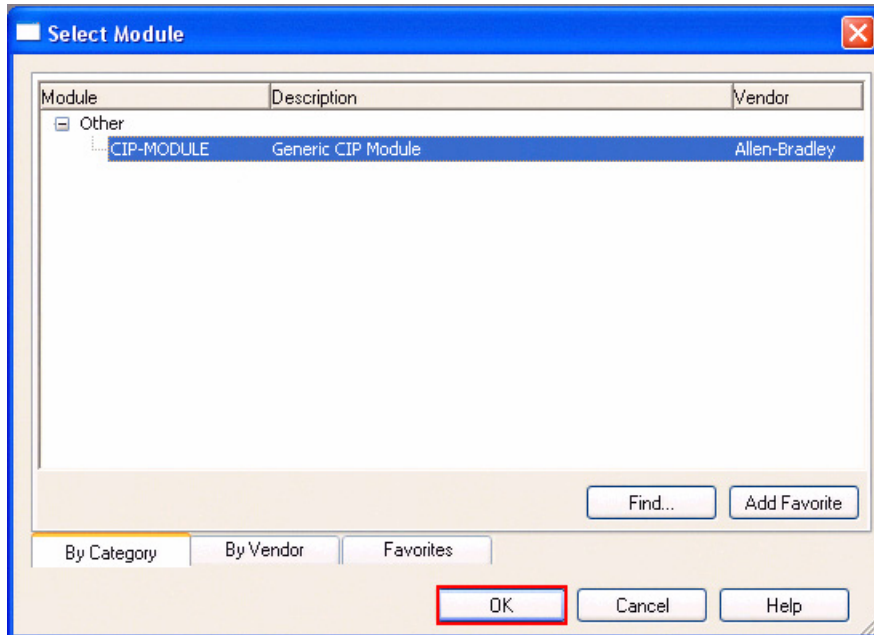
7.　　　　Select **OK**. This will open the *Module Properties* dialog.

8.　　　　Enter the appropriate name (**Instance_Pair1**) and Connection parameters. Choose the appropriate data type from the dropdown list. Depending on the chosen data type, choose the data size in bytes.

Note
Total Data size should be *496 bytes* for each instance. Enter the Input Connection Point (Output Instance no. of Device), Output Connection Point (Input Instance no. of Device), and Configuration Connection Object Instance as **1**. For more information on total data size, see Table 1-5 below or "Other information" on page 36.

Table 1-5. Total Data Size Table

Comm. format - data type	Input instance size (bytes)	Output instance size (bytes)
DINT	124	124
INT	248	248
SINT	496	496
REAL	124	124
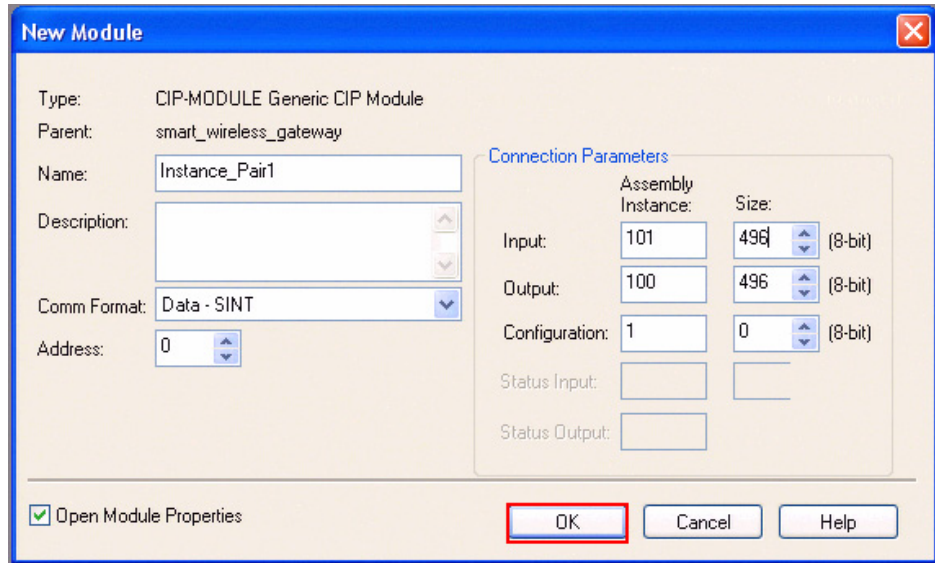
9.   Select **OK** to add the example to the I/O Configuration.

Note
Repeat steps 4 to 9 to establish connection to Instance Pair2 (Input=103 - Output=102) and Instance Pair3 (Input=105 - Output=104).

10.   A new *ETHERNET-MODULE* branch of *1756-ENET/B EnetBridge* node will appear in the *I/O Configuration* view.

11.   New entries will also appear in the *Controller Tags* view: *Smart_Wireless_Gateway:0: I* to view the input data,
Smart_Wireless_Gateway:0: O to modify the output data and
Smart_Wireless_Gateway:0: C to view the configuration data.
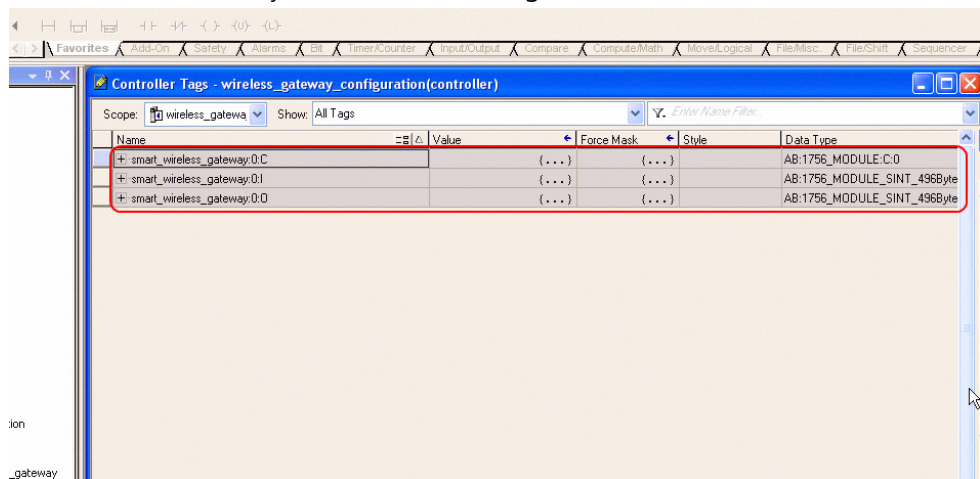
Save the configuration

1.   Use *Communications/Download* to download the new I/O configuration to the controller.

2.   If you haven't download the PLC before, you'll have to select the appropriate driver. Navigate to **Communication>Who Active.** Browse through the appropriate driver and download the project in the controller as shown.
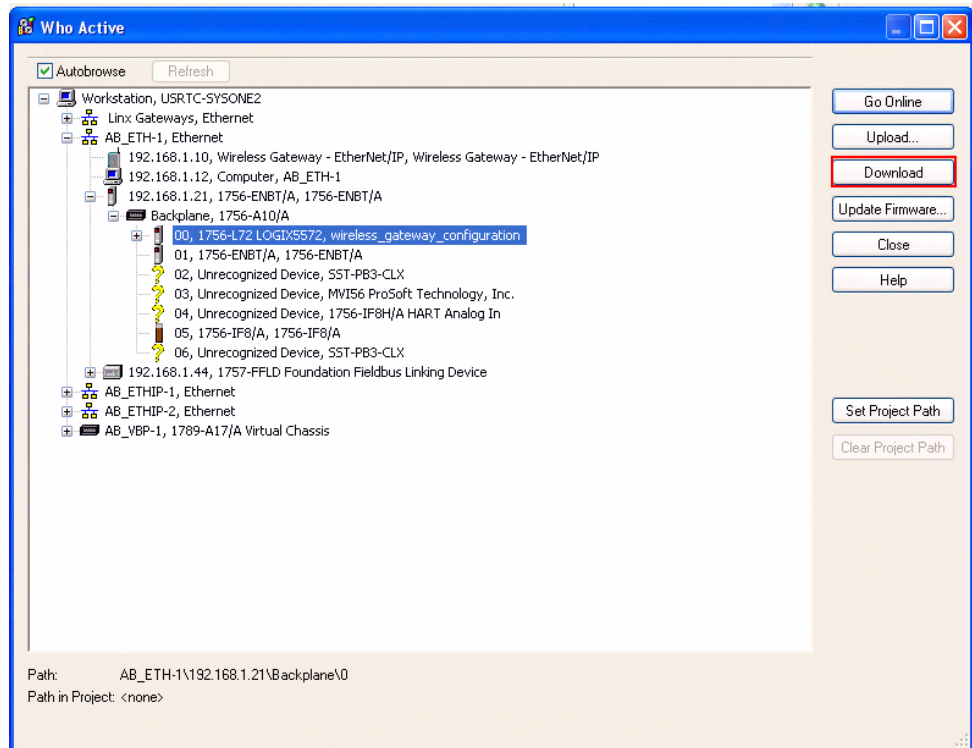
3.   Once the download is complete, the controller will automatically establish a new Class1 connection with the device through EtherNet/IP. It will use the configuration parameters entered in the *Module Properties* dialog.

1.3.3 Viewing class1 data on ControlLogix

Note
Class1 connections should be used with experienced users that understand how to implement messaging. Consult the Controllogix manual.

1.   Switch *RSLogix* to the *Remote Run* mode.
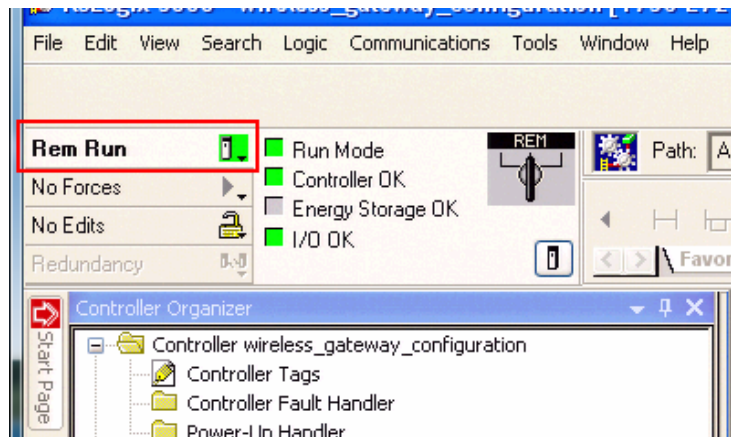
2.   Open **Instance_Pair1: I** and **Instance_Pair1: O** nodes by clicking on the plus sign in front of the nodes.
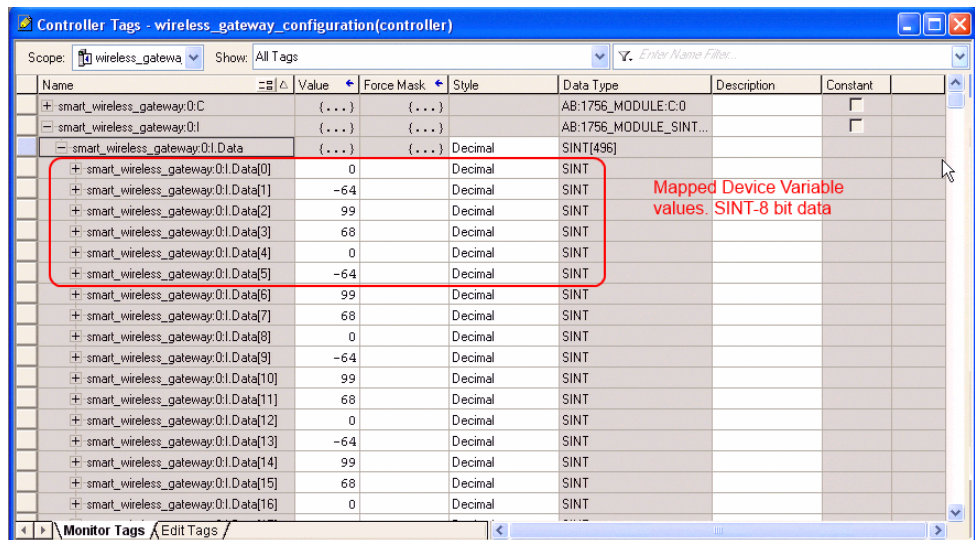
3.   Values should appear as per selected data type during Configuration.

1.3.4 UCMM connection (explicit messaging - unconnected)

1. Start RSLogix, Verify that PLC is **ON**.

2. Navigate to **File>New**.
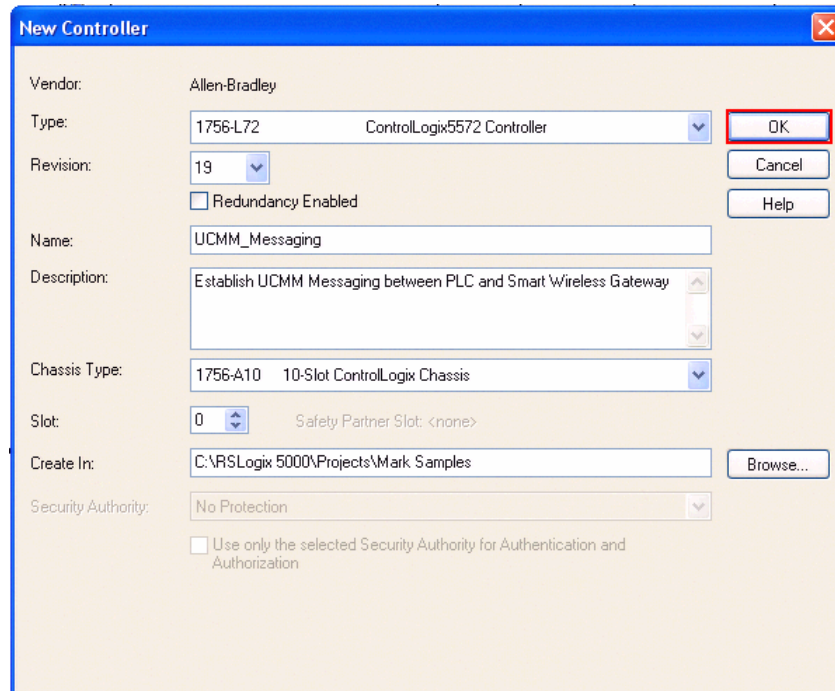
3. Enter the appropriate Controller information and Name. Select **OK**.

4. Right click on **I/O Configuration** and select **New Module**.
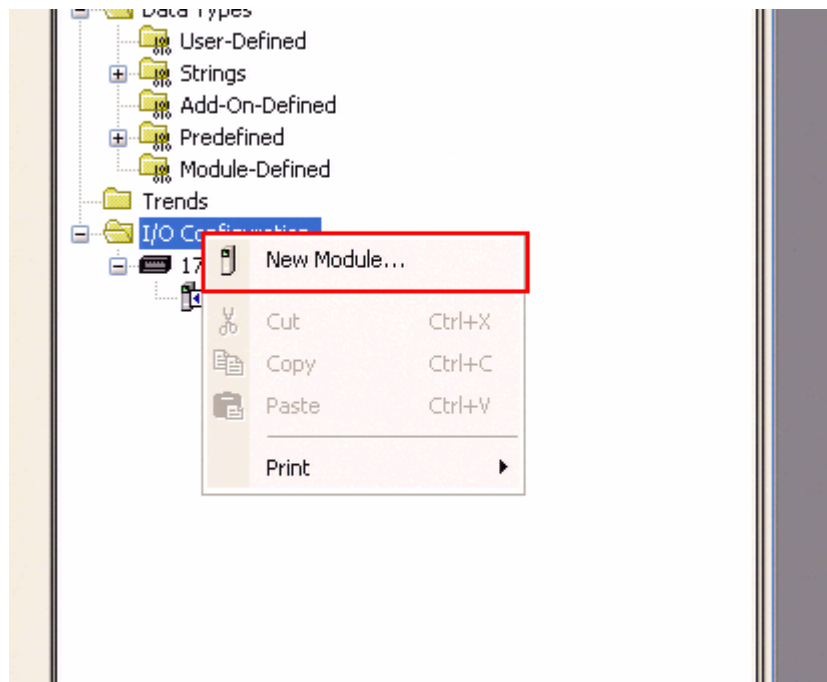
5.   Navigate to **Communications>1756 ENET/B 1756 Ethernet communication interface** as shown and select **OK**.
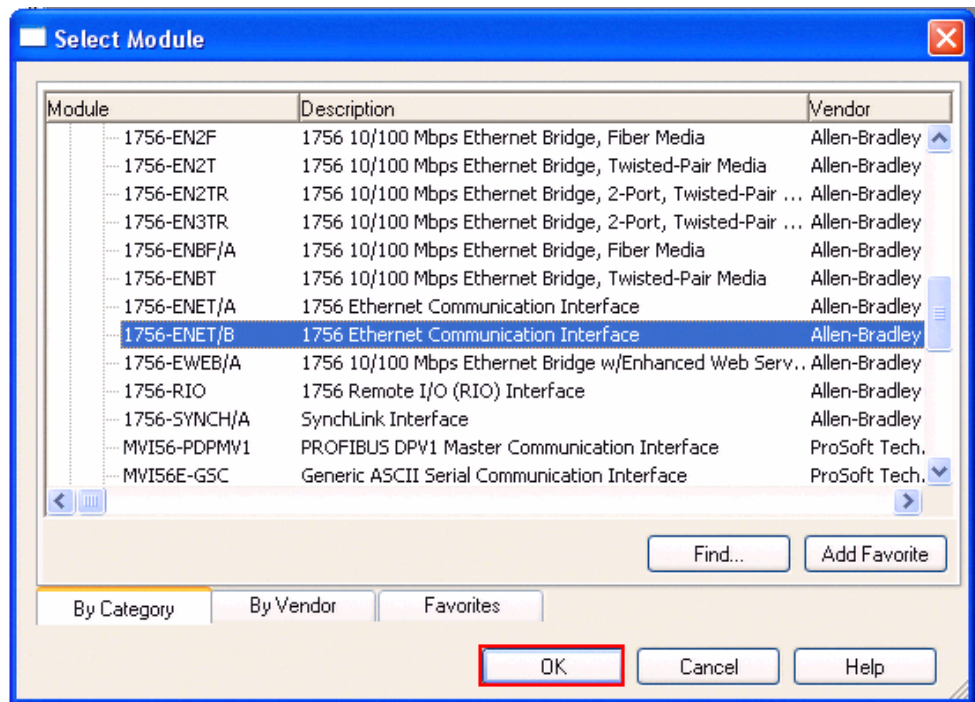
6.   Enter Name and Description if the user wants and the IP address of the PLC. Keep the other fields as is.
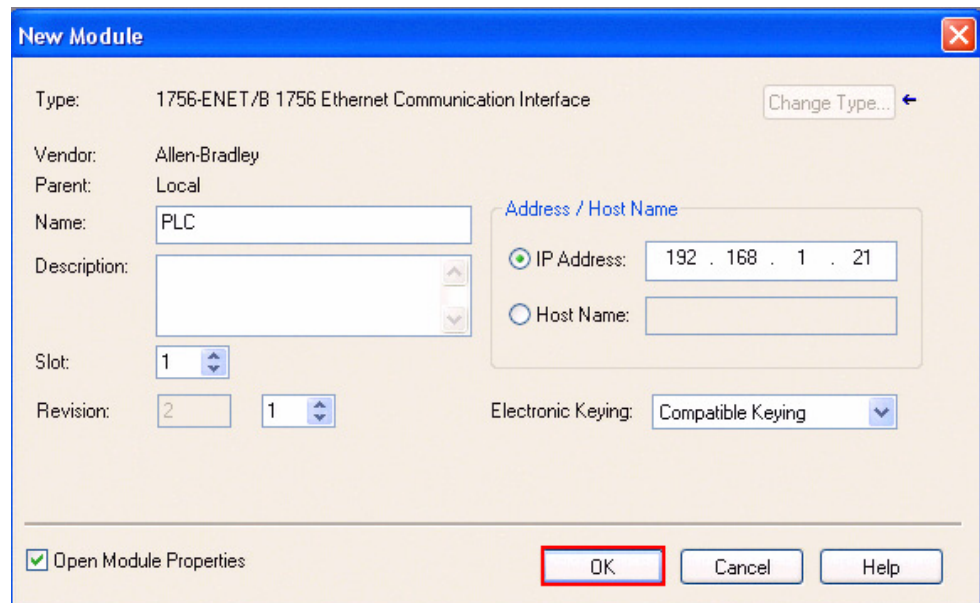
7. Select **OK** and finish the configuration of the PLC, make sure that the new *Ethernet* tab is appearing as shown. **Save** the Configuration.
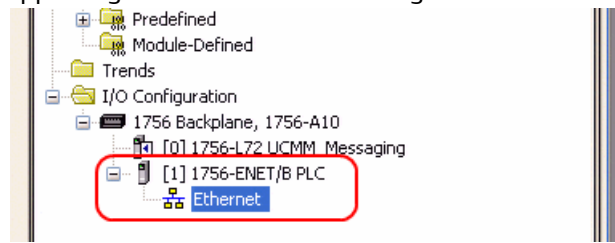
8. In the *Controller Organizer* menu, right click on **Controller Tags** and click on **New Tag…**
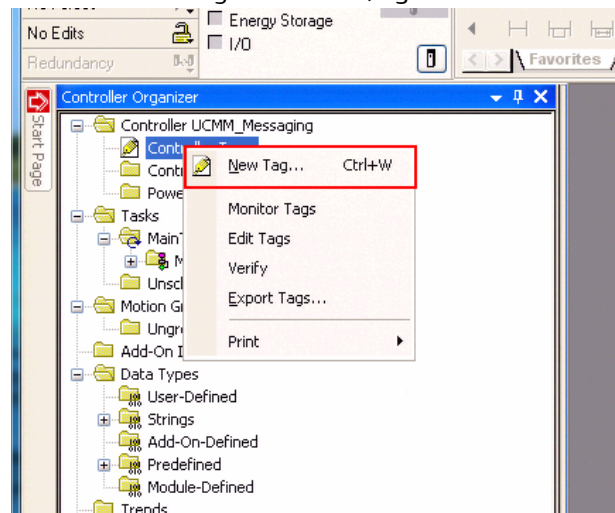
9. In the *New Tag* window give the appropriate name and description for explicit (UCMM) message.

10. Select **Type>Base, Data Type>MESSAGE**, *External Access* as **Read** or **Read/Write** depending on the requirement.

11. Select **OK**.
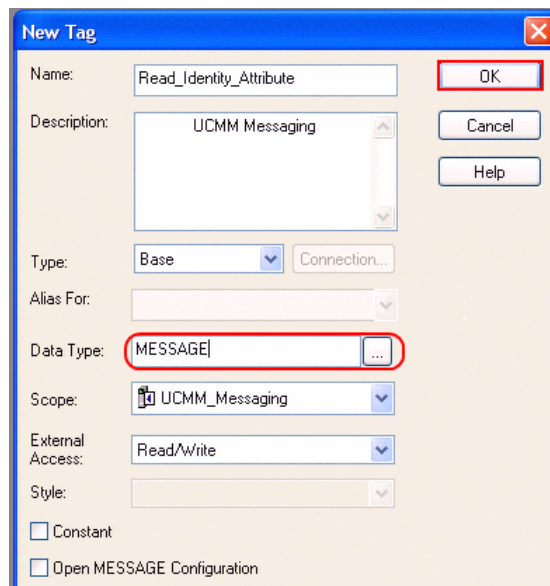
12.   Again in the *Controller Organizer* menu, right click on **Controller Tags** and select **New Tag**.

13.   In the *New Tag* window, give the appropriate name and description for message data type.

14.   Select **Type>Base, Data Type>Data Type of Parameter** to **Read/Write**, *External Access* as **Read** or **Read/Write** depending on requirement.

15.   Choose *Style* as per data type.

16.   Select **OK**.
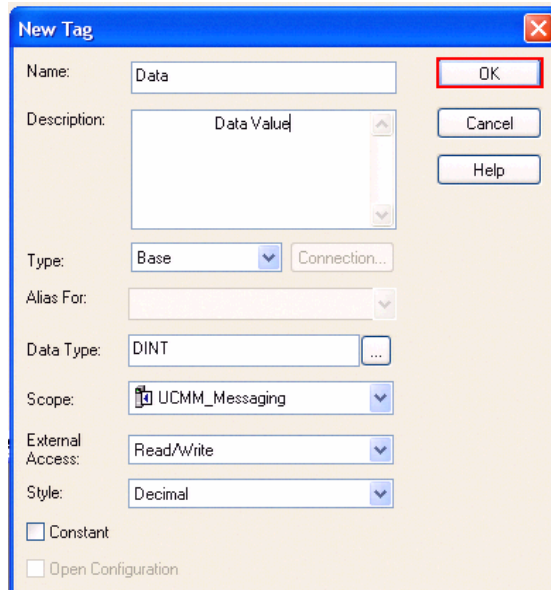
17.   **Save** the made configuration. Make sure that you are able to see the above configured tag in *Controller Tags* as shown.
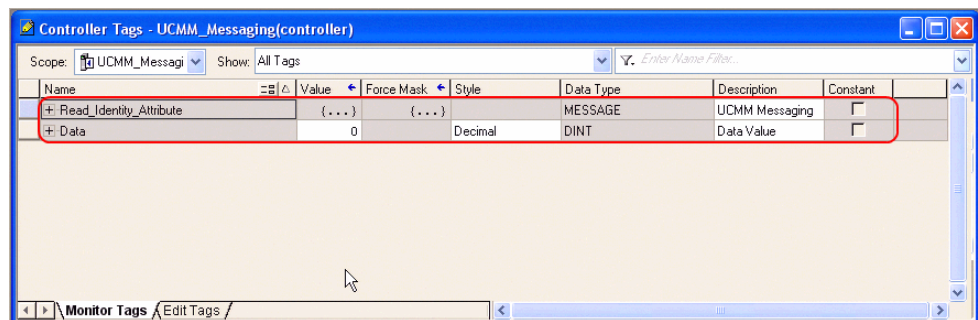
18.   Right click on **Tag** which is created in step 8(MESSAGE) and select **Configure Tag**.
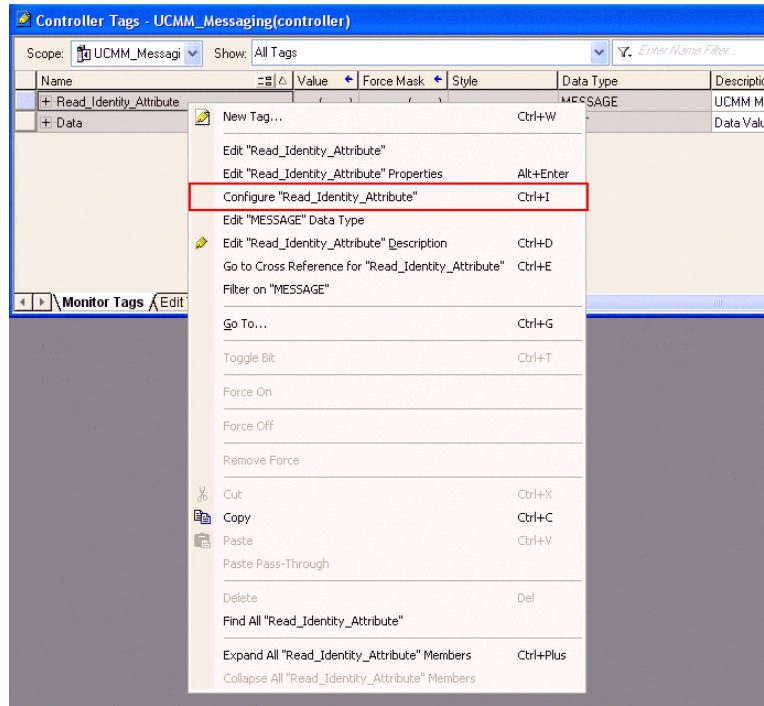
19.   In the *Message Configuration* table, choose *Message Type* as **CIP generic**.

20.   Set *Service Type* as **Get Attribute Single** or **Set Attribute Single** depending on read/write.

21.   Enter the values of the *Class*, *Instance*, and *Attribute* you want to read write.

22.   Choose the configured tag in step 12 (Message data) as a destination and click on **Apply**.
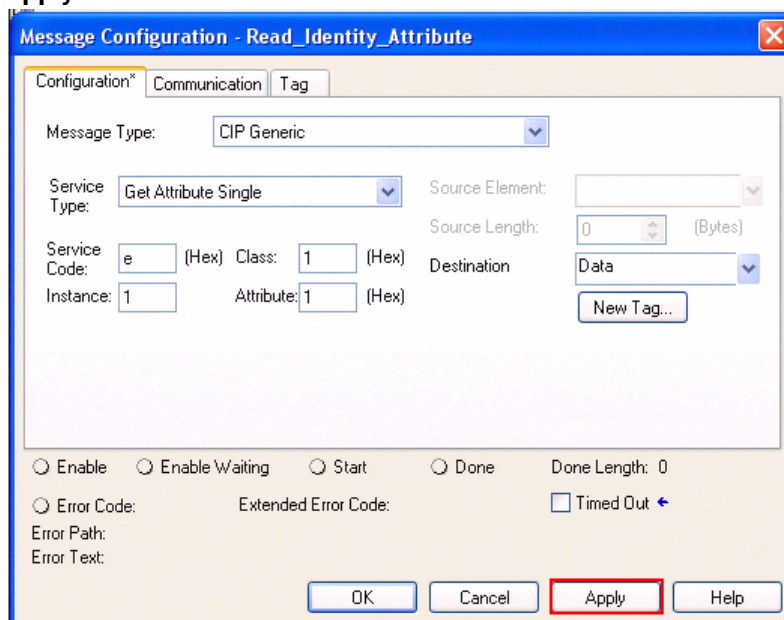
23.   Navigate to **Communication** in the same table and browse for the DUT path. Choose the path. <PLC><SLOT NUMBER><SMART WIRELESS Gateway IP ADDRESS>
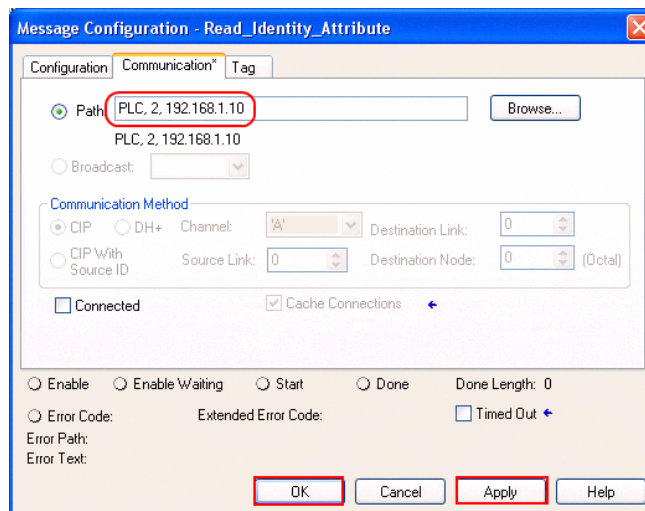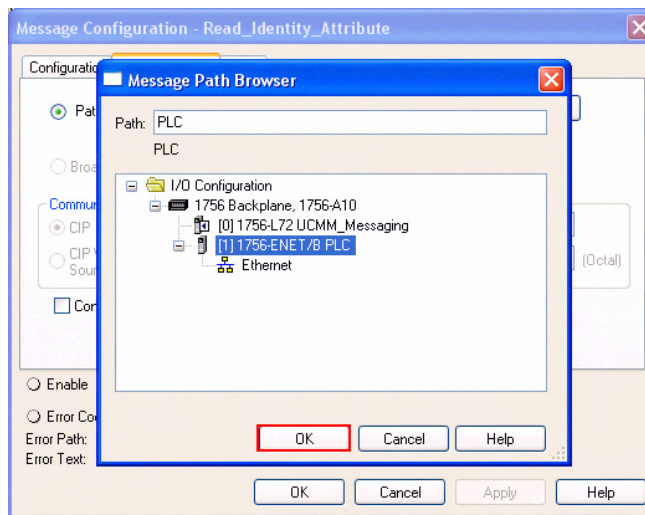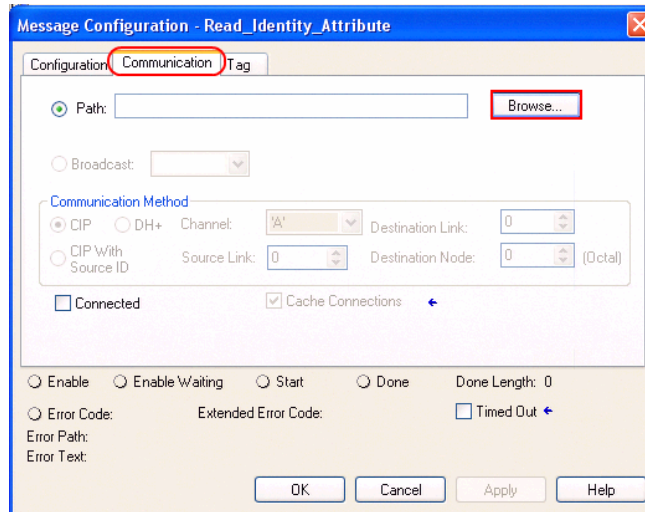
24.   Select **Apply** and **Save** the configuration.

25.   Select **Main Routine** in the tree structure.
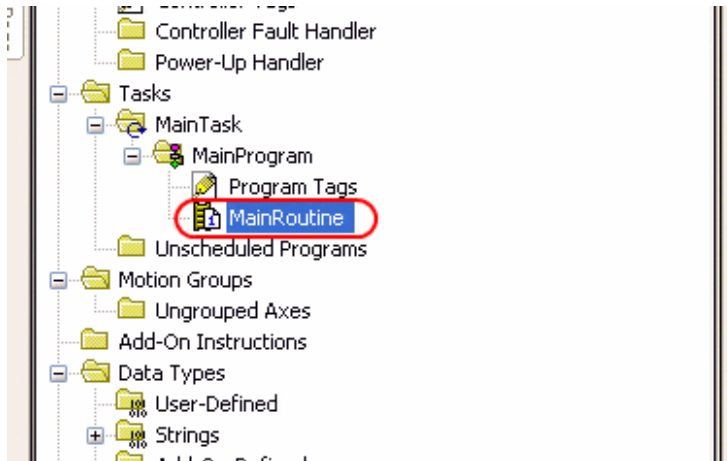
26.   Add the **Message Block** from *Input*/*output* to *rung*.
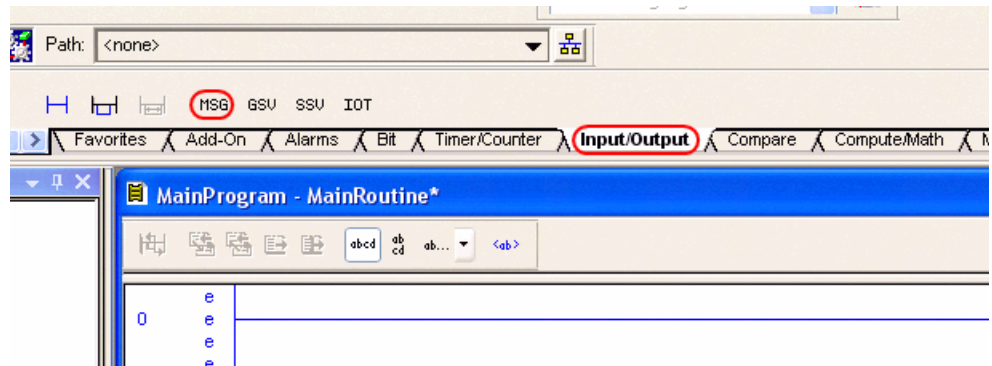
27.   Configure this message block as Message tag (tag which is configured in step 3).
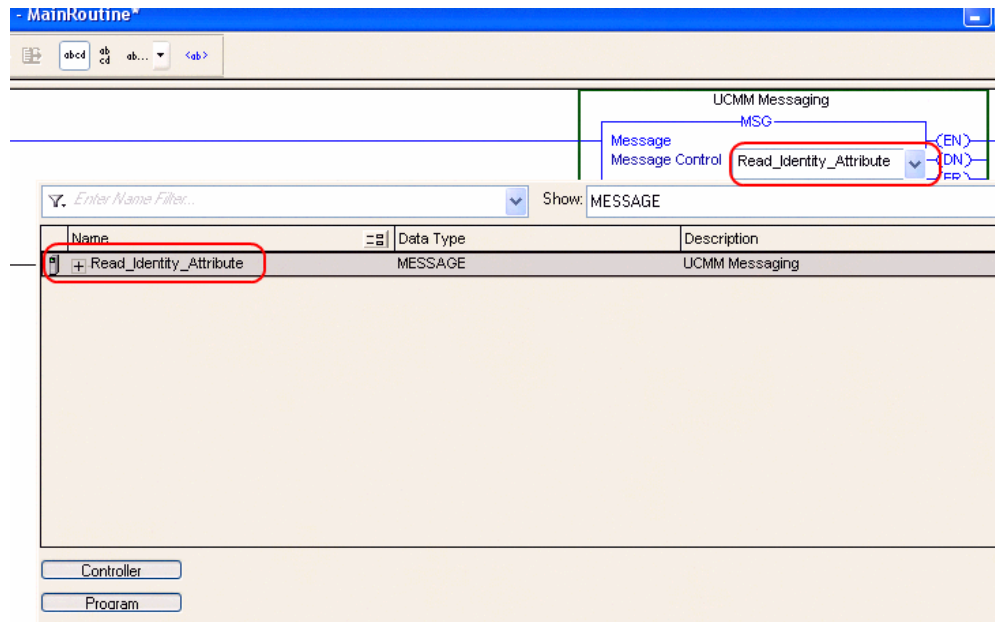
You can check the configured Message and data by selecting **View Configuration Dialogue box** as shown.
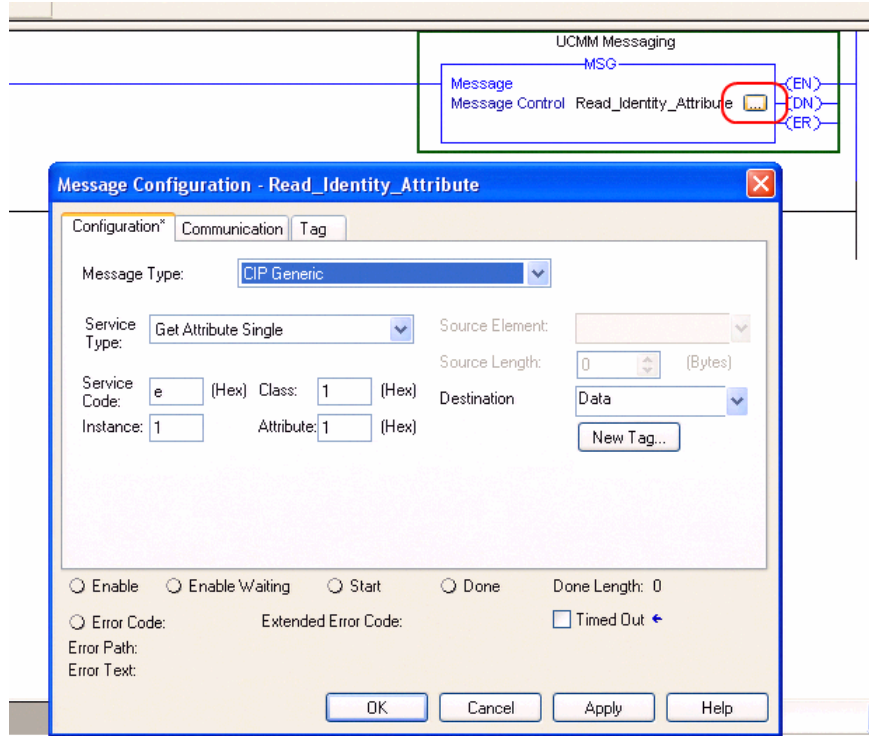
28.   **Save** and **Download** the configuration in *Controller*.
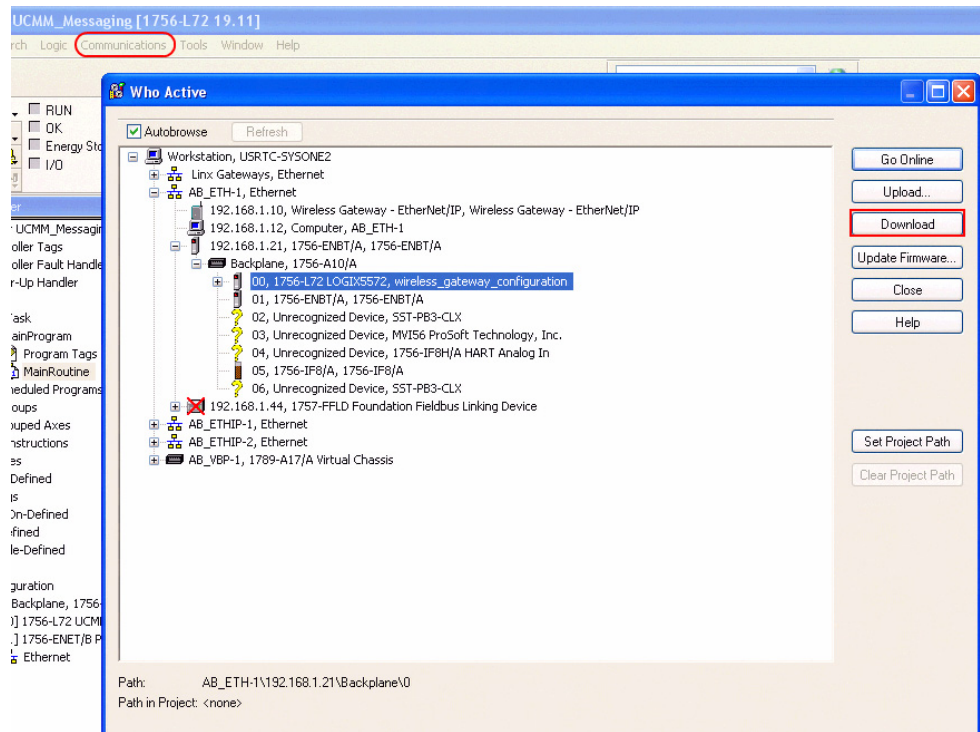
29.   To view the data go to **Run mode** and navigate to **Controller Tags**.
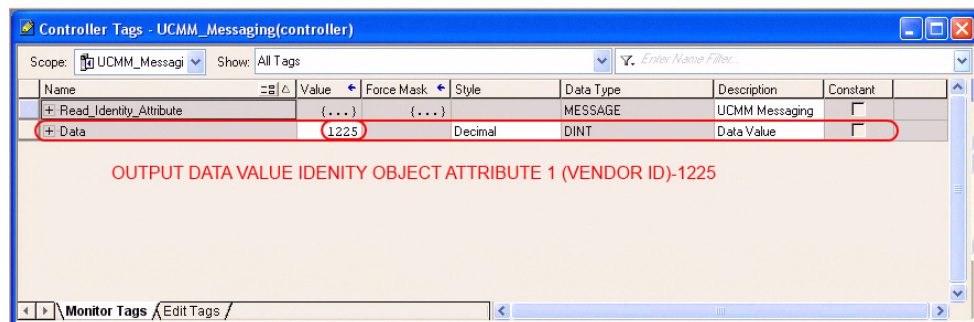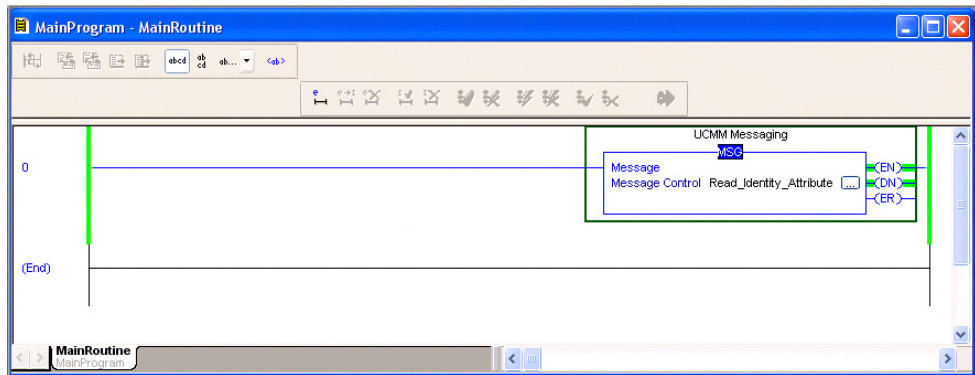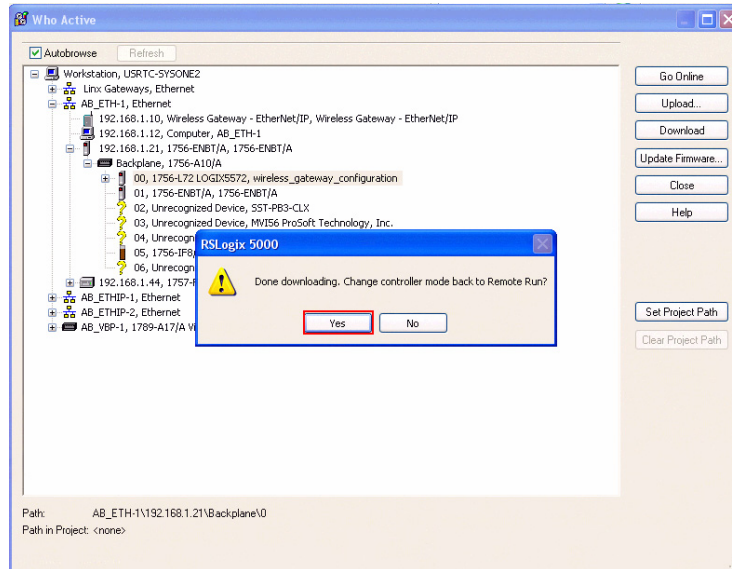
1.3.5   Class 3 connection (explicit messaging - connected)

1.   Repeat all steps of UCMM Connection.

Note
In the *Message Configuration* block, under *Communication*, make sure **Connected block** is selected.
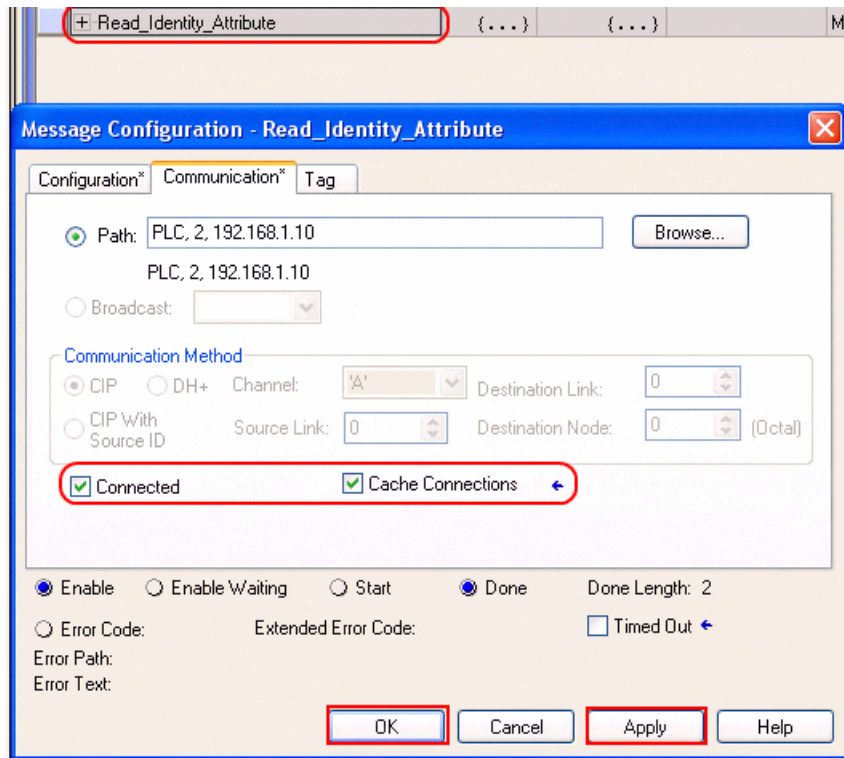
2.   **Apply** and **Save** the configuration settings.

3.   To view the data, go to **Run mode** and navigate to **Controller Tags**.

1.3.6 Utilizing the Generic Gateway Module

Note
Revision 17 and above is required for EtherNet/IP.
When using Compactlogix, you do not need to select a slot.

1.   Power **ON** the PLC.

2.   Run the RSLogix application and create a new configuration. Navigate to **File>New**.

3.   Enter the appropriate Controller information and Name. Select **OK**.

    a. Choose the controller model from the drop down list.

    b. Set the proper revision for the controller.

    c. Give the project a name.

    d. Choose the chassis type used from the dropdown list.

    e. Select the slot the controller occupies.

4.   Choose where to save the project and select **OK**.

Add 1756-ENet/b to RSLogix I/O configuration

1. Right click on the *I/O Configuration* node in the Controller Organizer view and select **New/Add Module**.

2. In the *Select Module Type* dialog choose **1756-ENET/B** entry.
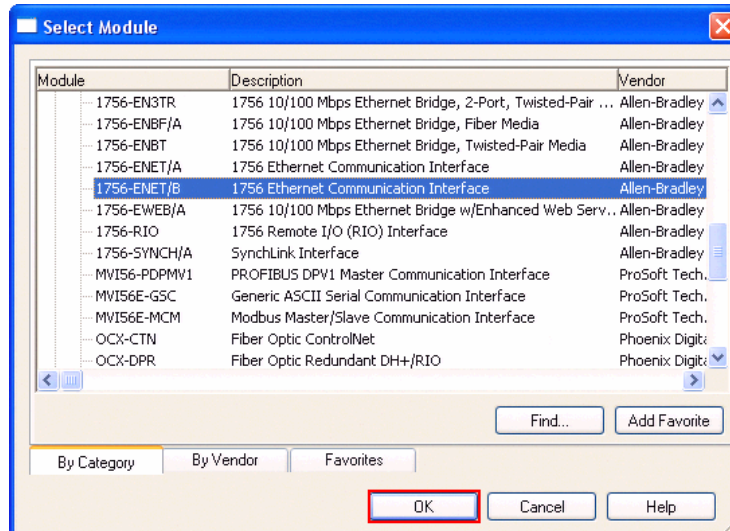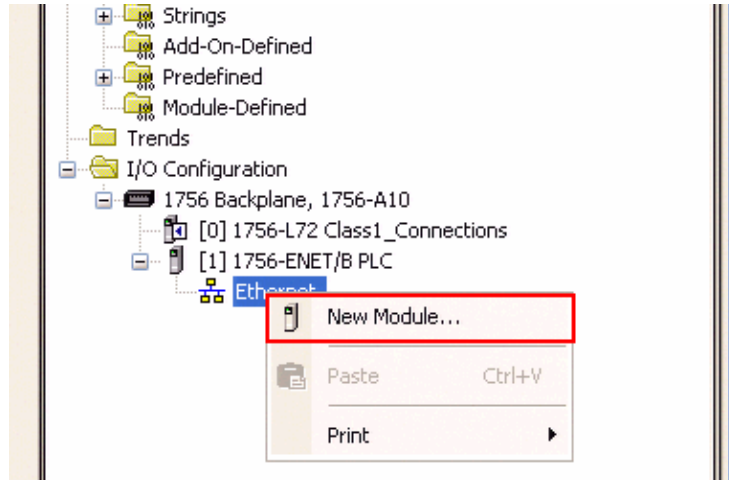

3. RSLogix will open the *Module Properties* dialog box. Enter the IP address of the 1756-ENET/B bridge and select **OK** to add the Interface to your I/O configuration.
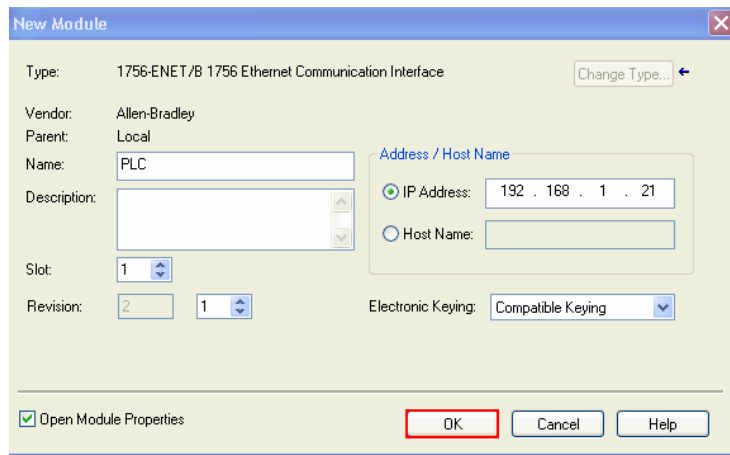

You may download the configuration to make sure the operation was successful.

Add Gateway as a module in RSLogix

1.   Ensure that EtherNet/IP protocol is enabled in Wireless Gateway.

2.   Right click on the *Ethernet* section, under the *1756-ENET/B EnetBridge* node, under *I/O Configuration*, in the Controller Organizer view and select **New Module**.

3.   In the *Select Module Type* dialog choose **Generic Ethernet Module**.
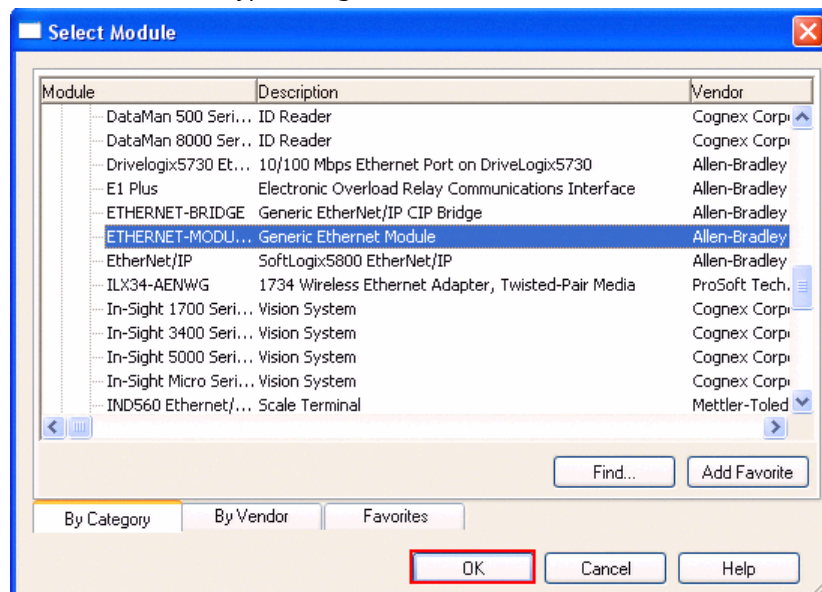
4.   Click **OK**. This will open the *Module Properties* dialog.

5.   Enter an IP address of the Smart Wireless Gateway in which EtherNet/IP application is running.

6.   Enter appropriate name (here Instance_Pair1) and connection parameters.
       Select the appropriate data type from the dropdown list.
       Depending on the selected data type choose the data size in bytes.

Note
Total Data size should be 496 bytes for each instance. Enter the Input Connection Point (Output Instance no. of Device), Output Connection Point (Input Instance no. of Device), and Configuration Connection Object Instance as 1. For more information, see "Other information" on page 36.

Comm. format - data type	Input instance size (bytes)	Output instance Size (bytes)
DINT	124	124
INT	248	248
SINT	496	496
REAL	124	124
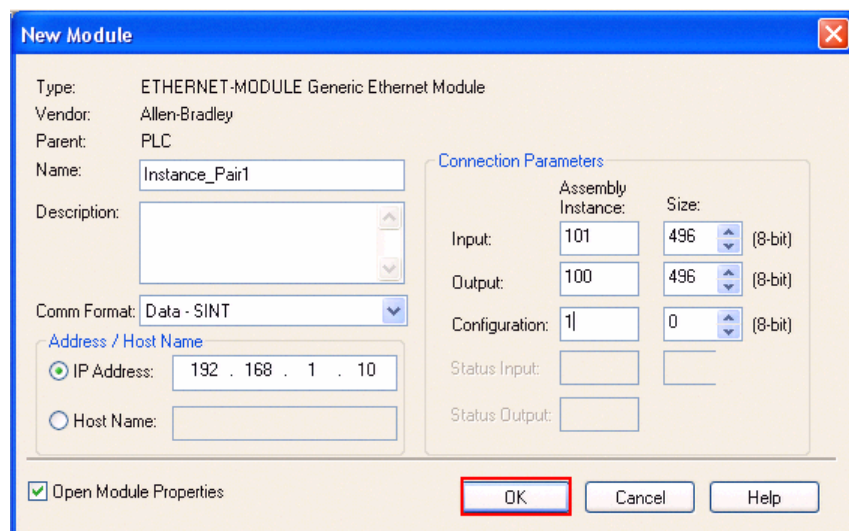
7.   Select **OK** to add the example to the I/O Configuration.

8.   You should see a new *ETHERNET-MODULE Instance_Pair1* branch of the *1756-ENET/B EnetBridge* node in the *I/O Configuration* view. You should also see 3 new entries in the Controller Tags view: *Instance_Pair1:I* to view the input data, *Instance_Pair1:O* to modify the output data and *Instance_Pair1:C* to view the configuration data:

9.   **Save** and **Download** the configurations to the controller:

    Use Communications/Download to download the new I/O configuration to the controller. Once the download is complete, the controller will automatically establish a new Class1 connection with the configured Instance Pair. It will use the configuration parameters entered in the Module Properties dialog.

Note
In Generic Ethernet Module method, you can establish class 1 connection with single pair at a time. For establishing Class 1 Connection to multiple pairs use Ethernet bridge CIP Bus method.

1.4　Write functionality using RSLogix 5000

Note
This manual describes write functionality for the CIP Bus Method.

1. Navigate to **Setup>EtherNet/IP>EtherNet/IP Mapping**.

2. Map the Rosemount 702 writable points in the *EtherNet/IP mapping* page.

Figure 1-5. EtherNet/IP Member Map

Note
In this example the Rosemount 702 Discrete Wireless Transmitter has both channels set to output and the variables set to on/off (to be either 1 or 0)

3. Observe the mapped variable values in the webpage as shown in the *Explorer* page or in the *Device Published* data page.

Figure 1-6. Explorer

Figure 1-7. Explorer >Choose Hart Tag of Device>Published Data

CHANNEL_1_COUNTS_CODE	4	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_1_COUNTS_HEALTHY	true	●	07/01/13 10:59:26	Boolean
CHANNEL_1_COUNTS_STATUS	192	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_1_COUNTS_UNITS	251	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_1_SETPOINT_D	0	●	07/01/13 10:59:26	16 bit int
CHANNEL_1_SETPOINT_D_HEALTHY	true	●	07/01/13 10:59:26	Boolean
CHANNEL_1_SETPOINT_D_STATUS	192	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_1_STATE	0.000	●	07/01/13 10:59:26	32 bit float
CHANNEL_1_STATE_CLASS	0	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_1_STATE_CODE	2	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_1_STATE_D	0	●	07/01/13 10:59:26	16 bit int
CHANNEL_1_STATE_D_HEALTHY	true	●	07/01/13 10:59:26	Boolean
CHANNEL_1_STATE_D_STATUS	192	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_1_STATE_HEALTHY	true	●	07/01/13 10:59:26	Boolean
CHANNEL_1_STATE_STATUS	192	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_1_STATE_UNITS	251	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_2_COUNTS	0.000	●	07/01/13 10:59:26	32 bit float
CHANNEL_2_COUNTS_CLASS	0	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_2_COUNTS_CODE	5	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_2_COUNTS_HEALTHY	true	●	07/01/13 10:59:26	Boolean
CHANNEL_2_COUNTS_STATUS	192	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_2_COUNTS_UNITS	251	●	07/01/13 10:59:26	8 bit unsigned int
CHANNEL_2_SETPOINT_D	0	●	07/01/13 10:59:26	16 bit int
CHANNEL_2_SETPOINT_D_HEALTHY	true	●	07/01/13 10:59:26	Boolean

4. Establish a Class 1 Connection with the Smart Wireless Gateway using RSLogix 5000 if not already established.

   a. Repeat steps 1 to 5 of Class1 Connection (I/O).

   b. If a connection is established successfully, navigate to **Controller Tags>Input section (I)** as shown in the below screenshot. It will show the present value of mapped Rosemount 702 parameters.
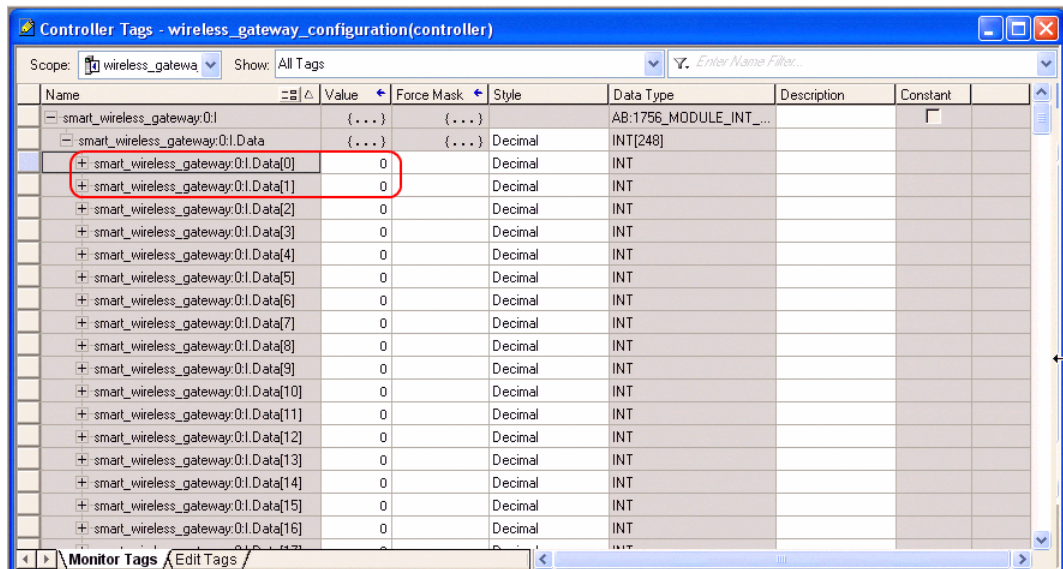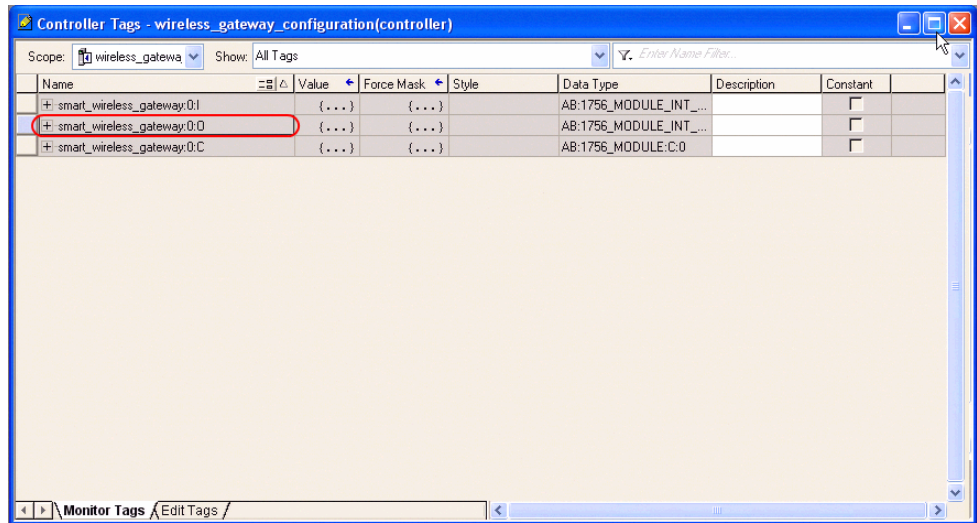
Note
In this example the CHANNEL_1_SETPOINT_D and CHANNEL_2_SETPOINT_D are 16 bit integers. This will require a Generic CIP module of the INT data type. If the module is not of the INT data type a new module must be created for this to be changed.
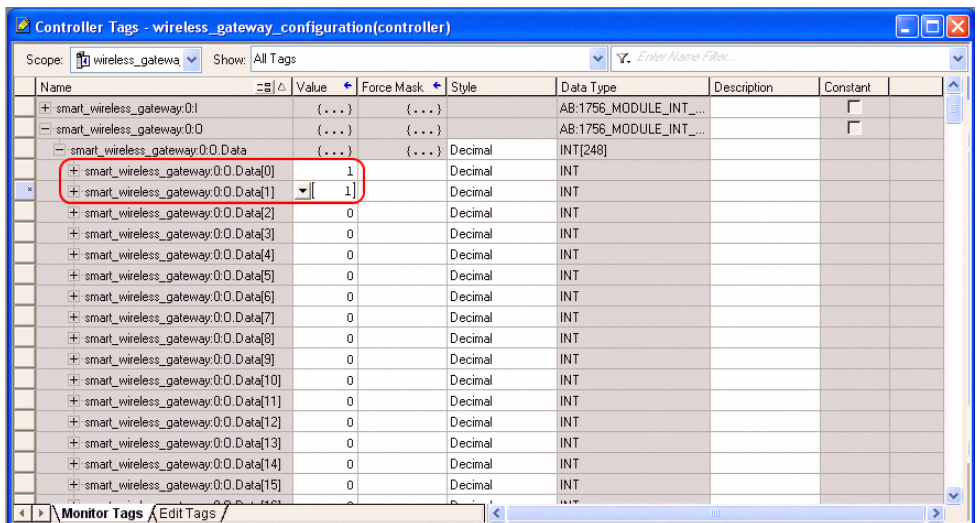
5.   Navigate to the **Output** section.

6.   Write the appropriate value in the *output* tabs as shown. (In this case 1 is written to both mapped parameters.)

Note
Data is written properly only in online mode.

7. Navigate to the *Input* tab again and observe the changed value as shown.

8.   Verify the same in the webpage.

CHANNEL_1_COUNTS_HEALTHY	true	●	07/01/13 13:32:47	Boolean
CHANNEL_1_COUNTS_STATUS	192	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_1_COUNTS_UNITS	251	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_1_SETPOINT_D	1	●	07/01/13 13:32:43	16 bit int
CHANNEL_1_SETPOINT_D_HEALTHY	true	●	07/01/13 13:32:43	Boolean
CHANNEL_1_SETPOINT_D_STATUS	192	●	07/01/13 13:32:43	8 bit unsigned int
CHANNEL_1_STATE	1.000	●	07/01/13 13:32:47	32 bit float
CHANNEL_1_STATE_CLASS	0	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_1_STATE_CODE	2	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_1_STATE_D	1	●	07/01/13 13:32:43	16 bit int
CHANNEL_1_STATE_D_HEALTHY	true	●	07/01/13 13:32:43	Boolean
CHANNEL_1_STATE_D_STATUS	192	●	07/01/13 13:32:43	8 bit unsigned int
CHANNEL_1_STATE_HEALTHY	true	●	07/01/13 13:32:47	Boolean
CHANNEL_1_STATE_STATUS	192	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_1_STATE_UNITS	251	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_2_COUNTS	2.000	●	07/01/13 13:32:47	32 bit float
CHANNEL_2_COUNTS_CLASS	0	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_2_COUNTS_CODE	5	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_2_COUNTS_HEALTHY	true	●	07/01/13 13:32:47	Boolean
CHANNEL_2_COUNTS_STATUS	192	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_2_COUNTS_UNITS	251	●	07/01/13 13:32:47	8 bit unsigned int
CHANNEL_2_SETPOINT_D	1	●	07/01/13 13:32:43	16 bit int
CHANNEL_2_SETPOINT_D_HEALTHY	true	●	07/01/13 13:32:43	Boolean
CHANNEL_2_SETPOINT_D_STATUS	192	●	07/01/13 13:32:43	8 bit unsigned int

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Process Management

Smart Wireless Gateway

Explorer   admin

192.168.1.10
Diagnostics
Explorer
Setup
Help

HART Tag	HART status	Last update	PV	SV	TV	QV	Burst rate
702 DEMO Input/Output	●	07/01/13 13:33:47	1.000 ●	1.000 ●	24.250 DegC ●	8.885 V ●	4
Rockwell-Gateway	●	07/01/13 13:33:37	4.000 ●	3.000 ●	34.000 DegC ●	34.750 DegC ●	

1.5 Troubleshooting

Problem	Suggested solution
Unable to see the Gateway on rslinx as described, although the EDS file was successfully installed.	We consider that the machine on which rslinx is installed is in the same subnet as the Gateway. We can explicitly add the Gateway IP address by choosing the *AB_ETH-1* driver. See attached screenshots. Also screenshots for EDS file Installation (Allen-Bradley Integration Document are in the user manual already.
Unable to find where to allocate the 'reliability' float and the tools for 'online,' 'PV_healthy,' etc. How do I poll them? Is it a different class instance? (The manual only shows dint/int/real/sint).	Float = real, Booleans also can be mapped. You can map any variable which you can see on *Explorer>Device Name>Published data* web page and read in RsLogix with the datatype mentioned on web page.
Are the definitions for SYSTEM_DIAG.ADDITIONAL_STATUS shown anywhere for the predefined registers?	Navigate to *Explorer>Device name(e.g.wihartgw)>See Additional status* tab.Let us know if you are looking for anything else by means of definition.
Do Predefined Registers hold last state if the instrument goes offline like the data does?	It will not hold the last state like other data, It will change according to the particular parameter status i.e good or bad. (Whatever Additional status is seen in the webpage, the same will appear in the RSLogix).

1.6 Other information

1. Only 124 members are allowed for mapping per pair.

   In EtherNet/IP, Each Instance Pair can hold the data up to 496 bytes, but the user can only map a maximum of 124 members per instance pair. (Whatever may be the data type of mapped variables, for e.g. If user wants to map all Boolean variables in particular instance, maximum 124 Boolean variables they can map in the selected instance pair.) Some of the hosts support maximum 1500 bytes of data. Hence presently for device variable mapping chosen 3 instance pairs of size 496 bytes each.

2. 32-bit error value, for the Point Name which does not exist or the Point Name which is having bad status while first time mapping.

   While mapping of a particular variable for the first time, if mapped variable status is bad/offline, EtherNet/IP will treat that variable as 32 bit (Undefined Data). So as shown in communication page, it will show the error as 32 bit value. (Whatever may be the actual data type of mapped variable).

3. The user can map variables/Point Names of mix data types in any instance pair. (100-101, 102-103, 104-105) In this case it's user's responsibility to find a particular mapped variable value in RSLogix Class1 I/O Connection. Here depending on different data types (8, 16, 32 bit) user need to see mapped variable values in Class 1 Connection.

4. Rosemount 702 written data becomes zero after reestablishment of Class 1, Class 3 Connections.

    ■ EtherNet/IP uses producer consumer model. So on every RPI EtherNet/IP scanner and adapter produces its own data for each other.

    ■ In Rosemount 702 write case, whenever Class 1, Class3 connection re-establishes, scanner will produce data with all zeros so Smart Wireless Gateway adapter will consume this data.

    ■ In case of Class 1, Class 3 connection reestablishment, the previous written data to Rosemount 702 devices will be zero (Here only those writable variable values become zero, which mapped to that particular instance). The user needs to record the Rosemount 702 written data before removing the particular connection and rewrite again.

5. Currently in the application there are 3 pairs of assembly objects 100-101, 102-103, 104-105 (decimal) can be read. The mapped values from 101, 103 & 105 (in case of explicit messaging) can be read depending on the mapping done in webpage.

6. Regarding Input Size 124:

    Size of assembly object is 496 bytes (fixed). When you are reading DINT or REAL (float values) which are of 4 bytes you have to read it as an array. For example, float values from the assembly object which is 496 bytes, so the size will be 124 or 496/4. If you want to read values as INT (2 bytes), the size will be 248, 496/2.

Note
Retaining old values vs. using "all zeros" on a new connection is "scanner specific" functionality, there are no rules in EtherNet/IP specs about this behavior.

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