Industrial Automation Tech Note 47

Mitsubishi Ethernet Communications



Abstract:

This document describes using the Crimson[®] Mitsubishi Q Series TCP/IP Master driver to communicate with Mitsubishi Programmable Logic Controllers (PLCs) via an Ethernet connection.

Products:

Red Lion CR1000 Human Machine Interface (HMI), CR3000 HMI, G3 HMI, G3 Kadet HMI, Graphite[®] HMI, Graphite Controller, Modular Controller, Data Station Plus (DSP), and ProducTVity Station[™] (PTV)

Use Case: Communicating With Mitsubishi PLCs via Ethernet

This document describes the settings required to use the Mitsubishi Q Series TCP/IP Master driver to communicate with Mitsubishi FX, L, and Q series PLCs.

Required Software:

Crimson 2.0, 3.0, or 3.1

Required Operating System:

Microsoft Windows 2000, or above

Required Firmware:

Crimson 2.0, build 126 or higher Crimson 3, all builds

Introduction

This document describes how to use the Crimson Mitsubishi Q Series TCP/IP Master driver to communicate with Mitsubishi FX, L, and Q series PLCs. Crimson and the desired PLC must be correctly configured before communications can be established. Refer to the next section for Crimson configuration instructions. Refer to "Configuring the Device" on page 4 for PLC-specific configuration instructions.

Configuring Crimson

Crimson configuration consists of configuring the Ethernet port and selecting the driver.

Configuring the Ethernet Port

- 1. Referring to Figure 1, go to the Navigation Pane and Navigate to the Communications section.
- 2. Click on Network; the Communications Network popup appears.
- 3. Click on the Ethernet tab.
- **4.** Configure the port, as required.

| + Untitled File - CR1000-04000 - Crimson 3.1 | | |
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| •••••••••••••••••••••••••••••••••••••• | $ < \mathcal{I} $ | 0 - |
| Navigation Pane X | Communications - Network | Resource Pane X |
| S New - X | Ethernet ZeroConfig Download | 2 |
| Communications | Port Settings | Devices |
| Frotocol 1 | Port Mode: Manual Configuration | i Not mapped |
| Protocol 2 | IP Address: 1921581.20 | |
| Protocol 3 | A resolution | |
| 🖃 🖚 Serial Ports | | |
| GO RS-232 Program Port Grams Port | Gateway: 0.0.0.0 | |
| •(1) RS-232 Mode | DNS Settings | |
| -0 RS-485 Mode | DNS Mode: Automatic - | |
| Time Manager | Name Server 1: 8.8.8.8 | |
| Get OPC Proxy | Name Server 2: 8.8.4.4 | |
| | | |
| | Physical Layer | |
| | Full Duplex Enabled • | |
| | High Speed: Enabled - | |
| | Maximum Segment Size | |
| | For Send: 1280 | |
| | For Receive: 1280 | |
| | | |
| | | |
| | | |
| Communications | | |
| 96 | | |
| 🥶 Data Tags | | |
| Display Pages | | Devices |
| Programs | | 🔩 Data Tags |
| Data Logger | | Programs |
| 83 Security | | System |
| | Err | ors Circular Translate READ CAPS NUM |

Figure 1.

Ethernet port configuration is now complete and the next step is to select the driver.



Selecting the Driver

- 1. Referring to Figure 2, go to the Navigation Pane and select the first available protocol; Protocol 1 in this example.
- 2. Go to the Driver: field under the Driver Selection heading and click the *Pick...* button; the Driver Picker for Ethernet Port popup appears.
- 3. Under the Manufacturer heading, select Mitsubishi.
- 4. Under the Driver heading, select Q Series TCP/IP Master.
- 5. Click OK.

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| Navigation Pane | X Communications - Network - Protocol 1 Port 4 | Co Resource Pane X |
| Communications Communications Theterootil Theterootil Theterootil Theterootil Theterootil Theterootil Communications | Diver Selection Diver Version 12 Performande Diver Selection Diver Version 120 Address Selection Diver Version 120 Diver Diver Selection Diver Version 120 Diver Version | Denices Not Mapped |
| Communications | | |
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| Search Display Pages | | Devices |
| Programs | | Data Tags |
| Data Logger | | Programs |
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| Port Number 4 | | Errors Circular Translate READ CAPS NUM |

Figure 2.

Crimson configuration is now complete. Next, the applicable device (Mitsubishi FX, L, or Q series PLC) must be configured.



Configuring the Device

The following two steps apply to all three Mitsubishi PLCs covered in this Tech Note.

- **1.** Referring to Figure 3, go to the Navigation Pane and click on the device that appeared below Protocol 1; PLC1 in this example.
- 2. Configure the Device Identification heading fields, as required:
 - **a.** IP Address: The IP Address of the PLC or communication card; 192.168.1.52 in this example.
 - **b.** TCP Port: The TCP port from which the PLC or communication card is listening; 5002 in this example. NOTE: Crimson's number is DECIMAL; the Mitsubishi PLC may be DECIMAL or HEX.
 - **c.** Network Number: The network on which the PLC resides; *0* in this example. NOTE: For most local on-board CPU communications, use 0.

d. PC Number: The station number of the remote station; *0* in this example.

NOTE: For most local on-board CPU communications, use 255.

e. CPU Access: Specifies which CPU will be accessed; Local in this example.

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| 3 3 1 3 4 3 4 5 5 5 | R 🐢 🖉 | 2 - |
| Navigation Pane X | Communications - Network - Protocol 1 - PLC1 Device 1 🕐 🚱 | Resource Pane X |
| 💰 New - 🗙 | Device Settings | ρ |
| Communications | Finable Device Vac | Devices |
| Protocol 1 - Q TCP/IP Master | | Not Mapped |
| PLC1 | Device Identification | |
| Protocol 3 | IP Address: 192.168.1.52 | |
| Protocol 4 | TCP Port: | |
| RS-232 Program Port | Network Number: 0 | |
| Image: second | PC Number: 0 | |
| -0 RS-485 Mode | CPU Access: Local 👻 | |
| Time Manager | Protocol Ontions | |
| OPC Proxy | AFGI Monitorion Timer 10 (250 ms per unit) | |
| | | |
| | uni type: Use Dealcated Societ | |
| | LLMP Ping: Disabled | |
| | Connection Timeout: | |
| | Connection Backoff: 200 ms | |
| | Transaction Timeout: 2500 🚖 ms | |
| | Advanced Settings | |
| | Spanning Reads: Enabled | |
| | Transactional Writes: Enabled | |
| Communications | Preempt Other Devices: No | |
| Data Tags | Favor UI Writes: No | |
| | Comms Delay: 0 ms | |
| Display Pages | | 96 Devices |
| Programs | Delete This Desise | 🥶 Data Tags |
| Data Logger | Add Gateway Block | Programs |
| 😔 Security | | System |
| Port Number 4. Device Number 1 | Frons | Circular Translate READ CAPS NUM |

Figure 3.

Refer to the Crimson Quick Start Guide for Data Tag, Display Page, and Data Logging configuration.

If configuring a Mitsubishi FX Series PLC, proceed to the next section. If configuring a Mitsubishi L or Q Series PLC, proceed to "Mitsubishi Q/L Series PLC Configuration" on page 6.



Mitsubishi FX Series PLC Configuration

The following steps apply to Mitsubishi FX PLC configuration, only:

- 1. Open the PLC's Ethernet Configuration window, as shown in Figure 4.
- 2. Configure the PLC's Ethernet connection using the following parameters:
 - a.Communication Method: SLMP
 - **b.** Protocol: *TCP*
 - c. Port No.: Should match the port number previously specified during Crimson configuration.

| | 1 | 1 | Detect Now | | | | | | |
|------------------|------|------|-----------------------------|--------------------|----------|--------------|---------------|----------|----------------|
| tion | - | | | | | | | | |
| OE Options | | No | Madal Name | Communication | | Fixed Buffer | PLC | | ersor/Devia |
| oject 🔺 | | 140. | Plote hame | Method | Protocol | e Setting | IP Address | Port No. | MAC Address |
| Module Configura | | | Host Station | | | - | 192.168.3.250 | | 1 |
| Program | | 1 | MELSOFT Connection Module | MELSOFT Connectic | TCP | | 192.168.3.250 | | |
| FB/FUN | 1166 | 2 | MELSOFT Connection Module | MELSOFT Connectic | TCP | | 192.168.3.250 | | |
| Davisa | - | 3 | MELSOFT Connection Module | MELSOFT Connectic | TCP | | 192.168.3.250 | | |
| Parameter | - | 4 | SLMP Connection Module | SLMP | TCP | | 192.168.3.250 | 5012 | |
| System Parame | UP. | 5 | Unpassive Connection Module | Socket Communicati | TCP | | 192.168.3.250 | 5010 | |
| FXSUCPU | | | | | | | | | |
| CPU Parame | | | | | | N | | | |
| F1 Ethernet | | | | | | 1 | | | |
| #1 485 Serie | • | | | | | | | | 2 |
| High Spe | _ | - | | | | | | | |
| 🛃 Input Re | | | No 1 No 2 | No.3 No | ation Lo | No 5 | | | |
| Analog It | - | | | | - | 1 | | | |

Figure 4.



Mitsubishi Q/L Series PLC Configuration

The following instructions apply to both Mitsubishi Q and L Series PLC configuration:

- **1.** Open the PLC's Ethernet configuration window, as shown in Figure 5.
- 2. Ensure that Communication Data Code is set for Binary Code.
- 3. Ensure that Enable online change (FTP, MC Protocol) is checked.

| Q Parameter Setting | | _ | _ | _ | | _ | _ | _ | X |
|--|---|--|------------------------------|---|-------------------|--------------------|--------------|--------------------|--------|
| PLC Name PLC Sys | tem PLC File | PLC RAS Boot | File Program S | FC Device I/O As | signment Mul | ltiple CPU Setting | Built-in Eth | ernet Port Setting |] |
| ⊢ IP Address Se IP Address Subnet Masi Default Rou | ting Pattern er IP Address | Input Format DE 192 168 255 255 192 168 | C 3 39 255 0 3 1 | Open Setting FTP Setting Time Setting Set if it is needed(| Ş Default / Ch | anged) | | | |
| Communication G Binary Co C ASCII Co T Enable or Disable d | Data Code de line change (F ect connectior | TP, MC Protocol) h to MELSOFT | | | | | | | |
| C Do not re | pond to search | n for CPU (Built-in E | Ethernet port) on ne | etwork | | | | | |
| Print Window | Print Windo | w Preview | Ackno | wledge XY Assignment | Defaul | t Chea | .k | End | Cancel |

Figure 5.

4. Click the Open Setting button.



5. Referring to Figure 6, configure a connection with the following parameters:

a. Protocol: TCP

b. Open System: *MC Protocol*

c. Host Station Port No.: Should match the port number previously specified during Crimson configuration.

| Protocol | | col | Open System | | TCP Connection | Host Station Port No. | Destination IP Address | Destinatio Port No. |
|----------|-----|-----|--------------------|---|----------------|--------------------------|---------------------------|------------------------|
| 1 | TCP | - | MC Protocol | - | - | OBBA | | |
| 2 | TCP | - | MELSOFT Connection | - | - | | | |
| 3 | TCP | - | MELSOFT Connection | - | - | | | |
| 4 | TCP | - | MELSOFT Connection | - | - | | | |
| 5 | TCP | - | MELSOFT Connection | - | - | | | |
| 6 | TCP | • | MELSOFT Connection | • | - | | | |
| 7 | TCP | - | MELSOFT Connection | - | - | | | |
| 8 | TCP | - | MELSOFT Connection | - | - | | | |
| 9 | TCP | - | MELSOFT Connection | - | - | | | |
| 10 | TCP | - | MELSOFT Connection | - | - | | | |
| 11 | TCP | - | MELSOFT Connection | - | - | | | |
| 12 | TCP | - | MELSOFT Connection | - | - | | | |
| 13 | TCP | * | MELSOFT Connection | + | - | | | |
| 14 | TCP | + | MELSOFT Connection | - | - | | | |
| 15 | TCP | - | MELSOFT Connection | - | - | | | |
| 16 | TCP | - | MELSOFT Connection | - | - | | | |

Figure 6.

d. Select the End button.



Disclaimer

It is the customer's responsibility to review the advice provided herein and its applicability to the system. Red Lion makes no representation about specific knowledge of the customer's system or the specific performance of the system. Red Lion is not responsible for any damage to equipment or connected systems. The use of this document is at your own risk. Red Lion standard product warranty applies.

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If you have any questions or trouble contact Red Lion Technical Support by emailing <u>support@redlion.net</u> or calling 1-877-432-9908.

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