ProSoft® TECHNOLOGY

Where Automation Connects.

inRAx®

ILX56-MM

ControlLogix Platform

inRAx Message Manager

March 31, 2009

SETUP GUIDE

Important Safety Information

WARNING – EXPLOSION HAZARD – DO NOT DISCONNECT EQUIPMENT UNLESS POWER HAS BEEN SWITCHED OFF OR THE AREA IS KNOWN TO BE NON-HAZARDOUS.
AVERTISSEMENT – RISQUE D'EXPLOSION – AVANT DE DÉCONNECTER L'EQUIPMENT, COUPER LE COURANT OU S'ASSURER QUE L'EMPLACEMENT EST DÉSIGNÉ NON DANGEREUX.

Markings

CSA/cUL	C22.2 No. 213-1987
CSA CB Certified	IEC61010

243333

Temp Code T5
0° C <= Ta <= 60° C

Warnings

North America Warnings

A Warning - Explosion Hazard - Substitution of components may impair suitability for Class I, Division 2.
B Warning - Explosion Hazard - When in Hazardous Locations, turn off power before replacing or rewiring modules.
Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.

Conditions of Safe Usage:

Power, Input, and Output (I/O) wiring must be in accordance with the authority having jurisdiction

A Warning - Explosion Hazard - When in hazardous locations, turn off power before replacing or wiring modules.
B Warning - Explosion Hazard - Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
C These products are intended to be mounted in an IP54 enclosure. The devices shall provide external means to prevent the rated voltage being exceeded by transient disturbances of more than 40%.
D DO NOT OPEN WHEN ENERGIZED.

Electrical Ratings

- Backplane Current Load: 1000 mA @ 5 V DC; 3mA @ 24V DC
- Operating Temperature: 0 to 60°C (32 to 140°F)
- Storage Temperature: -40 to 80°C (-40 to 176°F)
- Shock: 30g Operational; 50g non-operational; Vibration: 5 g from 10 to 150 Hz
- Relative Humidity 5% to 95% (non-condensing)
- All phase conductor sizes must be at least 1.3 mm (squared) and all earth ground conductors must be at least 4mm (squared).

Battery Life Advisory

This module uses a Lithium Vanadium Pentoxide battery to backup the date/time settings of the real-time clock and the BIOS settings in CMOS. The battery recharges whenever the module is receiving power and should not need to be replaced for the life of the module. The module must be powered for approximately twenty hours before the battery becomes fully charged.

If the module is left in an unpowered state for approximately 21 or more days, the battery will be completely drained and the module BIOS, date, and time will revert to their default settings. Before you remove a module from its power source, ensure the battery is fully charged. You can tell the battery is fully charged when the Battery State (ERR) LED is OFF.

Note: The battery is not user-replaceable.

ProSoft Technology® Product Documentation

In an effort to conserve paper, ProSoft Technology no longer includes printed manuals with our product shipments. User Manuals, Datasheets, Sample Ladder Files, and Configuration Files are provided on the enclosed CD, and are available at no charge from our web site: http://www.prosoft-technology.com

Printed documentation is available for purchase. Contact ProSoft Technology for pricing and availability.

Asia Pacific: +603.7724.2080
Europe, Middle East, Africa: +33 (0) 5.3436.87.20
Latin America: +1.281.298.9109
North America: +1.661.716.5100

Your Feedback Please

We always want you to feel that you made the right decision to use our products. If you have suggestions, comments, compliments or complaints about the product, documentation or support, please write or call us.

ProSoft Technology
1675 Chester Avenue, Fourth Floor
Bakersfield, CA 93301
+1 (661) 716-5100
+1 (661) 716-5101 (Fax)
http://www.prosoft-technology.com

Copyright © ProSoft Technology, Inc. 2009. All Rights Reserved.

ILX56-MM Setup Guide
March 31, 2009

ProSoft Technology ®, ProLinx ®, inRAx ®, ProTalk®, and RadioLinx ® are Registered Trademarks of ProSoft Technology, Inc. All other brand or product names are or may be trademarks of, and are used to identify products and services of, their respective owners.

Contents

Important Safety Information 2
Warnings 2
Battery Life Advisory 3
ProSoft Technology® Product Documentation 3
Your Feedback Please 3

1 Scope 7

1.1 About the ILX56-MM 7
1.2 Learning Objectives 7
1.3 ProSoft Technology Documentation 8
1.4 Prerequisites 8

2 Before You Begin 9

2.1 System Requirements 9
2.2 Package Contents 10
2.3 Required Items 10
2.4 Sample Files 10

3 The Sample Application 11

3.1 General Overview 11
3.2 Architecture 11
3.3 About the Sample Ladder Logic 14

4 Procedures 19

4.1 Physical Setup 19
4.2 Configure the ControlLogix Processor 23
4.3 Configure the CompactLogix Processor 25
4.4 Connect the ControlLogix and CompactLogix racks to the Ethernet Network 27
4.5 Configure the ILX56-MM Module 27
4.6 Verify Communication 50

5 Conclusion 53

5.1 Frequently Asked Questions 53

6 Glossary of Terms 55

Index 61

1 Scope

In This Chapter

- About the ILX56-MM 7
- Learning Objectives 7
- ProSoft Technology Documentation 8
- Prerequisites 8

This document acts as a tutorial in providing step-by-step instructions on how to read data from a CompactLogix controller using the ILX56-MM module in a ControlLogix rack.

1.1 About the ILX56-MM

The ILX56-Message Manager is a communications interface that can be installed in a Rockwell Automation® ControlLogix®1756 chassis to provide data transfer functionality between automation systems based on a diverse range of controllers and processors. Supported systems include:

- Rockwell Automation (RA) ControlLogix (CLX) Programmable Automation Controller (PAC) systems
- RA CompactLogix™ (CPLX) PAC systems
- Allen-Bradley® (A-B) PLC5® systems
- A-B SLC™ systems
- A-B MicroLogix™ systems
- Siemens S7® systems with Industrial Ethernet communications
- Schneider Electric® Quantum™ PLC systems with Modbus TCP/IP communications
- Any devices that support Modbus TCP/IP Protocol

1.2 Learning Objectives

When you have completed all the steps in this Setup Guide, you will have learned how to

- Understand how the sample application works
- Install and Configure the ILX56-MM module
- Import the Add-On Instructions to the ControlLogix and CompactLogix processors (page 24)
- Verify the ILX56-MM module communication status

1.3 ProSoft Technology Documentation

ProSoft Technology provides the following documentation (manuals) with your ILX56-MM.

Electronic documentation (on the ProSoft Solutions CD-ROM)

- **Quick Start Guide:** A printed insert in the product package that describes the basic steps to install the module and locate the configuration tools and documentation
- **Training Video:** A video program, playable on your PC with Windows Media Player or QuickTime, that demonstrates the basics of setting up the ILX56-MM module
- **Setup Guide: (this manual)** Describes the sample application, and takes you through the steps necessary to install, configure, and verify the correct operation of the module
- **User Manual:** Detailed reference guide to the module, protocol configuration, functional overview, diagnostics and troubleshooting procedures, and product specifications
- **Datasheet:** Brief description of the module hardware and protocol implementation, general and functional specifications

Additional documentation, tools, and product support

- **Email Technical Support:** Send your support questions to Support@prosoft-technology.com
- **Web Site Support:** Visit the ProSoft Technology web site at http://www.prosoft-technology.com to download additional documentation, tools and application information
- **Telephone Support:** Please call ProSoft Technology Technical Support at: (Country Code 1+) 661-716-5100. Support is available 24 hours a day, 7 days a week. ProSoft Technology telephone support is free and unlimited

1.4 Prerequisites

To get the most benefit from this setup guide, you should have the following skills:

- **Rockwell Automation® RSLogix 5000™ software**: launch the program, configure and transfer the Add-On Instruction to the processor
- **Microsoft Windows:** install and launch programs, execute menu commands, navigate dialog boxes and enter data.
- **Ethernet networking:** connect the ILX56-MM module to an Ethernet network using a valid IP address and subnet mask
- **Hardware installation and wiring**: install the module and safely connect it to the Ethernet network.

2 Before You Begin

In This Chapter

- System Requirements 9
- Package Contents 10
- Required Items 10
- Sample Files 10

2.1 System Requirements

The ILX56-MM module requires the following minimum hardware and software components:

- Rockwell Automation® ™ processor, with compatible power supply and one free slot in the rack for the ILX56-MM module. The module requires 1 Amp of available 5 VDC power
- Rockwell Automation RSLogix 5000 programming software version 16 or higher
- Rockwell Automation RSLinx communication software version 2.51 or higher
- Pentium® II 450 MHz minimum. Pentium III 733 MHz (or higher) recommended
- Supported operating systems:
  - Microsoft Windows Vista
  - Microsoft Windows XP Professional with Service Pack 1 or 2
  - Microsoft Windows 2000 Professional with Service Pack 1, 2, or 3
  - Microsoft Windows Server 2003
- Microsoft Internet Explorer version 7 or higher. Other web browsers are not supported at this time
- 128 Mbytes of RAM minimum, 256 Mbytes of RAM recommended
- 100 Mbytes of free hard disk space (or more based on application requirements)
- 256-color VGA graphics adapter, 800 x 600 minimum resolution (True Color 1024 × 768 recommended)
- CD-ROM drive

Note: The Hardware and Operating System requirements in this list are the minimum recommended to install and run software provided by ProSoft Technology. Other third party applications may have different minimum requirements. Refer to the documentation for any third party applications for system requirements.

2.2 Package Contents

The following components are included with your ILX56-MM module, and are all required for installation and configuration.

Important: Before beginning the installation, please verify that all of the following items are present.

Qty.	Part Name	Part Number	Part Description
1	ILX56-MM Module	ILX56-MM	inRAx Message Manager
1	ProSoft Solutions CD	CD-014	Contains sample programs, utilities, and documentation for the ILX56-MM module.
1	Cable	RL-CBL025	5 foot Ethernet Straight-Through Cable (Gray)

If any of these components are missing, please contact ProSoft Technology Support for replacement parts.

2.3 Required Items

This Setup Guide uses a sample application that shows you how to establish communication between the ILX56-MM module, the ControlLogix processor, and a CompactLogix processor. The sample application requires the following equipment.

Item	Description
ILX56-MM	inRAx Message Manager module
1756-L63	ControlLogix processor
1756-ENBT	ControlLogix EtherNet/IP module
1756-A7/B	ControlLogix rack
1756-PA72/B	ControlLogix rack power supply
1769-L35E	CompactLogix processor
1769-PA2	CompactLogix power supply
1769-ECR	CompactLogix right end
Ethernet cable	Ethernet cable to connect ILX56-MM module to Ethernet network (supplied with the module)

2.4 Sample Files

The following files are required for this procedure:

Item	Description
CLX.ACD	Sample ControlLogix Ladder File
_cLX.ACD	Sample CompactLogix Ladder File
ILX56-MM-1051020111.backup	Backup of the module's default configuration settings

3 The Sample Application

In This Chapter

- General Overview 11
- Architecture 11
- About the Sample Ladder Logic 14

3.1 General Overview

The Sample Application consists of two ladder logic files, one for a 1756-L55 ControlLogix 5555 Controller, and one for a 1769-L35E CompactLogix5335E Controller. These ladder logic files contain controller tags that you will import into the ILX56-MM module. You will then be able to transfer data between both processors from the ILX56-MM module.

3.1.1 Required Steps

This Setup Guide takes you through the following steps:

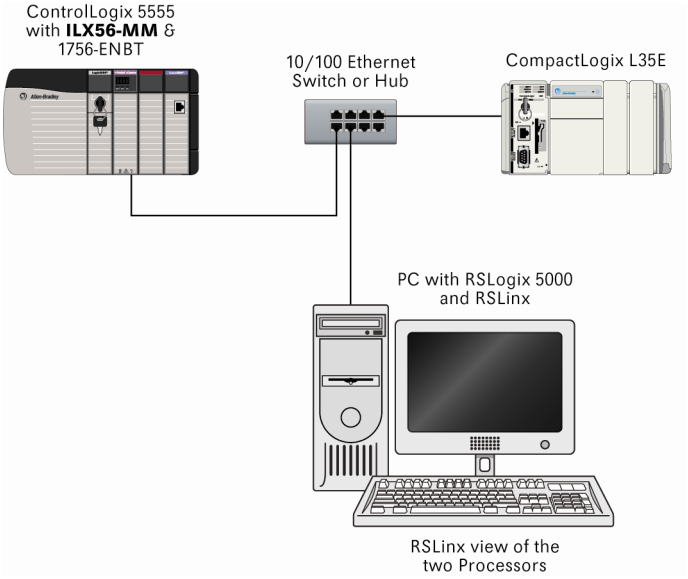
1. Install the ProSoft Module in the ControlLogix rack (page 20)
2. Set the module's permanent IP Address (page 21)
3. Download the Sample Ladder Logic to the ControlLogix Processor (page 23)
4. Download the Sample Ladder Logic to the CompactLogix Processor (page 25)
5. Connect the ControlLogix and CompactLogix racks to the Ethernet Network (page 27)
6. Configure ILX56-MM Module (page 27)
7. Verify Data Exchange (page 50)

3.2 Architecture

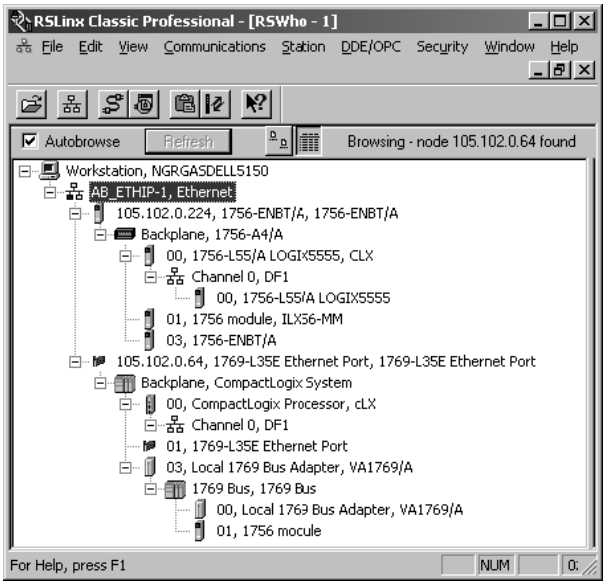
The sample application uses the following hardware and connections.

- A Personal Computer running a supported version of Microsoft Windows, with Microsoft Internet Explorer version 7 (or higher), RSLogix 5000, RSLinx, and an Ethernet port
- A ControlLogix processor with 1756-ENBT and ILX56-MM modules
- A CompactLogix processor
- An Ethernet network connecting the ControlLogix rack to the CompactLogix rack

The following illustration shows the sample application.



The following illustration, from RSLinx, shows the ControlLogix and CompactLogix processors and networking information.

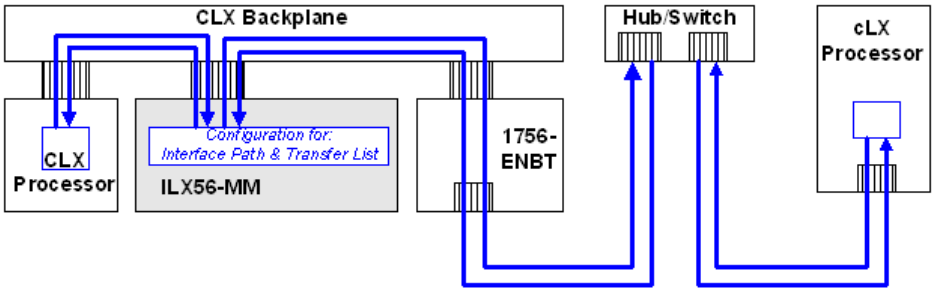


3.2.1 How the Sample Application Exchanges Data

In the Sample Application, the ILX56-MM is configured to exchange data between the two processors through its backplane connection to the ControlLogix processor. The module requires no additional programming to accomplish data exchange.

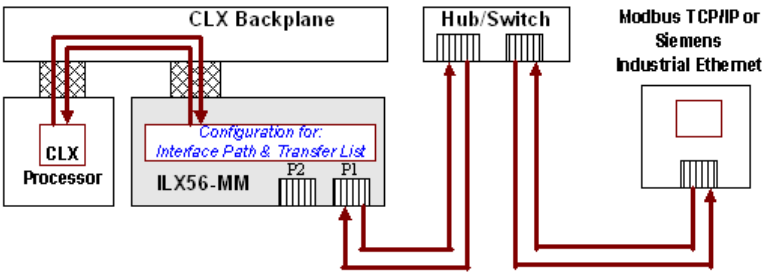
Sample Application using ControlLogix Backplane

The following diagram illustrates how data is transferred through the ILX56-MM module in the Sample Application.



Applications using Modbus TCP/IP or Siemens Industrial Ethernet

The following diagram shows how the module can also exchange data through either of its two Ethernet ports, with Modbus TCP/IP or Siemens Industrial Ethernet devices. Refer to the ILX56-MM User Manual for more information on data exchange using the module's Ethernet ports.



3.3 About the Sample Ladder Logic

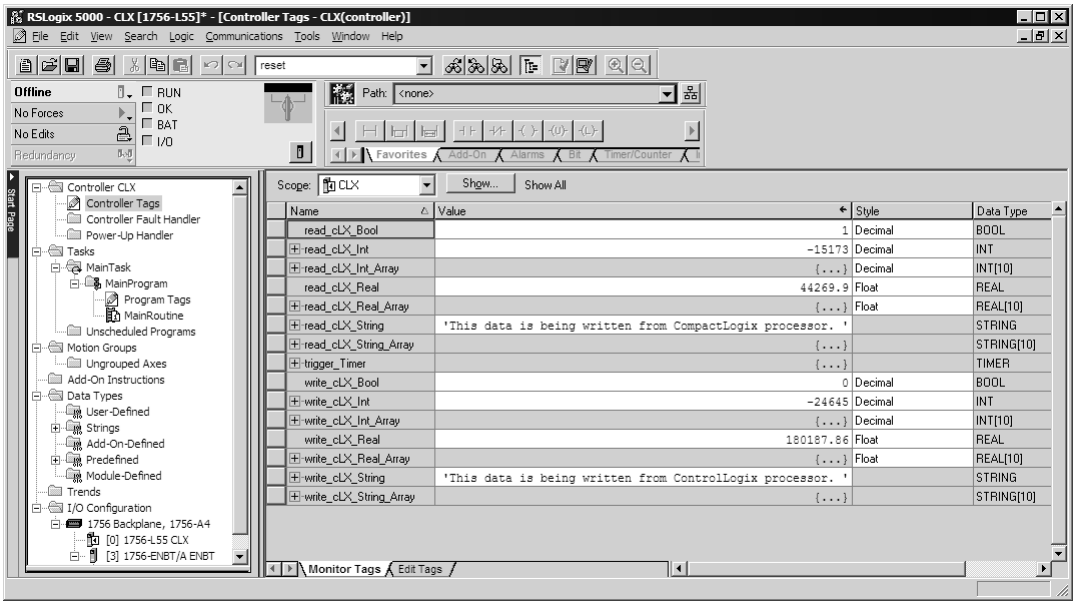
The Sample Application uses controller tags to read and exchange data values between the ControlLogix and CompactLogix processors. If you have downloaded the Sample Ladder Logic to both processors, these tags will be available in the ILX56-MM module.

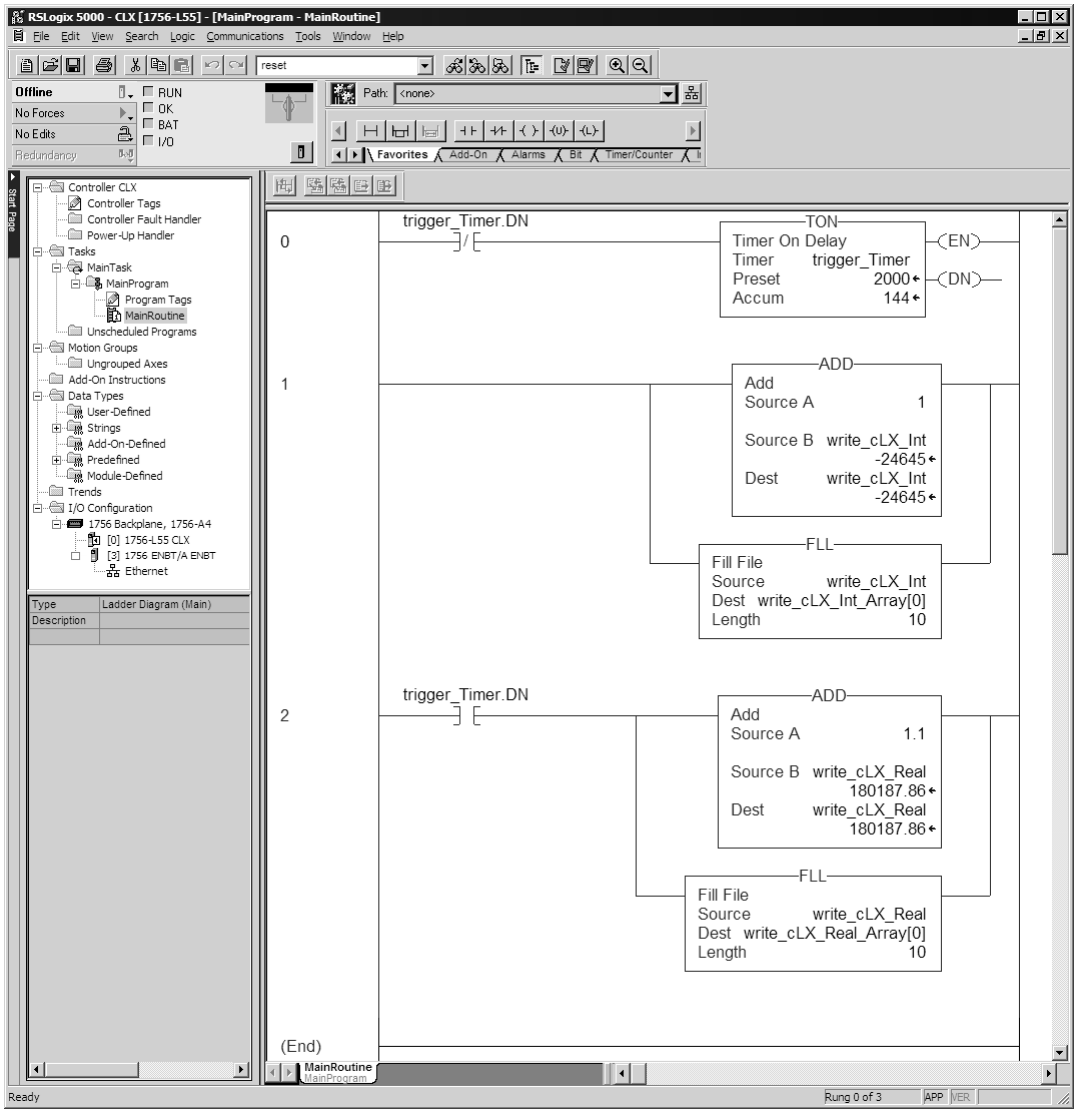
To start with, both PLCs need to have tags entered that will serve as the tags that will receive/read data values and tags that will transmit/write values from and to the other PLC. Once these tags have been entered and ladder logic developed in both PLCs, the ILX56-MM module's configuration process can proceed.

Note: The sample ladder logic is used only to demonstrate how to put values in tags.

3.3.1 ControlLogix Ladder

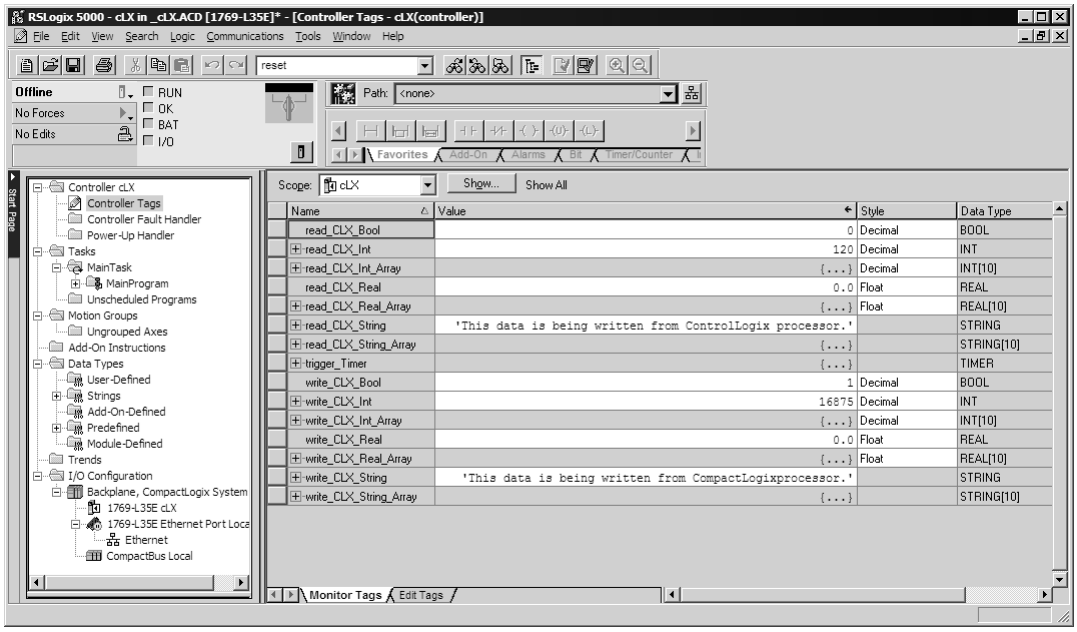
The following illustrations show the Controller Tags and Ladder Rungs for the ControlLogix sample program (CLX.ACD).

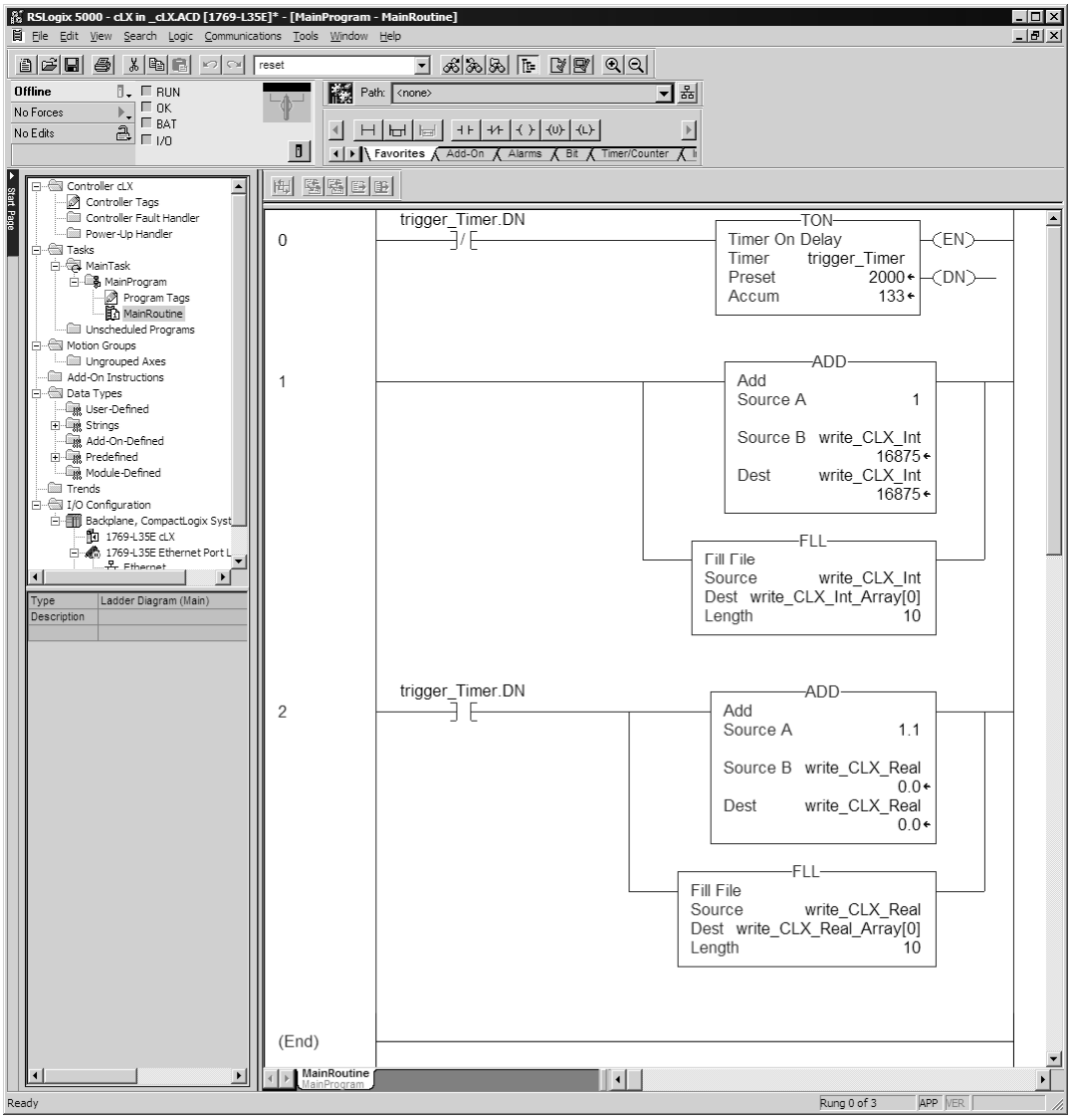



RSLogix 5000 - CLX [1756-L55] - [MainProgram - MainRoutine]
File Edit View Search Logic Communications Tools Window Help
reset
Offline
No Forces
No Edits
Redundancy
RUN
OK
BAT
I/O
Path: <none>
Favorites Add-On Alarms Bit Timer/Counter
Controller CLX
Controller Tags
Controller Fault Handler
Power-Up Handler
Tasks
MainTask
MainProgram
Program Tags
MainRoutine
Unscheduled Programs
Motion Groups
Ungrouped Axes
Add-On Instructions
Data Types
User-Defined
Strings
Add-On-Defined
Predefined
Module-Defined
Trends
I/O Configuration
1756 Backplane, 1756-A4
[0] 1756-L55 CLX
[3] 1756 ENBT/A ENBT
Ethernet
Type
Ladder Diagram (Main)
Description
0
trigger_Timer.DN
TON
Timer On Delay
Timer trigger_Timer
Preset 2000
Accum 144
EN
DN
1
ADD
Add
Source A 1
Source B write_cLX_Int -24645
Dest write_cLX_Int -24645
FLL
Fill File
Source write_cLX_Int
Dest write_cLX_Int_Array[0]
Length 10
2
trigger_Timer.DN
ADD
Add
Source A 1.1
Source B write_cLX_Real 180187.86
Dest write_cLX_Real 180187.86
FLL
Fill File
Source write_cLX_Real
Dest write_cLX_Real_Array[0]
Length 10
(End)
MainRoutine
MainProgram
Ready
Rung 0 of 3
APP
VER

3.3.2 CompactLogix Ladder

The following illustrations show the Controller Tags and Ladder Rungs for the CompactLogix sample program (_cLX.ACD).




RSLogix 5000 - cLX in _cLX.ACD [1769-L35E]* - [MainProgram - MainRoutine]
File Edit View Search Logic Communications Tools Window Help
reset
Offline
No Forces
No Edits
RUN
OK
BAT
I/O
Path: <none>
Favorites Add-On Alarms Bit Timer/Counter
Controller cLX
Controller Tags
Controller Fault Handler
Power-Up Handler
Tasks
MainTask
MainProgram
Program Tags
MainRoutine
Unscheduled Programs
Motion Groups
Ungrouped Axes
Add-On Instructions
Data Types
User-Defined
Strings
Add-On-Defined
Predefined
Module-Defined
Trends
I/O Configuration
Backplane, CompactLogix Syst
1769-L35E cLX
1769-L35E Ethernet Port L
Ethernet
Type
Ladder Diagram (Main)
Description
trigger_Timer.DN
0
TON
Timer On Delay
Timer trigger_Timer
Preset 2000
Accum 133
EN
DN
ADD
Add
Source A 1
Source B write_CLX_Int
16875
Dest write_CLX_Int
16875
FLL
Fill File
Source write_CLX_Int
Dest write_CLX_Int_Array[0]
Length 10
trigger_Timer.DN
2
ADD
Add
Source A 1.1
Source B write_CLX_Real
0.0
Dest write_CLX_Real
0.0
FLL
Fill File
Source write_CLX_Real
Dest write_CLX_Real_Array[0]
Length 10
(End)
MainRoutine
MainProgram
Ready
Rung 0 of 3
APP
VER

4 Procedures

In This Chapter

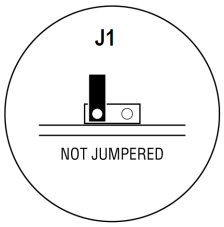
- Physical Setup 19
- Configure the ControlLogix Processor 23
- Configure the CompactLogix Processor 25
- Connect the ControlLogix and CompactLogix racks to the Ethernet Network 27
- Configure the ILX56-MM Module 27
- Verify Communication 50

4.1 Physical Setup

4.1.1 Setting Jumper

There is one Setup Jumper located on the back of the module, labeled **J1.** The Setup Jumper acts as "write protection" for the module's firmware. In "write protected" mode, the Setup pins are not connected, and the module's firmware cannot be overwritten.

The following illustration shows the ILX56-MM jumper configuration, with the Setup Jumper OFF.



If you need to update the firmware, apply the Setup jumper to both pins.

Note: If you are installing the module in a remote rack, you may prefer to leave the Setup pins jumpered. That way, you can update the module's firmware without requiring physical access to the module.

4.1.2 Install the Module in the Rack

If you have not already installed and configured your ControlLogix processor and power supply, please do so before installing the ILX56-MM module. Refer to your Rockwell Automation product documentation for installation instructions.

Warning: You must follow all safety instructions when installing this or any other electronic devices. Failure to follow safety procedures could result in damage to hardware or data, or even serious injury or death to personnel. Refer to the documentation for each device you plan to connect to verify that suitable safety procedures are in place before installing or servicing the device.

After you have checked the placement of the jumper, insert ILX56-MM into the ControlLogix chassis. Use the same technique recommended by Rockwell Automation to remove and install ControlLogix modules.

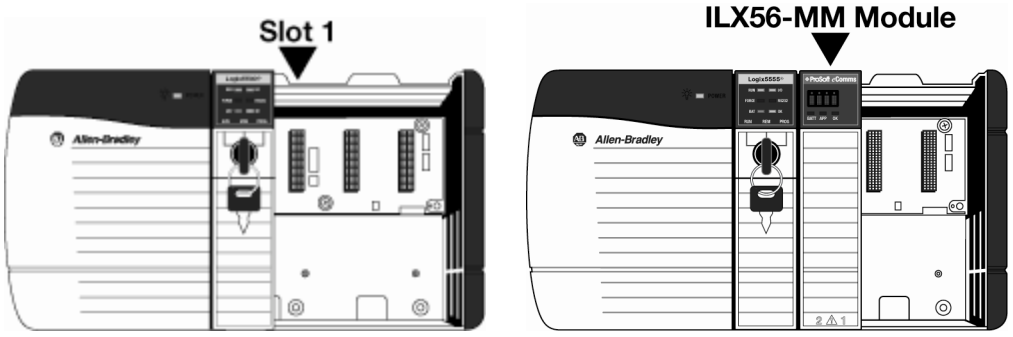
You can install or remove ControlLogix system components while chassis power is applied and the system is operating. However, please note the following warning.

Warning: When you insert or remove the module while backplane power is on, an electrical arc can occur. An electrical arc can cause personal injury or property damage by:

- sending an erroneous signal to your system's actuators causing unintended machine motion or loss of process control
- causing an explosion in a hazardous environment

Verify that power is removed or the area is non-hazardous before proceeding. Repeated electrical arcing causes excessive wear to contacts on both the module and its mating connector. Worn contacts may create electrical resistance that can affect module operation.

1 Align the module with the top and bottom guides, and then slide it into the rack until the module is firmly against the backplane connector.



2 With a firm but steady push, snap the module into place.
3 Check that the holding clips on the top and bottom of the module are securely in the locking holes of the rack.
4 Turn power ON.

Note: If you insert the module improperly, the system may stop working, or may behave unpredictably.

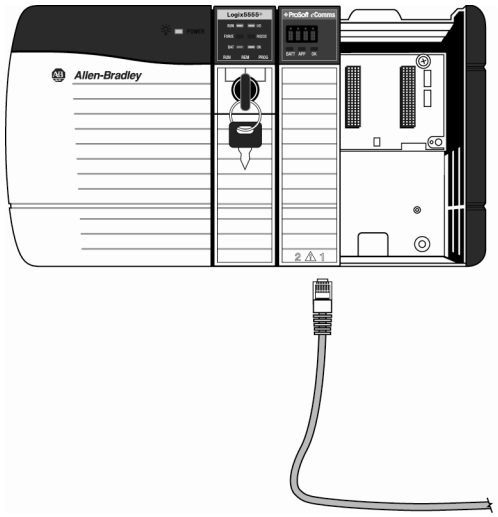
4.1.3 Set the Module's Permanent IP Address

If your network is configured to use IP addresses in the range 192.168.1.xxx, open Microsoft Internet Explorer (version 7 or higher), and connect to the following address:

http://192.168.1.254

If your network is configured to use a different IP range, follow these steps:

1 Disconnect your PC from the network
2 Connect the Ethernet cable between the Ethernet port on your PC and Port 1 on the module



3 Temporarily change the IP address and Subnet Mask on your PC to match the network configuration on the module:

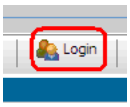
IP address: 192.168.1.1
Subnet mask: 255.255.255.0

Important: Make a note of your IP Address settings. You will need to restore these settings before you reconnect to the network.

4 Open Microsoft Internet Explorer (version 7 or higher), and connect to the following address:

http://192.168.1.254

5 Click the **LOGIN** button at the bottom of the screen, and use the following username and password to login.



Username: `admin`
Password: `admin`

6 Click the **ADMINISTRATION** tab, and then the **NETWORK** tab, and configure the IP Address, Subnet Mask and Default Gateway to work with your network.
7 Click the Save button to apply the updated settings.
8 Change the IP Address and Subnet Mask settings on your PC back to their original values, and then reconnect your PC to the network.
9 Connect to the module's web page again at the module's new IP address.

The following table describes the default Ethernet port configuration and login information.

Factory Default settings		
Ethernet Ports:	**Port 1**	**Port 2**
IP:	192.168.1.254.	DHCP
User Name:	admin	
Password:	admin	

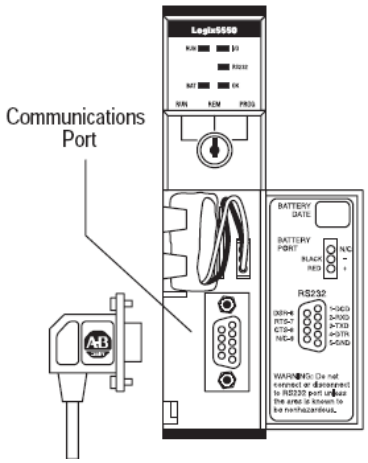
Important: The User Name and Password are case-sensitive.

4.2 Configure the ControlLogix Processor

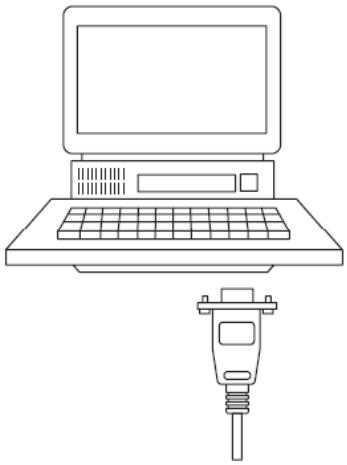
4.2.1 Connect your PC to the ControlLogix Processor

There are several ways to establish communication between your PC and the ControlLogix processor. The following steps show how to establish communication through the serial interface. Refer to your Rockwell Automation documentation for information on other connection methods.

1 Connect the right-angle connector end of the cable to your controller at the communications port.



2 Connect the straight connector end of the cable to the serial port on your computer.



4.2.2 Open the Sample Ladder Logic

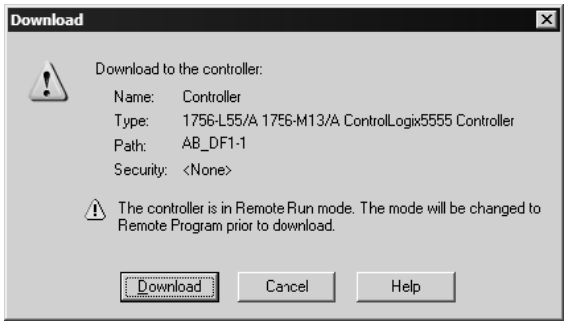
The sample ControlLogix program, CLX.ACD, located on the ProSoft Solutions CD-ROM, includes custom tags and ladder logic for data I/O and status monitoring. You will import these tags into the ILX56-MM module in a later step.

Notice that no ladder logic programming is required to accommodate the ILX56-MM module. The ILX56-MM derives all of its information from your existing tags.

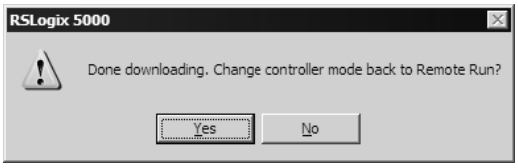
4.2.3 Download the Sample Program to the Processor

Note: The key switch on the front of the ControlLogix module must be in the REM position.

1. If you are not already online with the processor, open the **COMMUNICATIONS** menu, and then choose **DOWNLOAD.** RSLogix will establish communication with the processor.
2. When communication is established, RSLogix will open a confirmation dialog box. Click the **DOWNLOAD** button to transfer the sample program to the processor.



3. RSLogix will compile the program and transfer it to the processor. This process may take a few minutes.
4. When the download is complete, RSLogix will open another confirmation dialog box. Click **OK** to switch the processor from Program mode to Run mode.

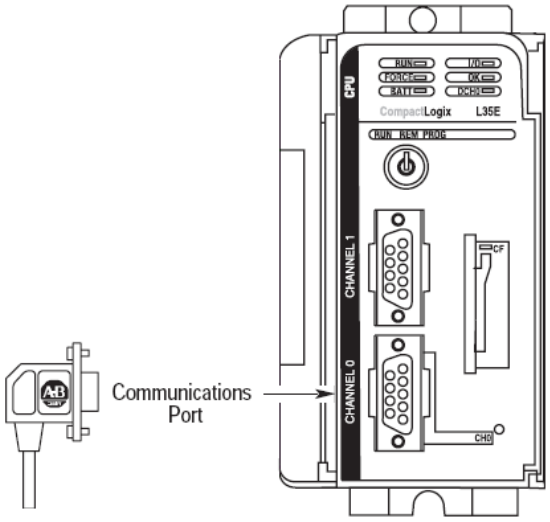


Note: If you receive an error message during these steps, refer to your RSLogix documentation to interpret and correct the error.

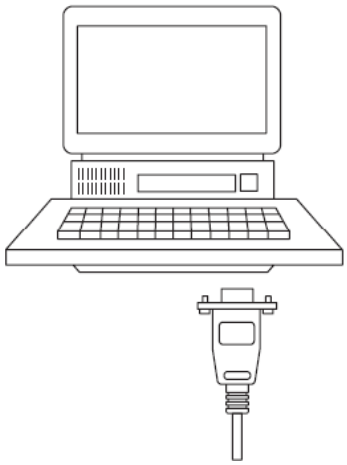
4.3 Configure the CompactLogix Processor

4.3.1 Connect your PC to the CompactLogix Processor

1 Connect the right-angle connector end of the cable to your controller at the communications port.



2 Connect the straight connector end of the cable to the serial port on your computer.



4.3.2 Open the Sample Ladder Logic

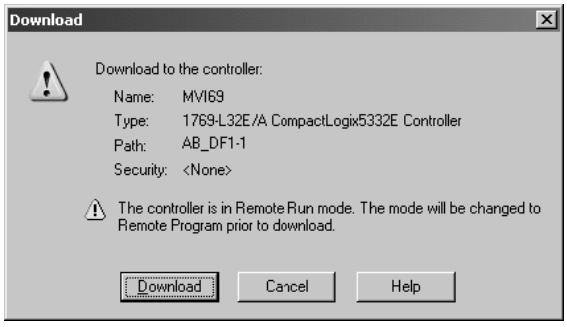
The sample CompactLogix program, _cLX.ACD, located on the ProSoft Solutions CD-ROM, includes custom tags and ladder logic for data I/O and status monitoring. You will import these tags into the ILX56-MM module in a later step.

Notice that no ladder logic programming is required to accommodate the ILX56-MM module. The ILX56-MM derives all of its information from your existing tags.

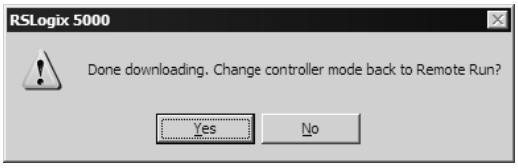
4.3.3 Download the Sample Program to the Processor

Note: The key switch on the front of the CompactLogix processor must be in the REM position.

1. If you are not already online to the processor, open the **COMMUNICATIONS** menu, and then choose **DOWNLOAD.** RSLogix will establish communication with the processor.
2. When communication is established, RSLogix will open a confirmation dialog box. Click the **DOWNLOAD** button to transfer the sample program to the processor.



3. RSLogix will compile the program and transfer it to the processor. This process may take a few minutes.
4. When the download is complete, RSLogix will open another confirmation dialog box. Click **OK** to switch the processor from **PROGRAM** mode to **RUN** mode.



Note: If you receive an error message during these steps, refer to your RSLogix documentation to interpret and correct the error.

4.4 Connect the ControlLogix and CompactLogix racks to the Ethernet Network

In order for the ControlLogix and CompactLogix racks to communicate to each other through the ILX56-MM module, you must connect both racks to the Ethernet network.

- Connect the 1756-ENBT module to an Ethernet hub or switch
- Connect the CompactLogix processor to an Ethernet hub or switch

Important: Both racks must be able to communicate on the same Ethernet network. Verify that the IP Address, Subnet Mask and Default Gateway are configured correctly for each rack. Refer to your Rockwell Automation documentation for assistance with Ethernet configuration for the 1756-ENBT module and CompactLogix processor.

4.5 Configure the ILX56-MM Module

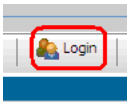
4.5.1 Create the Application

The next task is to use information from both processors to create the ILX56-MM application.

1 Open **MICROSOFT INTERNET EXPLORER** (version 7 or higher), and connect to the module's permanent IP address (page 21).

Tip: If you do not remember the IP address you assigned, watch the scrolling LED display on the front of the ILX56-MM module. As the display scrolls, you will see the IP addresses for Port 1 (static IP address) and Port 2 (DHCP IP address). Make a note of the IP address, and then enter it in the browser's address bar.

2 Click the **LOGIN** button at the bottom of the screen, and use the following username and password to login.



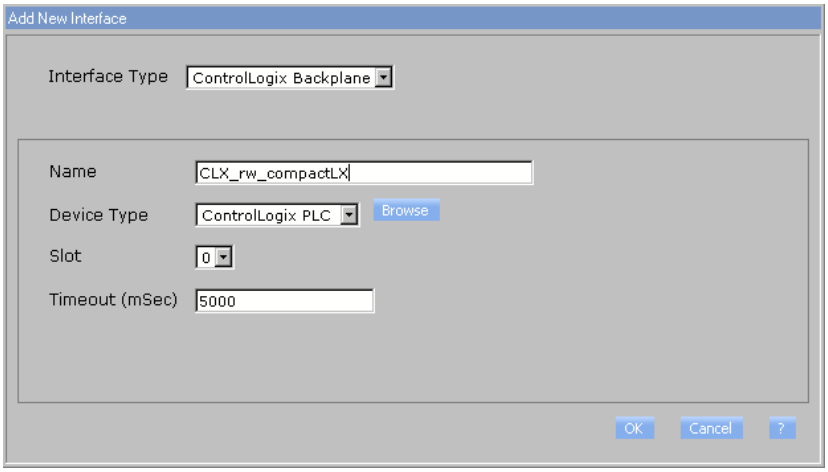
Username: `admin`
Password: `admin`

Important: The User Name and Password are case-sensitive.

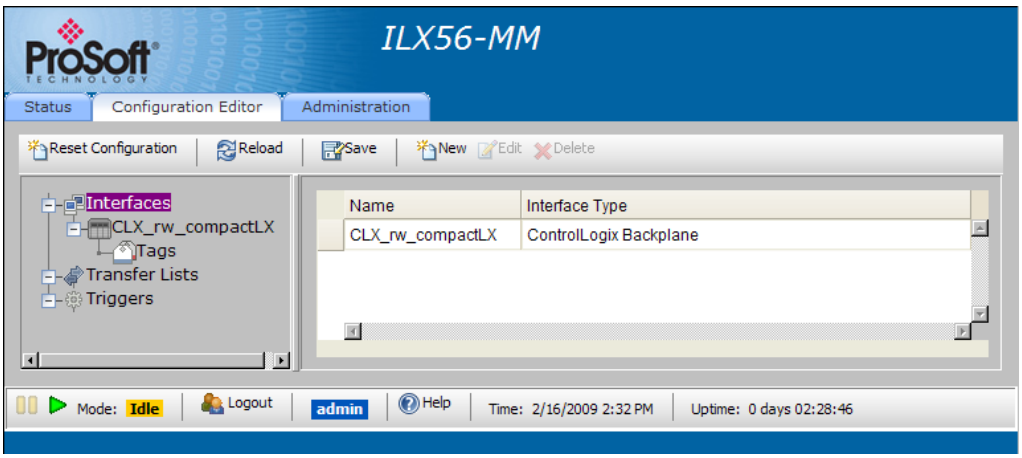
Create the ControlLogix Controller Interface

Interfaces are used to configure controllers or bridges in the local ControlLogix rack. An Interface defined as a controller will contain a **TAGS** node under it in the Configuration Editor tree. The **TAGS** node contains all the Tags referenced for that controller.

1. In the ILX56-MM web page, click the **CONFIGURATION EDITOR** tab.
2. In the left pane of the **CONFIGURATION EDITOR** tab, select the **INTERFACES** node.
3. In the toolbar below the tabs, click the **NEW** button. This action opens the **ADD NEW INTERFACE** dialog box.
4. Create the ControlLogix interface. Fill in the fields in the dialog box as shown in the following illustration.



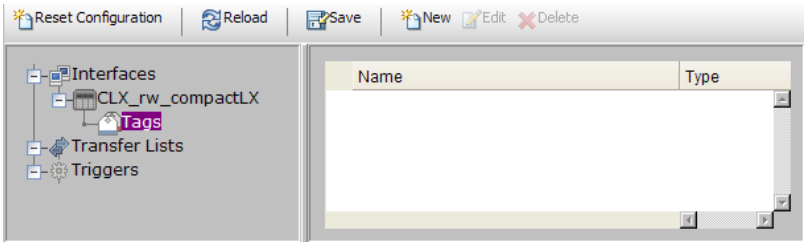
5. Click **OK** to store the interface. Notice that the interface you created now appears in the **CONFIGURATION EDITOR** tab.



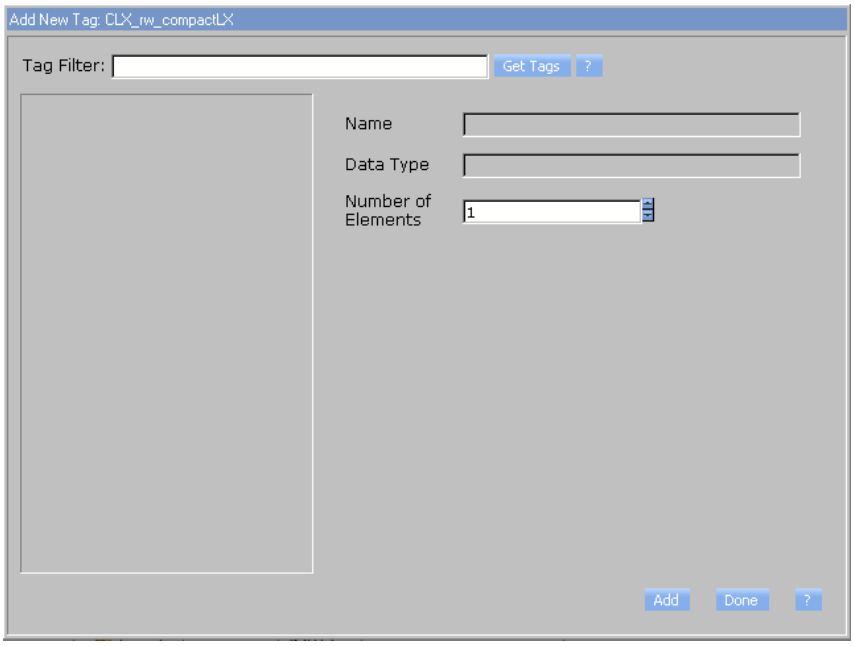
Import the ControlLogix Tags

Tags refer to individual data objects in the controllers that can be transferred to another controller.

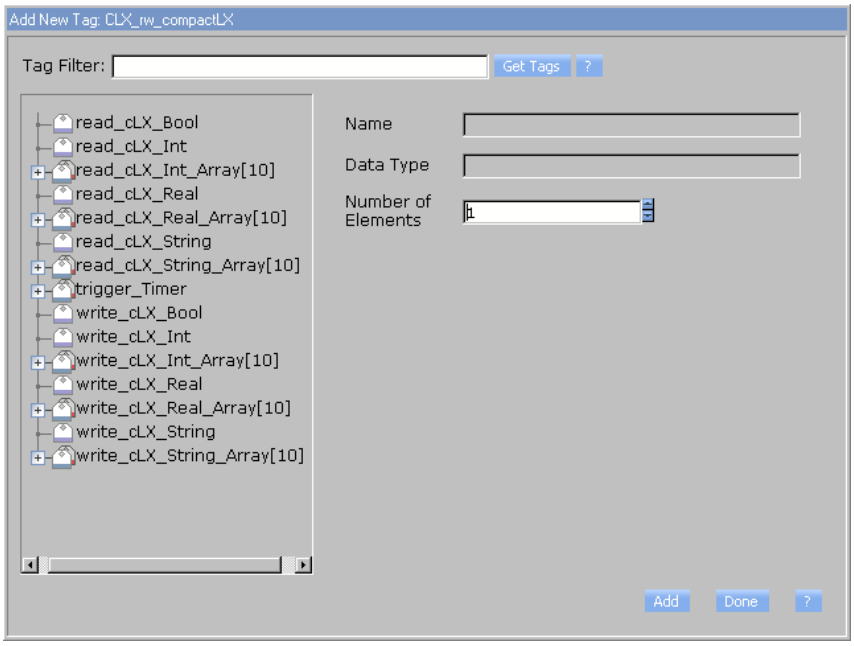
1 Expand the **CLX__RW_COMPACTLX** node, and then select **TAGS**.



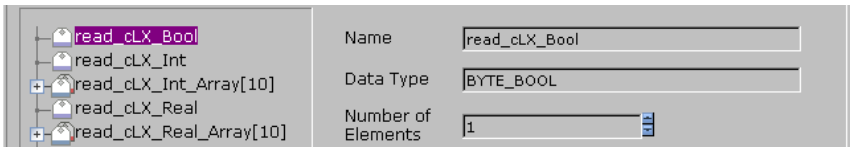
2 Click the **NEW** button. This action opens the **ADD NEW TAG** dialog box.



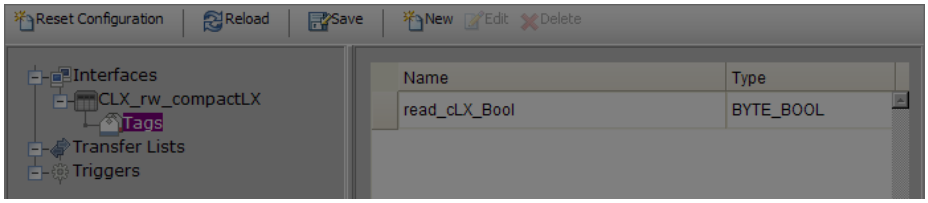
3 In the **ADD NEW TAG** dialog box, click **GET TAGS.** This action retrieves controller tags from the ControlLogix processor. Notice that the tags now appear in the left pane.



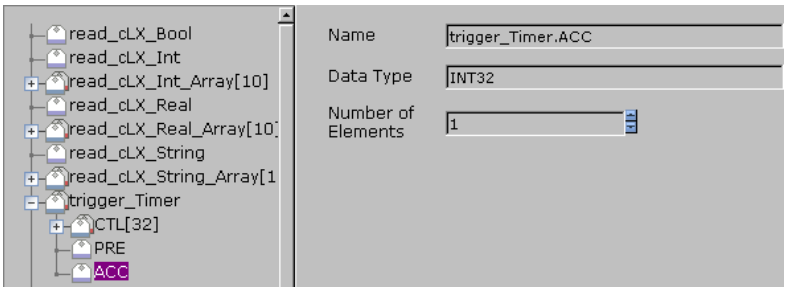
4 Select the tag **READ_CLX_BOOL**. Notice that the tag name and data type now appear in the right pane.



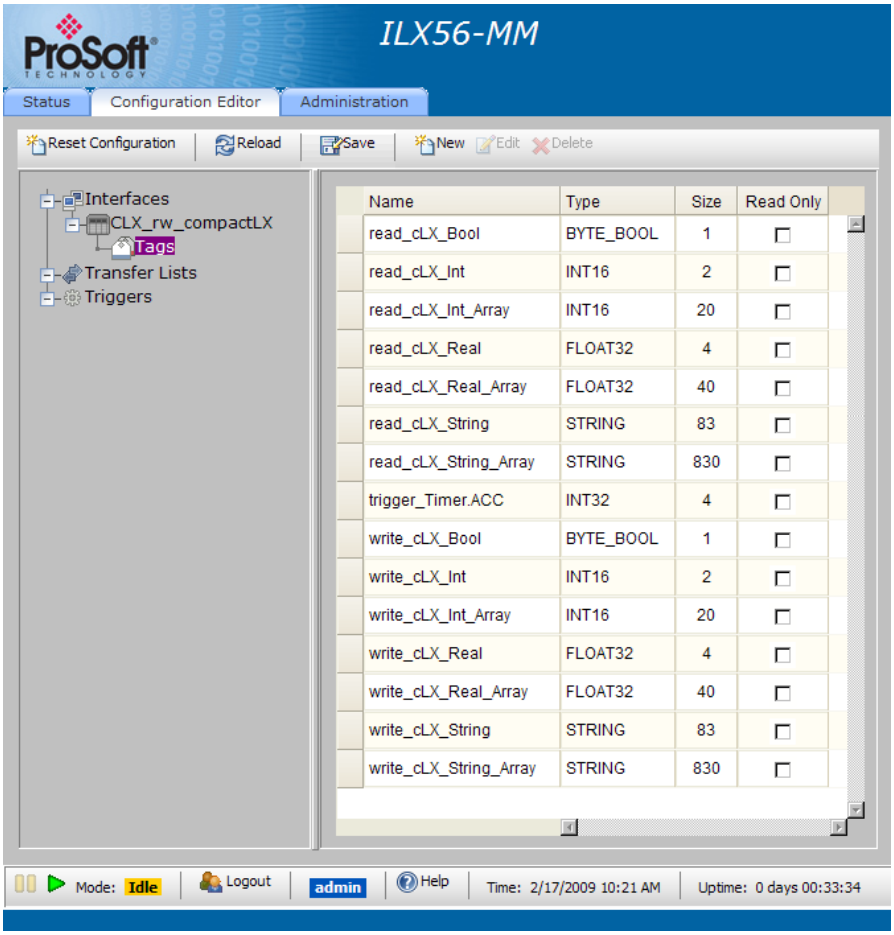
5 Click **ADD** to store the tag. Notice that the tag you added now appears in the Configuration Editor.



6 Repeat steps **4** and **5** to add the rest of the **READ** and **WRITE** tags, and the **TRIGGER_TIMER.ACC** tag.



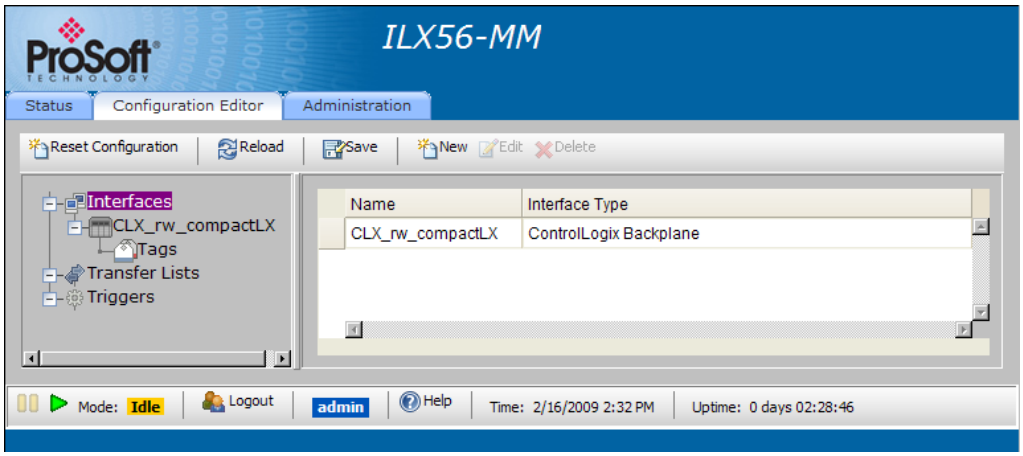
7 When you have finished adding tags, click the **DONE** button. Notice that the tags now appear in the right pane of the **CONFIGURATION EDITOR** tab.



Create the Ethernet Bridge

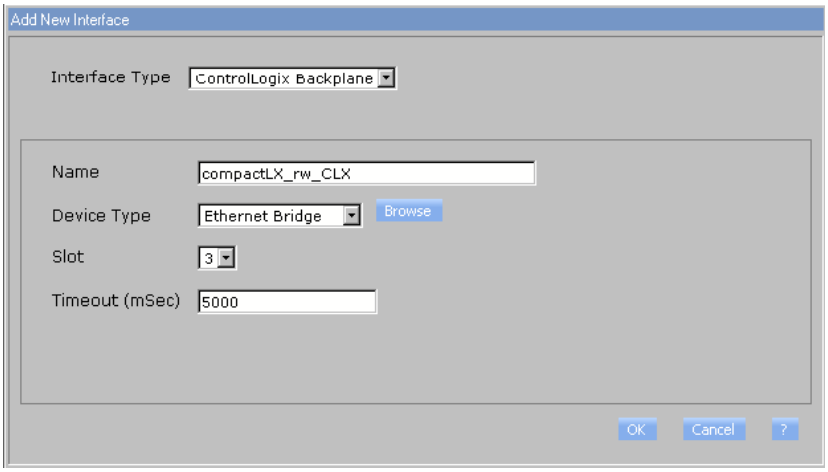
An Interface defined as a bridge will contain a Devices node under it in the Configuration Editor tree.

1 Expand the **INTERFACES** node.

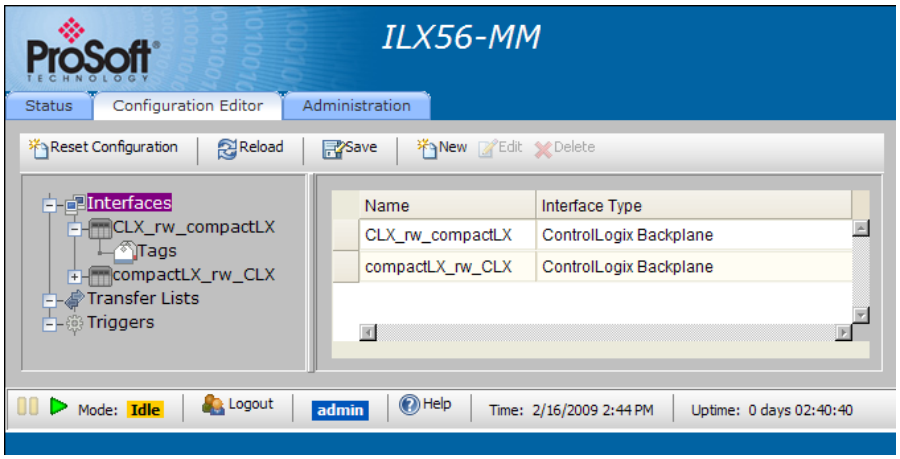


2 In the toolbar below the tabs, click the **NEW** button. This action opens the **ADD NEW INTERFACE** dialog box.

3 Fill in the fields in the dialog box as shown in the following illustration. These settings specify that the ILX56-MM will communicate through the backplane to the 1756-ENBT located in slot 3.

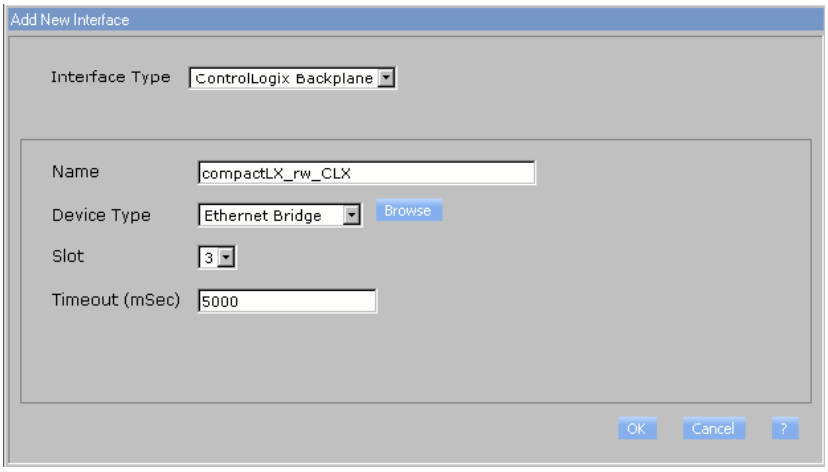


4 Click **OK** to store the interface. Notice that the interface you created now appears in the **CONFIGURATION EDITOR** tab.

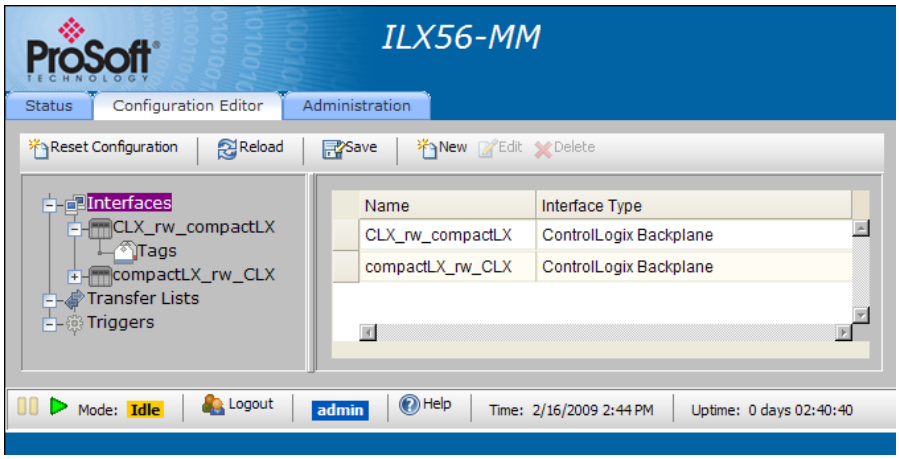


Create the CompactLogix Interface

1. In the left pane of the **CONFIGURATION EDITOR** tab, select the **INTERFACES** node.
2. In the toolbar below the tabs, click the **NEW** button. This action opens the **ADD NEW INTERFACE** dialog box.
3. Create the CompactLogix interface. Fill in the fields in the dialog box as shown in the following illustration.



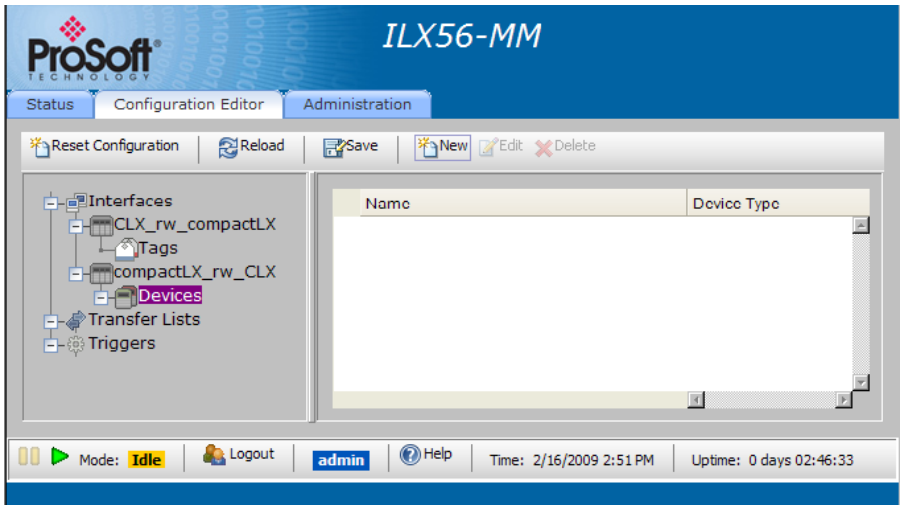
4. Click **OK** to store the interface. Notice that the interface you created now appears in the **CONFIGURATION EDITOR** tab.



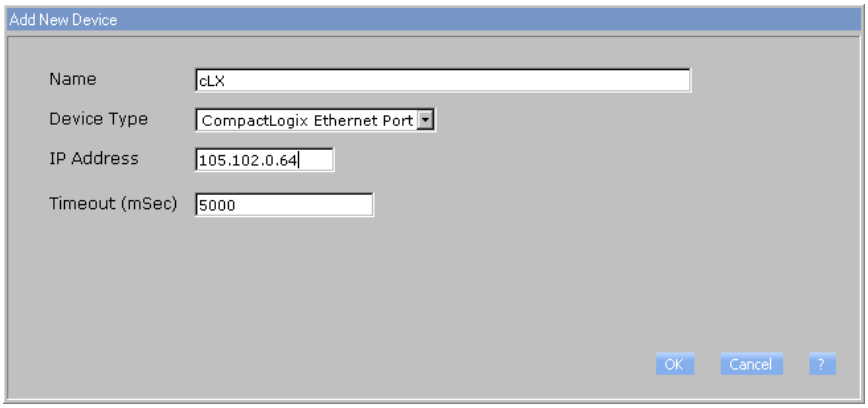
Create the CompactLogix Device

Devices are used to configure bridges and controllers that are remotely connected through bridges in the local rack or one of the Ethernet ports on the module.

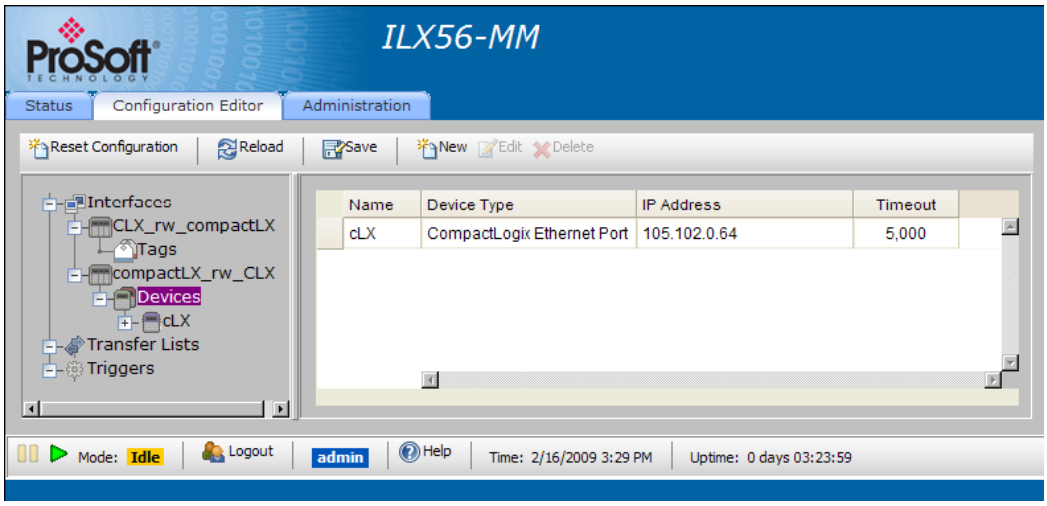
1 Expand the **COMPACTLX_RW_CLX** node, and then select **DEVICES.**



2 In the toolbar below the tabs, click the **NEW** button. This action opens the Add New Device dialog box. Fill in the fields in the dialog box as shown in the following illustration.

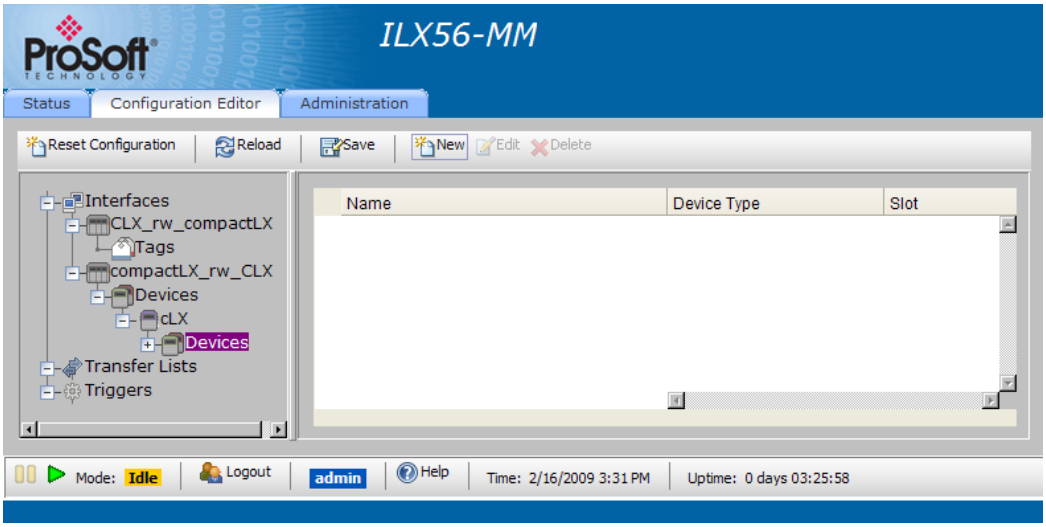


3 Click **OK** to store the device. Notice that the device you created now appears in the **CONFIGURATION EDITOR** tab.



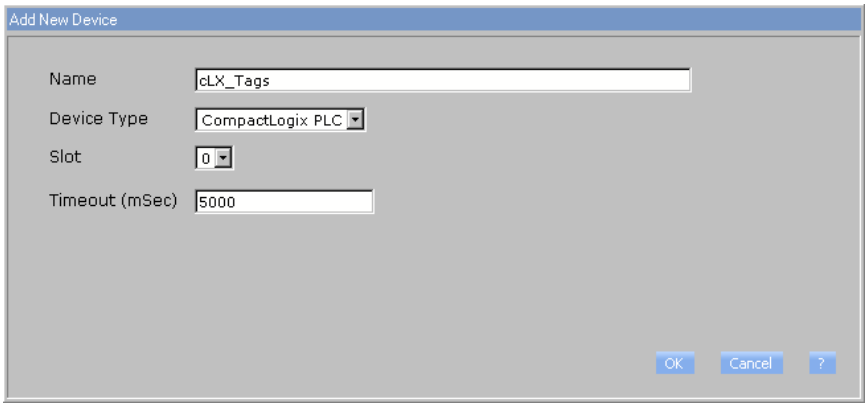
Create the CompactLogix Tags

1 Expand the **CLX** node, and then select **DEVICES**.

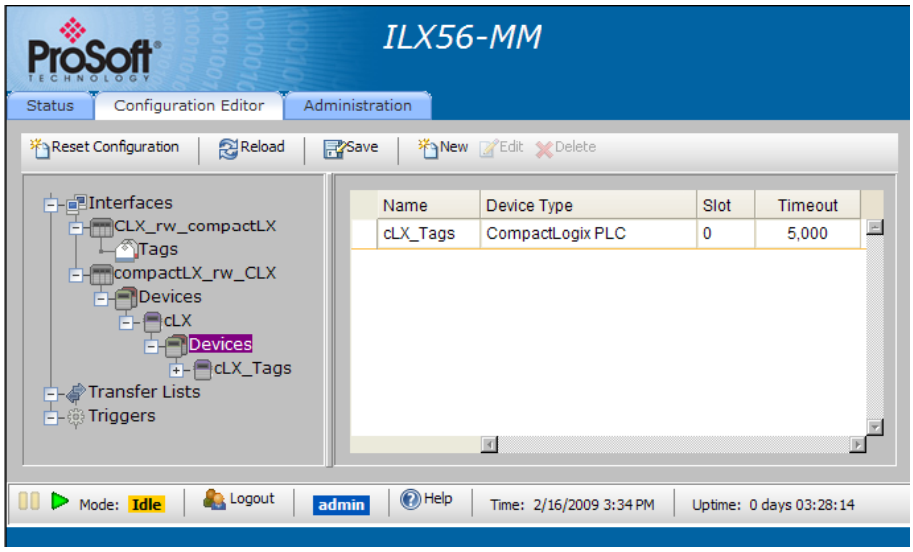


2 Click the **NEW** button. This action opens the **ADD NEW DEVICE** dialog box.

3 Create the **CLX_TAGS** device Fill in the fields in the dialog box as shown in the following illustration.



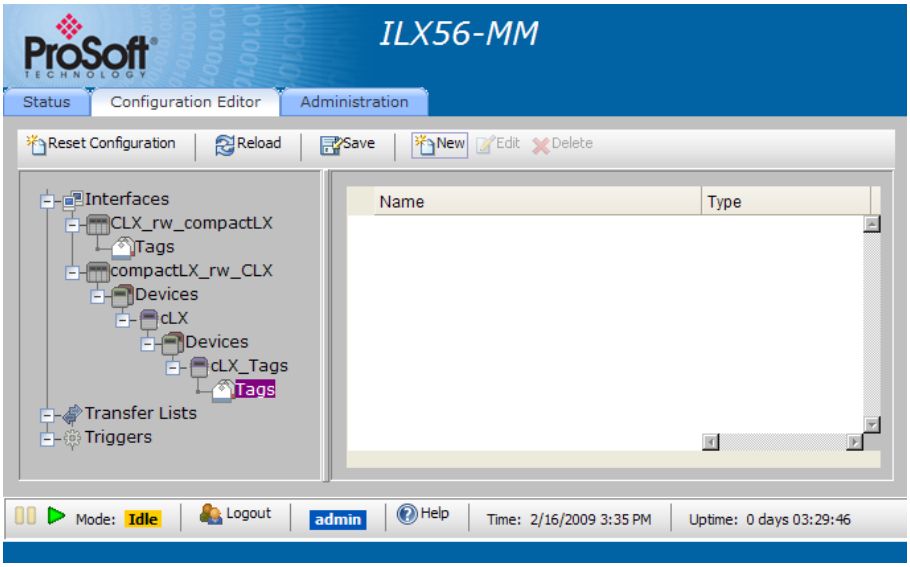
4 Click **OK** to store the device. Notice that the device you created now appears in the **CONFIGURATION EDITOR** tab.



Import the CompactLogix Tags

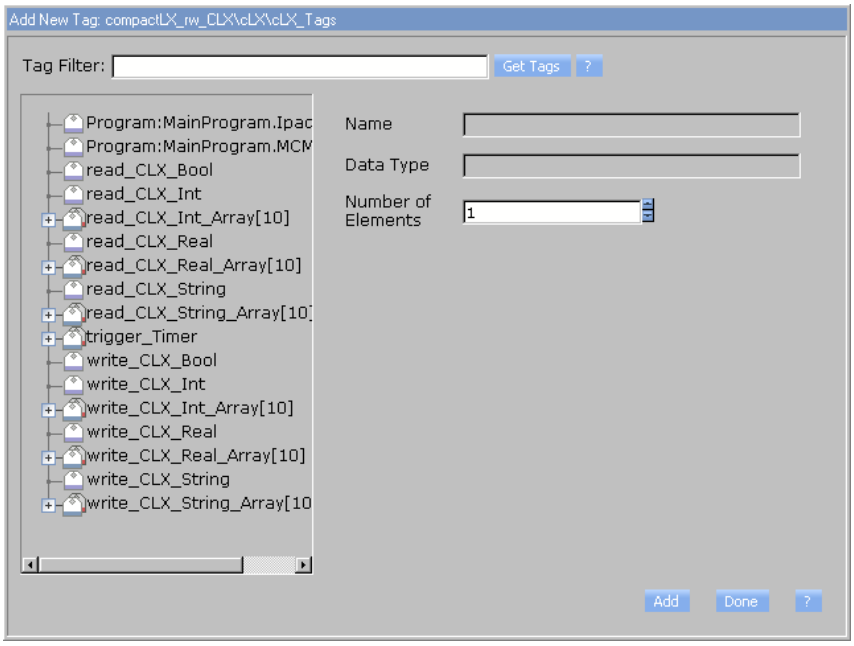
Tags refer to individual data objects in the controllers that can be transferred to another controller.

1 Expand the **COMPACTLX_RW_CLX** node, and then select **TAGS**.

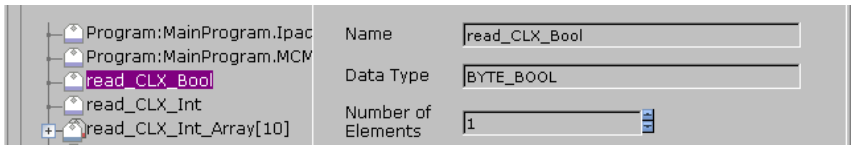


2 Click the **NEW** button. This action opens the **ADD NEW TAG** dialog box.

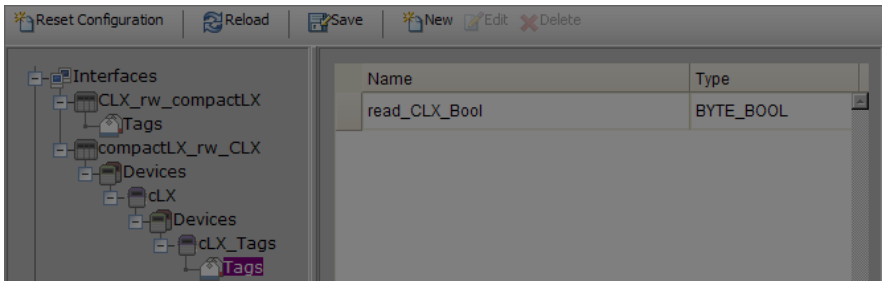
3 In the **ADD NEW TAG** dialog box, click **GET TAGS.** This action retrieves controller tags from the CompactLogix processor. Notice that the tags now appear in the left pane.



4 Select the tag **READ_CLX_BOOL**. Notice that the tag name and data type now appear in the right pane.

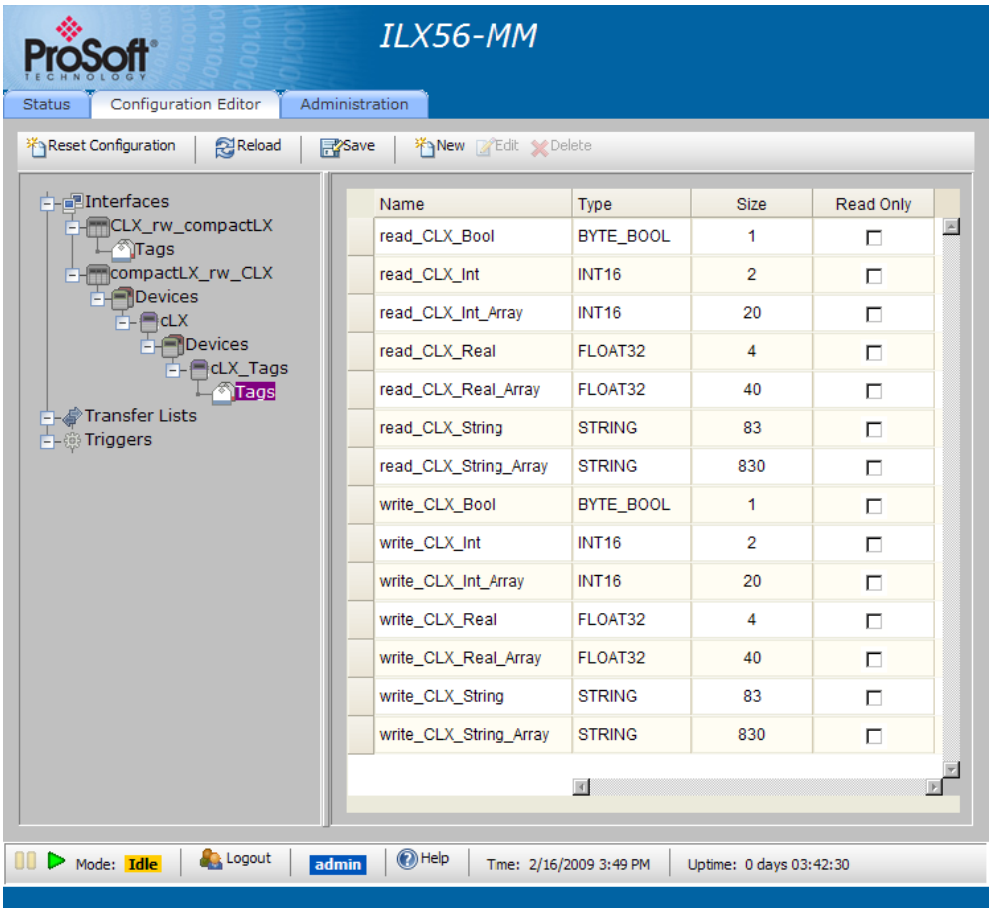


5 Click **ADD** to store the tag. Notice that the tag you added now appears in the Configuration Editor.



6 Repeat steps **4** and **5** to add the rest of the **READ** and **WRITE** tags.

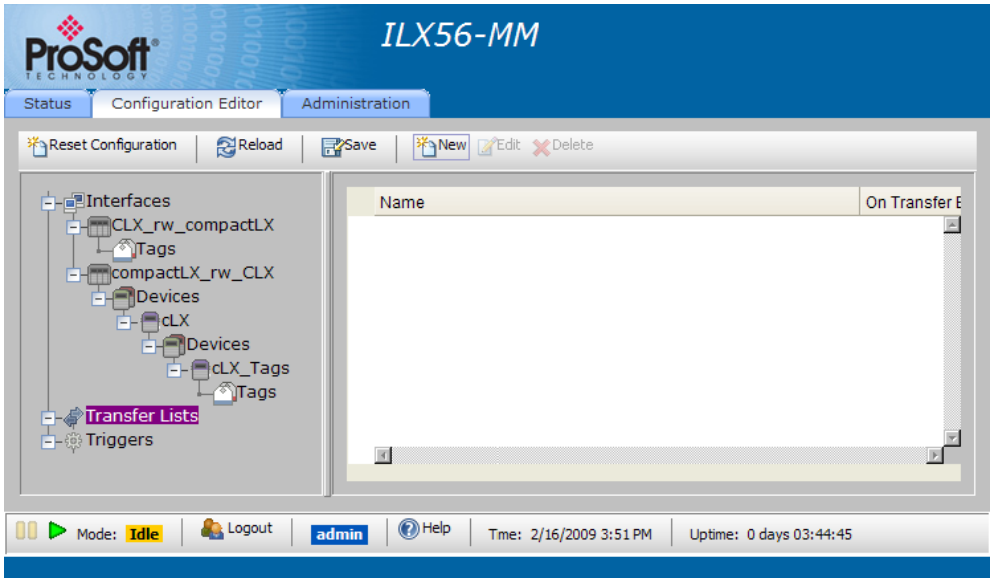
7 When you have finished adding tags, click the **DONE** button. Notice that the tags now appear in the right pane of the **CONFIGURATION EDITOR** tab.



Create the Transfer List

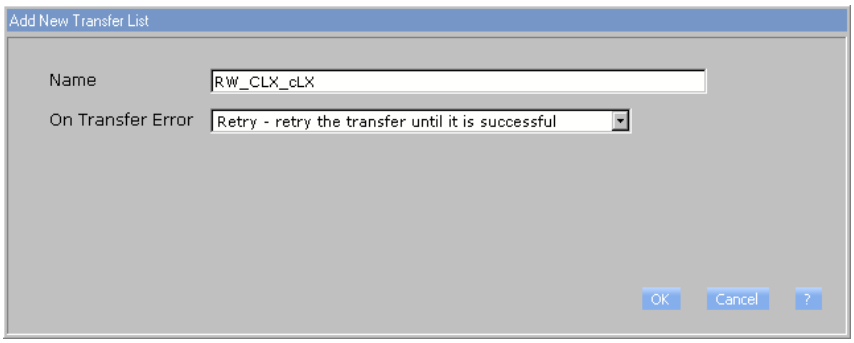
A Transfer List is a list of Transfers that specify what data is transferred between the programmable controllers.

1 Select the **TRANSFER LISTS** node.

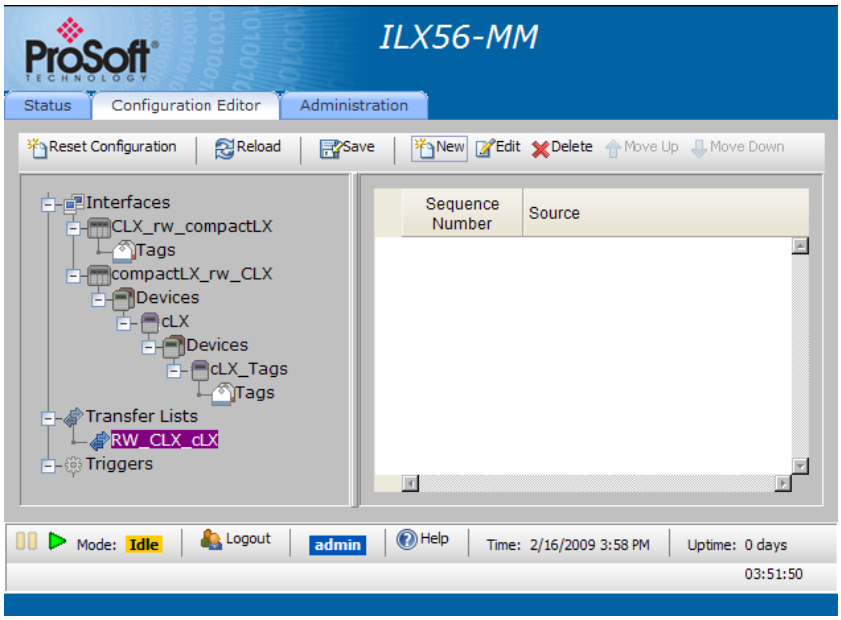


2 In the toolbar below the tabs, click the **NEW** button. This action opens the **ADD NEW TRANSFER LIST** dialog box.

3 Create the **RW_CLX_cLX** Transfer List. Fill in the fields in the dialog box as shown in the following illustration.



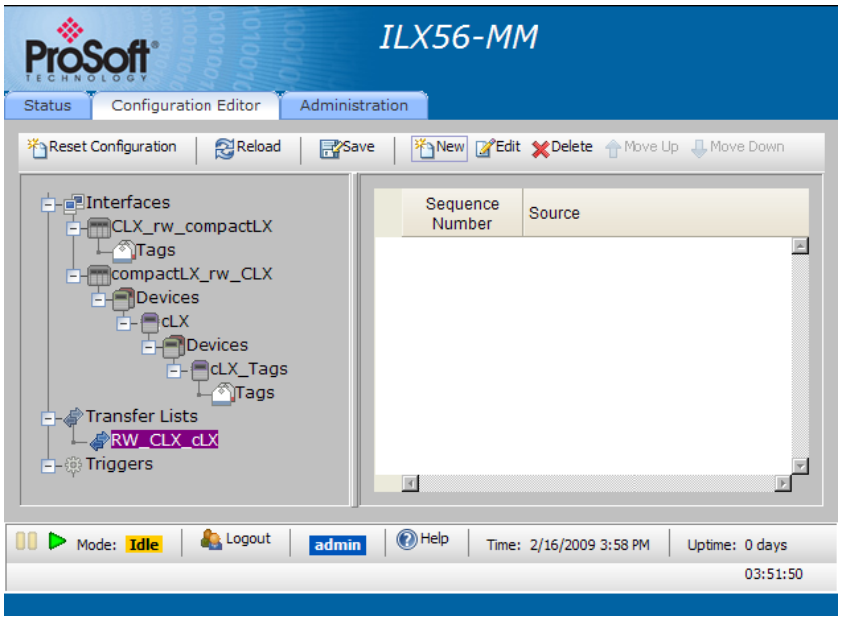
4 Click **OK** to store the transfer list. Notice that the transfer list you created now appears in the **CONFIGURATION EDITOR** tab.



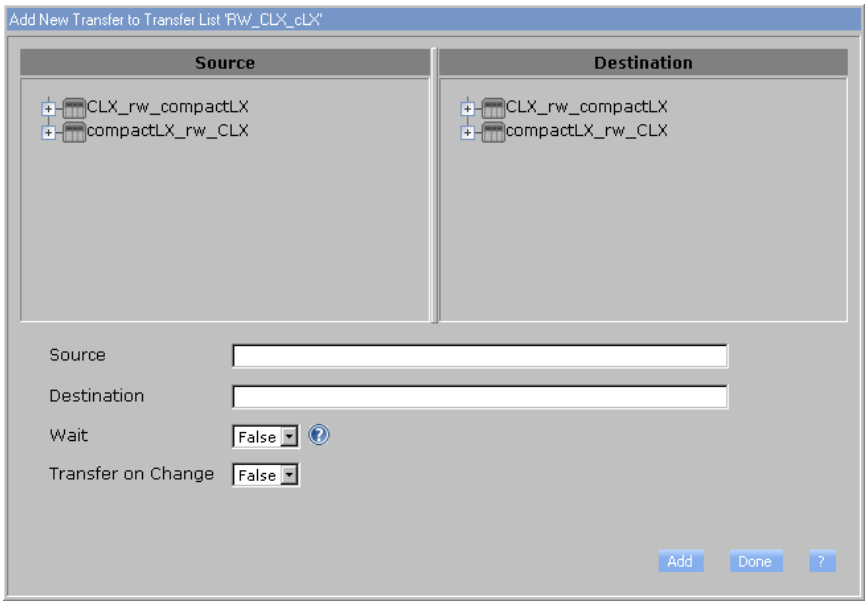
Add Transfers to the Transfer List

A Transfer specifies a Source and a Destination and includes a Sequence Number, Wait indicator, and a Transfer on Change indicator.

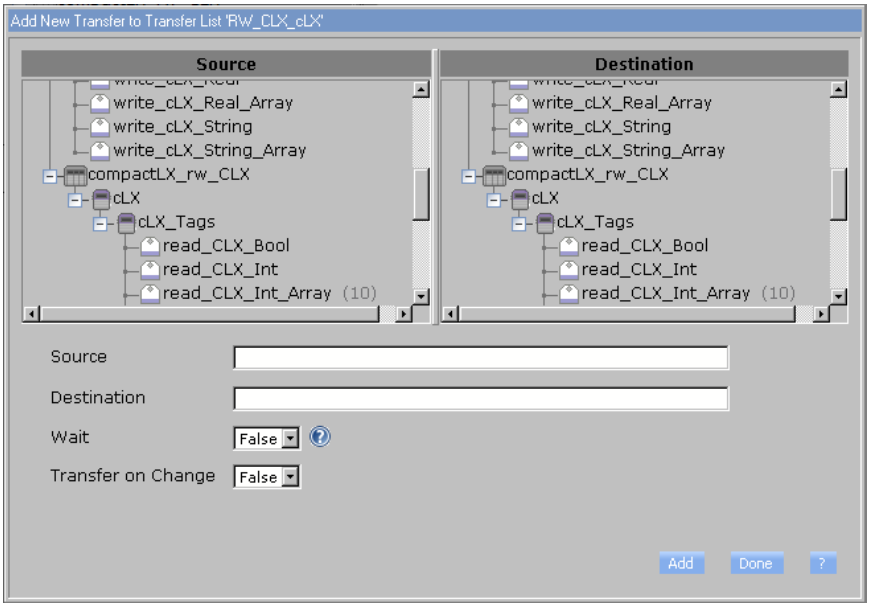
1 Expand the **TRANSFER LISTS** node, and then select **RW_CLX_cLX**.



2 Click the **NEW** button. This action opens the **ADD NEW TRANSFER** dialog box.

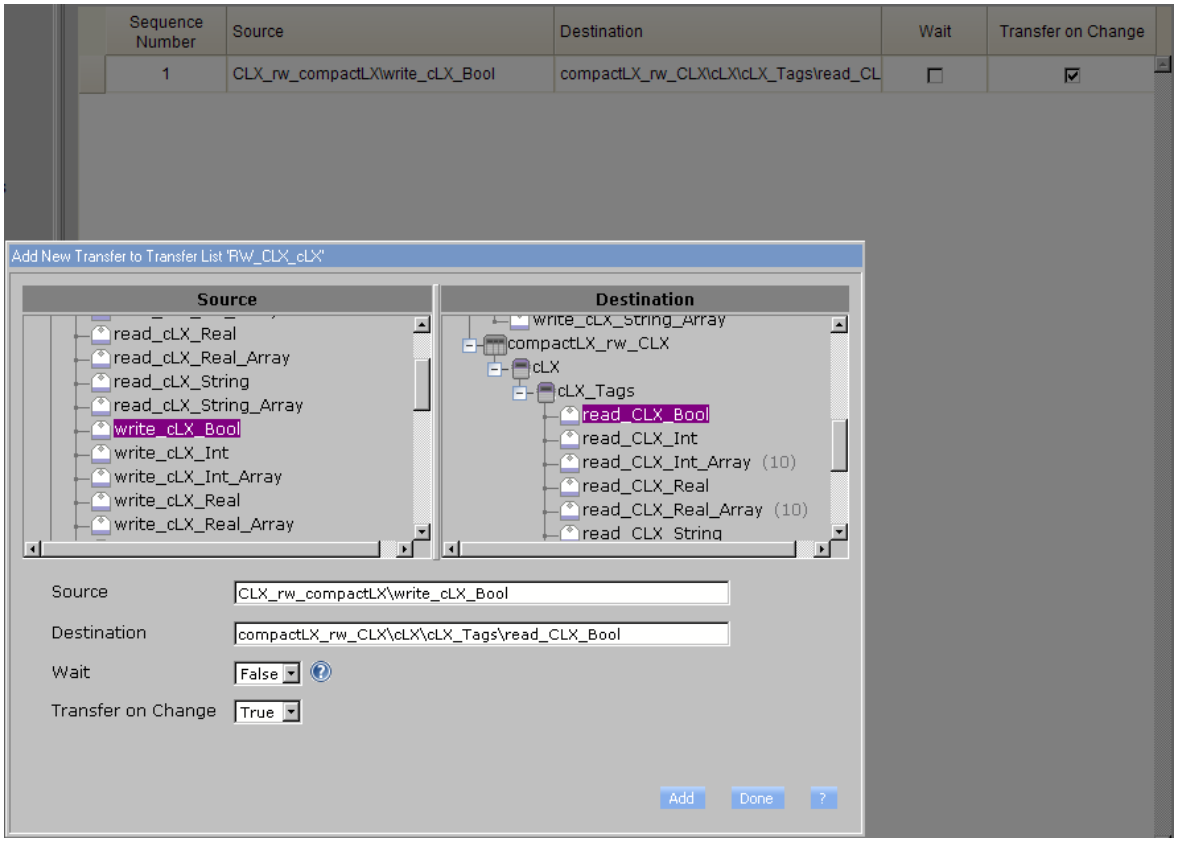


3 Click to expand all the interfaces.



For the Sample Application, the ControlLogix processor will write data to the CompactLogix processor, and the ControlLogix processor will also read data from the CompactLogix processor. In the following steps, you will match the ControlLogix **WRITE** tags in the Source pane to the CompactLogix **READ** tags in the Destination pane.

1 In the Source pane, select ControlLogix Tag **WRITE_CLX_BOOL**. In the Destination pane, select CompactLogix tag **READ_CLX_BOOL,** and then click the **ADD** button to store the transfer. Notice that the Transfer appears in the **CONFIGURATION EDITOR** tab.



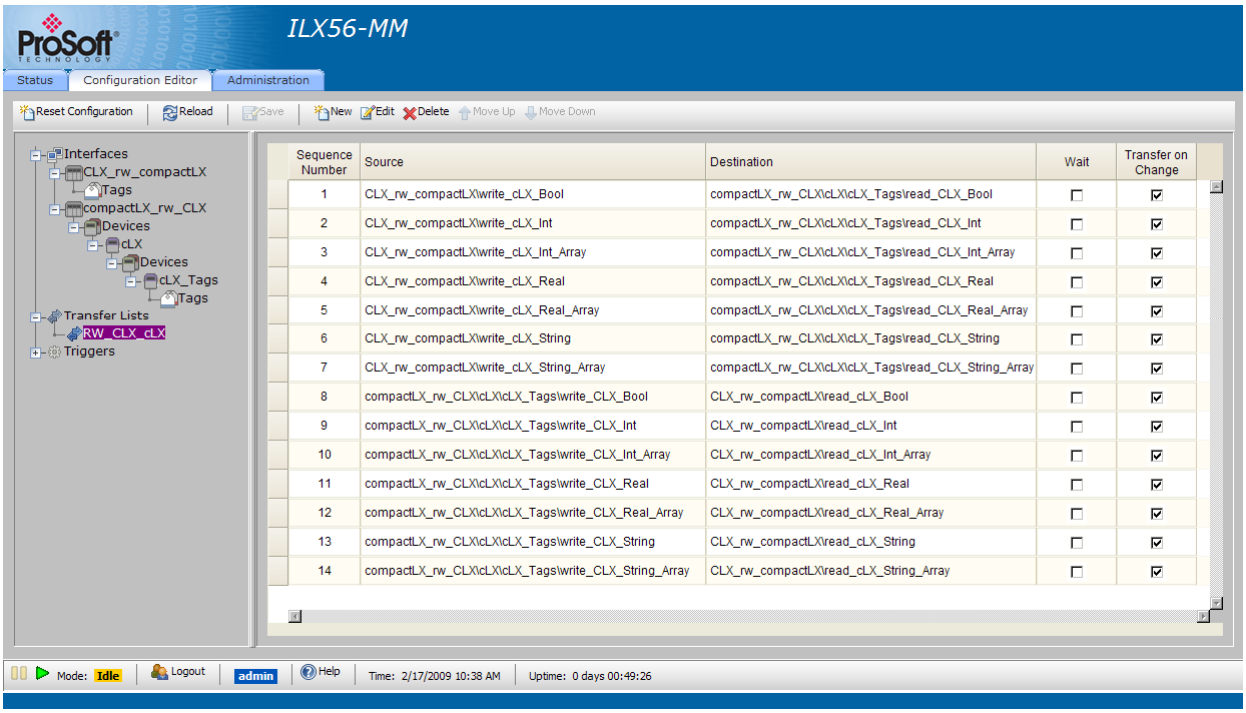
2 In the Source pane, select ControlLogix Tag **WRITE_CLX_INT.** In the Destination pane, select CompactLogix tag **READ_CLX_INT,** and then click the **ADD** button to store the transfer.

3 Continue matching Source and Destination tags until you have assigned all of them to the Transfer List.

4 Next, match the ControlLogix **WRITE** tags in the Source pane to the CompactLogix **READ** tags in the Destination pane.

Important: Verify that the Data Type is the same for each pair of Source and Destination tags.

5 When you have finished adding transfers, verify that there are now fourteen transfers in the transfer list, and then click the **DONE** button. If the transfers in your list do not match the following illustration, go back and correct any errors before continuing.

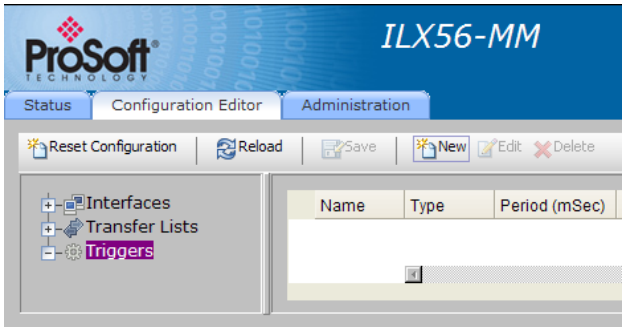


Sequence Number	Source	Destination	Wait	Transfer on Change
1	CLX_rw_compactLX\write_cLX_Bool	compactLX_rw_CLX\cLX\cLX_Tags\read_CLX_Bool	☐	☑
2	CLX_rw_compactLX\write_cLX_Int	compactLX_rw_CLX\cLX\cLX_Tags\read_CLX_Int	☐	☑
3	CLX_rw_compactLX\write_cLX_Int_Array	compactLX_rw_CLX\cLX\cLX_Tags\read_CLX_Int_Array	☐	☑
4	CLX_rw_compactLX\write_cLX_Real	compactLX_rw_CLX\cLX\cLX_Tags\read_CLX_Real	☐	☑
5	CLX_rw_compactLX\write_cLX_Real_Array	compactLX_rw_CLX\cLX\cLX_Tags\read_CLX_Real_Array	☐	☑
6	CLX_rw_compactLX\write_cLX_String	compactLX_rw_CLX\cLX\cLX_Tags\read_CLX_String	☐	☑
7	CLX_rw_compactLX\write_cLX_String_Array	compactLX_rw_CLX\cLX\cLX_Tags\read_CLX_String_Array	☐	☑
8	compactLX_rw_CLX\cLX\cLX_Tags\write_CLX_Bool	CLX_rw_compactLX\read_cLX_Bool	☐	☑
9	compactLX_rw_CLX\cLX\cLX_Tags\write_CLX_Int	CLX_rw_compactLX\read_cLX_Int	☐	☑
10	compactLX_rw_CLX\cLX\cLX_Tags\write_CLX_Int_Array	CLX_rw_compactLX\read_cLX_Int_Array	☐	☑
11	compactLX_rw_CLX\cLX\cLX_Tags\write_CLX_Real	CLX_rw_compactLX\read_cLX_Real	☐	☑
12	compactLX_rw_CLX\cLX\cLX_Tags\write_CLX_Real_Array	CLX_rw_compactLX\read_cLX_Real_Array	☐	☑
13	compactLX_rw_CLX\cLX\cLX_Tags\write_CLX_String	CLX_rw_compactLX\read_cLX_String	☐	☑
14	compactLX_rw_CLX\cLX\cLX_Tags\write_CLX_String_Array	CLX_rw_compactLX\read_cLX_String_Array	☐	☑

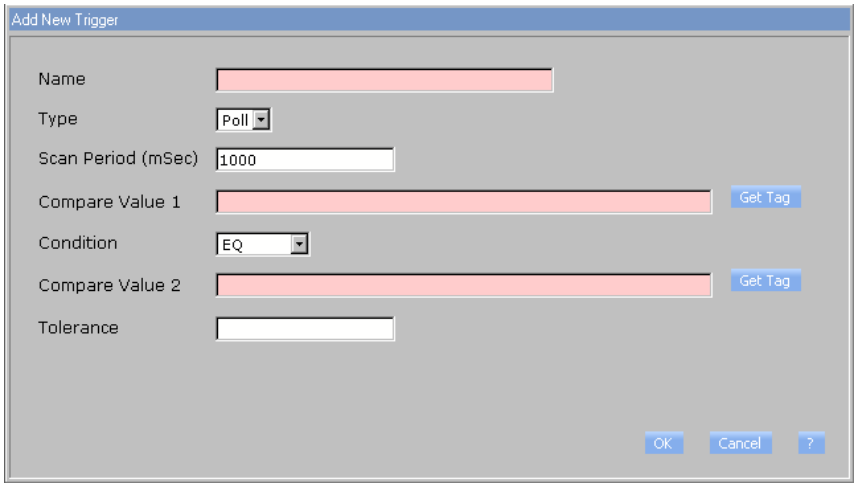
Create a Trigger

Triggers are used to define when the data is transferred from one programmable controller to another.

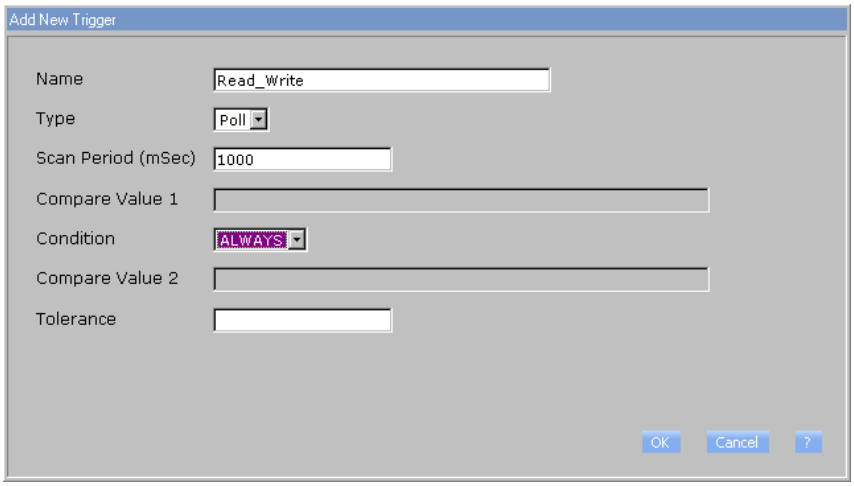
1 Select the **TRIGGERS** node.



2 Click the **NEW** button. This action opens the **ADD NEW TRIGGER** dialog box.

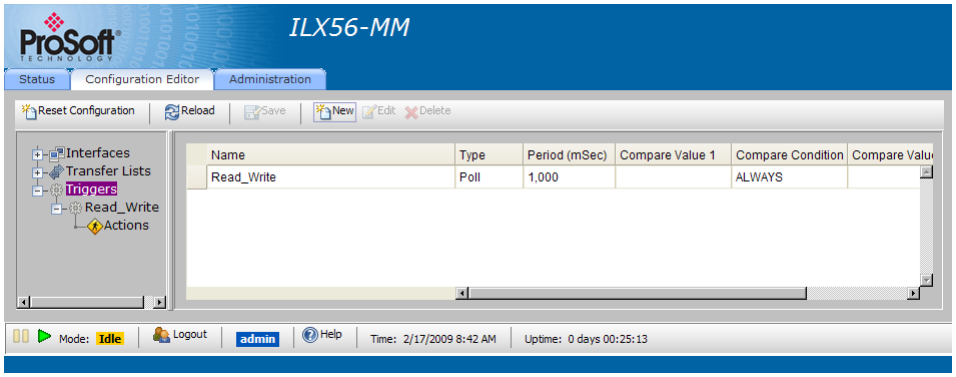


3 Create the trigger. Fill in the fields in the dialog box as shown in the following illustration.



Note: When you select the Condition ALWAYS, the COMPARE VALUE fields are not accessible, meaning that this trigger will always be executed, regardless of the contents of each tag.

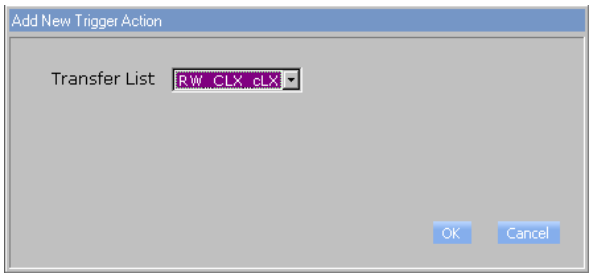
4 Click **OK** to store the trigger. Notice that the trigger now appears in the **CONFIGURATION EDITOR** tab.



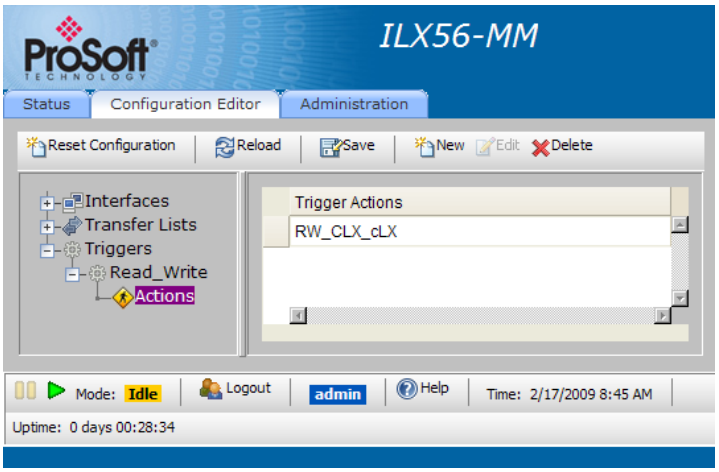
Create a Trigger Action

A Trigger Action specifies the transfer list to execute when the action is triggered. For the Sample Application, the Trigger Action will execute the Transfer List you created in a previous step (page 41).

1 Expand the **TRIGGERS** node, and then select **ACTIONS**.
2 In the toolbar below the tabs, click the **NEW** button. This action opens the **ADD NEW TRIGGER ACTION** dialog box.



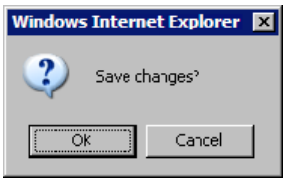
3 Select **RW_CLX_cLX** from the dropdown list, and then click **OK** to store the trigger action. Notice that the trigger action you created now appears in the Configuration Editor tab.



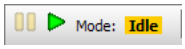
4.5.2 Save and Start the Sample Application

The final task consists of saving the sample application and placing the module in RUN mode.

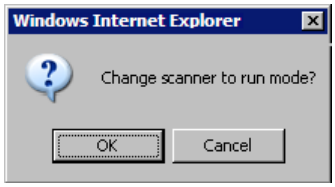
1 In the toolbar below the tabs, click the **SAVE** button. This action opens a confirmation dialog box. Click **OK** to continue.



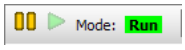
2 Next, place the module in Run mode. In the status bar at the bottom of the window, click the green Arrow button.



3 Click **OK** when prompted to confirm Run mode.



4 Notice that the module has switched to Run mode.



4.6 Verify Communication

There are several ways to verify that the ILX56-MM module is communicating with the processor and with the Modbus network. You can ...

- View the RSLogix 5000 Controller Tags.
- View Chassis Status (page 50)
- View Resources (page 51)
- View Data Transfer Statistics (page 51)
- View Trigger Statistics (page 52)

4.6.1 Viewing the RSLogix 5000 Controller Tags

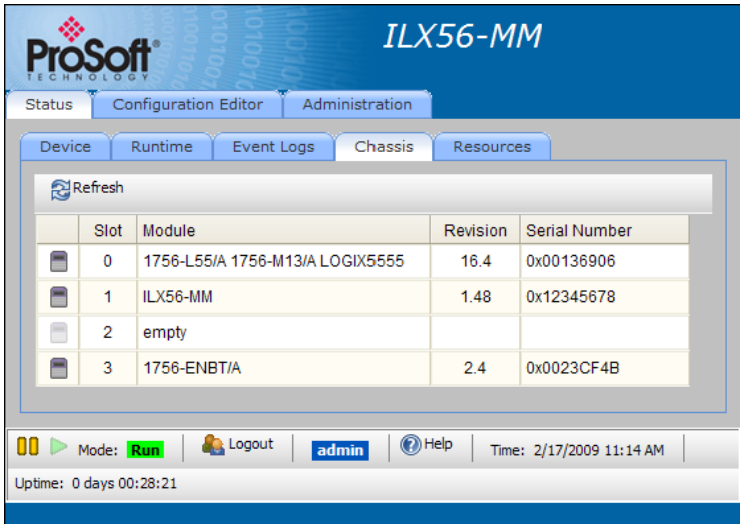
In RSLogix 5000, go online to the ControlLogix processor, and navigate to the following controller tags.

read_cLX_Int	25311	read_cLX_Int	28086
write_cLX_Int	-28589	write_cLX_Int	-7252

If the ILX56-MM module is communicating, you will be able to observe these tag values changing.

4.6.2 Viewing Chassis Status in the ILX56-MM Module

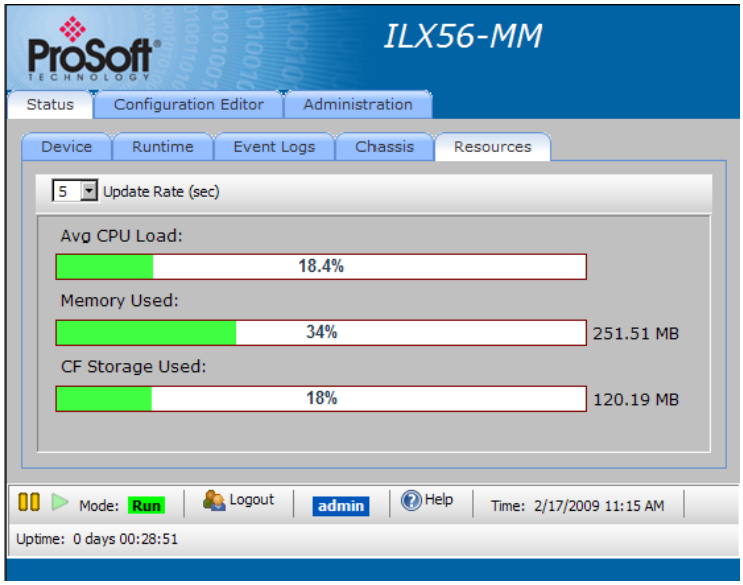
Log into the ILX56-MM module's web page, click the **STATUS** tab, and then click the **CHASSIS** tab.



If the ILX56-MM module is communicating, you will be able to see the ControlLogix processor and the other modules in the chassis.

4.6.3 Viewing Resources Status in the ILX56-MM Module

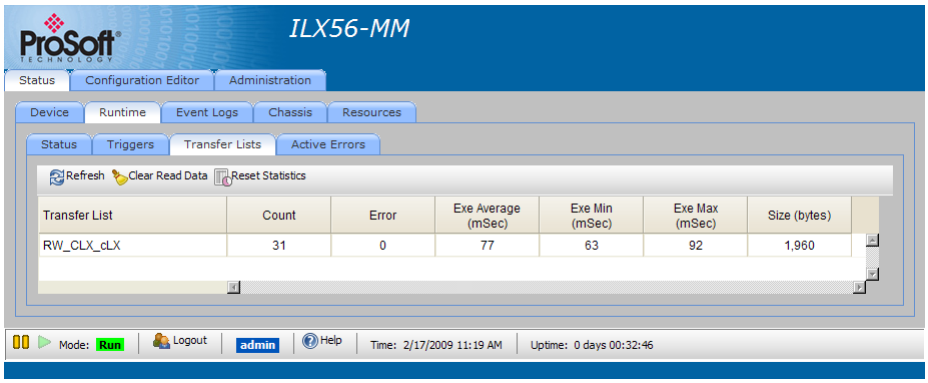
Log into the ILX56-MM module's web page, click the **STATUS** tab, and then click the **RESOURCES** tab.



If the ILX56-MM module is communicating, you will be able to observe the statistics for the module's CPU usage, Memory and CF Storage.

4.6.4 Viewing Data Transfer Statistics in the ILX56-MM Module

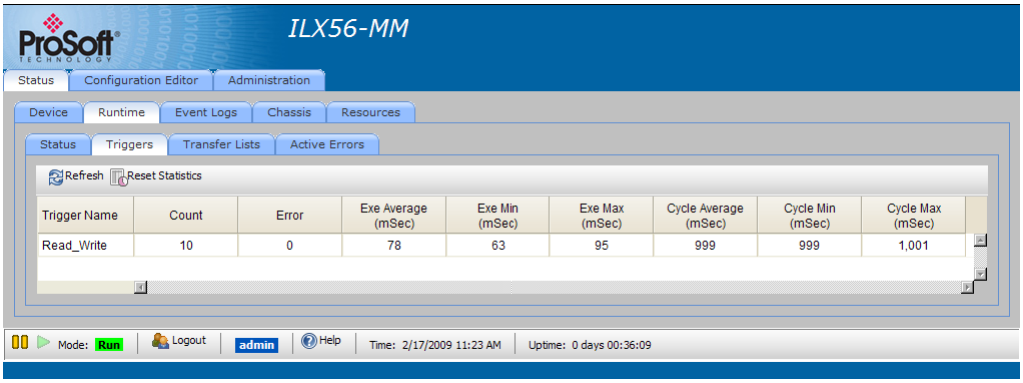
Log into the ILX56-MM module's web page, click the **STATUS** tab, the **RUNTIME** tab, and then the **TRANSFER LISTS** tab.



If the ILX56-MM module is communicating, these values will be populated. Click the **REFRESH** button and observe that the **COUNT** field increments once per second.

4.6.5 Viewing Trigger Statistics in the ILX56-MM Module

Log into the ILX56-MM module's web page, click the **STATUS** tab, the **RUNTIME** tab, and then the **TRIGGERS** tab.



If the ILX56-MM module is communicating, these values will be populated. Click the **REFRESH** button and observe that the **COUNT** field increments once per second.

5 Conclusion

In This Chapter

❖ Frequently Asked Questions 53

Now that you have installed, configured, and verified the ILX56-MM module, the next step is to incorporate the module into your own application.

1. For more information about the ILX56-MM module, including detailed configuration, monitoring and troubleshooting information, refer to the ILX56-MM User Manual, on the ProSoft Solutions CD-ROM.
2. For a brief video tutorial, refer to the Training Video, on the ProSoft Solutions CD-ROM.
3. For technical support and warranty information for your ProLinx module, refer to Support, Service and Warranty in the ILX56-MM User Manual.
4. For more information on ProSoft Technology products and services, please visit http://www.prosoft-technology.com.

5.1 Frequently Asked Questions

What advantages does the Message Manager (ILX56-MM) offer over the traditional approach using Message Instructions in ladder logic?

The biggest advantage offered by the Message Manager is the ability to easily move data between diverse controller platforms and even between diverse process networks without the need for one single rung of ladder logic. Controllers from Rockwell Automation, Schneider Electric and Siemens use each processor's high speed Ethernet protocols. Rockwell Automation users have even more protocol choices for moving data, all without any ladder logic required. This allows the Message Manager to act as both a communications co-processors as well as a cross-platform communications bridge. Programming message instructions in PLCs use PLC program memory, processor scan time and can require complicated sequencing. The Message Manager eliminates all of this. Maintaining data transfers in a control system is now in one location versus message instructions in many PLC programs.

If ladder logic is not required for the Message Manager, how can message execution be controlled?

Bi-directional data transfers can be sent at regular timed intervals or based on the data value of designated "trigger" tags. Therefore, any tag value read from any configured controller can be designated as triggers to move specific data to and from other controllers on any network where that data may be needed. The built-in web-based configuration tool makes this easy to accomplish.

How do I configure the Message Manager?

The ILX56-MM has an easy-to-use, web browser interface for doing all required configuration tasks. No special software is required, as the web interface allows both local and remote access. Configurations are created on-line through the web interface, can be saved Off-Line to a PC and down-loaded to other Message Manager modules.

How many users can access the Message Manager configuration at the same time?

The Message Manager configuration can be viewed by multiple users at the same time. There is no need to log in to view configuration settings or on-line diagnostic information. For safety reasons, only one user may log in at a time to make changes to the configuration.

Why have two built-in Ethernet ports?

Having two Ethernet ports allows the Message Manager to operate on two separate subnets (network groups) at the same time. Either port can be used for connecting to your web browser for configuration. Having two ports also allows you to communicate on separate Modbus TCP/IP and/or Siemens Industrial Ethernet networks without having to physically interconnect the two networks.

What browsers are supported?

To fully implement all the advanced features of the Message Manager, ProSoft Technology recommends the use of Internet Explorer 7.0 (or higher). Older versions of Internet Explorer and other browsers may not offer full access to all Message Manager's features.

For initial connection to the module, what IP address should I use?

The default IP address for Port 1 is 192.168.1.254. The default for Port 2 comes from a DHCP server on the network.

6 Glossary of Terms

A

Administrator security level

The security level given to any username/password login account when the assigned user needs to be able to start or stop ILX56-MM data transfer operations, change the ILX56-MM configuration, or manage Username/Password login accounts and assign security access levels to those accounts.

ASCII

American Standard Code for Information Interchange. A communication mode in which each eight-bit byte in a message contains one ASCII character code. ASCII characters (or hexadecimal characters) are sometimes used as a key to encrypt data and ensure its secure transmission.

B

Baud Rate

The speed of communication between devices on the network. All devices must communicate at the same rate.

C

Client

A client is software program, or the device on which that program runs, that makes requests for information from a software program, or the device on which that program runs, in a client-server (page 58) relationship.

A Client on an Ethernet network is equivalent to a Master (page 57) on a serial network.

D

DCE

Data communications equipment. A modem, for example.

Default Gateway

The IP address of a network router where data is sent if the destination IP address is outside the local subnet. The gateway is the computer that routes the traffic from the local area network to other networks such as the Internet.

Device

A configuration option that is a subset of the Interface configuration that defines all the communication parameters required to make a backplane data transfer link through a Rockwell Automation (RA) 1756 chassis backplane to a communication bridge module in that chassis. The Device configuration is used only when a controller to be accessed is an RA controller and the data transfer link must go through RA network bridges to establish a communications link.

DTE

Data terminal equipment. A computer or terminal, for example.

E

ESD

Electrostatic Discharge. Can cause internal circuit damage to the coprocessor.

Ethernet

A set of network cabling and network access (CSMA/CD) protocol standards for bus topology computer networks invented by Xerox but now controlled by the 802.3 subcommittee of the IEEE.

F

Firmware

Software for embedded computers.

Full-Duplex

Simultaneous two-way independent transmission in both directions

H

Half-Duplex

A circuit designed to transmit in either direction, but not in both simultaneously.

I

Interface

A configuration option that defines all the communication parameters required to make a data transfer link one controller to another controller. An Interface configuration also includes Tag definitions of data points to be used for data transfer between target controllers. Up to 16 separate Interfaces (controller and associated Tags), may be defined for the ILX56-MM.

IP Address

An identifier for a computer or device in a TCP/IP network. Networks using the TCP/IP Protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be 0 to 255. For example, 192.168.0.100 could be an IP address.

L

LED

Light-emitting diode.

M

MAC ID

A unique hexadecimal number that identifies any Ethernet device.

Master

A Master is a device that makes requests for information from a software program, or the device on which that program runs, in a client-server (page 58) relationship.

A Client on an Ethernet (page 56) network is equivalent to a Master (page 57) on a Serial (page 58) network.

N

Network

A series of stations or nodes connected by some type of communication medium. A network may consist of a single link or multiple links.

Node

An address or software location on the network.

P

Peer-to-Peer

A network relationship between devices where each device can send commands as a master or client, and respond to commands as a slave or server.

Poll

A data transfer operation whereby one device or controller sends a message to another device or controller, which then generally sends a response message back to the originating device or controller. A Poll message may be a request to either read data from the other controller or write data to the other controller. In the ILX56-MM, polls are created based on the configurations entered for Interface, Tags, Transfer Lists, and Triggers.

Power Supply

Device that supplies power to the I/O chassis containing the processor and coprocessor, or to other modules.

Project Security Level

The security level given to any username/password login account when the assigned user needs to be able to start or stop ILX56-MM data transfer operations or change the ILX56-MM configuration.

Protocol

The language or packaging of information that is transmitted between nodes on a network.

R

RS-232

Recommended Standard 232; the standard for serial binary signals between a DTE and a DCE.

S

Serial

Data that is transferred one bit at a time.

Server

A Server is a software program, or the device on which that program runs, that provides a specific kind of service to a Client (page 55) software program, or the device on which that program runs, on an Ethernet network.

A Server on an Ethernet network is equivalent to a Slave (page 58) on a Serial (page 58) network.

Simplex

A circuit capable of operating in only one direction.

Slave

A Slave is a software program, or the device on which that program runs, that provides a specific kind of service to a Master (page 57) software program, or the device on which that program runs, on a serial network.

A Slave on a Serial network is equivalent to a Server (page 58) on an Ethernet (page 56) network.

Subnet Mask

A mask used to determine what subnet an IP address belongs to. An IP address has two components: the network address, and the host address. For example, consider the IP address 150.215.017.009. Assuming this is part of a Class B network (with a subnet mask of 255.255.0.0), the first two numbers (150.215) represent the Class B network address, and the second two numbers (017.009) identify a particular host on this network.

T

Tag

A configuration option that is a subset of the Interface configuration that defines all the parameters required to make a data transfer link to a single data point or data array in a target controller.

Target Controller

Any controller that has been defined to be part of a Interface configuration for data transfer operations. Memory registers or data structures in a target controller may be used as the Source of data to be transferred or may be the destination into which data will be transferred.

Transfer List

A configuration option that defines specific data transfer links between any two target controllers. The Transfer List will consist of one or more items that list an Interface/Tag combination as the data Source and an Interface/Tag combination as the data Destination. For successful data transfer, the data type of the Destination Interface/Tag must be the same as the Source Interface/Tag data type; that is, both must be Binary, 8-bit Integer, 16-bit Integer, 32-bit Integer, 32-bit Floating Point, String, and so forth. Transfer Lists provide a convenient way of grouping data transfer operations.

Trigger

A way to control execution of Transfer Lists. Triggers may be configured using time intervals for regular periodic polling or logical events to poll only under the specific Boolean logical conditions of designated Tag values, such as tag value is greater than, less than, equal to, or not equal to another tag value or constant. The same Trigger may be assigned to control more than one Transfer List.

Index

A

About the ILX56-MM • 7
About the Sample Ladder Logic • 14
Add Transfers to the Transfer List • 42
Administrator security level • 55
Architecture • 11
ASCII • 55

B

Battery Life Advisory • 3
Baud Rate • 55
Before You Begin • 9

C

Client • 55, 58
CompactLogix Ladder • 17
Conclusion • 53
Configure the CompactLogix Processor • 11, 25
Configure the ControlLogix Processor • 11, 23
Configure the ILX56-MM Module • 11, 27
Connect the ControlLogix and CompactLogix racks to the Ethernet Network • 11, 27
Connect your PC to the CompactLogix Processor • 25
Connect your PC to the ControlLogix Processor • 23
ControlLogix Ladder • 15
Create a Trigger • 46
Create a Trigger Action • 48
Create the Application • 27
Create the CompactLogix Device • 35
Create the CompactLogix Interface • 34
Create the CompactLogix Tags • 37
Create the ControlLogix Controller Interface • 28
Create the Ethernet Bridge • 32
Create the Transfer List • 41, 48

D

DCE • 55
Default Gateway • 55
Device • 56
Download the Sample Program to the Processor • 7, 24, 26
DTE • 56

E

ESD • 56
Ethernet • 56, 57, 58

F

Firmware • 56
Frequently Asked Questions • 53
Full-Duplex • 56

G

General Overview • 11

H

Half-Duplex • 56
How the Sample Application Exchanges Data • 13

I

Import the CompactLogix Tags • 38
Import the ControlLogix Tags • 29
Important Safety Information • 2
Install the Module in the Rack • 11, 20
Interface • 56
IP Address • 57

L

Learning Objectives • 7
LED • 57

M

MAC ID • 57
Master • 55, 57, 58

N

Network • 57
Node • 57

O

Open the Sample Ladder Logic • 24, 26

P

Package Contents • 10
Peer-to-Peer • 57
Physical Setup • 19
Poll • 57
Power Supply • 58
Prerequisites • 8
Procedures • 19
Project Security Level • 58
ProSoft Technology Documentation • 8
ProSoft Technology® Product Documentation • 3
Protocol • 58

R

Required Items • 10
Required Steps • 11
RS-232 • 58

S

Sample Files • 10
Save and Start the Sample Application • 49
Scope • 7
Serial • 58
Server • 55, 57, 58

Set the Module's Permanent IP Address • 11, 21, 27
Setting Jumper • 19
Simplex • 58
Slave • 57, 58
Subnet Mask • 59
System Requirements • 9

T

Tag • 59
Target Controller • 59
The Sample Application • 11
Transfer List • 59
Trigger • 59

V

Verify Communication • 11, 50
Viewing Chassis Status in the ILX56-MM Module • 50
Viewing Data Transfer Statistics in the ILX56-MM Module • 50, 51
Viewing Resources Status in the ILX56-MM Module • 50, 51
Viewing the RSLogix 5000 Controller Tags • 50
Viewing Trigger Statistics in the ILX56-MM Module • 50, 52

W

Warnings • 2

Y

Your Feedback Please • 3