**BusWorks® Series 9xxEN w/Ethernet/IP**
**BusWorks® Series XT1xx2 w/Ethernet/IP**
**10/100MB Industrial Ethernet I/O Modules**

# Application Note – Ethernet/IP

# Communicating with Acromag Series 9xxEN-60xx, XTxxx2-xxx and NTE2xxx-xxxx Ethernet/IP Modules from a Compact Logix PLC Device

8500762H

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This document illustrates a procedure for configuring message commands to Acromag Busworks® Ethernet/IP modules using ladder logic programming software and a Compact Logix Programmable Controller.  Acromag assumes no responsibility for any errors that may occur in this document, and makes no commitment to update, or keep this information current.   Be sure to visit Acromag on the web at **www.acromag.com.**

# COMMUNICATING WITH COMPACT LOGIX CONTROLLERS

This document illustrates a procedure for configuring message commands intended for Acromag Busworks® Series Ethernet/IP modules using ladder logic programming software and a Compact Logix Programmable Controller.  It is assumed that the user has a working knowledge of ladder logic programming, the RSLogix5000 software, and the Compact Logix hardware.
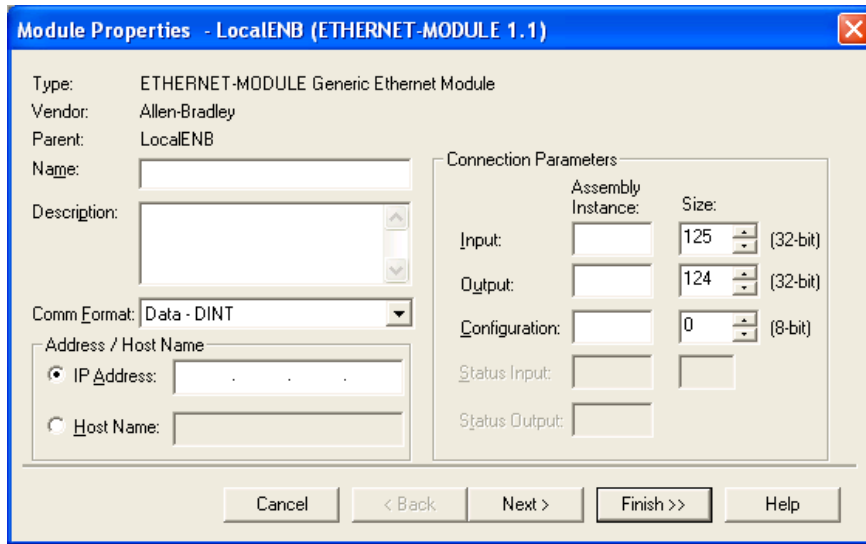
## Configuring I/O Connection in RSLogix 5000
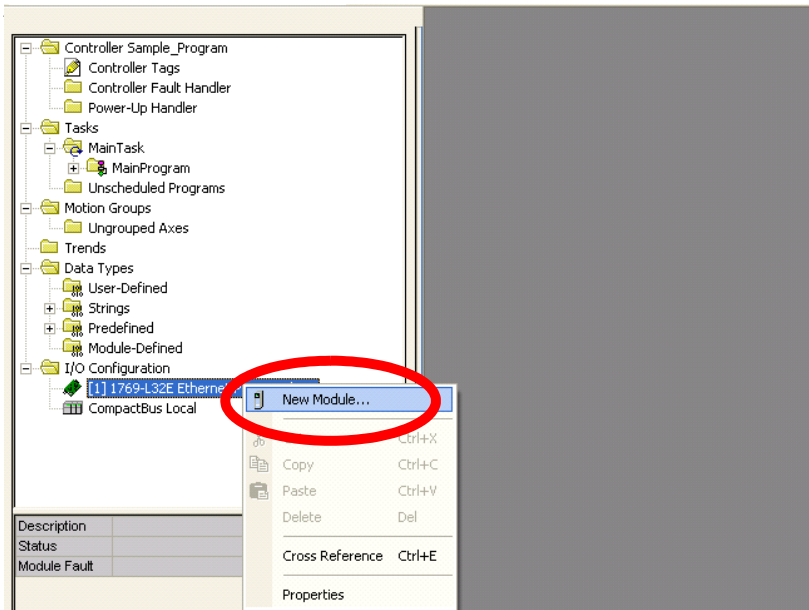


1. From a new or existing project, right click on the Compact Logix Ethernet controller (shown as 1769-L32E in this example) and select **New Module**.
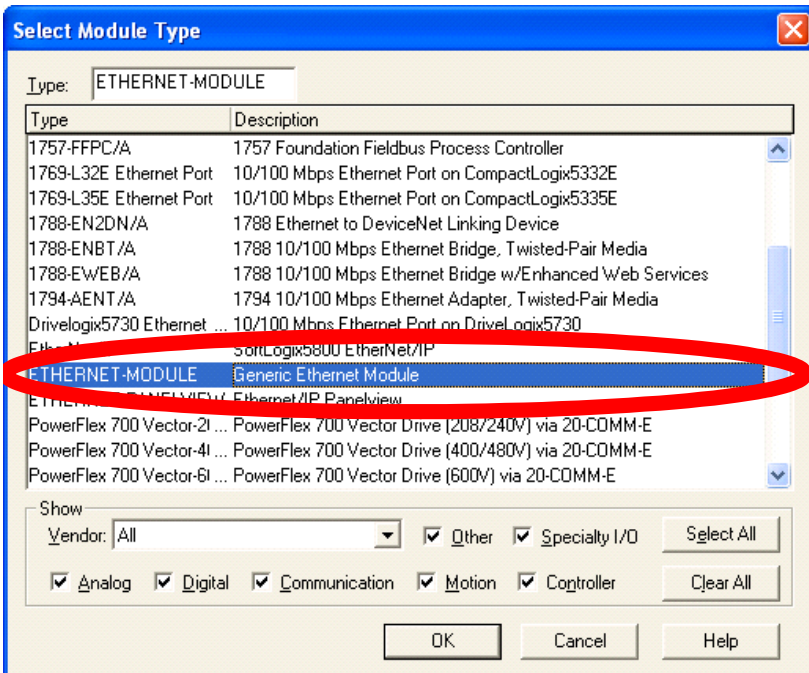


2. In the **Select Module Type** box, select **Ethernet-Module** as shown in the example, and click **[OK]**.

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3. The **Module Properties** window should automatically open. Under the **Name** box, type in the name of the module.  In the example below left, the 964EN module is used.

   The type of **Communication Format** used by all modules is **Data – INT.**

   **Note:**  Once the **[Finish]** button is pressed, the Comm format of the module cannot be changed.
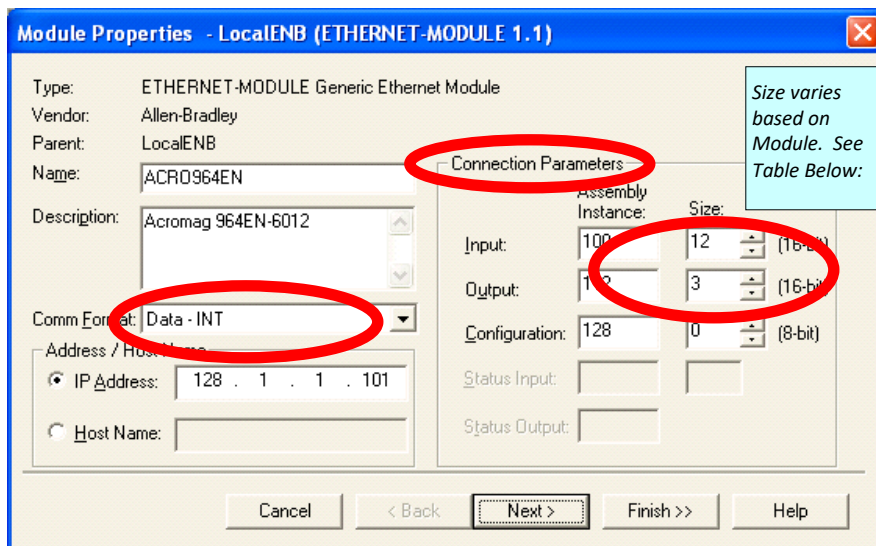
   Under the **Address / Host Name** box, the **IP Address** must be selected and the IP Address of the module typed in.  In the example at left, the IP Address of the module is 128.1.1.101, but this will vary depending on the address of your Compact Logix controller. See chart on next page for **Comm Format** and **Connection Parameters**.

| Module Type | Comm Format | Inp Assy Instance | Input Size | Outp Assy Instance | Output Size |
|---|---|---|---|---|---|
| 981/2/3EN-6012 | Data-INT | 100 | 1 | 112 | 1 |
| 961/2EN-6006 | Data-INT | 100 | 6 | 112 | 3 |
| 963/4EN-6012 | Data-INT | 100 | 12 | 112 | 3 |
| 965EN-6004 | Data-INT | 100 | 4 | 112 | 5 |
| 965EN-6006 | Data-INT | 100 | 6 | 112 | 5 |
| 966EN-6004 | Data-INT | 100 | 4 | 112 | 3 |
| 966EN-6006 | Data-INT | 100 | 6 | 112 | 3 |
| 972/3EN-6004 | Data-INT | 100 | 1 | 112 | 7 |
| 972/3EN-6006 | Data-INT | 100 | 1 | 112 | 9 |
| 951/2EN-6012 | Data-INT | 100 | 5 | 112 | 9 |
| XT11x2 | Data-INT | 101 | 5 | 100 | 4 |
| XT1212/XT1222 | Input Data-INT-Run/Program | 101 | 9 | 100 | NA |
| XT1232/XT1242 | Input Data-INT-Run/Program | 101 | 17 | 100 | NA |
| XT1532 | Data-INT | 101 | 2 | 100 | 5 |
| XT1542 | Data-INT | 101 | 2 | 100 | 9 |
| NTE2xxx | Data-INT | 101 | 164 | 100 | 68 |

Use the Chart at left or the Assembly Object in the manual to fill out the **Comm Format** and **Connection Parameters**.

*Configuration Assemble Instance = 128 with Size = 0 for all modules.

When all data is entered and correct, click on the **[Finish]** button

**Note:**  If you have frequent communication errors or dropouts, consult the BusWorks Manual for the Input Conversion Rate or Output Update Rate, and adjust your PLC RPI rate as required.  Some units, particularly Temperature Modules, take up to 480ms to process the inputs and periodically, another 240ms for Cold Junction Compensation before RPI's can be accommodated.  In this case, an RPI of 1,000ms is recommended to solve the problem.

## I/O Commands Using the Assembly Object
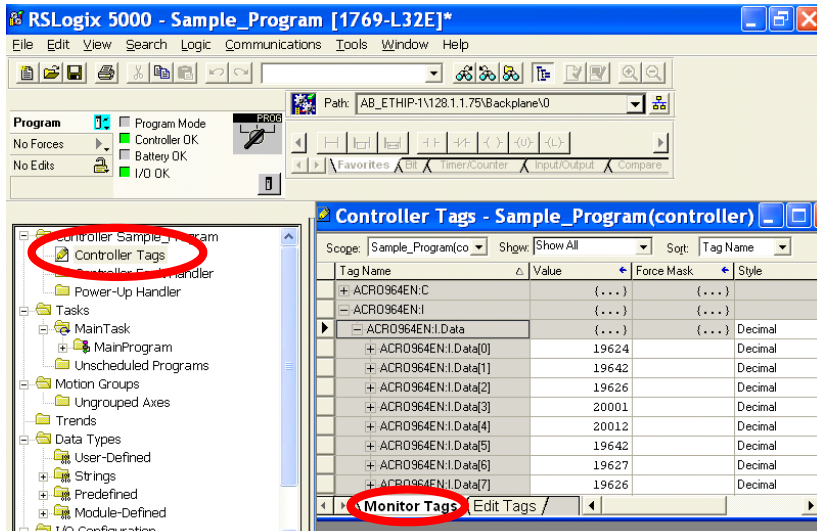


1. Download the project to the Compact Logix Controller.

2. Double-click on **Controller Tags.** On the bottom of the Controller Tags window, click on the tab labeled **Monitor Tags**.
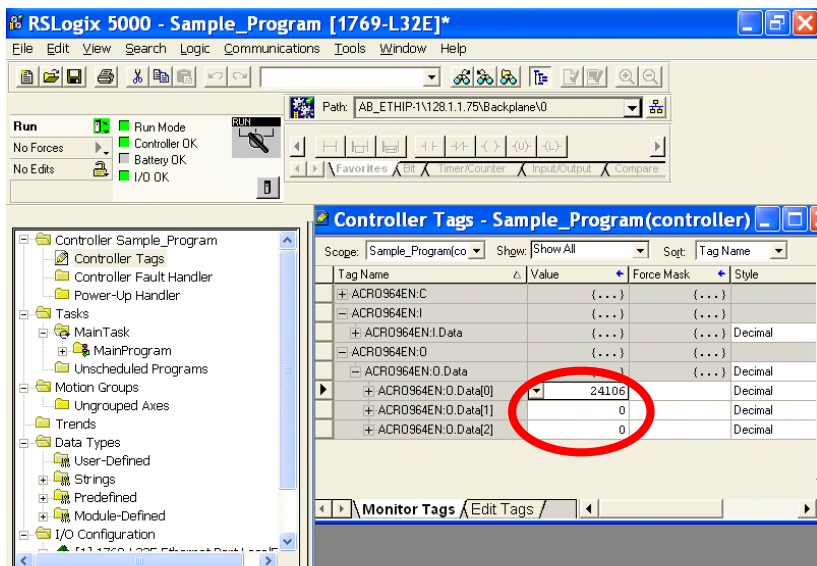


3. To read the Discrete and Analog Input Data (where applicable), expand the **ACRO9xx:I** tag, and then the **ACRO9xx:I.data** tag. The input data will be continuously updated.

4. To write to the Discrete and Analog output data, (where applicable) expand the **ACRO9xx:O** tag, and then the **ACRO9xxO.data** tag.  Enter the data value in the corresponding data value box.  When the data is entered, turn the CPU key to **Run Mode.**

   **Note:**  When the CPU is in run mode, Discrete/Analog Output Data is being continuously written to the module.

## Configuring Explicit Message Commands (900EN Only, Not Applicable to XT/NT)
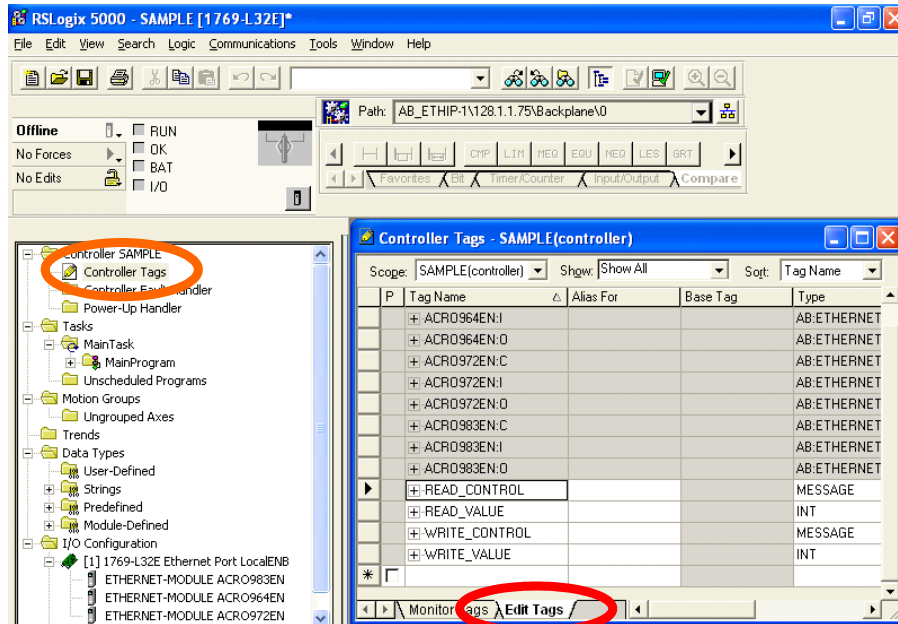


1. Double-click on **Controller Tags** in the **Controller Organizer** box**.**  At the bottom of the **Control Tags** window, select the **Edit Tags** tab.
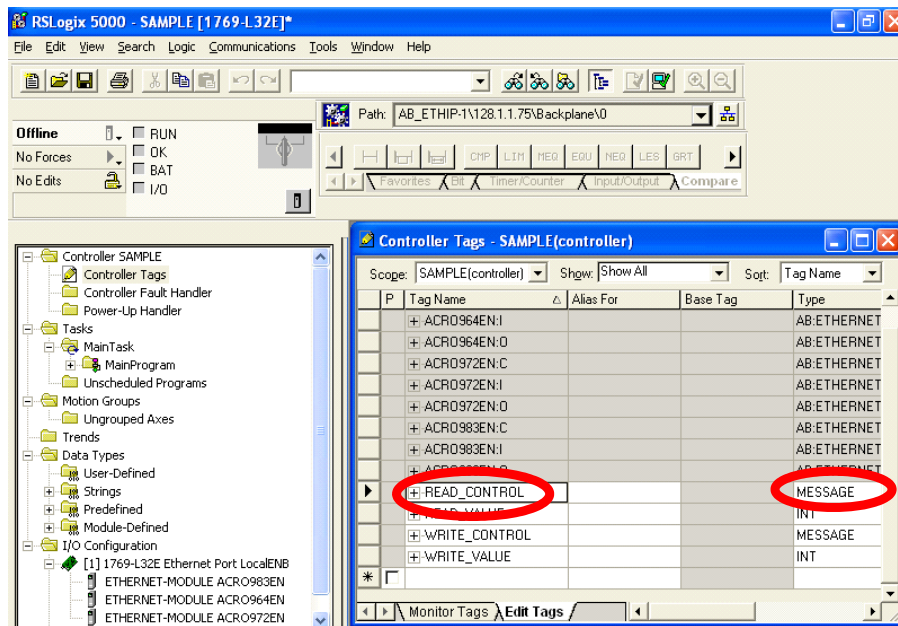


2. In an empty Tag Name box, add two names for either a read or a write.

   For **Type**, select one of the tag names to be a **Message** (the controller), and the other set as an **Int** (data values).  In the given example, there are four tags.  Two are for module reads, and the other two are for writes.

   To enter data for the write tag, click on the **Monitor Tags** tab, and click on the desired data box under the column **Value**.

## Configuring Explicit Message Commands (900EN Only)
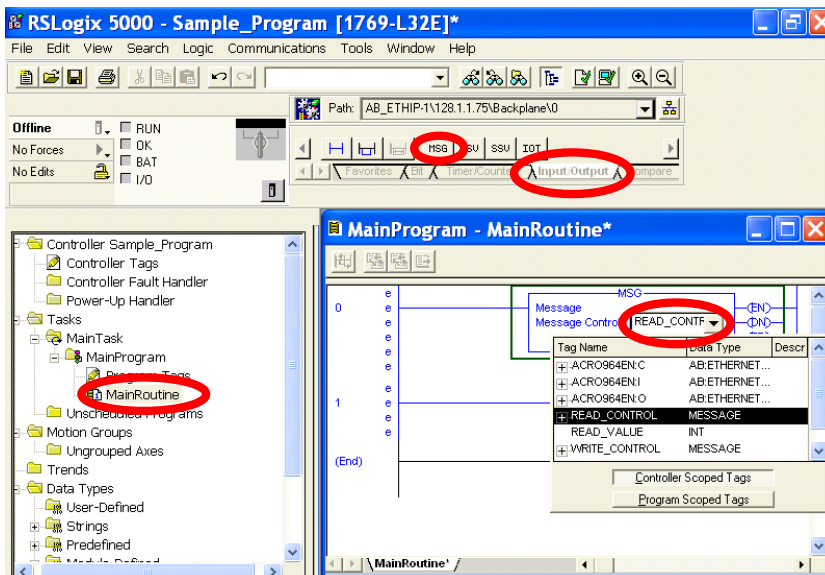




3. In the **Controller Organizer** box, expand the **MainTask** and **MainProgram** folders. Double-click **MainRoutine.**

4. To add a **MSG** command, click on the **Input/Output** tab on the **Language Element** toolbar, and click **MSG**.

5. In the **MSG** box, click on the **Message Control** box and select the **Message** Tag. In this example, the **Read_Control** tag was selected. The Tag chosen for a **Message Control** must be a **Message Datatype**.
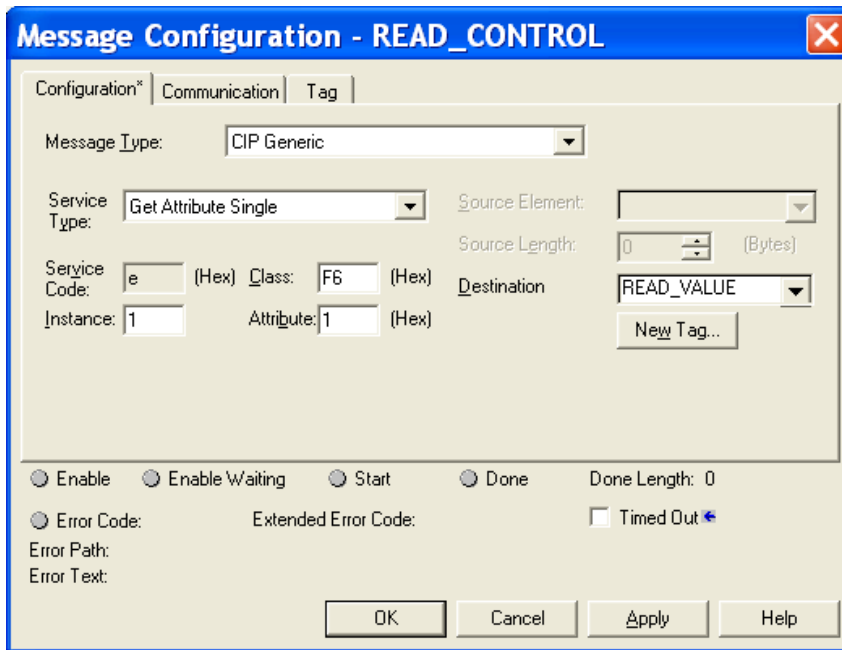
6. Click the " **…** " button to the right of **Message Control**.

7. In the **Message Configuration** box, set the **Message Type** to **CIP Generic**. The **Service Type** can be set to either **Set Attribute Single** for a write, or **Get Attribute Single** for a read. The example shown is setup to read **Object/Class** F6, **Instance** 1 & **Attribute** 1.

   The **Destination** box is the data tag where data read from the module will be stored. In the example, tag READ_VALUE was chosen.

   **Note:** The locations for the attributes are found in the User's Manual under the Ethernet/IP section.

## Configuring Explicit Message Commands (900EN Only)
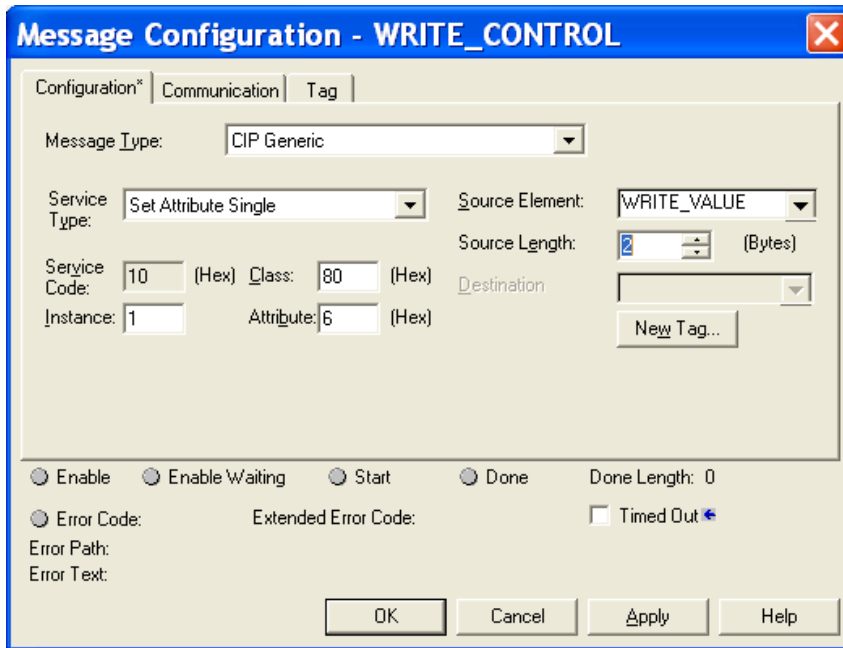


8. For an attribute write, the **Service Type** must be changed to **Set Attribute Single**. The **Class, Instance,** and **Attribute** are located in the User's manual. The **Source Element** is a data tag that will contain the value(s) to be written to the attribute. The **Source Length** is the number of Bytes to be sent to the attribute. This information is found in the User's manual under the **Data Type** column.

   **NOTE:** To avoid communication errors for multiple Set/Get commands, validate the previous MSG command before sending the next command.
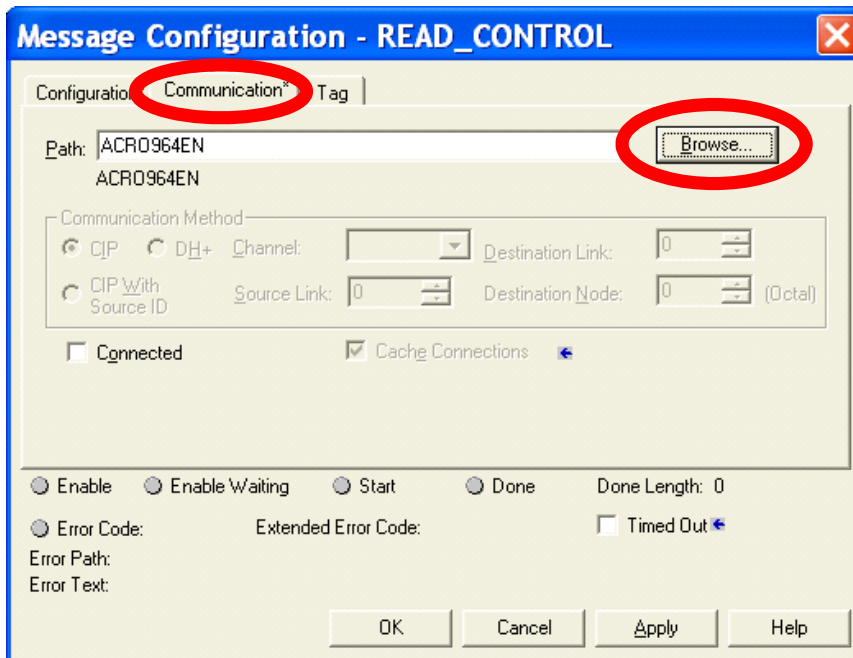


9. In the **Message Configuration** box, click the **Communication** tab, click **Browse**, and select the module to send the message. Click **OK** to save changes and close the box.

## Configuring Explicit Message Commands (900EN Only)…

### This Step For Attribute Writes Only
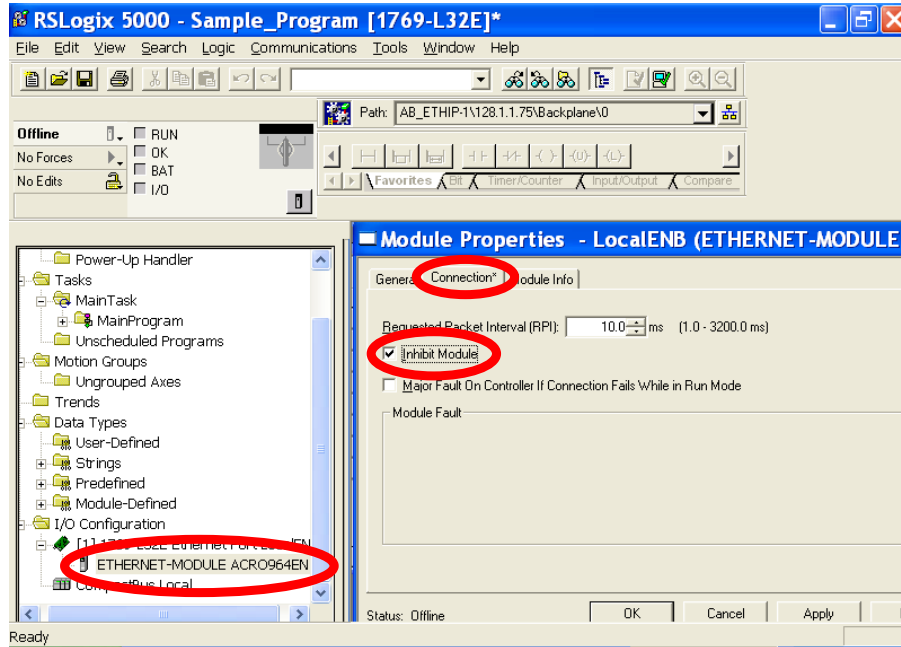


10. (Attribute Writes Only): To write to a module, in the **Controller Organization** box, right click on the module and click on properties.  In the **Module Properties** window, click on the **Connection** tab and check the **Inhibit Module** box.  Click **[OK]** to save changes.

    **Note:**  When the module is inhibited, I/O connection to the assembly object is locked.
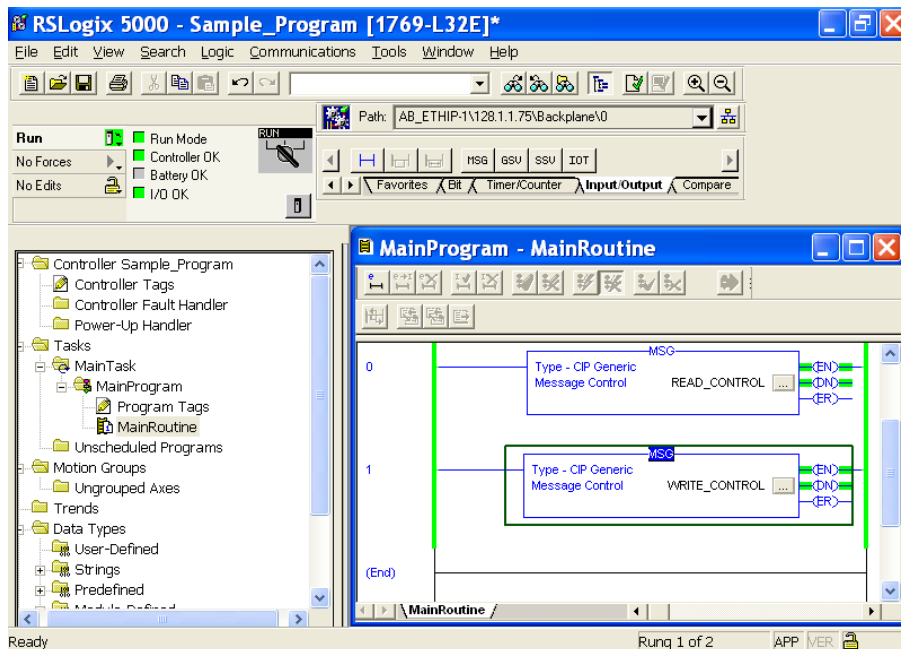


11. Download the program to the Compact Logix Controller and switch to run.

## Notes:

The following table shows the revision history for this document:

| Release Date | Version | EGR/DOC | Description of Revision |
|---|---|---|---|
| 09-DEC-2004 | A | RH/KLK | Initial Acromag release |
| | ● | | |
| | ● | | |
| | ● | | |
| 28-AUG-2014 | F | RH/ARP | Add XT15x models to parameter chart |
| 19 APR 2021 | G | HWW/AMM | Add note regarding communication errors or dropouts (Pg. 5). |
| 14-NOV-2022 | H | BW/BC | Add NT Series & Restrict Explicit Messaging to 900EN Only. |