DEVICE•MASTER®
UP

EtherNet®/IP User Guide

COMTROL®
Network Enabling Devices

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Patents Pending

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Chapter 1. Introduction

The *EtherNet/IP User Guide* discusses the following topics:

- *Chapter 2. Programming Interface* on Page 13
- *Chapter 3. Embedded Configuration Pages* on Page 61
- *Chapter 4. Embedded Diagnostic and Statistics Pages* on Page 79

For information about connecting the hardware, programming the DeviceMaster UP IP address, or uploading EtherNet/IP firmware, see the *DeviceMaster UP Hardware Installation and Configuration Guide*.

See the *EtherNet/IP Interface Configuration Quick Start* for embedded web page configuration procedures if you have *Read-only or read/write* devices, which provides procedures for your devices.

See *1.4. Locating Updated Software and Documents* on Page 10 to locate the latest firmware, documentation, and tools.

1.1. Audience

The primary audience of this document is the person responsible for installing the DeviceMaster UP and programming the PLC. This guide assumes you are familiar with the following topics:

- Windows operating system
- EtherNet/IP
- Allen-Bradley ControlLogix family, PLC-5, SLC or MicroLogix PLCs
- RSLogix 5000, RSLogix 500 or RSLogix 5 programs

1.2. Product Overview

The DeviceMaster UP operates as an EtherNet/IP gateway when EtherNet/IP firmware is uploaded to the DeviceMaster UP. The DeviceMaster UP then provides an EtherNet/IP interface to devices with raw/ASCII serial and Ethernet TCP/IP interfaces.

The DeviceMaster UP provides an Modbus/TCP interface models, which may or may not have the Modbus/TCP firmware loaded (depending on the model you purchased).

Note: *Models that have Modbus/TCP loaded on the DeviceMaster UP are identified in PortVision Plus and the DeviceMaster UP is labeled accordingly.*

This document describes how to configure the DeviceMaster UP for the EtherNet/IP protocol after basic DeviceMaster UP installation and configuration procedures.

You can configure and manage the DeviceMaster UP through one of the following methods:

- Embedded web page interface
- EtherNet/IP Interface Profile objects

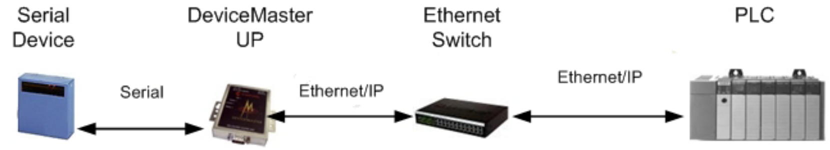
1.3. EtherNet/IP Firmware

The following subsections provides information for existing users who may or may not want to update systems with the enhanced EtherNet/IP firmware V3.x.

For new users, the following subsections provide EtherNet/IP system architecture information.

1.3.1. Traditional EtherNet/IP System Architecture (Firmware V2.x)

EtherNet/IP firmware V2.x provided a traditional EtherNet/IP interface to devices through a raw/ASCII serial interface as illustrated.



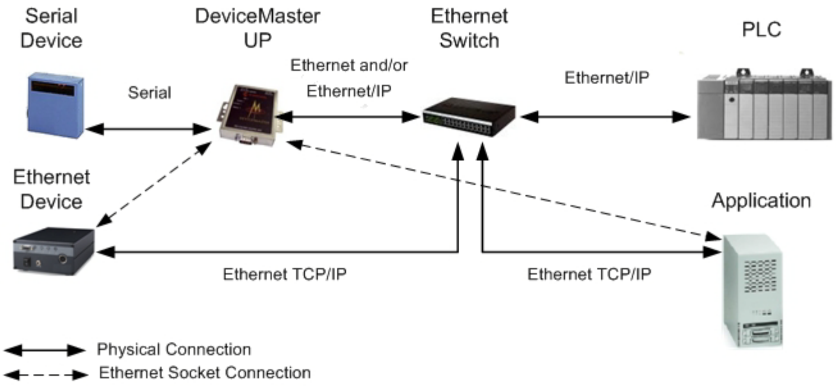
Traditional EtherNet/IP System Architecture (Firmware V2.x)

1.3.2. Enhanced EtherNet/IP System Architecture (Firmware 3.x)

Using the Ethernet TCP/IP firmware V3.x doubles the capacity of the DeviceMaster UP by providing a raw/ASCII interface to both serial and Ethernet TCP/IP devices.

For example:

- The DeviceMaster UP 1-port provides EtherNet/IP support for one serial device and one Ethernet device for a total of two devices.
- The DeviceMaster UP 2-port provides EtherNet/IP support for two serial devices and two Ethernet devices for a total of four devices.
- The DeviceMaster UP 4-port provides EtherNet/IP support for four serial devices and four Ethernet devices for a total of eight devices.

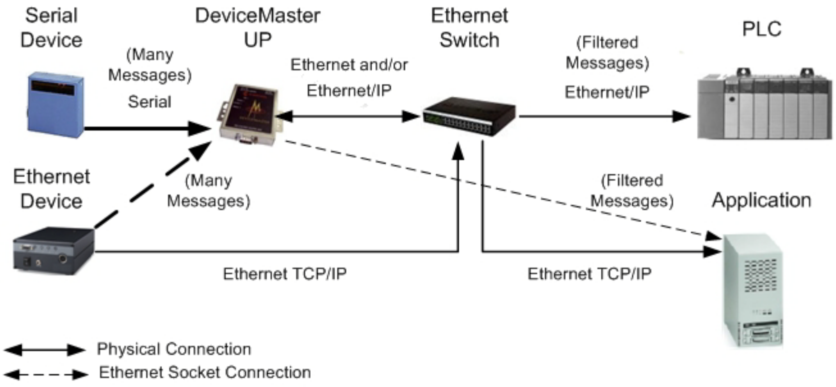


Comtrol EtherNet/IP System Architecture (V3.x)

EtherNet/IP firmware 3.x provides an application interface for both serial and Ethernet devices. You can connect any application, such as a configuration, database, or control application, via the application socket port to the serial and/or Ethernet devices while the device(s) are attached to the PLC via EtherNet/IP.

1.3.3. Filtering and Data Extraction Functionality (Patent Pending)

EtherNet/IP firmware 3.x provides the following filtering and data extraction functionality:



EtherNet/IP Filtering Functionality (V3.x)

- Filtering
    - String Filtering of up to 128 bytes of raw/ASCII data to both the PLC and/or application.
    - RFID filtering of EPCglobal formatted RFID tag data to both the PLC and/or application.
    - Barcode filtering of all UPC/EAN formatted barcodes data to both the PLC and/or application.
- Data extraction
    - RFID data extraction extracts all parameters, such as company code, product code, and serial numbers, from any or all of the 43 EPCglobal tag formats. It then transfers the data to the PLC and/or application in a consistent and simple format.
    - Barcode data extraction extracts the company, product, and numbering codes from UPC/EAN formatted barcodes. It then transfers the data to the PLC and/or application in a consistent and simple format.
- Environment specific support
    - Support for multiple RFID reader tag formats.
    - RFID antenna grouping.
    - Aging of filtered string/RFID/barcode entries.
    - Discarding of unrecognized RFID and barcode messages.

If you are running firmware V2.x, you may want to review the following list additional features provided in firmware V3.x.

- Improved PLC interfaces
    - Increased PLC interface bandwidth provides improved performance and lower latencies when interfacing to higher bandwidth serial and Ethernet devices such as RFID readers.
    - Transfer of large received serial device packets up to 1518 bytes.
    - Transfer of large received Ethernet device packets up to 2048 bytes.
    - Throttling of received data to the PLC in the *Write-to-Tag/File* receive mode ensures data received by the PLC is not overwritten before it can be processed.
    - Disabling of non-filtered receive queue ensures the PLC will only receive the latest received serial/Ethernet device data.
- New embedded web pages
    - *PLC Interface Diagnostics* page, which provides statistics and error messages to monitor and help diagnose PLC interface problems.
    - *Serial/Ethernet Device Communication Statistics* page, which is a comprehensive statistics page for all serial and Ethernet device interfaces. Includes packet, byte, and error counts to the PLC(s) and Application(s) as well as comprehensive filtering statistics.
    - *Ethernet Device Interface Configuration* page, which provides a user interface to the Ethernet device interface configuration.

For detailed information about filtering and data extraction, see the *DeviceMaster UP Filtering and Data Extraction Reference Guide*.

1.4. Locating Updated Software and Documents

You can access the firmware software assembly, PortVision Plus, and the *DeviceMaster UP* documentation from the CD shipped with the DeviceMaster UP or you can download the latest files using these internet links.

DeviceMaster UP	
Hardware Installation and Configuration Guide contains hardware installation, PortVision Plus installation, and if necessary, firmware updating procedures.	🌐

PortVision Plus	
PortVision Plus is the application that you use to configure network settings and if necessary, upload the firmware.	🌐

Modbus/TCP Firmware	
EtherNet/IP (**.msi**) file contains the firmware and supporting files. The firmware provides embedded configuration web pages. ***Note:*** *If you are currently running EtherNet/IP firmware V2.x platform, review 1.3. EtherNet/IP Firmware on Page 8 to see if you want to add the architecture enhancement using EtherNet/IP V3.x or higher.*	🌐

Modbus/TCP Documentation	
EtherNet/IP Interface Configuration Quick Start is an outline of installation and configuration procedures with links to the appropriate documents.	🌐
DeviceMaster UP Filtering and Data Extraction Reference Guide describes the data extraction and filtering processes provided by the DeviceMaster UP with EtherNet/IP or Modbus/TCP 3.x firmware or higher.	🌐
EtherNet/IP User Guide (this guide) contains detailed protocol specific information about the DeviceMaster UP.	🌐

1.5. EtherNet/IP Application Setup

Before you can configure EtherNet/IP protocol on the DeviceMaster UP, you must have previously performed the following steps:

- Install the hardware
- Install PortVision Plus
- If necessary, upload the EtherNet/IP firmware using PortVision Plus

  Note: *Models that have Modbus/TCP loaded on the DeviceMaster UP are identified in PortVision Plus and the DeviceMaster UP is labeled accordingly.*

- Configure the DeviceMaster UP IP address using PortVision Plus

  Note: *If necessary, refer to the DeviceMaster UP Hardware Installation and Configuration Guide for the above procedures.*

Use the following steps to complete the DeviceMaster UP configuration for EtherNet/IP.

1. Select the appropriate programming procedure for the following interfaces:

Interfaces	Programming Procedure
ControlLogix PLC	• Program the PLC. See the instructions in *5.3. ControlLogix PLC Programming Example Instructions* on Page 91. • **(Optional)** Access the DeviceMaster UP *Server Configuration* page to configure the serial/socket port settings, if you did not configure the serial/socket port setting in the PLC program. See the *DeviceMaster UP Interface Configuration Guide* for procedures and reference *Chapter 3. Embedded Configuration Pages* on Page 61, if necessary.
SLC or MicroLogix PLC	• Program the SLC or MicroLogix PLC, see the instructions in *5.4. SLC or MicroLogix PLC Programming Example Instructions* on Page 104. • Access the DeviceMaster UP *Server Configuration* page to configure the serial/socket port settings. See the *DeviceMaster UP Interface Configuration Guide* for procedures and reference *Chapter 3. Embedded Configuration Pages* on Page 61, if necessary.
PLC-5 PLC	• Program the PLC-5 PLC, see the instructions in *5.5. PLC-5 PLC Programming Example Instructions* on Page 131. • Access the DeviceMaster UP *Server Configuration* page to configure the serial/socket port settings. See the *DeviceMaster UP Interface Configuration Guide* for procedures and reference *Chapter 3. Embedded Configuration Pages* on Page 61, if necessary.

2. Connect your serial device or devices and make sure all Ethernet devices are attached to the same Ethernet subnet. If necessary, refer to the *DeviceMaster UP Hardware Installation and Configuration Guide*.

Chapter 2. Programming Interface

2.1. Overview

The DeviceMaster UP provides an EtherNet/IP interface to:

- Transmit and receive raw/ASCII serial and socket (Ethernet device) data
- Filtering of the data
- Extraction of RFID and barcode parameters
- A connection to an optional application via a TCP/IP socket

The DeviceMaster UP provides EtherNet/IP connectivity to the entire ControlLogix family of PLCs as well as the SLC, PLC-5, and MicroLogix PLCs.

2.1.1. ControlLogix Family

The DeviceMaster UP supports ControlLogix PLCs. You can configure DeviceMaster UP through the PLC program or the DeviceMaster UP *Server Configuration* web page. The DeviceMaster UP interface for the ControlLogix PLC is described in *2.3. EtherNet/IP Interface Profile (ControlLogix)* on Page 15.

The *EtherNet/IP Quick Start* describes the quick start for read-only devices such as barcode scanners and read/write devices such as printers.

5.3. ControlLogix PLC Programming Example Instructions on Page 91 provides descriptions of the RSLogix 5000 PLC program examples intended to aid the PLC programmer.

You can also use the *Server Configuration* page on the DeviceMaster UP when you do not want to use the PLC programming interface to configure the DeviceMaster UP. *Chapter 3. Embedded Configuration Pages* on Page 61 describes the web pages on the DeviceMaster UP and provides instructions for configuring the serial/socket port settings

2.1.2. PLC-5/SLC or MicroLogix

The DeviceMaster UP supports PLC-5, SLC and MicroLogix PLCs. You must configure the DeviceMaster UP through the web pages on the DeviceMaster UP. The DeviceMaster UP interface for the PLC-5/SLC or MicroLogix PLC is described in *2.4. PLC-5/SLC and MicroLogix Interfaces* on Page 51.

The *EtherNet/IP Quick Start* describes the quick start for read-only devices such as barcode scanners and read/write devices such as printers.

- **SLC or MicroLogix PLC** and want more information than provided in the *EtherNet/IP Quick Start*, see *5.4. SLC or MicroLogix PLC Programming Example Instructions* on Page 104. There you will find descriptions of the RSLogix 500 PLC program examples intended to aid the PLC programmer.
- **PLC-5 PLC** and want more information than provided in the *EtherNet/IP Quick Start*, see *5.5. PLC-5 PLC Programming Example Instructions* on Page 131. There you will find descriptions of the RSLogix 5 PLC program examples intended to aid the PLC programmer.

2.1.3. What is EtherNet/IP?

EtherNet/IP is an industrial application layer protocol for industrial automation applications. The IP stands for 'Industrial Protocol'. Built on the standard TCP/IP protocols, it uses long established Ethernet hardware and software to define an application layer protocol for configuring access and controlling industrial automation devices. EtherNet/IP classifies Ethernet nodes as predefined device types with specific behaviors. The EtherNet/IP application layer protocol is based on the Common Industrial Protocol (CIP) layer. Building on these protocols, EtherNet/IP provides a seamless integrated system from the Industrial floor to the enterprise network.

2.2. Data Type Definitions

The following list defines the available data types.

Data Type	Definition
USINT	Unsigned short integer (8-bits)
UINT	Unsigned integer (16-bit)
UDINT	Unsigned double integer (32-bits)
INT	Signed integer (16-bits)
DINT	Signed double integer (32-bits)
BYTE	Bit string (8-bits)
WORD	Bit string (16-bits)
DWORD	Bit string (32-bits)
STRING	Character string (1-byte per character)

2.3. EtherNet/IP Interface Profile (ControlLogix)

This section describes the EtherNet/IP objects included in the ControlLogix EtherNet/IP interface and supported by the DeviceMaster UP.

2.3.1. Serial Port Configuration Object Definition (70 Hex)

The *Serial Port Configuration* vendor specific object defines the protocol by which:

- A PLC can communicate with a serial port device through a DeviceMaster UP over EtherNet/IP.
- An optional application can communicate with a serial device through the DeviceMaster UP over an Ethernet TCP/IP socket port.
- The optional serial data filtering and data extraction functions can be implemented.

Note: *The instance number corresponds to the associated serial port number on the DeviceMaster UP. (Port numbers are numbered from one to N.)*

You can disregard this object definition if you configure the DeviceMaster UP using the Server Configuration web page. See *Chapter 3. Embedded Configuration Pages* on Page 61 to configure the DeviceMaster UP using the embedded web page.

2.3.1.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	Number of ports on the DeviceMaster UP	Get
3	Num Instances	UINT	Number of ports on the DeviceMaster UP	Get

2.3.1.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Serial Port Device Type	UDINT	0=Raw Data Device (Default=0)	Set/Get
2	Serial Port Commands	DWORD	1=Reset Serial Port 2=Save in Flash 4=Clear Sequence Counters 8=Clear Statistics Counters (Default=0)	Set/Get (Get returns last command sent)
3	Baud Rate	UDINT	Valid rates: 300, 600, 1200, 2400, 4800, 9600 (Default), 19200, 38400, 57600, 115200, 230400	Set/Get
4	Interface Mode	USINT	0=RS-232 (Default) 1=RS-422 2=RS-485	Set/Get
5	Parity	USINT	0=None (Default) 1=Even 2=Odd	Set/Get
6	Data Bits	USINT	Valid Values: 5-8 (Default=8)	Set/Get
7	Stop Bits	USINT	Valid Values: 1 or 2 (Default=1)	Set/Get
8	Flow Control	USINT	0=None (Default) 1=RTS/CTS 2=XON/XOFF 3=Half Duplex	Set/Get
9	DTR Control	USINT	0=Off (Default) 1=On	Set/Get
10	PLC Transmit STX Append Value **Structure of:** Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	 USINT USINT USINT	 0,1,2 (0=No STX) (Default=0) 0 to 255 0 to 255	Set/Get
11	PLC Transmit ETX Append Value **Structure of:** Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	 USINT USINT USINT	 0,1,2 (0=No ETX) (Default=0) 0 to 255 0 to 255	Set/Get
12	Reserved	UINT	0	Get

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
13	Receive STX Detect Value **Structure of:** Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	USINT USINT USINT	0,1,2 (0=No STX) (Default=1) 0 to 255 0 to 255 (Default: Value1 = 2)	Set/Get
14	Receive ETX Detect Value **Structure of:** Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	USINT USINT USINT	0,1,2 (0=No ETX) (Default=1) 0 to 255 0 to 255 (Default: Value1 = 3)	Set/Get
15	Receive Timeout Between Packets (if no ETX or time to wait for ETX value)	UINT (msec)	0 to 65535 (Default = 200 msec)	Set/Get
16	Serial Port Transfer Options	WORD (bitwise OR)	01 Hex = Strip received STX/ETX characters to the PLC 02 Hex = Discard received packets with errors 04 Hex = (PLC-5/SLC) Rx MS Byte First 08 Hex = (PLC-5/SLC) Tx MS Byte First 10 Hex = Tx Sequence Number Checking 20 Hex = Disable Queuing of Non-Filtered Rx Messages 40 Hex = Strip received STX/ETX characters to the application (Default = 03) 80 Hex = Drop oversized received packets	Set/Get
17	Receive (DeviceMaster UP to PLC) Ethernet Data Transfer Method	USINT	0=OFF 1=Unsolicited - Write-to-Tag 2=Unsolicited - Write-to-Tag-Synced 3=Polling (Default=3)	Set/Get
18	Reserved	USINT	0	Get
19	Maximum Receive Data Packet Size	UINT	1-1518 (Default=440)	Set/Get
20	Maximum PLC Update Rate (No more than one message per time interval in ms.)	UINT (ms)	10-65535 (Default = 40)	Set/Get
21	Reserved	USINT	0	Get
22	PLC Controller Slot Number	USINT	0 to Max Slot Number on PLC (Default=0)	Set/Get
23	PLC IP Address	UDINT	00000000 Hex to FFFFFFFF Hex (Mask= 255.255.255.255)	Set/Get
24	Receive (DeviceMaster UP to PLC) Produced Data Tag Name	STRING (Array of 40 SINTs)	ASCII string	Set/Get
25	Application Socket Enable	USINT	0=Disabled 1=Enabled	Set/Get
26	Application Listen Enable	USINT	0=Disabled 1=Enabled	Set/Get

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
27	Application Connect Mode	USINT	0=Never 1=Connect Always 2=Connect On Data	Set/Get
28	Application Disconnect Mode	USINT	0=Never 1=Disconnect On Idle	Set/Get
29	Application Listen Socket Port	UINT	0-65535	Set/Get
30	Application Connect Socket Port	UINT	0-65535	Set/Get
31	Application Connect IP Address	UDINT	00000000 Hex to FFFFFFFF Hex (Mask=255.255.255.255)	Set/Get
32	Application Idle Timeout	UDINT (ms)	0 to FFFFFFFF Hex	Set/Get
33	To PLC Filter Mode	USINT	0=Off 1=String (128 byte maximum) 2=RFID (EPCglobal formats) 3= Barcode (UPC/EAN formats)	Set/Get
34	To Application Filter Mode	USINT	0=Off 1=String (128 byte maximum) 2=RFID (EPCglobal formats) 3= Barcode (UPC/EAN formats)	Set/Get
35	Discard Unrecognized Data Mode (RFID and Barcode Filter mode only)	USINT	0=Off 1=To PLC 2=To application 3=To PLC/application	Set/Get
36	RFID Antenna Grouping	USINT	0=None 1=Groups of Twos 2=Groups of Threes 3=Groups of Fours 4=First Two Only 5=First Three Only	Set/Get
37	To PLC Filter Options	WORD (Bitwise OR)	01 Hex = Encoding Scheme 02 Hex = Filter Code 04 Hex = Antenna Number 08 Hex = Company Code 10 Hex = Product/Location Code 20 Hex = Serial Number	Set/Get
38	To Application Filter Options	WORD (Bitwise OR)	01 Hex = Encoding Scheme 02 Hex = Filter Code 04 Hex = Antenna Number 08 Hex = Company Code 10 Hex = Product/Location Code 20 Hex = Serial Number	Set/Get
39	Filter Age Time	UDINT (ms)	0 - FFFFFFFF Hex	Set/Get
40	RFID Reader Interface Type	UINT	0=Unspecified 10=Alien (Text Mode) 11=Alien (Terse Mode) 20=Intermec (Hex ASCII Mode)	Set/Get

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
41	Barcode Formats (Barcode Filtering Only)	UINT	**Standard 12-14 Digit Format** (Mask = 000F Hex) 00 Hex=NONE 01 Hex=Five Company/Five Product Digits 02 Hex=Six Company/Four Product Digits 03 Hex=Seven Company/Three Product Digits 04 Hex=Eight Company/Two Product Digits 05 Hex=Nine Company/One Product Digits **Eight Digit Format** (Mask = 00F0 Hex) 00 Hex=NONE 10 Hex=EAN-8; Two Company/Five Product Digits 20 Hex=EAN-8; Three Company/Four Product Digits 30 Hex=UPC-E	Set/Get
42	Application Transmit STX Append Value **Structure of:** Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	 USINT USINT USINT	 0,1,2 (0=No STX) (Default=0) 0 to 255 0 to 255	Set/Get
43	Application Transmit ETX Append Value **Structure of:** Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	 USINT USINT USINT	 0,1,2 (0=No ETX) (Default=0) 0 to 255 0 to 255	Set/Get
44	Reserved	USINT[2]	0	Get

2.3.1.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
01 Hex	Yes	Yes	Get_Attributes_All
02 Hex	No	Yes	Set_Attributes_All
0E Hex	Yes	Yes	Get_Attribute_Single
10 Hex	No	Yes	Set_Attribute_Single

2.3.1.4. Instance Attribute Definitions

Attribute 1 - Serial Port Device: This attribute indicates the **Serial Port Device Type.** Raw Data device is the only currently supported option.

Attribute 2 - Serial Port Commands: DeviceMaster UP supports the following commands:

- **Reset serial port -** This option resets the serial port hardware and statistics counters. You must reset the DeviceMaster UP after modifying any of the serial port configuration options, including: baud rate, interface mode, parity, data bits, stop bits, flow control, or DTR control. It does not clear the sequence counters.
- **Save in Flash -** This option saves the port configuration in flash memory. These settings are restored when you reboot the DeviceMaster UP.
- **Clear sequence counters -** This option clears the Receive Produced and Consumed Sequence counters for the selected port.
- **Clear statistics counters -** This option clears the statistics counters for the selected port.

Attributes 3 to 9 - Standard Serial Port Settings: These are standard serial port settings.

Attribute 10 - PLC Transmit STX Append Value - You can set this attribute to append an STX (start of transmission) byte sequence which is configurable as 1 or 2-bytes to the beginning of the serial packet before it is sent.

The length indicates the number of STX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function.
- **1 (one STX byte) -** Inserts one STX byte before the data.
- **2 (two STX bytes) -** Inserts two STX bytes before the data.
- **Value1 -** Specifies the transmit character associated with the first STX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the transmit character associated with the second STX byte. (Only if length is two bytes.) You can specify a value between 0 and 255.

Attribute 11 - PLC Transmit ETX Append Value - You can set this attribute to append an ETX (end of transmission) byte sequence which is configurable as 1 or 2 -bytes to the end of the serial packet before it is sent.

The length indicates the number of ETX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function.
- **1 (one ETX byte) -** Inserts one ETX byte at the end of the data.
- **2 (two ETX bytes) -** Inserts two ETX bytes at the end of the data.
- **Value -** Specifies the transmit character associated with the first ETX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the transmit character associated with the second ETX byte. (Only if length is 2-bytes.) You can specify a value between 0 and 255.

Attribute 13 - Receive STX Detect Value - This attribute detects an STX (start of transmission) byte sequence which is configurable as 1 or 2-bytes when it receives a serial packet.

The length indicates the number of STX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function. When disabled, the DeviceMaster UP accepts the first byte received after the last ETX byte(s) as the start of the next data packet.
- **1 (one STX byte) -** Scans serial data for one STX byte. If the DeviceMaster UP finds an STX byte it collects the data. If the first byte is not the STX byte, the DeviceMaster UP discards the byte. The DeviceMaster UP continues to discard the bytes until the DeviceMaster UP finds an STX byte.
- **2 (two STX bytes) -** Scans serial data for two STX bytes. If the DeviceMaster UP finds two STX bytes it collects the data. If the first two bytes are not the STX bytes, the DeviceMaster UP discards the bytes. Bytes continue to be discarded until the DeviceMaster UP finds two STX bytes.
- **Value1 -** Specifies the character that represents the first STX byte. DeviceMaster UP looks for this character in the first STX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the character that represents the second STX byte. DeviceMaster UP looks for this character in the first STX byte. (Only if length is two bytes.) You can specify a value between 0 and 255.

Attribute 14 - Receive ETX Detect Value - This attribute detects an ETX (end of transmission) byte sequence which is configurable as 1 or 2 bytes marking the end of the serial packet.

The length indicates the number of ETX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function. When disabled, the DeviceMaster UP uses the Receive Timeout Between Packets (attribute 15) to indicate the end of data packet.
- **1 (one ETX byte) -** Scans serial data for one ETX byte. When the DeviceMaster UP finds an ETX byte it identifies the data as a serial packet.
- **2 (two ETX bytes) -** Scans serial data for two ETX bytes. When the DeviceMaster UP finds two ETX bytes it identifies the data as a serial packet.
- **Value1 -** Specifies the character to scan for in the first ETX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the character to scan for in the second ETX byte. (Only if length is 2-bytes.) You can specify a value between 0 and 255.

Attribute 15 - Receive Timeout Between Packets - This attributes specifies:

- How long DeviceMaster UP waits (in milliseconds) if the Receive ETX length is not zero (0) and it does not receive an ETX byte sequence.
- The time to wait (in milliseconds) between serial packets if the Receive ETX Detect length is set to zero (0).

Attribute 16 - Serial Port Transfer Options - This attribute specifies special serial port transfer options. The following options are supported:

- **01 Hexadecimal (Bit 0) -** DeviceMaster UP strips received STX/ETX characters from received packets before sending the packet to the PLC.
- **02 Hexadecimal (Bit 1) -** DeviceMaster UP discards received packets with errors.
- **04 Hexadecimal (Bit 2) -** (PLC-5/SLC only) DeviceMaster UP receives Most Significant (MS) byte of 16-bit integer first. The default is transmit Least Significant (LS) byte first.
- **08 Hexadecimal (Bit 3) -** (PLC-5/SLC only) DeviceMaster UP transmit

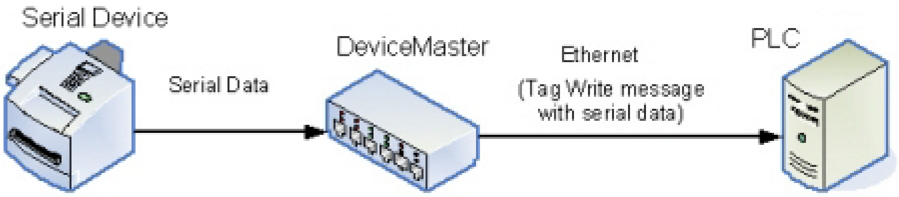
  Most significant (MS) byte of 16-bit integer first. The default is transmit Least Significant (LS) byte first.
- **10 Hexadecimal (Bit 4) -** Enable Transmit Sequence Number Checking.
  - DeviceMaster UP rejects messages with duplicate sequence numbers (that is, the same sequence number as the previous transmit data message) and increments the **Duplicate Transmit Sequence Error Count**.
  - DeviceMaster UP transmits messages with unexpected transmit sequence numbers (that is, sequence numbers that are not the same as or are not equal to the previous sequence number plus one) and increments the **Unexpected Transmit Sequence Error Count**.
- **20 Hexadecimal (Bit 5) -** Disable Queuing of Non-Filtered Rx messages to PLC. If filtering is disabled, only the last message received is sent to the PLC.
- **40 Hexadecimal (Bit 6) -** DeviceMaster UP strips received STX/ETX characters from received packets before sending the packet to the application.

- **80 Hexadecimal (Bit 7) -** Drop oversized received data packets.

Attribute 17 - Receive (DeviceMaster UP to PLC) Ethernet Data Transfer Method - This attribute specifies the Ethernet data transfer method used by the DeviceMaster UP. There are three methods that DeviceMaster UP can use to transfer data received from a serial device to the PLC. These methods are:

- Off - DeviceMaster UP will not allow any data to be sent to the PLC.
- *Unsolicited - Write-to-Tag receive* method - DeviceMaster UP writes the received serial data directly into tag(s) on the PLC.

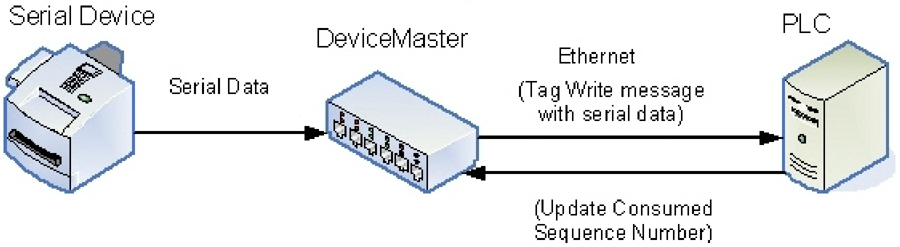
  The following diagram shows the Write-to-Tag receive data flow:

  The following restrictions apply to this method:

  - **The Receive Data Tag Name** (Attribute 24) must have the same name as the tag defined on the PLC. (For more information, see Attribute 24 on Page 23.)
  - The tag on the PLC must be of type SINT and must be large enough to contain the sequence number, length, and data field associated with the received data structure. (For more information, see *2.3.2. Serial Port Data Transfer Object Definition (71 Hex)* on Page 28.)
  - An incremented sequence number indicates new data.
  - The PLC program must scan and consume new data faster than the data can be received on the serial port to ensure that no data is lost.
- *Unsolicited - Write-to-Tag-Synced receive* method - DeviceMaster UP writes the serial data into tag(s) on the PLC and provides a mechanism to synchronize the data flow between the PLC and DeviceMaster UP.

  In this method, DeviceMaster UP does not write the serial packet to the tag on the PLC until the PLC updates the consumed sequence number (**Serial Port Data Transfer** object Attribute 4) to match the produced data sequence number. Then the DeviceMaster UP writes the data into the "tag" data location on the PLC in the same way as the *Unsolicited - Write-to-Tag receive* method. For more information, see the description of Attribute 4 in *2.3.2. Serial Port Data Transfer Object Definition (71 Hex)* on Page 28. The following diagram shows the *Write-to-Tag-Synced* received data flow:

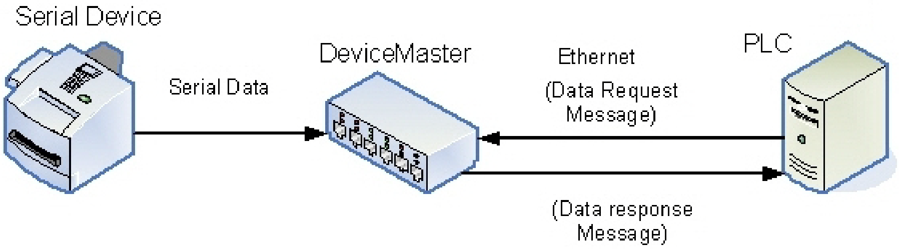
  The following restrictions apply to this method:

  - The **Receive Data Area Tag Name** (Attribute 24) must have the same name as the tag defined on the PLC.
  - The tag on the PLC must be an SINT type and large enough to contain the sequence number, length, and data field associated with the received data structure. (For more information, see the *2.3.2. Serial Port Data Transfer Object Definition (71 Hex)* on Page 28.)
  - An incremented sequence number indicates new data.
  - The DeviceMaster UP will not write new data to the tag on the PLC until the consumed sequence number has been incremented to match the last produced sequence number.
  - While the DeviceMaster UP queues received serial port data, the PLC program must consume the new data faster than the data can be received on the serial port to ensure the receive buffers on the DeviceMaster UP do not overflow. (For example: If the serial port can receive two serial packets per second, then the consumption rate must be at least one packet every 500 microsecond.)

- *Polling receive* method - The PLC requests data on a periodic basis.

  In this method, DeviceMaster UP returns the serial data in the response to the data request message. The PLC requests data by accessing the **Serial Port Data Transfer Object** Attribute 2. For more information, see the description of Attribute 2 in *2.3.2. Serial Port Data Transfer Object Definition (71 Hex)* on Page 28.

  The following diagram shows the polling receive data flow:



  The following restrictions apply to this method:

  - The data tag to receive the data on the PLC must be large enough to contain the sequence number, length, and data field associated with the received data structure. (For more information, see the *2.3.2. Serial Port Data Transfer Object Definition (71 Hex)* on Page 28.)
  - An incremented sequence number indicates new data.
  - The same data may be returned more than once. However, the same data packet will also return the same sequence number.
  - A length of zero (0) indicates no data.
  - While the DeviceMaster UP queues received serial port data, the PLC program must poll for new data faster than the data can be received on the serial port to ensure the receive queues on the DeviceMaster UP do not overflow. (For example: If the serial port can receive two packets per second, then the polling rate must be at least once every 500 microseconds.)

Attribute 19 - Maximum Receive Data Packet Size: Specifies the maximum acceptable size of a received serial packet. The maximum received serial packet size is 1518 bytes while operating in *Write-to-Tag/File* or *Write-to-Tag-File-Synced* receive modes.

Attribute 20 - Maximum PLC Update Rate: The maximum rate (or minimum time interval) in milliseconds, that messages are sent to the PLC tag in the *Write-To-Tag receive* method. This attribute configures the DeviceMaster UP to space the messages to the PLC to prevent overrunning of data before the PLC can process it.

Attribute 22 - PLC Controller Slot Number: This attribute specifies the slot number on the PLC where the controller resides. The slot numbers typically start at zero (0) for the first slot.

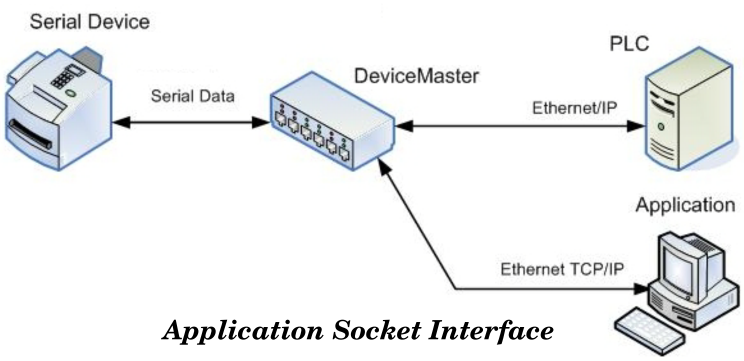
Note: *The Polling method does not use this attribute.*

Attribute 23 - PLC IP Address: This attribute specifies the IP address in hexadecimal format for the PLC EtherNet/IP card. For example, an IP address of 10.1.2.100 is 0A010264 in hexadecimal.

Note: *The Polling method does not use this attribute.*

Attribute 24 - Receive (DeviceMaster UP to PLC) Produced Data Tag Name - This attributes specifies the PLC tag name. It indicates where to write received data while operating in the *Unsolicited - Write-to-Tag* or *Unsolicited - Write-to-Tag-Synced receive* method.

The maximum length for the tag name is 40 characters.



Application Socket Interface

Attribute 25 - Application Socket Enable: This setting enables/disables the Application Socket Interface. Enabling this function allows an application to be connected to the serial port. If both the PLC and application are connected to the serial port, both can transmit to and receive data from the serial port. However, the PLC and application cannot communicate directly to each other.

Attribute 26 - Application Listen Enable: Enabling this setting allows the application to connect to the DeviceMaster UP via an Ethernet TCP/IP socket.

- 0 = Disables listening - The DeviceMaster UP will not accept connection attempts.
- 1 = Enables listening - The DeviceMaster UP will accept connection attempts from the application socket port.

Attribute 27 - Application Connect Mode: This setting controls if and how the DeviceMaster UP attempts to connect to the application at the application connection IP address and application connection socket port.

- 0 = Never - The DeviceMaster UP will not attempt to connect to the application.
- 1 = Connect Always - The DeviceMaster UP will attempt to connect to the application socket port until a connection is made.
- 2 = Connect On Data - The DeviceMaster UP will not attempt to connect to the application socket port until there is data to send to the application. Once data is received from the serial device, the DeviceMaster UP will attempt to connect to the application until a connection is made.

Attribute 28 - Application Disconnect Mode: This setting controls if and how the DeviceMaster UP disconnects from an application.

- 0 = Never - The DeviceMaster UP will not disconnect from the application socket port.
- 1 = Disconnect On Idle - The DeviceMaster UP will disconnect when there has been no transmit or received data between the serial device and application socket port for a specified **Idle** period (Attribute 32: Application Connection IP Address).

Attribute 29 - Application Listen Socket Port: This is the socket port number on the DeviceMaster UP the application will connect to if **Application Listen Enable** is enabled.

Attribute 30 - Application Connection Socket Port: This is the application socket port number the DeviceMaster UP will connect to if the **Application Connect Mode** is set to either **Connect Always** or **Connect On Data**.

Attribute 31 - Application Connection IP Address: This is the application IP address in hexadecimal format that the DeviceMaster UP will connect to if the **Application Connect Mode** is set to either **Connect Always** or **Connect On Data**. For example, an IP address of 10.1.2.100 is 0A010264 in hexadecimal.

Attribute 32 - Application Idle Timeout: The idle timeout period in milliseconds that is used if the **Application Disconnect Mode** is set to **Disconnect On Idle.**

Attribute 33 - To PLC Filter/Data Extraction Mode: The filter/data extraction mode to be employed on data to be sent to the PLC.

- 0 = Off
- 1 = String (128 char max) - Raw/ASCII data is filtered up to 128 characters (or bytes) in length.
- 2 = RFID (EPCglobal formats) - RFID data in any of the EPCglobal formats is filtered, the associated parameters is extracted, and the extracted data and RFID tag is sent to the PLC in a specified format.
- 3 = Barcode (UPC/EAN formats) - Barcode data in specified UPC/EAN formats is filtered, the associated parameters is extracted, and the extracted data and barcode is sent to the PLC in a specified format. See the barcode format definitions in Attribute 41 on Page 26.

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 34 - To Application Filter/Data Extraction Mode: The filter/data extraction mode to be employed on data to be sent to the application.

- 0 = Off
- 1 = String (128 char max) - Raw/ASCII data is filtered up to 128 characters (or bytes) in length.
- 2 = RFID (EPCglobal formats) - RFID data in any of the EPCglobal formats is filtered, the associated parameters is extracted, and the extracted data and RFID tag is sent to the application in a specified format.
- 3 = Barcode (UPC/EAN formats) - Barcode data in specified UPC/EAN formats is filtered, the associated parameters is extracted, and the extracted data and barcode is sent to the application in a specified format. See the barcode format definitions in Attribute 41 on Page 26.

The application filter mode can be set independently of the PLC filtering mode. The only exceptions are:

- If the PLC filter mode is set to **RFID**, the application filter mode cannot be set to **Barcode**.
- If the PLC filter mode is set to **Barcode**, the application filter mode cannot be set to **RFID**.

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 35 - Discard Unrecognized Data Mode: This attribute controls what to do with unrecognized RFID or barcode data.

- 0 = Off - Send unrecognized data to the PLC and/or application.
- 1 = Discard unrecognized data to the PLC. Allow sending of unrecognized data to the application.
- 2 = Discard unrecognized data to the application. Allow sending of unrecognized data to the PLC.
- 3 = Discard unrecognized data to both the PLC and application.

Attribute 36 - RFID Antenna Grouping: This attribute is applicable only to RFID filtering and only if the **Antenna** filtering option is enabled. It allows the DeviceMaster UP to filter RFID tags based on Antenna groupings. The possible groupings are:

Setting	Group 1 Antennas	Group 2 Antennas	Group 3 Antennas	Group N Antennas
None	1	2	3	4
Groups of Twos	1,2	3,4	5,6	Etc.
Groups of Threes	1,2,3	4,5,6	7,8,9	Etc.
Groups of Fours	1,2,3,4	5,6,7,8	9,10,11,12	Etc.
First Two Only	1,2	3	4	N+1
First Three Only	1,2,3	4	5	N+2

Attribute 37 - To PLC Filtering Options: This attribute defines the RFID filtering criteria to the PLC. If an option is enabled, it is used to decide when an RFID tag can be filtered or sent to the PLC.

- 01 Hex = **Encoding/Numbering -** Include the **Encoding/Numbering** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 02 Hex = **Filter Value -** Include the **Filter Value** in the filtering criteria, which is part of the RFID tag data.
- 04 Hex = **Antenna -** Include the **Antenna** number in the filtering criteria. This is data from the RFID reader and not from the RFID tag.
- 08 Hex = **Company -** Include the **Company** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 10 Hex = **Product/Location -** Include the **Product/Location** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 20 Hex = **Serial Number -** Include the **Serial Number** in the filtering criteria, which is part of the RFID tag data.

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 38 - To Application Filtering Options: This attribute defines the RFID filtering criteria to the application. If an option is enabled, it is used to decide when an RFID tag can be filtered or sent to the application.

- 01 Hex = **Encoding/Numbering -** Include the **Encoding/Numbering** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 02 Hex = **Filter Value -** Include the **Filter Value** in the filtering criteria, which is part of the RFID tag data.
- 04 Hex = **Antenna -** Include the **Antenna** number in the filtering criteria. This is data from the RFID reader and not from the RFID tag.
- 08 Hex = **Company -** Include the **Company** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 10 Hex = **Product/Location -** Include the **Product/Location** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 20 Hex = **Serial Number -** Include the **Serial Number** in the filtering criteria, which is part of the RFID tag data.

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 39 - Filter Age Time: This attribute defines the time a filter string, RFID tag, or barcode will continue to be filtered after the last time it was received. If an entry is received before the **Filter Age Time** has passed, the entry is filtered and the data will not be sent to the PLC and/or application. However, if the **Filter Age Time** has passed, it will pass filtering and be sent to the PLC and/or application.

Attribute 40 - RFID Reader Interface Type: This attribute defines the expected RFID data format. Each format is unique and pertains to the RFID reader manufacturer. If a RFID reader is to be used and it provides a similar format to the ones listed below, it can also be used.

- 0=Unspecified
- 10 (Decimal) = Alien (Text Mode)
- 11 (Decimal) = Alien (Terse Mode)
- 20 (Decimal) = Intermec (Hex ASCII Mode)

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 41 - Barcode Formats: This attribute defines barcode format to be used for both standard and eight digit UPC labels. The term *standard* refers to UPC-A, EAN-13, JAN, and EAN-14 barcodes which all have ten company/product digits.

The standard and eight digit formats are selected independently and each operates independently. It is important to note that the barcode filtering/data extraction will not function if no format is selected.

Format	Numbering Digits	Company Digits	Product Digits	Check Digit
Standard Formats				
None	N/A	N/A	N/A	N/A
Company-5/ Product-5	1-3	5	5	1
Company-6/ Product-4	1-3	6	4	1
Company-7/ Product-3	1-3	7	3	1
Company-8/ Product-2	1-3	8	2	1
Company-9/ Product-1	1-3	9	1	1
Eight Digit Formats				
EAN-8 Number-2/Product 5	2	0	5	1
EAN-8 Number-3/Product 4	3	0	4	1
UPC-E	1	Variable	Variable	1

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 42 - Application Transmit STX Append Value - You can set this attribute to append an STX (start of transmission) byte sequence which is configurable as 1 or 2-bytes to the beginning of the serial packet before it is sent.

The length indicates the number of STX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function.
- **1 (one STX byte) -** Inserts one STX byte before the data.
- **2 (two STX bytes) -** Inserts two STX bytes before the data.
- **Value1 -** Specifies the transmit character associated with the first STX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the transmit character associated with the second STX byte. (Only if length is two bytes.) You can specify a value between 0 and 255.

Attribute 43 - Application Transmit ETX Append Value - You can set this attribute to append an ETX (end of transmission) byte sequence which is configurable as 1 or 2 -bytes to the end of the serial packet before it is sent.

The length indicates the number of ETX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function.
- **1 (one ETX byte) -** Inserts one ETX byte at the end of the data.
- **2 (two ETX bytes) -** Inserts two ETX bytes at the end of the data.
- **Value -** Specifies the transmit character associated with the first ETX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the transmit character associated with the second ETX byte. (Only if length is 2-bytes.) You can specify a value between 0 and 255.

2.3.2. Serial Port Data Transfer Object Definition (71 Hex)

The *Serial Port Data Transfer vendor specific* object defines the attributes by which the PLC can transfer data to and from a serial port device through a DeviceMaster UP over EtherNet/IP.

Note: *There is one instance of this object per serial port. The instance number corresponds to the associated serial port number on the DeviceMaster UP. (Port numbers are numbered from one to N.)*

2.3.2.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	Number of ports on the DeviceMaster UP	Get
3	Num Instances	UINT	Number of ports on the DeviceMaster UP	Get

2.3.2.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Transmit (PLC to DeviceMaster UP) message data. **Structure of:** Produced data sequence number Data length Data array	 UINT UINT Array of USINT	 0-65535 (FFFF hex) 1-440 0-255	Set/Get
2	Receive (DeviceMaster UP to PLC) message data. **Structure of:** Produced data sequence number Data length Data array	 UINT UINT Array of USINT	 0-65535 (FFFF hex) 0-440* 0-255	Get
3	Receive (DeviceMaster UP to PLC) produced data sequence number - Normally sent to the PLC from the DeviceMaster UP in data transfer.	UINT	0-65535 (FFFF hex)	Set/Get
4	Receive (DeviceMaster UP to PLC) consumed sequence number - normally updated by the PLC in the *Write-to-Tag-Synced receive* method.	UINT	0-65535 (FFFF hex)	Set/Get
5	Transmit (PLC to DeviceMaster UP) produced data sequence number - normally sent to the DeviceMaster UP from the PLC in data transfer.	UINT	0-65535 (FFFF hex)	Set/Get
* *For the Polling receive method only. The maximum sized serial port message in the Write-to-Tag and Write-to-Tag-Synced receive method is 1518 bytes.*				

2.3.2.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
0E Hex	Yes	Yes	Get_Attribute_Single
10 Hex	No	Yes	Set_Attribute_Single

2.3.2.4. Instance Attribute Definitions

Attribute 1 - Transmit (PLC to DeviceMaster UP) Message Data: This attribute transmits data out of a serial port on the DeviceMaster UP.

- In most cases, incrementing the sequence number is optional. However, it is required if you enable the *Transmit Sequence Number Checking* option. (For more information, see *Attribute 16 - Serial Port Transfer Options* on Page 21.)
- The length must be at least one and a maximum of 440-bytes.
- A “Get” returns the last successfully transmitted data message.

Attribute 2 - Receive (DeviceMaster UP to PLC) Message Data: This attribute provides the receive data while operating in the Polling communication method.

- DeviceMaster UP increments the sequence number for each new serial port packet received.
- A length of zero indicates no data was received on the specified serial port.
- Two or more “Gets” may return the same data packet, but the messages will also have the same sequence number.
- Serial packets up to 1518 bytes may be received while operating in the *Write-To-Tag* or *Write-To-Tag-Synced* received methods. For serial packets over 440 bytes, the DeviceMaster UP will place the data into a sequence of tags. These tags must meet the following criteria:
  - All must be of type SINTs.
  - The entire sequence must be large enough to contain the maximum sized receive packet plus four SINTS for the sequence number and length parameters.
  - All tags except the last of the sequence must be 444 SINTs in size.
  - The tags must have the same base name and numbered in sequence. The first tag will not be numbered (i.e. Com1_RxData), the second tag will have a “2” appended (i.e. Com1_RxData2), the third will have a “3” appended (i.e. Com1_RxData3) and so on.
  - The sequence number and total length is placed in the first tag and the first tag is the last tag updated. Therefore, once the sequence number is updated, the entire serial packet will have been received and the PLC can process the data.

Attribute 3 - Receive (DeviceMaster UP to PLC) Produced Data Sequence Number: Use this attribute to get and set the *Produced Data Sequence number*. This is the same *Produced Data Sequence number* sent to the PLC in all the receive communication methods.

Attribute 4 - Receive (DeviceMaster UP to PLC) Consumed Data Sequence Number: Use this attribute to get and set the *Consumed Data Sequence number*. You can only specify this attribute when you are using the *Unsolicited - Write-to-Tag-Synced receive* method under Attribute 17 in the *Serial Port Configuration* object definition. When used, the PLC increments this attribute to indicate the data received has been consumed and it is now ready for another serial data packet. For more information, see the description of *Unsolicited -Write-to-Tag-Synced* in Attribute 17 on Page 22.

Attribute 5 - Transmit (PLC to DeviceMaster UP) Produced Data Sequence Number: Use this attribute to get and set the *Transmit Produced Data Sequence number*. This is the same *Produced Data Sequence number* sent to the DeviceMaster UP in the *Transmit Message data*.

2.3.3. Serial Port Statistics Object Definition (72 Hex)

The *Serial Port Statistics* object defines the statistics gathered by the DeviceMaster UP on a serial port basis.

Note: *There is one instance of this object per serial port. The instance number corresponds to the associated serial port number on the DeviceMaster UP. (Port numbers are numbered from one to N.)*

2.3.3.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	Number of ports on the DeviceMaster UP	Get
3	Num Instances	UINT	Number of ports on the DeviceMaster UP	Get

2.3.3.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Receive Byte Count	UDINT	0=default	Get
2	Receive Packet Count	UDINT	0=default	Get
3	Transmit Byte Count	UDINT	0=default	Get
4	Transmit Packet Count	UDINT	0=default	Get
5	Dropped Packet to PLC Count	UDINT	0=default	Get
6	Parity Error Count	UDINT	0=default	Get
7	Framing Error Count	UDINT	0=default	Get
8	Overrun Error Count	UDINT	0=default	Get
9	Received Consumed Sequence Error Count	UDINT	0=default	Get
10	Duplicate Transmit Sequence Number errors	UDINT	0=default	Get
11	Unexpected Transmit Sequence Number errors	UDINT	0=default	Get
12	Dropped Packet to Application Count	UDINT	0=default	Get

2.3.3.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
01 Hex	Yes	Yes	Get_Attribute_All
0E Hex	Yes	Yes	Get_Attribute_Single

2.3.3.4. Instance Attribute Definitions

Attribute 1 - Receive Byte Count: This attribute counts the number of bytes received over the serial port.

Attribute 2 - Receive Packet Count: This attribute counts the packets received over the serial port.

Attribute 3 - Transmit Byte Count: This attribute counts the number of bytes sent out the serial port.

Attribute 4 - Transmit Packet Count: This attribute counts the number of packets sent out the serial port.

Attribute 5 - Dropped Packet to PLC Count: This attribute counts the number of received serial packets intended for the PLC dropped due to:

- No STX byte(s) found
- No ETX byte(s) found
- Time-outs
- Too large of packet
- Receive buffer queue overflows

Attribute 6 - Parity Error Count: This attribute counts the number of received serial packets dropped due to parity errors.

Attribute 7 - Framing Error Count: This attribute counts the number of received serial packets dropped due to framing errors.

Attribute 8 - Overrun Error Count: This attribute counts the number of received serial packets dropped due to overrun error incidents.

Attribute 9 - Received Consumed Sequence Error Count: This attribute counts the number of received consumed sequence number errors. The DeviceMaster UP only increments this number when all of the following statements are true:

- You selected the *Unsolicited - Write-to-Tag-Synced* method of receive communication.
- DeviceMaster UP receives a serial packet.
- The *Consumed Sequence number* is out of sync. (It is not equal to the *Produced Sequence number* or equal to the *Produced Sequence number* minus one.)

Attribute 10 - Duplicate Transmit Sequence Number Error Count: This attribute counts the number of *Duplicate Transmit Sequence Number* errors. The DeviceMaster UP only increments this number when the following statements are true:

- You enabled the *Transmit Sequence Number Checking configuration* option. (See *Attribute 16 - Serial Port Transfer Options* on Page 21 for additional information.)
- DeviceMaster UP receives a transmit message with a sequence number equal to the previous sequence number. (The DeviceMaster UP expects this sequence number to be incremented by one from the sequence number in the previous transmit message.)

Attribute 11 - Unexpected Transmit Sequence Number Error Count: This attribute counts the number of *Unexpected Transmit Sequence Number* errors. The DeviceMaster UP increments this number when the following statements are true:

- You enabled the *Transmit Sequence Number Checking* configuration option. (See *Attribute 16 - Serial Port Transfer Options* on Page 21 for additional information.)
- DeviceMaster UP receives a transmit message with a sequence number that is not equal to either the previous transmit sequence number or the previous transmit sequence number plus one. (The DeviceMaster UP expects this sequence number to be incremented by one with each new transmit message.)

Attribute 12 - Dropped Packet to Application Count: This attribute counts the number of received serial packets intended for the application dropped due to:

- No STX byte(s) found
- No ETX byte(s) found
- Time-outs
- Too large of packet
- Receive buffer queue overflows

2.3.4. Socket Port Configuration Object Definition (73 Hex)

The Socket Port Configuration vendor specific object defines the protocol by which:

- A PLC can communicate with an Ethernet TCP/IP device through a DeviceMaster UP over Ethernet/IP.
- An optional application can communicate with the Ethernet device through the DeviceMaster UP over an Ethernet TCP/IP socket port.
- The optional data filtering and data extraction functions can be implemented.

Note: *The instance number corresponds to the associated socket port number on the DeviceMaster UP. (Socket port numbers can be numbered form 1 to N.)*

You can disregard this object definition if you configure the DeviceMaster UP using the embedded *Server Configuration* web page. Use *Chapter 3. Embedded Configuration Pages* on Page 61 to configure the DeviceMaster UP using the embedded web pages.

2.3.4.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	Number of ports on the DeviceMaster UP	Get
3	Num Instances	UINT	Number of ports on the DeviceMaster UP	Get

2.3.4.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Socket Port Device	UDINT	0=Raw/ASCII Data Device	Set/Get
2	Socket Port Commands	DWORD	1=Reset Socket Port 2=Save in Flash 4=Clear Sequence Counters 8=Clear Statistics Counters	Set/Get (Get returns last command sent)
3	Device Socket Enable	USINT	0=Disabled 1=Enabled	Set/Get
4	Device Listen Enable	USINT	0=Disabled 1=Enabled	Set/Get
5	Device Listen Socket Port	UINT	0-65535	Set/Get
6	Device Connect Mode	USINT	0=Never 1=Connect Always 2=Connect On Data	Set/Get
7	Device Disconnect Mode	USINT	0=Never 1=Disconnect On Idle	Set/Get
8	Device Connect Socket Port	UINT	0-65535	Set/Get
9	Device Connect IP Address	UDINT	00000000 Hex to FFFFFFFF Hex (Mask=255.255.255.255)	Set/Get
10	Device Idle Timeout	UDINT (msec)	0 to FFFFFFFF Hex	Set/Get

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
11	Receive Timeout Between Packets (if no ETX or time to wait for ETX value)	UINT (msec)	0 to 65535 (Default = 0)	Set/Get
36 (part 1)	(**As defined only for Get/ Set All.**) PLC Transmit STX Append Length	USINT	0,1,2 (0=No STX) (Default=0)	Set/Get
37 (part 1)	(**As defined only for Get/ Set All.**) PLC Transmit ETX Append Length	USINT	0,1,2 (0=No STX) (Default=0)	Set/Get
12	PLC IP Address	UDINT	0000000 Hex to FFFFFFFF Hex (Mask = 255.255.255.255)	Set/Get
13	Receive (DeviceMaster UP to PLC) Ethernet Data Transfer Method	USINT	0=OFF 1=Unsolicited - Write-to-Tag 2=Unsolicited - Write-to-Tag-Synced 3=Polling (Default=3)	Set/Get
14	PLC Controller Slot Number	USINT	0 to Max Slot Number on PLC (Default = 0)	Set/Get
15	Socket Port Transfer Options	WORD (bitwise OR)	01 Hex = (PLC/SLC) Rx MS Byte First 02 Hex = (PLC/SLC) Tx MS Byte First 04 Hex = Tx Sequence Number Checking 08 Hex = Disable Queuing of Non-Filtered Rx Messages 10 Hex = Drop oversized received packets	Set/Get
16	Maximum PLC Update Rate (No more than one message per time period.)	UINT (msec)	10-65535 (Default = 40)	Set/Get
17	Maximum Receive Data Packet Size	UINT	1-2048 (Default = 440)	Set/Get
18	Received (DeviceMaster UP to PLC) Produced Data Tag Name	STRING (Array of 40 SINTS)	ASCII String	
19	Application Socket Enable	USINT	0=Disabled 1=Enabled	Set/Get
20	Application Listen Enable	USINT	0=Disabled 1=Enabled	Set/Get
21	Application Connect Mode	USINT	0=Never 1=Connect Always 2=Connect On Data	Set/Get
22	Application Disconnect Mode	USINT	0=Never 1=Disconnect On Idle	Set/Get
23	Application Listen Socket Port	UINT	0-65535	Set/Get
24	Application Connect Socket Port	UINT	0-65535	Set/Get
25	Application Connect IP Address	UDINT	00000000 Hex to FFFFFFFF Hex (Mask=255.255.255.255)	Set/Get

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
26	Application Idle Timeout	UDINT (msec)	0 to FFFFFFFF Hex	Set/Get
27	To PLC Filter Mode	USINT	0=Off 1=String (128 byte maximum) 2=RFID (EPC Global formats) 3= Barcode (UPC/EAN formats)	Set/Get
28	To Application Filter Mode	USINT	0=Off 1=String (128 byte maximum) 2=RFID (EPC Global formats) 3= Barcode (UPC/EAN formats)	Set/Get
29	Discard Unrecognized Data Mode (RFID and Barcode Filter mode only)	USINT	0=Off 1=To PLC 2=To application 3=To PLC/application	Set/Get
30	RFID Antenna Grouping	USINT	0=None 1=Groups of Twos 2=Groups of Threes 3=Groups of Fours 4=First Two Only 5=First Three Only	Set/Get
31	To PLC Filter Options	WORD (Bitwise OR)	01 Hex = Encoding Scheme 02 Hex = Filter Code 04 Hex = Antenna Number 08 Hex = Company Code 10 Hex = Product/Location Code 20 Hex = Serial Number	Set/Get
32	To Application Filter Options	WORD (Bitwise OR)	01 Hex = Encoding Scheme 02 Hex = Filter Code 04 Hex = Antenna Number 08 Hex = Company Code 10 Hex = Product/Location Code 20 Hex = Serial Number	Set/Get
33	Filter Age Time	UDINT (msec)	0 - FFFFFFFF Hex	Set/Get
34	RFID Reader Interface Type	UINT	0=Unspecified 10=Alien (Text Mode) 11=Alien (Terse Mode) 20=Intermec (Hex ASCII Mode)	Set/Get
35	Barcode Formats (Barcode Filtering Only)	UINT	**Standard 12-14 Digit Format** (mask = 000F Hex) 00 Hex=NONE 01 Hex=Five Company/Five Product Digits 02 Hex=Six Company/Four Product Digits 03 Hex=Seven Company/Three Product Digits 04 Hex=Eight Company/Two Product Digits 05 Hex=Nine Company/One Product Digits **Eight Digit Format** (mask = 00F0 Hex) 00 Hex=NONE 10 Hex=EAN-8; Two Company/Five Product Digits 20 Hex=EAN-8; Three Company/Four Product Digits 30 Hex=UPC-E	Set/Get

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
36	(As defined for Get/Set All.)			Set/Get
	PLC Transmit STX Append Value **Structure of**:			
	Value1 (Only valid if Length not zero)	USINT	0 to 255	
	Value2 (Only valid if Length=2)	USINT	0 to 25	
	(As defined for Get/Set Single)			
	PLC Transmit STX Append Value **Structure of**:			
	Length	USINT	0,1,2 (0=No STX) (Default=0)	
	Value1 (Only valid if Length not zero)	USINT	0 to 255	
	Value2 (Only valid if Length=2)	USINT	0 to 255	
37	(As defined for Get/Set All.)			Set/Get
	PLC Transmit ETX Append Value **Structure of**:			
	Value1 (Only valid if Length not zero)	USINT	0 to 255	
	Value2 (Only valid if Length=2)	USINT	0 to 25	
	(As defined for Get/Set Single)			
	PLC Transmit ETX Append Value **Structure of**:			
	Length	USINT	0,1,2 (0=No ETX) (Default=0)	
	Value1 (Only valid if Length not zero)	USINT	0 to 255	
	Value2 (Only valid if Length=2)	USINT	0 to 255	
38	Receive STX Detect Value **Structure of**:			Set/Get
	Length	USINT	0,1,2 (0=No STX) (Default=0)	
	Value1 (Only valid if Length not zero)	USINT	0 to 255	
	Value2 (Only valid if Length=2)	USINT	0 to 255	

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
39	Receive ETX Detect Value **Structure of**: Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	USINT USINT USINT	0,1,2 (0=No ETX) (Default=0) 0 to 255 0 to 255	Set/Get
40	Application Transmit STX Append Value Structure of: Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	USINT USINT USINT	0,1,2 (0=No STX) (Default=0) 0 to 255 0 to 255	Set/Get
41	Application Transmit ETX Append Value Structure of: Length Value1 (Only valid if Length not zero) Value2 (Only valid if Length=2)	USINT USINT USINT	0,1,2 (0=No ETX) (Default=0) 0 to 255 0 to 255	Set/Get

2.3.4.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
01 Hex	Yes	Yes	Get_Attributes_All
02 Hex	No	Yes	Set_Attributes_All
0E Hex	Yes	Yes	Get_Attribute_Single
10 Hex	No	Yes	Set_Attribute_Single

2.3.4.4. Instance Attribute Definitions

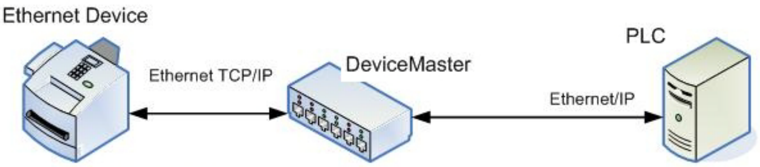
Attribute 1 - Socket Port Device Type: This attribute indicates the socket port device type. **Raw/ASCII Data Device** is the only currently supported option for EtherNet/IP.

Attribute 2 - Socket Port Commands: DeviceMaster UP supports the following commands:

- **Reset socket port -** This option resets the device socket port, application socket port, and the statistics counters. Generally this is not required when changing socket port settings because the DeviceMaster UP will detect the changes and, if necessary, automatically reset the socket connection(s).
- **Save in Flash -** This option saves the socket port configuration in flash memory. These settings are restored when you reboot the DeviceMaster UP.
- **Clear sequence counters -** This option clears the Receive Produced, Receive Consumed, and Transmit Produced sequence counters for the selected socket port.
- **Clear statistics counters -** This option clears the statistics counters for the selected socket port.

Attribute 3- Device Socket Enable - This attribute enables/disables the Device Socket Interface. Enabling this function allows an Ethernet device to be connected to the DeviceMaster UP via an Ethernet TCP/IP socket.

Device Socket Interface



Attribute 4 - Device Listen Enable: Enabling this setting allows the device to connect to the DeviceMaster UP via an Ethernet TCP/IP socket.

- 0 = Disables listening - The DeviceMaster UP will not accept connection attempts.
- 1 = Enables listening - The DeviceMaster UP will accept connection attempts from the specified socket.

Attribute 5 - Device Listen Socket Port: This is the socket port number on the DeviceMaster UP the device will connect to if **Device Listen Enable** is enabled.

Attribute 6 - Device Connect Mode: This setting controls if and how the DeviceMaster UP attempts to connect to the device at the specified IP Address and socket.

- 0 = Never - The DeviceMaster UP will not attempt to connect to the device.
- 1 = Connect Always - Will attempt to connect to the device until a connection is made.
- 2 = Connect On Data - The DeviceMaster UP will not attempt to connect to the device until there is data to send to the device from either the PLC or application. Once data is received for the socket device, the DeviceMaster UP will attempt to connect to the device until a connection is made.

Attribute 7 - Device Disconnect Mode: This setting controls if and how the DeviceMaster UP disconnects from a socket device.

- 0 = Never - The DeviceMaster UP will not disconnect from the device.
- 1 = Disconnect On Idle - The DeviceMaster UP will disconnect when there has been no transmit or received data between the socket device and PLC and/or application for a specified Idle period. (Please see Attribute 10.)

Attribute 8 - Device Connection Socket Port: This is the device socket port number the DeviceMaster UP will connect to if the **Device Connect Mode** is set to either **Connect Always** or **Connect On Data.**

Attribute 9 - Device Connection IP Address: This is the device IP address the DeviceMaster UP will connect to if the **Device Connect Mode** is set to either **Connect Always** or **Connect On Data.** The IP address is in hexadecimal format. For example, an IP address of 10.1.2.100 is 0A010264 in hexadecimal.

Attribute 10 - Device Idle Timeout: The idle timeout period in milliseconds that is used if the **Device Disconnect Mode** is set to **Disconnect On Idle**.

Attribute 11 - Receive Timeout Between Packets: This attributes specifies:

- How long DeviceMaster UP waits (in milliseconds) if the Receive ETX length is not zero (0) and it does not receive an ETX byte sequence.
- The time to wait (in milliseconds) between Ethernet packets if the Receive ETX Detect length is set to zero (0).

Attribute 12 - PLC IP Address: This attribute specifies the IP address in hexadecimal format for the PLC EtherNet/IP card. For example, an IP address of 10.1.2.100 is 0A010264 in hexadecimal.

Note: *The Polling method does not use this attribute.*

Attribute 13 - Receive (DeviceMaster UP to PLC) Ethernet Data Transfer Method: This attribute specifies Ethernet data transfer method used by the DeviceMaster UP for the specified socket port. Please refer to Attribute 17 of the *Serial Port Configuration Object* for a detailed explanation of these methods.

Attribute 14 - PLC Controller Slot Number: This attribute specifies the slot number on the PLC where the controller resides. The slot numbers typically start at zero (0) for the first slot.

Note: *This is generally zero for CompactLogix PLCs. The Polling method does not use this attribute.*

Attribute 15 - Socket Port Data Transfer Options: This attribute specifies the socket port transfer options. The following options are supported:

- **01 Hexadecimal (Bit 0)** = (PLC-5/SLC only) Receive Most Significant (MS) byte of 16 bit integer first. The default is transmit least significant (LS) byte first.
- **02 Hexadecimal (Bit 1)** = (PLC-5/SLC only) Transmit Most Significant (MS) byte of 16 bit integer first. The default is transmit least significant (LS) byte first.
- **04 Hexadecimal (Bit 2)** = Tx Sequence Number Checking
  - DeviceMaster UP rejects messages with duplicate sequence numbers, (that is, the same sequence number as the previous transmit data message), and increments the Duplicate Transmit Sequence Error Count.
  - DeviceMaster UP transmits messages with unexpected transmit sequence numbers, (that is, sequence numbers that are not the same as or are not equal to the previous sequence number plus one) increments the Unexpected Transmit Sequence Error Count.
- **08 Hexadecimal (Bit 3)** = Disable Queuing of Non-Filtered Rx Messages to the PLC. If filtering is disabled, only the last message received is sent to the PLC.
- **10 Hexadecimal (Bit 4)** = Drop oversized received data packets.

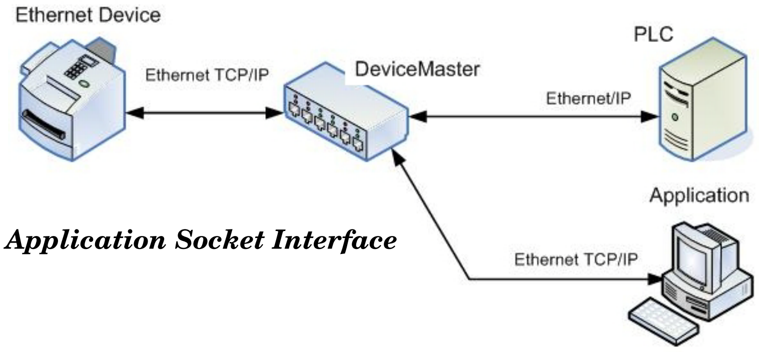
Attribute 16 - Maximum PLC Update Rate: The maximum rate (or minimum time interval) in milliseconds, that messages are sent to the PLC tag in the *Write-To-Tag receive* method. This attribute configures the DeviceMaster UP to space the messages to the PLC to prevent overrunning of data before the PLC can process it.

Attribute 17 - Maximum Receive Data Packet Size - Specifies the maximum acceptable size of a received Ethernet packet. The maximum received Ethernet packet size is 2048 bytes while operating in *Write-to-Tag/File* or *Write-to-Tag-File-Synced* receive modes.

Attribute 18 - Receive (DeviceMaster UP to PLC) Data Tag Name - This attribute specifies the PLC tag name. It indicates where to write received data while operating in the *Write-to-Tag* or *Write-to-Tag-Synced receive* method.

Note: *This attribute is not used in the Polling method.*

Attribute 19 - Application Socket Enable: This attribute enables/disables the Application Socket Interface. Enabling this function allows an application to be connected to the device socket port. If both the PLC and application are connected to the device socket port, both can transmit to and receive data from the device socket port. However, the PLC and application cannot communicate directly to each other.



Application Socket Interface

Attribute 20 - Application Listen Enable: Enabling this setting allows the application to connect to the DeviceMaster UP via an Ethernet TCP/IP socket.

- 0 = Disables listening - The DeviceMaster UP will not accept connection attempts.
- 1 = Enables listening - The DeviceMaster UP will accept connection attempts from the specified socket.

Attribute 21 - Application Connect Mode: This setting controls if and how the DeviceMaster UP attempts to connect to the application at the specified IP address and socket.

- 0 = Never - The DeviceMaster UP will not attempt to connect to the application.
- 1 = Connect Always - Will attempt to connect to the application until a connection is made.
- 2 = Connect On Data - The DeviceMaster UP will not attempt to connect to the application until there is data to send to the application. Once data is received from the socket device, the DeviceMaster UP will attempt to connect to the application until a connection is made.

Attribute 22 - Application Disconnect Mode: This setting controls if and how the DeviceMaster UP disconnects from an application.

- 0 = Never - The DeviceMaster UP will not disconnect from the application.
- 1 = Disconnect On Idle - The DeviceMaster UP will disconnect when there has been no transmit or received data between the socket device and application for a specified Idle period. (See Attribute 32.)

Attribute 23 - Application Listen Socket Port: This is the socket port number on the DeviceMaster UP the application will connect to if **Application Listen Enable** is enabled.

Attribute 24 - Application Connection Socket Port: This is the application socket port number the DeviceMaster UP will connect to if the **Application Connect Mode** is set to either **Connect Always** or **Connect On Data.**

Attribute 25 - Application Connection IP Address: This is the application IP address the DeviceMaster UP will connect to if the **Application Connect Mode** is set to either **Connect Always** or **Connect On Data.**

Attribute 26 - Application Idle Timeout: The idle timeout period in milliseconds that is used if the **Application Disconnect Mode** is set to **Disconnect On Idle.**

Attribute 27 - To PLC Filter/Data Extraction Mode: The filter/data extraction mode to be employed on data to be sent to the PLC.

- 0 = Off
- 1 = String (128 char max) - Raw/ASCII data is filtered up to 128 characters (or bytes) in length.
- 2 = RFID (EPCglobal formats) - RFID data in any of the EPCglobal formats is filtered, the associated parameters is extracted, and the extracted data and RFID tag is sent to the PLC in a specified format.
- 3 = Barcode (UPC/EAN formats) - Barcode data in specified UPC/EAN formats is filtered, the associated parameters is extracted, and the extracted data and barcode is sent to the PLC in a specified format. See the barcode format definitions in Attribute 41 on Page 26.

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 28 - To Application Filter/Data Extraction Mode: The filter/data extraction mode to be employed on data to be sent to the application.

- 0 = Off
- 1 = String (128 char max) - Raw/ASCII data is filtered up to 128 characters (or bytes) in length.
- 2 = RFID (EPCglobal formats) - RFID data in any of the EPCglobal formats is filtered, the associated parameters is extracted, and the extracted data and RFID tag is sent to the application in a specified format.
- 3 = Barcode (UPC/EAN formats) - Barcode data in specified UPC/EAN formats is filtered, the associated parameters is extracted, and the extracted data and barcode is sent to the application in a specified format.See the barcode format definitions in Attribute 41 on Page 26.

The application filter mode can be set independently of the PLC filtering mode. The only exceptions are:

- If the PLC filter mode is set to RFID, the application filter mode cannot be set to **Barcode.**
- If the PLC filter mode is set to Barcode, the application filter mode cannot be set to **RFID.**

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 29 - Discard Unrecognized Data Mode: This attribute controls what to do with unrecognized RFID or barcode data.

- 0 = Off - Send unrecognized data to the PLC and/or application.
- 1 = Discard unrecognized data to the PLC. Allow sending of unrecognized data to the application.
- 2 = Discard unrecognized data to the application. Allow sending of unrecognized data to the PLC.
- 3 = Discard unrecognized data to both the PLC and application.

Attribute 30 - RFID Antenna Grouping: This attribute is applicable only to RFID filtering and only if the Antenna filtering option is enabled. It allows the DeviceMaster UP to filter RFID tags based on Antenna groupings. The possible groupings are:

Setting	Group 1 Antennas	Group 2 Antennas	Group 3 Antennas	Group N Antennas
None	1	2	3	4
Groups of Twos	1,2	3,4	5,6	Etc.
Groups of Threes	1,2,3	4,5,6	7,8,9	Etc.
Groups of Fours	1,2,3,4	5,6,7,8	9,10,11,12	Etc.
First Two Only	1,2	3	4	N+1
First Three Only	1,2,3	4	5	N+2

Attribute 31 - To PLC Filtering Options: This attribute defines the RFID filtering criteria to the PLC. If an option is enabled, it is used to decide when an RFID tag can be filtered or sent to the PLC.

- 01 Hex = **Encoding/Numbering -** Include the **Encoding/Numbering** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 02 Hex = **Filter Value -** Include the **Filter Value** in the filtering criteria, which is part of the RFID tag data.
- 04 Hex = **Antenna -** Include the **Antenna** number in the filtering criteria. This is data from the RFID reader and not from the RFID tag.
- 08 Hex = **Company -** Include the **Company** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 10 Hex = **Product/Location -** Include the **Product/Location** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 20 Hex = **Serial Number -** Include the **Serial Number** in the filtering criteria, which is part of the RFID tag data.

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 32 - To Application Filtering Options: This attribute defines the RFID filtering criteria to the application. If an option is enabled, it is used to decide when an RFID tag can be filtered or sent to the application.

- 01 Hex = **Encoding/Numbering -** Include the **Encoding/Numbering** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 02 Hex = **Filter Value -** Include the **Filter Value** in the filtering criteria, which is part of the RFID tag data.
- 04 Hex = **Antenna -** Include the **Antenna** number in the filtering criteria. This is data from the RFID reader and not from the RFID tag.
- 08 Hex = **Company -** Include the **Company** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 10 Hex = **Product/Location -** Include the **Product/Location** code in the filtering criteria, which is part of the RFID tag or barcode data.
- 20 Hex = **Serial Number -** Include the **Serial Number** in the filtering criteria, which is part of the RFID tag data.

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 33 - Filter Age Time: This attribute defines the time a filter string, RFID tag, or barcode will continue to be filtered after the last time it was received. If an entry is received before the **Filter Age Time** has passed, the entry is filtered and the data will not be sent to the PLC and/or application. However, if the **Filter Age Time** has passed, it will pass filtering and be sent to the PLC and/or application.

Attribute 34 - RFID Reader Interface Type: This attribute defines the expected RFID data format. Each format is unique and pertains to the RFID reader manufacturer. If a RFID reader is to be used and it provides a similar format to the ones listed below, it can also be used.

- 0=Unspecified
- 10 (Decimal) = Alien (Text Mode)
- 11 (Decimal) = Alien (Terse Mode)
- 20 (Decimal) = Intermec (Hex ASCII Mode)

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 35 - Barcode Formats - This attribute defines barcode format to be used for both standard and eight digit UPC labels. The term *standard* refers to UPC-A, EAN-13, JAN, and EAN-14 barcodes which all have ten company/product digits.

The standard and eight digit formats are selected independently and each operates independently. It is important to note that the barcode filtering/data extraction will not function if no format is selected.

Format	Numbering Digits	Company Digits	Product Digits	Check Digit
Standard Formats				
None	N/A	N/A	N/A	N/A
Company-5/ Product-5	1-3	5	5	1
Company-6/ Product-4	1-3	6	4	1
Company-7/ Product-3	1-3	7	3	1
Company-8/ Product-2	1-3	8	2	1
Company-9/ Product-1	1-3	9	1	1
Eight Digit Formats				
EAN-8 Number-2/Product 5	2	0	5	1
EAN-8 Number-3/Product 4	3	0	4	1
UPC-E	1	Variable	Variable	1

See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.

Attribute 36 - PLC Transmit STX Append Value: You can set this attribute to append an STX (start of transmission) byte sequence which is configurable as 1 or 2-bytes to the beginning of the Ethernet packet before it is sent. The length indicates the number of STX bytes. The valid values for length are: • 0 (zero) - Setting this attribute to zero disables this function.

- **1 (one STX byte) -** Inserts one STX byte before the data.
- **2 (two STX bytes) -** Inserts two STX bytes before the data.
- **Value1 -** Specifies the transmit character associated with the first STX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the transmit character associated with the second STX byte. (Only if length is two bytes.) You can specify a value between 0 and 255.

Attribute 37 - PLC Transmit ETX Append Value: You can set this attribute to append an ETX (end of transmission) byte sequence which is configurable as 1 or 2 -bytes to the end of the Ethernet packet before it is sent. The length indicates the number of ETX bytes.

The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function.
- **1 (one ETX byte) -** Inserts one ETX byte at the end of the data.
- **2 (two ETX bytes) -** Inserts two ETX bytes at the end of the data.
- **Value -** Specifies the transmit character associated with the first ETX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.

- **Value2 -** Specifies the transmit character associated with the second ETX byte. (Only if length is 2-bytes.) You can specify a value between 0 and 255.

Attribute 38 - Receive STX Detect Value: This attribute detects an STX (start of transmission) byte sequence which is configurable as 1 or 2-bytes when it receives a Ethernet packet. The length indicates the number of STX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function. When disabled, the DeviceMaster UP accepts the first byte received after the last ETX byte(s) as the start of the next data packet.
- **1 (one STX byte) -** Scans Ethernet data for one STX byte. If the DeviceMaster UP finds an STX byte it collects the data. If the first byte is not the STX byte, the DeviceMaster UP discards the byte. The DeviceMaster UP continues to discard the bytes until the DeviceMaster UP finds an STX byte.
- **2 (two STX bytes) -** Scans Ethernet data for two STX bytes. If the DeviceMaster UP finds two STX bytes it collects the data. If the first two bytes are not the STX bytes, the DeviceMaster UP discards the bytes. Bytes continue to be discarded until the DeviceMaster UP finds two STX bytes.
- **Value1 -** Specifies the character that represents the first STX byte. DeviceMaster UP looks for this character in the first STX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the character that represents the second STX byte. DeviceMaster UP looks for this character in the first STX byte. (Only if length is two bytes.) You can specify a value between 0 and 255.

Attribute 39 - Receive ETX Detect Value : This attribute detects an ETX (end of transmission) byte sequence which is configurable as 1 or 2 bytes marking the end of the Ethernet packet. The length indicates the number of ETX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function. When disabled, the DeviceMaster UP uses the Receive Timeout Between Packets (attribute 11) to indicate the end of data packet.
- **1 (one ETX byte) -** Scans Ethernet data for one ETX byte. When the DeviceMaster UP finds an ETX byte it identifies the data as a Ethernet packet.
- **2 (two ETX bytes) -** Scans Ethernet data for two ETX bytes. When the DeviceMaster UP finds two ETX bytes it identifies the data as a Ethernet packet.
- **Value1 -** Specifies the character to scan for in the first ETX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the character to scan for in the second ETX byte. (Only if length is 2-bytes.) You can specify a value between 0 and 255.

Attribute 40 - Application Transmit STX Append Value: - You can set this attribute to append an STX (start of transmission) byte sequence which is configurable as 1 or 2-bytes to the beginning of the Ethernet packet before it is sent. The length indicates the number of STX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function.
- **1 (one STX byte) -** Inserts one STX byte before the data.
- **2 (two STX bytes) -** Inserts two STX bytes before the data.
- **Value1 -** Specifies the transmit character associated with the first STX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the transmit character associated with the second STX byte. (Only if length is two bytes.) You can specify a value between 0 and 255.

Attribute 41 - Application Transmit ETX Append Value: You can set this attribute to append an ETX (end of transmission) byte sequence which is configurable as 1 or 2 -bytes to the end of the Ethernet packet before it is sent. The length indicates the number of ETX bytes. The valid values for length are:

- **0 (zero) -** Setting this attribute to zero disables this function.
- **1 (one ETX byte) -** Inserts one ETX byte at the end of the data.
- **2 (two ETX bytes) -** Inserts two ETX bytes at the end of the data.
- **Value1 -** Specifies the transmit character associated with the first ETX byte. (Only if the length is not zero.) You can specify a value between 0 and 255.
- **Value2 -** Specifies the transmit character associated with the second ETX byte. (Only if length is 2-bytes.) You can specify a value between 0 and 255.

2.3.5. Socket Port Data Transfer Definition Object (74 Hex)

The *Socket Port Data Transfer vendor specific* object defines the attributes by which the PLC can transfer data to and from an Ethernet device, via a socket port through a DeviceMaster UP over EtherNet/IP.

Note: *There is one instance of this object per socket port. The instance number corresponds to the associated socket port number on the DeviceMaster UP. (Port numbers are numbered from one to N.)*

2.3.5.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	Number of ports on the DeviceMaster UP	Get
3	Num Instances	UINT	Number of ports on the DeviceMaster UP	Get

2.3.5.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Transmit (PLC to DeviceMaster UP) message data. **Structure of:** Produced data sequence number Data length Data array	UINT UINT Array of USINT	0-65535 (FFFF hex) 1-440 0-255	Set/Get
2	Receive (DeviceMaster UP to PLC) message data. **Structure of:** Produced data sequence number Data length Data array	UINT UINT Array of USINT	0-65535 (FFFF hex) 0-440* 0-255	Get
3	Receive (DeviceMaster UP to PLC) produced data sequence number - Normally sent to the PLC from the DeviceMaster UP in data transfer.	UINT	0-65535 (FFFF hex)	Set/Get
4	Receive (DeviceMaster UP to PLC) consumed sequence number - normally updated by the PLC in the *Write-to-Tag-Synced receive* method.	UINT	0-65535 (FFFF hex)	Set/Get
5	Transmit (PLC to DeviceMaster UP) produced data sequence number - normally sent to the DeviceMaster UP from the PLC in data transfer.	UINT	0-65535 (FFFF hex)	Set/Get

* *For the Polling receive method only. The maximum sized socket port message in the Write-to-Tag and Write-to-Tag-Synced receive method is 2048 bytes.*

2.3.5.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
0E Hex	Yes	Yes	Get_Attribute_Single
10 Hex	No	Yes	Set_Attribute_Single

2.3.5.4. Instance Attribute Definitions

Attribute 1 - Transmit (PLC to DeviceMaster UP) Message Data: This attribute transmits data out of a socket port on the DeviceMaster UP.

In most cases, incrementing the sequence number is optional. However, it is required if you enable the *Transmit Sequence Number Checking* option. (For more information, see *Attribute 16 - Serial Port Transfer Options* on Page 21.)

The length must be at least one and a maximum of 440-bytes.

A **Get** returns the last successfully transmitted data message.

Attribute 2 - Receive (DeviceMaster UP to PLC) Message Data: This attribute provides the receive data while operating in the Polling communication method.

- DeviceMaster UP increments the sequence number for each new socket port packet received.
- A length of zero indicates no data was received on the specified socket port.
- Two or more **Gets** may return the same data packet, but the messages will also have the same sequence number.
- Socket packets up to 2048 bytes may be received while operating in the *Write-To-Tag* or *Write-To-Tag-Synced received* methods. For socket packets over 440 bytes, the DeviceMaster UP will place the data into a sequence of tags. These tags must meet the following criteria:
  - All must be of type SINTs.
  - The entire sequence must be large enough to contain the maximum sized receive packet plus four SINTS for the sequence number and length parameters.
  - All tags except the last of the sequence must be 444 SINTs in size.
  - The tags must have the same base name and numbered in sequence. The first tag will not be numbered (i.e. **Com1_RxData**), the second tag will have a **2** appended (i.e. **Com1_RxData2**), the third will have a **3** appended (i.e. **Com1_RxData3**) and so on.
  - The sequence number and total length is placed in the first tag and the first tag is the last tag updated. Therefore, once the sequence number is updated, the entire socket packet will have been received and the PLC can process the data.

Attribute 3 - Receive (DeviceMaster UP to PLC) Produced Data Sequence Number: Use this attribute to get and set the *Produced Data Sequence number*. This is the same *Produced Data Sequence number* sent to the PLC in all the receive communication methods.

Attribute 4 - Receive (DeviceMaster UP to PLC) Consumed Data Sequence Number: Use this attribute to get and set the *Consumed Data Sequence number*. You can only specify this attribute when you are using the *Unsolicited - Write-to-Tag-Synced receive* method under Attribute 17 in the *Serial Port Configuration* object definition. When used, the PLC increments this attribute to indicate the data received has been consumed and it is now ready for another socket data packet. For more information, see the description of *Unsolicited -Write-to-Tag-Synced* in Attribute 17 on Page 22.

Attribute 5 - Transmit (PLC to DeviceMaster UP) Produced Data Sequence Number: Use this attribute to get and set the *Transmit Produced Data Sequence number*. This is the same *Produced Data Sequence number* sent to the DeviceMaster UP in the *Transmit Message data*.

2.3.6. Informational Objects

The following object definitions are included for informational purposes only. While some software packages such as RSLinx make use of these objects, few PLC programmers will have a need to directly access them.

2.3.6.1. Identity Object (01 Hex, 1 instance)

The *Identity Object* provides identification of and general information about the DeviceMaster UP.

2.3.6.1.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get

2.3.6.1.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Vendor ID	UINT	909 (Comtrol)	Get
2	Device Type	UINT	70 hex (vendor specific device)	Get
3	Product Code	UINT	1-65535	Get
4	Revision (product or software release) **Structure of:** Major Revision Minor Revision	USINT USINT	1 to 127 1 to 999	Get
5	Status	WORD	See *2.3.6.1.3. Status Word*, below.	Get
6	Serial Number	UDINT	1-65535	Get
7	Product Name **Structure of:** Name Length Name String	USINT STRING	Length of string: “DeviceMaster UP **x**P” (where “**x**” is 1 or 4 depending on the model)	Get

2.3.6.1.3. Status Word

Please refer to Pages 5-8 in Volume 1 of the *CIP Common Specification*.

2.3.6.1.4. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
01 hex	No	Yes	Get_Attribute_All
05 hex	No	Yes	Reset
0E hex	Yes	Yes	Get_Attribute_Single

2.3.6.2. Message Router Object (02 Hex)

The *Message Router Object* provides a messaging connection point through which a client may address a service to any object or instance residing in the physical device.

2.3.6.2.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get

2.3.6.2.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Object List **Structure of:** Number Classes	UINT Array of UINT	Number of supported class codes List of supported class codes	Get
2	Max Connections	UINT	128	Get

2.3.6.2.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
01 Hex	No	Yes	Get_Attribute_All (Class only)
0E Hex	Yes	Yes	Get_Attribute_Single (Instance only)

2.3.6.3. Connection Manager Object (06 Hex)

The *Connection Manager Object* provides services for connection and connection-less communications.

This object has no supported attributes.

2.3.6.3.1. Instance Object Specific Services

DeviceMaster UP supports the following instance object specific services:

Service Code	Service Name	Service Description
4E Hex	Forward_Close	Closes a connection.
52 Hex	Unconnected_ Send	Unconnected Send Service.
54 Hex	Forward_Open	Opens a connection.

2.3.6.4. Port Object (F4 Hex - 1 instance)

The *Port Object* enumerates the CIP ports on the DeviceMaster UP.

2.3.6.4.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	1	Get
3	Num Instances	UINT	1	Get
8	Entry Port	UINT	1	Get
9	All Ports	Array of UINT	[0]=0 [1]=0 [2]=TCP_IP_PORT_TYPE (4) [3]=TCP_IP_PORT_NUMBER(2)	Get

2.3.6.4.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Port Type	UINT	4 (TCP/IP)	Get
2	Port Number	UINT	2 (TCP/IP)	Get
3	Port Object **Structure of:** 16-bit word count in path Path	UINT Array of UINT	2 [0]=0212 Hex [1]=0	Get

2.3.6.4.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
01 Hex	Yes	Yes	Get_Attribute_All
0E Hex	Yes	Yes	Get Attribute Single

2.3.6.5. TCP Object (F5 Hex - 1 instance)

The *TCP/IP Interface Object* provides the mechanism to retrieve the TCP/IP attributes for DeviceMaster UP.

2.3.6.5.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	1	Get
2	Max Instance	UINT	1	Get
3	Num Instances	UINT	1	Get

2.3.6.5.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Status	DWORD	0=Not configured 1=Valid configuration	Get
2	Configuration Capability	DWORD	14 Hex (DHCP and SETTABLE)	Get
3	Configuration Control	DWORD	0=Use stored IP address (static IP address) 2=DHCP	Get
4	Physical Link Object **Structure of:** Path Size Path	UINT Array of USINT	2 [0]=20 Hex [1]=F6 Hex [2]=24 Hex [3]=01 Hex	Get
5	Interface Configuration **Structure of:** IP Address Network Mask Gateway Address Name Server Name Server 2 Domain Name Length Domain Name	UDINT UDINT UDINT UDINT UDINT UINT STRING	<IP address> <Network mask> <Gateway Addr> <Name server> <Name server2> <Length of name> <Domain name>	Get
6	Host Name **Structure of:** Host Name Length Host Name	UINT STRING	7 to 15 <IP address>	Get

2.3.6.5.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
01 Hex	Yes	Yes	Get_Attribute_All
0E Hex	Yes	Yes	Get_Attribute_Single

2.3.6.6. Ethernet Link Object (F6 Hex)

The *Ethernet Link* object maintains link-specific counters and status information for the Ethernet communications on the DeviceMaster UP.

2.3.6.6.1. Class Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Revision	UINT	2	Get
2	Max Instance	UINT	1	Get
3	Num Instances	UINT	1	Get

2.3.6.6.2. Instance Attributes

Attribute ID	Name	Data Type	Data Value(s)	Access Rule
1	Interface speed (current operational speed)	UDINT	10=10-Mbit 100=100-Mbit	Get
2	Interface Flags (Current operational status)	DWORD	Bit 0 =link status (0=inactive) (1=active) Bit 1=Half/Full Duplex (0=half duplex) (2=full duplex)	Get
3	Physical Address	Array of 6 USINT	MAC address	Get

2.3.6.6.3. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
01 Hex	Yes	Yes	Get_Attribute_All
0E Hex	Yes	Yes	Get_Attribute_Single

2.3.6.7. PCCC Object (67 Hex)

The *PCCC object* provides the ability to encapsulates, and then transmit and receive PCCC messages between devices on an EtherNet/IP network. This is the primary interface for the PLC-5 and SLC PLCs.

2.3.6.7.1. Class Attributes

Not supported.

2.3.6.7.2. Instance Attributes

Not supported.

2.3.6.7.3. Instances

Supports Instance 1.

2.3.6.7.4. Common Services

Service Code	Implemented in Class	Implemented in Instance	Service Name
4B Hex	No	Yes	Execute_PCCC

2.3.6.7.5. Message Structure for Execute PCCC

Request Message Name	Data Type	Description
Length	USINT	Length of requestor ID
Vendor	UINT	Vendor number of requestor
Serial Number	UDINT	ASA serial number of requestor
CMD	USINT	Command byte
STS	USINT	0
TNSW	UINT	Transport word
FNC	USINT	Function code
PCCC_params	Array of USINT	CMD/FMC specific parameters

Response Message Name	Data Type	Description
Length	USINT	Length of requestor ID
Vendor	UINT	Vendor number of requestor
Serial Number	UDINT	ASA serial number of requestor
CMD	USINT	Command byte
STS	USINT	Status byte
TNSW	UINT	Transport word - Same value as request.
EXT_STS	USINT	Extended status (if error)
PCCC_params	Array of USINT	CMD/FMC specific result data

Supported PCCC Command Types	FNC	Description
0F Hex	67 Hex	PLC-5 typed write
0F Hex	68 Hex	PLC-5 typed read
0F Hex	A2 Hex	SLC 500 protected typed read with 3 address fields
0F Hex	AA Hex	SLC 500 protected typed write with 3 address fields

2.4. PLC-5/SLC and MicroLogix Interfaces

EtherNet/IP firmware versions 2.01 or later supports EtherNet/IP connections to the PLC-5 and SLC PLCs. As of EtherNet/IP version 3.02, the PLC-5 and SLC interface supports:

- Polling, Write-to-File, and Write-to-File-Synced receive communication methods.
- PCCC based messages transferred by means of the PCCC object, including:
  - SLC Typed Read Message
  - SLC Typed Write Message
  - PLC-5 Typed Read Message (Logical ASCII address format)
  - PLC-5 Typed Write Message (Logical ASCII address format)
- Configuration of the DeviceMaster UP only through the embedded web page. There is no DeviceMaster UP configuration available through the PLC-5 and SLC PLCs. See the following topics for more information:
  - *5.4. SLC or MicroLogix PLC Programming Example Instructions* on Page 104
  - *5.5. PLC-5 PLC Programming Example Instructions* on Page 131
- Receive, transmit and statistics data.
- Standard PLC-5/SLC file naming conventions.
- Ethernet device interface via Ethernet TCP/IP sockets.
- Application interface via Ethernet TCP/IP sockets.
- Filtering and data extraction:
  - String filtering of up to 128 bytes.
  - RFID - EPCglobal tag data filtering and data extraction.
  - Barcode - UPC/EAN barcode data filtering and data extraction.
  - Independent filtering criteria to the PLC and application.
- Serial data packet transfers up to 1518 bytes and socket packet data transfers up to 2048 bytes in the *Write-to-File* and *Write-to-File-Synced receive* methods.
- Controlled message rate to the PLC when operating in the *Write-to-File receive* method. This is accomplished by setting the **Maximum PLC Update Rate**.

The primary differences between the PLC-5/SLC interface and the ControlLogix interfaces are:

- Since the PLC-5 and SLC PLCs operate on a file memory system, the PLC-5/SLC interface provides *Write-to-File* and *Write-to-File-Synced* communication methods. They operate in a very similar manner to the *Write-to-Tag* and *Write-to-Tag-Synced* methods available for the ControlLogix family of PLCs.
- Polling is performed through the PLC-5/SLC specific messages instead of accessing the Serial Port Data Transfer object.
- When configuring the DeviceMaster UP to operate in *Write-to-File* or *Write-to-File-Synced*, enter the file name starting with a "$" (i.e. **$N10:0**) for SLC and PLC-5, and with a "#" (i.e. **#N10:0**) for MicroLogix.
- The maximum serial and socket port packet sizes in polling mode are smaller due to PCCC message size limitations.
- The configuration options cannot be set through SLC or PLC-5 messages.

Note: *While ControlLogix PLCs support the SLC and PLC-5 messages, using those messages on ControlLogix PLCs is not recommended due to data size and performance considerations. For ease of programming, Comtrol recommends the Write-to-File receive method used with the Maximum PLC Update Rate option*

2.4.1. Requirements

Your PLC-5/SLC must support:

- MultipHop
- ControlLogix devices
- EtherNet/IP

The following tables list PLCs that support EtherNet/IP and the required firmware version for each PLC.

Note: *Older versions of the PLC firmware may or may not provide EtherNet/IP functionality. You must verify that an older version of the PLC firmware provides EtherNet/IP functionality before you can use it with DeviceMaster UP. If you need to update your PLC firmware, contact your Rockwell distributor.*

2.4.1.1. SLC 5/05

Models	Catalog Numbers	Required Firmware Version for EtherNet/IP
SLC 5/05	1747-L551 1747-L552 1747-L553	Series A: FRN 5 or later Series C: FRN 3 or later

Reference*: SLC 500 Instruction Set, Appendix A Firmware History*, Rockwell Publication 1747-RM001D-EN-P

2.4.1.2. PLC-5

Models	Catalog Numbers	Required Firmware Version for EtherNet/IP
Ethernet PLC-5	1785-L20E, 1785-L40E, 1785-L80E	**Base EtherNet/IP functionality:** Series C: Revision N or later Series D: Revision E or later Series E: Revision D or later **Full EtherNet/IP Compliance:** Series C: Revision R or later Series D: Revision H or later Series E: Revision G or later
Enhanced PLC-5 attached to Ethernet Module	1785-L11B, 1785-L20B, 1785-L30B, 1785-L40B, 1785-L40L, 1785-L60B, 1785-L60L, 1785-L80B	Series B: Revision N.1 or later Series C: Revision N or later Series D: Revision E or later Series E: Revision D or later
ControlNet PLC-5 attached to Ethernet Module	1785-L30C15 1785-L40C15 1785-L60C15 1785-L80C15	Series C: Revision N or later Series D: Revision E or later Series E: Revision D or later All revisions
Ethernet Module	1785-Enet	Series B: **Base EtherNet/IP functionality:** All revisions **Full EtherNet/IP Compliance:** Revision D or later

References:

- *Enhanced & Ethernet PLC-5 Series and Enhancement History*, Rockwell Publication G19099
- *ControlNet Processor Phase, Series and Enhancement History*, Rockwell Publication G19102
- *PLC-5 Programmable Controllers System Selection Guide*, Rockwell Publication 1785-SG001A-EN-P - March 2004
- *Ethernet Interface Module Series B, Revision D Product Release Notes*, Rockwell Publication 1785-RN191E-EN-P - December 2002

2.4.2. Messages

The PLC-5 and SLC 5/05 PLCs support the following *PCCC* messages:

Message Type	PCCC Message ID	Maximum Message Size	Maximum Serial Packet Size
SLC Typed Read	162	CLX: 242 SINTs (121 INTs) SLC: 206 SINTs (103 INTs) PLC-5: 240 SINTs (120 INTs)	CLX: 238 SINTs (119 INTs) SLC: 202 SINTs (101 INTs) PLC-5: 236 SINTs (118 INTs)
SLC Typed Write	170	CLX: 220 SINTs (110 INTs) SLC: 206 SINTs 103 INTs) PLC-5: 238 SINTs (119 INTs)	216 SINTs (108 INTs) SLC: 202 SINTs (101 INTs) PLC-5: 234 SINTs (117 INTs)
PLC-5 Typed Read	104	CLX: 234 SINTs (117 INTs) SLC: 252 SINTs (126 INTs) PLC-5: 238 SINTs (119 INTs)	230 SINTS (115 INTs) SLC: 248 SINTs (124 INTs) PLC-5: 234 SINTs (117 INTs)
PLC-5 Typed Write	103	CLX: 226 SINTs (113 INTs) SLC: 226 SINTs (113 INTs) PLC-5: 224 SINTs (112 INTs)	CLX: 222 SINTs (111 INTs) SLC: 222 SINTs (111 INTs) PLC-5: 220 SINTs (110 INTs)

2.4.2.1. DeviceMaster UP File Addressing

The following tables display the DeviceMaster UP file addressing for the PLC-5/SLC messages.

Serial Port Number	Receive Data	Receive Data Produced Sequence Number	Receive Data Consumed Sequence Number	Transmit Data	Transmit Data Sequence Number	Statistics
1	N10:0	N10:128	N10:129	N11:0	N11:128	N12:0
2	N20:0	N20:128	N20:129	N21:0	N21:128	N22:0
3	N30:0	N30:128	N30:129	N31:0	N31:128	N32:0
4	N40:0	N40:128	N40:129	N41:0	N41:128	N42:0

Socket Port Number	Receive Data	Receive Data Produced Sequence Number	Receive Data Consumed Sequence Number	Transmit Data	Transmit data Sequence Number
1	N50:0	N50:128	N50:129	N51:0	N51:128
2	N60:0	N60:128	N60:129	N61:0	N61:128
3	N70:0	N70:128	N70:129	N71:0	N71:128
4	N80:0	N80:128	N80:129	N81:0	N81:128

Note: *There are no statistics available for the Ethernet socket ports.*

2.4.3. Receive Data Message

The *Receive Data message* format is similar to the format used in the *Serial Port Data Transfer* Object. However, the data is in 16-bit integer format instead of byte format. The 16-bit integer format is required when connecting to PLC-5 and SLC PLCs.

The following table displays the format of the *Receive Data* message.

Name	Data Type	Data Value(s)	Access Rule
Receive (DeviceMaster UP to PLC) message data. **Structure of:**			Read only
Produced data sequence number	**UINT**	0-65535 (FFFF hex)	
Data length (in bytes)	**UINT**	0-222 (SLC) 0-248 (PLC-5)*	
	Array of **UINT**	0-65535	
Data array			

Receive messages have the following characteristics:

- It returns all data in UINTs.
- The data length field indicates the number of valid bytes contained in the message.
- The message received from the PLC determines the actual length of the message returned to the PLC. (This is often greater than the length of the actual Receive Data Message.)
- All unused bytes in a message returned to the PLC are filled with zeroes.
- The default order of the bytes is Least Significant Byte First. However, you can select the *(PLC-5/SLC) Rx MS Byte First* option in the web page to return bytes by **Most Significant Byte First**. For more information, see *(PLC-5/SLC) Rx MS Byte First* under *3.3.3. Serial Packet Identification* on Page 65.
- The DeviceMaster UP supports serial packets of up 1518 bytes and socket packets up to 2048 bytes in the *Write-To-File* and *Write-to-File-Synced receive* methods.
- For large received data packets:
  - The data will automatically be placed in sequential files.
  - The files must be 256 integers in size with the exception of the last file. The last file may be shorter than 256 integers as long as the total length of all files in the sequence is sufficient to hold the largest receive packet, plus two integers for the sequence number and length parameters.
  - All data will have been transferred to the PLC when the sequence number is updated.

2.4.4. Transmit Data Message

The *Transmit Data message* format is similar to the format used in the *Serial Port Data Transfer* Object. However, the data is in 16-bit integer format instead of byte format. The 16-bit integer format is required when connecting to PLC-5 and SLC PLCs.

The following table displays the format of the *Transmit Data* message.

Name	Data Type	Data Value(s)	Access Rule
Transmit (PLC to DeviceMaster UP) message data. **Structure of:** Produced data sequence number Data length (in bytes) Data array	 **UINT** **UINT** Array of **UINT**	 0-65535 (FFFF hex) 1-202 (SLC) 1-222 (PLC-5) 0-65535	Read/Write

Transmit messages have the following characteristics:

- It transfers all data in UINTs.
- The data length field indicates the number of valid bytes contained in the message.
- The actual length of a message received from the PLC may contain extra, unused data.
- It ignores all unused bytes in a message.
- The default order of the bytes is **Least Significant Byte First**. However, you can select the *(PLC-5/SLC) Tx MS Byte First* option in the web page to transmit bytes by **Most Significant Byte First**. For more information, see *(PLC-5/SLC) Tx MS Byte First* under *3.3.3. Serial Packet Identification* on Page 65.
- A **Get** returns the last successfully transmitted serial/socket packet.

2.4.5. Sequence Number Messages

PLC-5/SLC typed read and typed write messages can read and modify both receive and transmit produced data sequence numbers. These are the same sequence numbers returned to the PLC in the *Receive Data Message* and sent to the DeviceMaster UP in the *Transmit Data* message. Access to these sequence numbers are provided primarily for initialization purposes at the start of the PLC program when you may want to initialize the sequence numbers on the PLC, DeviceMaster UP or both.

PLC-5/SLC typed read and write messages can also read and modify the consumed receive sequence number(s). The consumed receive sequence number(s) are used in the *Write-to-File-Synced* communication method.

2.4.6. Retrieve Statistics Message

The data returned from the *Retrieve Statistics* message is identical to the data returned for the *Serial Port Statistics* Object. The *Retrieve Statistics* message formats the data into 32-bit integers and returns data in an array of **s** just like all data sent to a PLC-5 or SLC PLC. The first contains the least significant word and the second contains the most significant word.

The following table displays the format of the *Retrieve Statistics* message.

Index	Name	Data Type	Data Value(s)	Access Rule
1	Receive Byte Count	UDINT	0=default	Read only
2	Receive Packet Count	UDINT	0=default	Read only
3	Transmit Byte Count	UDINT	0=default	Read only
4	Transmit Packet Count	UDINT	0=default	Read only
5	Dropped Packet to PLC Count	UDINT	0=default	Read only
6	Parity Error Count	UDINT	0=default	Read only
7	Framing Error Count	UDINT	0=default	Read only
8	Overrun Error Count	UDINT	0=default	Read only
9	Received Consumed Sequence Error Count	UDINT	0=default	Read only
10	Duplicate Transmit Sequence Number errors	UDINT	0=default	Read only
11	Unexpected Transmit Sequence Number errors	UDINT	0=default	Read only
12	Dropped Packet to Application Count	UDINT	0=default	Get

The *Retrieve Statistics* messages have the following characteristics.

Retrieve Statistics Message Description	
Receive Byte Count	This attribute counts the number of bytes received on the serial port.
Receive Packet Count	This attribute counts the number of packets received on the serial port.
Transmit Byte Count	This attribute counts the number of bytes transmitted on the serial port.
Transmit Packet Count	This attribute counts the number of packets transmitted on the serial port.
Dropped Packet to PLC Count	This attribute counts the number of dropped receive packets on the serial port intended for the PLC due to: • No STX byte(s) found • No ETX byte(s) found • Time-outs • Too large of packet • Receive buffer queue overflows
Parity Error Count	This attribute counts the number of packets with parity errors received on the serial port.
Framing Error Count	This attribute counts the number of packets with framing errors received on the serial port.
Overrun Error Count	This attribute counts the number of packets with overrun type errors received on the serial port.

Retrieve Statistics Message Description (Continued)	
Received Consumed Sequence Error Count	This attribute counts the number of received consumed sequence number errors. The DeviceMaster UP only increments this number when all of the following statements are true: • You selected the *Unsolicited - Write-to-Tag-Synced* method of receive communication. • DeviceMaster UP receives a serial packet. • The Consumed Sequence number is out of sync. (It is not equal to the Produced Sequence number or equal to the Produced Sequence number minus one.)
Duplicate Transmit Sequence Number Error Count	This attribute counts the number of Duplicate Transmit Sequence Number errors. The DeviceMaster UP increments this number when the following statements are true: • You enabled the Transmit Sequence Number Checking configuration option. See *Transmit Sequence Number Checking* under *3.6.1. Ethernet/IP Settings* on Page 71 for additional information. • DeviceMaster UP receives a transmit message with a sequence number equal to the previous sequence number. (The DeviceMaster UP expects this sequence number to be incremented by one from the sequence number in the previous transmit message.)
Unexpected Transmit Sequence Number Error Count	This attribute counts the number of Unexpected Transmit Sequence Number errors.The DeviceMaster UP increments this number when the following statements are true. • You enabled the T*ransmit Sequence Number Checking* configuration option. See **Transmit Sequence Number Checking** under *3.6.1. Ethernet/IP Settings*. • DeviceMaster UP receives a transmit message with a sequence number that is not equal to either the previous sequence number or the previous sequence number plus one. (The DeviceMaster UP increments this sequence number by one with each new transmit message.)
Dropped Packet to Application Count	This attribute counts the number of dropped receive packets on the serial port intended for the application due to: • No STX byte(s) found • No ETX byte(s) found • Time-outs • Too large of packet • Receive buffer queue overflows

2.4.7. Receive Communication Methods

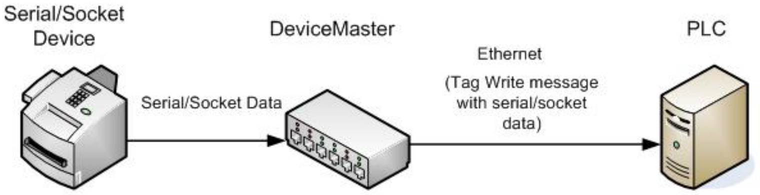
There are three methods of transferring received data to the PLC from the DeviceMaster UP.

2.4.7.1. Unsolicited - Write to File Receive Method

Note: *This is the recommended receive method.*

When a serial/socket packet is received on the DeviceMaster UP, the data packet is immediately written to a file data location on the PLC. The following diagram shows the data flow.

Unsolicited - Write to File Receive Data Flow



The following restrictions apply to this method:

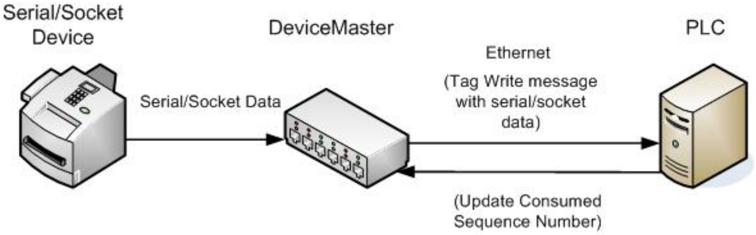
- The Receive Data File Name must be the same file name and offset defined to receive data on the PLC.
- The file on the PLC must be of integer type and must be of sufficient size to contain the sequence number, length, and data field associated with the maximum sized received data structure. See *2.4.3. Receive Data Message* on Page 54 for more information.
- New data is indicated with an incremented sequence number.
- The PLC program must be able to process the new data faster than the data can be received. To accomplish this, set the Maximum PLC Update Rate to an interval time that will allow your PLC to process the data. The default of 40 milliseconds may or may not need to be increased for your PLC application.

2.4.7.2. Unsolicited - Write to File Synced Receive Method

This method provides a syncing option to allow the PLC to control the data flow by indicating when it is ready for the next serial data packet.

In this method, the serial/socket packet is not written into the file on the PLC until the consumed receive sequence number has been updated by the PLC to match the produced receive data sequence number. Then the data is written into the file data location on the PLC in the same way as the *Write-to-File* method.

Unsolicited - Write to File Synced Receive Data Flow


Serial/Socket Device
DeviceMaster
PLC
Serial/Socket Data
Ethernet
(Tag Write message with serial/socket data)
(Update Consumed Sequence Number)

The following restrictions apply to this method:

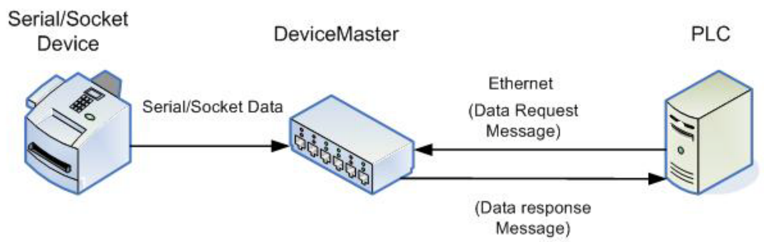
- The **Receive Data File Name** must be the same file name and offset defined to receive data on the PLC.
- The file on the PLC must be of integer type and must be of sufficient size to contain the sequence number, length, and data field associated with the maximum sized received data structure. See *2.4.3. Receive Data Message* on Page 54 for more information.
- New data is indicated with an incremented sequence number.
- New data will not be written to the file on the PLC until the consumed receive sequence number has been incremented to match the last produced receive sequence number.
- While the DeviceMaster UP queues received serial/socket port data, the PLC program must consume the new data faster than the data can be received on the serial port to ensure the receive buffers on the DeviceMaster UP do not overflow. (Example: If two packets can be received per second on the serial port, then the consumption rate would need to be at least one packet every 500 msec.)

2.4.7.3. Polling Receive Method

This method provides the *polling* method that allows the PLC to request data on a periodic basis.

In this method, the serial/socket data is returned in the response to the data request message.

Polling Receive Data Flow



The following restrictions apply to this method:

- The file on the PLC must be of integer type and must be of sufficient size to contain the sequence number, length, and data field associated with the maximum sized received data structure. See *2.4.3. Receive Data Message* on Page 54 for more information.
- New data is indicated with an incremented sequence number.
- The same data may be returned more than once. However, the same data packet will also return the same sequence number.
- No data is indicated with a length of zero.
- While the DeviceMaster UP queues received serial port data, the PLC program must poll for new data faster than the data can be received on the serial port to ensure the receive queues on the DeviceMaster UP do not overflow. (Example: If two packets can be received per second on the serial port, then the polling rate would need to be at least once every 500 msec.)

Chapter 3. Embedded Configuration Pages

This chapter provides detailed information about the embedded web pages for serial and Ethernet device configuration. Ethernet devices are configured via an Ethernet TCP/IP socket connection. The latest Modbus/TCP firmware must be installed before you can configure network or serial/socket port characteristics. For firmware installation and setup information, see the *DeviceMaster UP Hardware Installation and Configuration Guide* or the PortVision Plus help system.

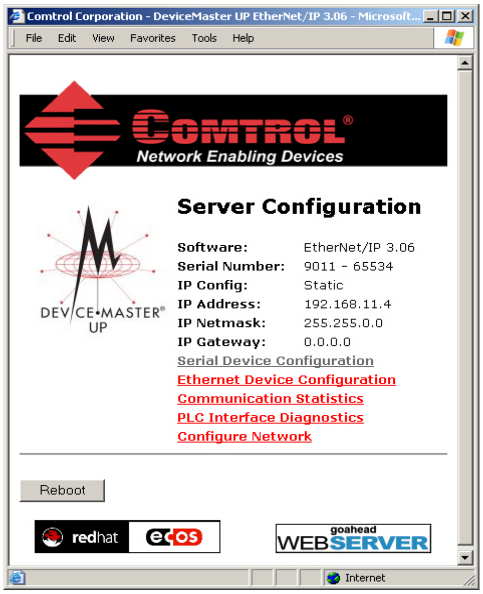
Use the *Modbus/TCP Interface Configuration Guide* (Page 10) to locate configuration procedures for your site and use this chapter as a reference if you need information about specific fields. The *Interface Configuration Guide* is intended to provide you with a way to quickly configure.devices such as barcode scanners, RFID readers, and printers. In addition, there is also a section that discusses configuring read/write devices such as some printers and weigh scales.

Note: *ControlLogix PLC environments can optionally change the serial/socket port settings through the ControlLogix PLC using the Serial Port Configuration (2.3.1. Serial Port Configuration Object Definition (70 Hex) on Page 15) or Socket Port Configuration (2.3.4. Socket Port Configuration Object Definition (73 Hex) on Page 32) objects.*

3.1. Overview

The following overview shows how to access the DeviceMaster UP *Server Configuration* embedded web page and configure serial and Ethernet device interfaces.

If you have not configured the network information into the DeviceMaster UP during initial setup, you must configure the network information before configuring serial/socket port characteristics. See the *DeviceMaster UP Hardware Installation and Configuration Guide* or the PortVision Plus help system for help configuring the network settings.



Server Configuration

Software: EtherNet/IP 3.06
Serial Number: 9011 - 65534
IP Config: Static
IP Address: 192.168.11.4
IP Netmask: 255.255.0.0
IP Gateway: 0.0.0.0

Serial Device Configuration
Ethernet Device Configuration
Communication Statistics
PLC Interface Diagnostics
Configure Network

1. From PortVision Plus, highlight the DeviceMaster UP that you want to configure and select **Web Manager**.

   Note: *Optionally, enter the IP address of the device in the **Address** box of your web browse.*

2. Select the appropriate procedure for your environment.

   Serial Device

   a. Select **Serial Device Configuration**.

   b. Select the appropriate port to access the *Edit Serial Port Configuration* page for that port.

   c. Change the serial port configuration properties (Page 63) as required for your site.

   Ethernet Device

   a. Select **Ethernet Device Configuration**.

   b. Select the appropriate socket to access the *Edit Socket Port Configuration* page for that port.

   c. Change the socket port configuration properties (Page 67) as required for your site.

3. Select **Submit** to commit the changes and repeat for each port.

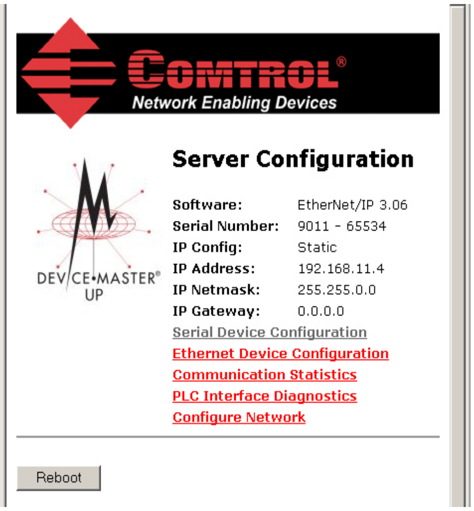
4. Use the appropriate procedure for your environment to complete the DeviceMaster UP installation.
    - **ControlLogix PLC**: *5.3. ControlLogix PLC Programming Example Instructions* on Page 91 describes how to use RSLogix 5000 to configure and run the DeviceMaster UP.
    - **SLC or MicroLogix PLC**: *5.4. SLC or MicroLogix PLC Programming Example Instructions* on Page 104 describes how to use RSLogix 500 to configure and run the DeviceMaster UP.
    - **PLC-5 PLC**: *5.5. PLC-5 PLC Programming Example Instructions* on Page 131 describes how to use RSLogix 5 to configure and run the DeviceMaster UP.

3.2. Embedded Web Pages Overview

The embedded web pages are the easiest way to configure serial and Ethernet device port settings for a DeviceMaster UP.

Access the main DeviceMaster UP web page (*Server Configuration*) from PortVision Plus or enter the IP address of the DeviceMaster UP in the **Address** box of your web browser.

The *Server Configuration* page displays the software version and current network configuration for the DeviceMaster UP. In addition, the *Server Configuration* page links to the configuration, statistics, and diagnostics pages, which are discussed in the table below.



Server Configuration

Software:	EtherNet/IP 3.06
Serial Number:	9011 - 65534
IP Config:	Static
IP Address:	192.168.11.4
IP Netmask:	255.255.0.0
IP Gateway:	0.0.0.0

Serial Device Configuration
Ethernet Device Configuration
Communication Statistics
PLC Interface Diagnostics
Configure Network

Server Configuration Page	
Software	Modbus/TCP firmware version currently running on the DeviceMaster UP.
Serial Number	DeviceMaster UP serial number.
IP Config	Type of IP configuration currently in use (static or DHCP).
IP Address, **IP Netmask**, and **IP Gateway**	IP address, netmask, and gateway configured in the DeviceMaster UP.
Serial Device Configuration	Opens the *Serial Device Configuration* page (*3.3. Serial Device Configuration Page* on Page 63), which *provides an overview of the serial device interface settings and access to the Edit Serial Port Configuration* page for serial port configuration on the selected port.
Ethernet Device Configuration	Opens the *Ethernet Device Configuration* page (*3.4. Ethernet Device Configuration Page* on Page 67), which *provides an overview of the Ethernet device interface settings and access to the Edit Socket Port Configuration* page for Ethernet device configuration on the selected socket port.
Communication Statistics	Opens the *Communication Statistics* page (*4.1. Serial/ Ethernet Device Communication Statistics* on Page 80), which contains the serial and Ethernet device interface statistics.
PLC Interface Diagnostics	Opens the *PLC Interface Diagnostics* page (4.4. PLC Interface Diagnostics on Page 85), which contains the statistics and error reporting for the Modbus/TCP PLC interface.
Configure Network	Opens the *Configure Network* page (*3.7. Edit Network Configuration Page* on Page 78), which can be used to modify DeviceMaster UP network configuration after initial configuration using PortVision Plus.

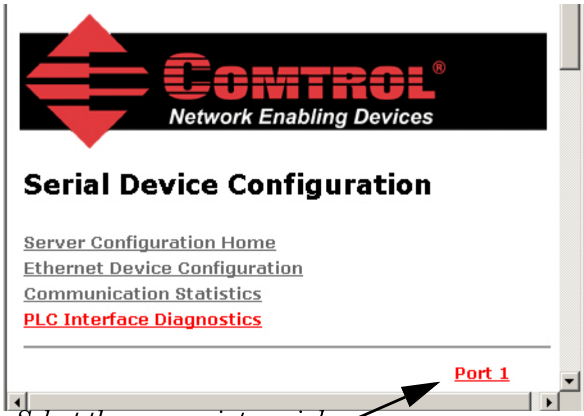
Server Configuration Page	
Reboot	Reboots the DeviceMaster UP.

3.3. Serial Device Configuration Page

The *Serial Device Configuration* page provides:

- Links to other pages
- Access to the *Edit Serial Port Configuration* page for each port (**Port** #)
- An overview of serial device configuration settings for each port displays the current settings

To change these settings for a port, select the corresponding **Port** # link, which opens the *Edit Serial Port Configuration* page. See *3.3.1. Edit Serial Port Configuration Page* on Page 63 to locate information for each setting area.


COMTROL®
Network Enabling Devices

Serial Device Configuration

Server Configuration Home
Ethernet Device Configuration
Communication Statistics
PLC Interface Diagnostics
Port 1

Select the appropriate serial port number to configure the serial port characteristics.

3.3.1. Edit Serial Port Configuration Page

Use the *Edit Serial Port Configuration* page to change a serial port's configuration parameters.

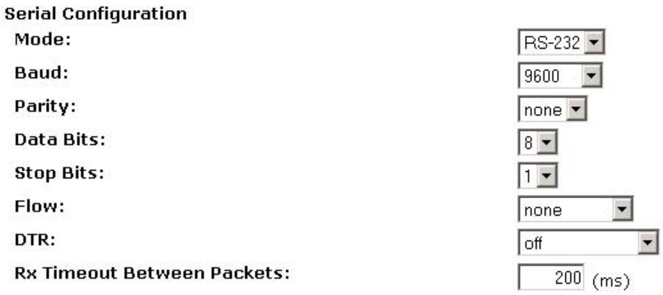
To access the *Edit Serial Port Configuration* page, select the appropriate port number link (for example, **Port 1**) on the *Serial Device Configuration* page.

The next two subsections discuss the *Serial Port* and *Serial Packet ID Settings* areas on this page. The remainder of the page is discussed in the following subsections, which are located under the *3.6. Common Configuration Areas (Serial or Ethernet Device)* section:

- *3.6.1. Ethernet/IP Settings* on Page 71
- *3.6.2. Filtering/Data Extraction Configuration* on Page 73
- *3.6.3. Application TCP Connection Configuration* on Page 76
- *3.6.4. Saving Port Options* on Page 77

3.3.2. Serial Configuration

Use the *Serial Configuration* area of the *Edit Serial Port Configuration* page to configure serial port characteristics for the device that you plan on connecting to the port.



Serial Configuration

Mode: RS-232

Baud: 9600

Parity: none

Data Bits: 8

Stop Bits: 1

Flow: none

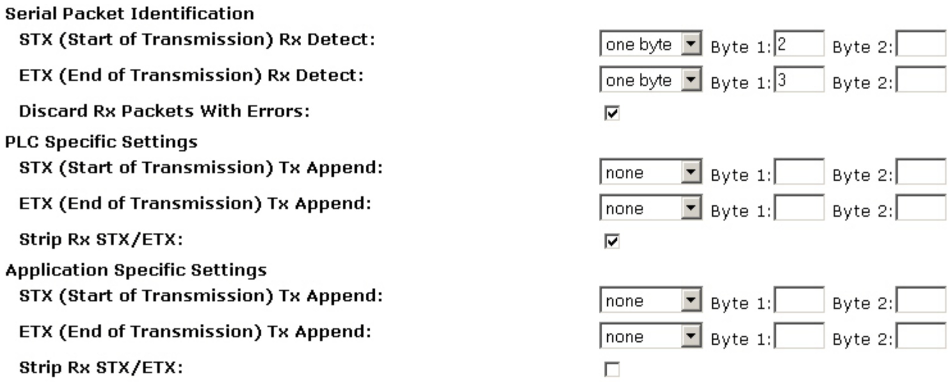
DTR: off

Rx Timeout Between Packets: 200 (ms)

Serial Configuration	
Mode	Select the communications mode for the serial device that you are connecting to the port. The available modes are RS-232, RS-422, and RS-485.
Baud	Select a baud rate from the list. The baud rate that you select determines how fast information is transferred through a port.
Parity	Select a method for error checking. • **None -** When the parity is set to none, there is no parity bit, and DeviceMaster UP does not perform parity checking. • **Odd -** Indicates that the sum of all the 1-bits in the byte plus the parity bit must be odd. When the total is odd, the parity bit is set to zero, when it is even, the parity bit is set to one. • **Even -** When the sum of all the 1-bits is even, the parity bit must be set to zero; when it is odd, the parity bit must be set to one.
Data Bits	Select the number of bits that make up the data. Choose from 5, 6, 7 or 8-bits.
Stop Bits	Select the number of bits to mark the end of data transmission.
Flow	Specifies the ability to start and stop the flow of data without the loss of bytes. Select a method for controlling the flow of data from the following list: • **None -** Indicates flow control is not in affect. • **RTS/CTS -** Request To Send (RTS) tells the receiving device that the sending device has data that is ready to send and Clear To Send (CTS) indicates the device is ready to accept data. • **XON/XOFF -** When selected, applies the standard method of controlling data flow between two modems. • **Half Duplex -** Transmits data in half-duplex mode.
DTR	Select the state of Data Terminal Ready (DTR). • **on -** Enables DTR. • **off -** Disables DTR. • **WhenEnabled -** Select this option when enabling the serial port through the PLC.
Rx Timeout Between Packets	Specifies the following information: • How long the DeviceMaster UP should wait (in milliseconds) before timing-out, if the **ETX Rx Detect** length is one byte or two bytes and the ETX byte(s) are not received. • The time to wait in milliseconds between serial packets if the **ETX Rx Detect** length is set to **none**.

3.3.3. Serial Packet Identification

Use the *Serial Packet Identification* area of the *Edit Serial Configuration* page to configure the raw data serial packet identification (ID) settings for a serial port.



Serial Packet Identification

STX (Start of Transmission) Rx Detect:	one byte	Byte 1: 2	Byte 2:
ETX (End of Transmission) Rx Detect:	one byte	Byte 1: 3	Byte 2:
Discard Rx Packets With Errors:	☑		

PLC Specific Settings

STX (Start of Transmission) Tx Append:	none	Byte 1:	Byte 2:
ETX (End of Transmission) Tx Append:	none	Byte 1:	Byte 2:
Strip Rx STX/ETX:	☑		

Application Specific Settings

STX (Start of Transmission) Tx Append:	none	Byte 1:	Byte 2:
ETX (End of Transmission) Tx Append:	none	Byte 1:	Byte 2:
Strip Rx STX/ETX:	☐		

For more information on serial packet ID settings, see *2.3.1. Serial Port Configuration Object Definition (70 Hex)* on Page 15.

Serial Packet Identification	
STX (Start of Transmission) Rx Detect	When enabled, the DeviceMaster UP detects an STX (start of transmission) byte sequence which is configured as **one byte** or **two bytes** when it receives a serial packet. The length indicates the number of STX bytes, valid values for length are: • **none -** Disables this function and the DeviceMaster UP accepts the first byte received after the last ETX byte(s) as the start of the next data packet. • **one byte -** Scans serial data for one STX byte and when the DeviceMaster UP finds an STX byte it collects the data. If the first byte is not the STX byte, it discards the byte. The DeviceMaster UP continues to discard the bytes until it finds an STX byte. • **two bytes -** Scans serial data for two STX bytes and when the DeviceMaster UP finds two STX bytes it collects the data. If the STX bytes cannot be found, it discards the bytes. The DeviceMaster UP continues to discard the bytes until it finds the two STX bytes. **Byte 1 -** Specifies the character that represents the first STX byte. The DeviceMaster UP looks for this character in the first STX byte, if the length is **one byte** or **two bytes**. You can specify a value between 0 and 255 in decimal format. **Byte 2 -** Specifies the character that represents the second STX byte. The DeviceMaster UP looks for this character in the second STX byte, only if the length is **two bytes.** You can specify a value between 0 and 255 in decimal format.
ETX (End of Transmission) Rx Detect	When enabled, the DeviceMaster UP detects an ETX (end of transmission) byte sequence that is configured as **one byte** or **two bytes** marking the end of the serial packet. The length indicates the number of ETX bytes, valid values for length are: • **none -** Disables this function and the DeviceMaster UP uses the *Rx Timeout Between Packets* to indicate the end of data packet. • **one byte -** Scans serial data for one ETX byte and when the DeviceMaster UP finds the ETX byte, it identifies the data as a serial packet. • **two bytes -** Scans serial data for two ETX bytes and when the DeviceMaster UP finds the ETX bytes, it identifies the data as a serial packet. **Byte 1 -** Specifies the character to scan for in the first ETX byte, if the length is **one byte** or **two bytes.** You can specify a value between 0 and 255 in decimal format. **Byte 2 -** Specifies the character to scan for in the second ETX byte, if the length is **two bytes.** You can specify a value between 0 and 255 in decimal format.

Serial Packet Identification(Continued)	
Discard Rx Pkts with Errors	By default, this box is checked and the DeviceMaster UP discards serial packets with errors. Clear the check box when you need to receive a serial packet with errors to troubleshoot an issue.
PLC Specific Settings and Application Specific Settings **STX Tx Append**	When enabled, the DeviceMaster UP appends an STX (start of transmission) byte sequence which is configured as **one byte** or **two bytes** to the beginning of the serial packet before it is sent. The length indicates the number of STX bytes, values for length are: • **none -** Disables this function. • **one byte -** Inserts one STX byte before the data. • **two bytes -** Inserts two STX bytes before the data. **Byte 1 -** Specifies the transmit character associated with the first STX byte, if the length is **one byte** or **two bytes.** You can specify a value between 0 and 255 in decimal format. **Byte 2 -** Specifies the transmit character associated with the second STX byte, if the length is **two bytes.** You can specify a value between 0 and 255 in decimal format.
PLC Specific Settings and Application Specific Settings **ETX Tx Append**	When enabled, the DeviceMaster UP appends an ETX (end of transmission) byte sequence which is configured as **one byte** or **two bytes** to the end of the serial packet before it is sent. The length indicates the number of ETX bytes, valid values for length are: • **none -** Disables this function. • **one byte -** Inserts one ETX byte at the end of the data. • **two bytes -** Inserts two ETX bytes at the end of the data. **Byte 1 -** Specifies the transmit character associated with the first ETX byte, if the length is set to **one byte** or **two bytes.** You can specify a value between 0 and 255 in decimal format. **Byte 2 -** Specifies the transmit character associated with the second ETX byte, if the length is **two bytes.** You can specify a value between 0 and 255 in decimal format.
PLC Specific Settings and Application Specific Settings **Strip Rx STX/ETX**	When you select this check box, the DeviceMaster UP strips STX/ETX characters from received serial packets. Clear the check box when you do not want the DeviceMaster UP to strip STX/ETX characters from received serial packets. Serial Packets sent from the PLC or application to the DeviceMaster UP (over Ethernet), and then sent out the serial port, are not checked for STX/ETX. No STX/ETX character stripping occurs in these serial packets, and framing/parity/overrun error checking does not apply.

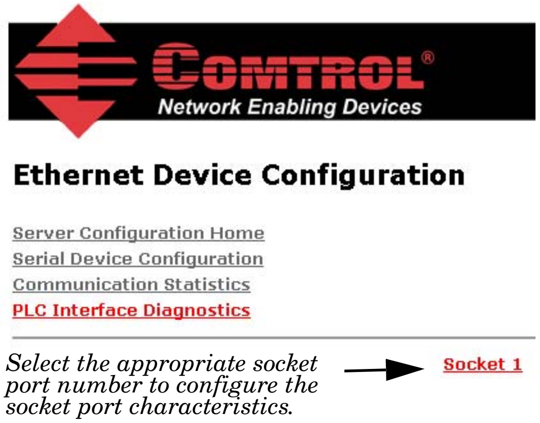
3.4. Ethernet Device Configuration Page

The *Ethernet Device Configuration* page provides:

- Links to other pages
- Access to the *Edit Socket Port Configuration* page for each port (**Port #**)
- An overview of Ethernet device configuration settings

The overview area for each port displays the current settings.

To change these settings for a port, select the corresponding **Port #** link, which opens the *Edit Socket Port Configuration* page. See *3.3.1. Edit Serial Port Configuration Page* on Page 63 to locate information for each setting area.



Ethernet Device Configuration

Server Configuration Home
Serial Device Configuration
Communication Statistics
PLC Interface Diagnostics

Select the appropriate socket port number to configure the socket port characteristics.

Socket 1

3.5. Edit Socket Port Configuration Page

This section discusses the following:

- *3.5.1. Device TCP Connection Configuration*
- *3.5.2. Socket Packet ID Settings* on Page 69

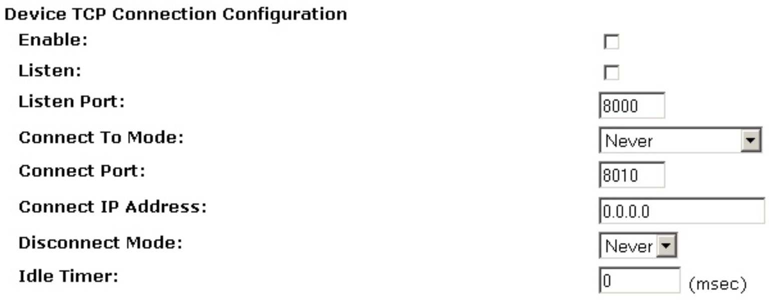
3.5.1. Device TCP Connection Configuration

Access to the *Edit Socket Port Configuration* page is provided by selecting the corresponding socket number on the *Ethernet Device Configuration* page (for example, **Socket 1**).

The remainder of this subsection discusses the *Device TCP Connection Configuration* area on this page.

The other areas of this page are discussed in the following subsections, which are located under the *3.6. Common Configuration Areas (Serial or Ethernet Device)* section:

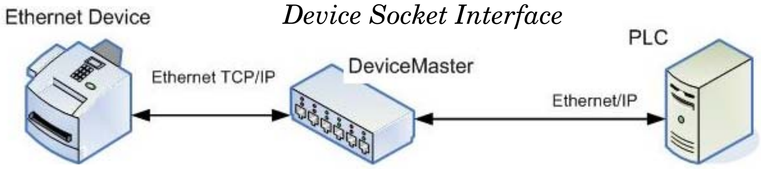
- *3.6.1. Ethernet/IP Settings* on Page 71
- *3.6.2. Filtering/Data Extraction Configuration* on Page 73
- *3.6.3. Application TCP Connection Configuration* on Page 76
- *3.6.4. Saving Port Options* on Page 77



Device TCP Connection Configuration

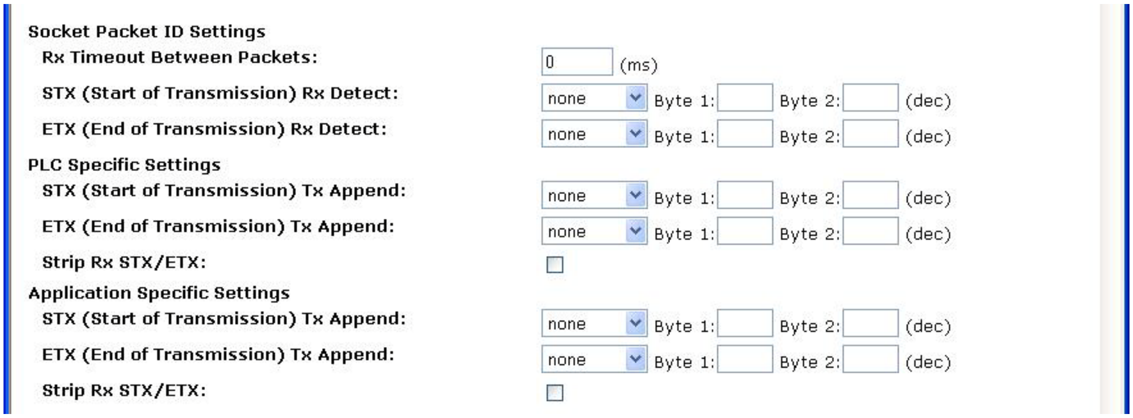
Enable:	□
Listen:	□
Listen Port:	8000
Connect To Mode:	Never
Connect Port:	8010
Connect IP Address:	0.0.0.0
Disconnect Mode:	Never
Idle Timer:	0 (msec)

The following table provides information about configuring the *Device TCP Connection Configuration* area.

Device TCP Connection Configuration	
Enable	This setting enables/disables the *Device Ethernet Device*. Enabling this function allows an Ethernet TCP/IP device to be connected to a PLC and/or application. If both the PLC and application are connected to the device, both can transmit to and receive data from the device socket port. However, the PLC and application cannot communicate directly to each other. *Device Socket Interface*  Ethernet Device Ethernet TCP/IP DeviceMaster Ethernet/IP PLC
Listen	Enabling this setting allows the device to connect to the DeviceMaster UP via an Ethernet TCP/IP socket. • **Not selected -** Disables listening; the DeviceMaster UP will not accept connection attempts. • **Selected -** Enables listening; the DeviceMaster UP will accept connection attempts from the specified **Listen Port**.
Listen Port	This is the socket port number on the DeviceMaster UP the application will connect to if the **Device Listen Enable** is selected.
Connect To Mode	This setting specifies if and how the DeviceMaster UP attempts to connect to the device at the specified **Connect IP Address** and **Connect Port**. • **Never -** The DeviceMaster UP will not attempt to connect to the device. • **Connect-Always -** The DeviceMaster UP will attempt to connect to the device until a connection is made. • **Connect-On-Data -** The DeviceMaster UP will not attempt to connect to the device until there is data to send to the device. Once data is received for the device, the DeviceMaster UP will attempt to connect to the device until a connection is made.
Connect Port	The device socket port number the DeviceMaster UP will connect to if the **Device Connect To Mode** is set to either **Connect-Always** or **Connect-On-Data.**
Connect IP Address	The device IP address the DeviceMaster UP will connect to if the **Device Connect To Mode** is set to either **Connect-Always** or **Connect-On-Data**.
Disconnect Mode	This setting specifies if and how the DeviceMaster UP disconnects from the device. • **Never -** The DeviceMaster UP will not disconnect from the device. • **Idle -** The DeviceMaster UP will disconnect when there has been no transmit or received data between the device and PLC/application for a specified Idle Timer period.
Idle Timer	The idle timeout period in milliseconds that is used if the **Device Disconnect Mode** is set to **Idle**.

3.5.2. Socket Packet ID Settings

This subsection discusses the *SocketPacket ID Settings* area of the *Ethernet Device Configuration* page.



Socket Packet ID Settings

Rx Timeout Between Packets: 0 (ms)

STX (Start of Transmission) Rx Detect: none Byte 1: Byte 2: (dec)

ETX (End of Transmission) Rx Detect: none Byte 1: Byte 2: (dec)

PLC Specific Settings

STX (Start of Transmission) Tx Append: none Byte 1: Byte 2: (dec)

ETX (End of Transmission) Tx Append: none Byte 1: Byte 2: (dec)

Strip Rx STX/ETX: □

Application Specific Settings

STX (Start of Transmission) Tx Append: none Byte 1: Byte 2: (dec)

ETX (End of Transmission) Tx Append: none Byte 1: Byte 2: (dec)

Strip Rx STX/ETX: □

Socket Packet ID Settings	
Rx Timeout Between Packets	Specifies the following information: • How long the DeviceMaster UP should wait (in milliseconds) before timing-out, if the ETX Rx Detect length is one byte or two bytes and the ETX byte(s) are not received. • The time to wait in milliseconds between Ethernet packets if the ETX Rx Detect length is set to none.
STX (Start of Transmission) Rx Detect	When enabled, the DeviceMaster UP detects an STX (start of transmission) byte sequence which is configured as **one byte** or **two bytes** when it receives an Ethernet packet. The length indicates the number of STX bytes, valid values for length are: • **none -** Disables this function and the DeviceMaster UP accepts the first byte received after the last ETX byte(s) as the start of the next Ethernet packet. • **one byte -** Scans Ethernet data for one STX byte and when the DeviceMaster UP finds an STX byte it collects the data. If the first byte is not the STX byte, it discards the byte. The DeviceMaster UP continues to discard the bytes until it finds an STX byte. • **two bytes -** Scans Ethernet data for two STX bytes and when the DeviceMaster UP finds two STX bytes it collects the data. If the STX bytes cannot be found, it discards the bytes. The DeviceMaster UP continues to discard the bytes until it finds the two STX bytes. **Byte 1 -** Specifies the character that represents the first STX byte. The DeviceMaster UP looks for this character in the first STX byte, if the length is **one byte** or **two bytes**. You can specify a value between 0 and 255 in decimal format. **Byte 2 -** Specifies the character that represents the second STX byte. The DeviceMaster UP looks for this character in the second STX byte, only if the length is two bytes. You can specify a value between 0 and 255 in decimal format.

Socket Packet ID Settings	
ETX (End of Transmission) Rx Detect	When enabled, the DeviceMaster UP detects an ETX (end of transmission) byte sequence that is configured as one byte or two bytes marking the end of the Ethernet packet. The length indicates the number of ETX bytes, valid values for length are: • **none -** Disables this function and the DeviceMaster UP uses the Rx Timeout Between Packets to indicate the end of data packet. • **one byte -** Scans Ethernet data for one ETX byte and when the DeviceMaster UP finds the ETX byte, it identifies the data as an Ethernet packet. • **two bytes -** Scans Ethernet data for two ETX bytes and when the DeviceMaster UP finds the ETX bytes, it identifies the data as an Ethernet packet. **Byte 1 -** Specifies the character to scan for in the first ETX byte, if the length is one byte or two bytes. You can specify a value between 0 and 255 in decimal format. **Byte 2 -** Specifies the character to scan for in the second ETX byte, if the length is two bytes. You can specify a value between 0 and 255 in decimal format.
PLC Specific Settings and Application Specific Settings **STX Tx Append**	When enabled, the DeviceMaster UP appends an STX (start of transmission) byte sequence which is configured as one byte or two bytes to the beginning of the Ethernet packet before it is sent. The length indicates the number of STX bytes, values for length are: • **none -** Disables this function. • **one byte -** Inserts one STX byte before the data. • **two bytes -** Inserts two STX bytes before the data. **Byte 1 -** Specifies the transmit character associated with the first STX byte, if the length is **one byte** or **two bytes.** You can specify a value between 0 and 255 in decimal format. **Byte 2 -** Specifies the transmit character associated with the second STX byte, if the length is **two bytes.** You can specify a value between 0 and 255 in decimal format.
PLC Specific Settings and Application Specific Settings ***ETX Tx Append***	When enabled, the DeviceMaster UP appends an ETX (end of transmission) byte sequence which is configured as **one byte** or **two bytes** to the end of the Ethernet packet before it is sent. The length indicates the number of ETX bytes, valid values for length are: • **none -** Disables this function. • **one byte -** Inserts one ETX byte at the end of the data. • **two bytes -** Inserts two ETX bytes at the end of the data. **Byte 1 -** Specifies the transmit character associated with the first ETX byte, if the length is set to **one byte** or **two bytes.** You can specify a value between 0 and 255 in decimal format. **Byte 2 -** Specifies the transmit character associated with the second ETX byte, if the length is **two bytes.** You can specify a value between 0 and 255 in decimal format.
PLC Specific Settings and Application Specific Settings **Strip Rx STX/ETX**	When you select this check box, the DeviceMaster UP strips STX/ETX characters from received Ethernet packets. Clear the check box when you do not want the DeviceMaster UP to strip STX/ETX characters from received Ethernet packets. Packets sent from the PLC or application to the DeviceMaster UP (over Ethernet), and then sent out the Ethernet port, are not checked for STX/ETX. No STX/ETX character stripping occurs in these Ethernet packets.

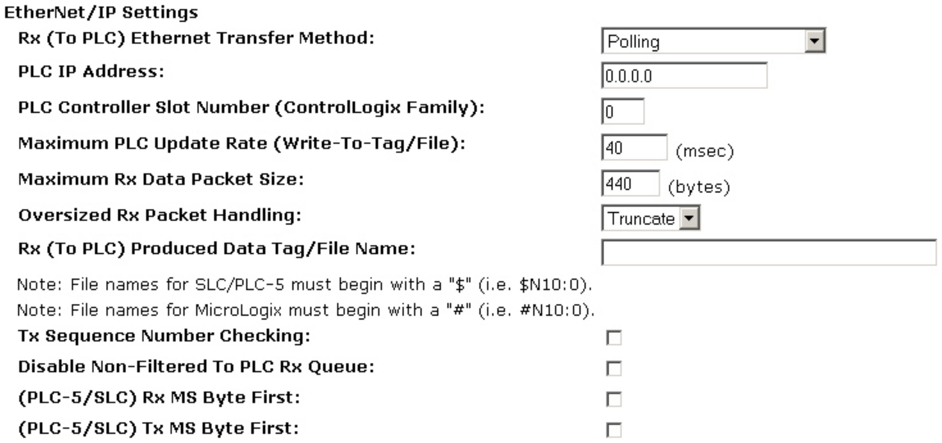
3.6. Common Configuration Areas (Serial or Ethernet Device)

The *Edit Serial Port Configuration* and *Edit Socket Port Configuration* pages have the following areas in common. This section discusses the following:

- *3.6.1. Ethernet/IP Settings* on Page 71
- *3.6.2. Filtering/Data Extraction Configuration* on Page 73
- *3.6.3. Application TCP Connection Configuration* on Page 76

3.6.1. Ethernet/IP Settings

Use this area to set up the EtherNet/IP settings for a serial or socket port using the appropriate *Edit Port Configuration* page.



EtherNet/IP Settings

Rx (To PLC) Ethernet Transfer Method: Polling

PLC IP Address: 0.0.0.0

PLC Controller Slot Number (ControlLogix Family): 0

Maximum PLC Update Rate (Write-To-Tag/File): 40 (msec)

Maximum Rx Data Packet Size: 440 (bytes)

Oversized Rx Packet Handling: Truncate

Rx (To PLC) Produced Data Tag/File Name:

Note: File names for SLC/PLC-5 must begin with a "$" (i.e. $N10:0).

Note: File names for MicroLogix must begin with a "#" (i.e. #N10:0).

Tx Sequence Number Checking: □

Disable Non-Filtered To PLC Rx Queue: □

(PLC-5/SLC) Rx MS Byte First: □

(PLC-5/SLC) Tx MS Byte First: □

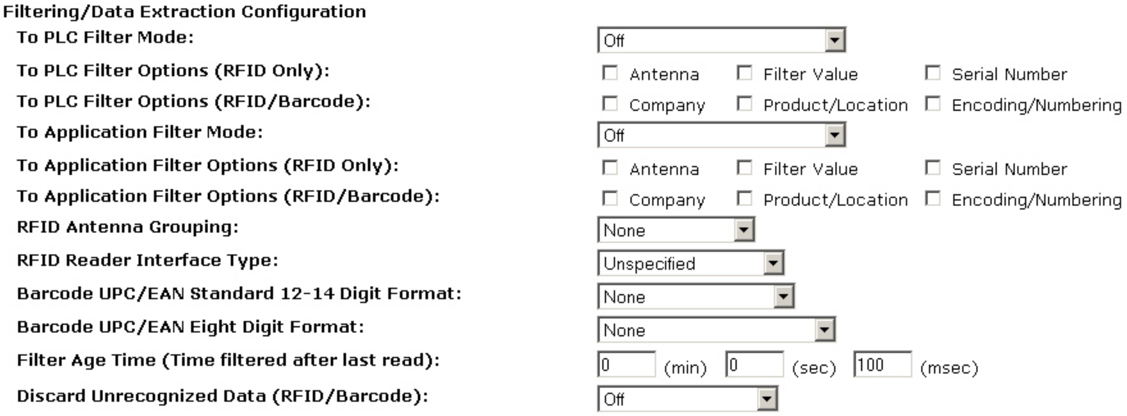
For more information on EtherNet/IP settings, see *2.3.1. Serial Port Configuration Object Definition (70 Hex)* on Page 15.

Ethernet/IP Settings (Serial or Socket Port)	
Rx (To PLC) Ethernet Transfer Method	Specifies the Ethernet data transfer method used by the DeviceMaster UP. There are three methods that the DeviceMaster UP can use to transfer data received from a serial or Ethernet device to the PLC. These methods are: • *Write-to-Tag/File* - The DeviceMaster UP writes the serial data directly into a tag or file on the PLC. However, it should only be used if the PLC can scan and consume the serial data faster than the serial device can produce it. • *Write-to-Tag/File-Synced* - The DeviceMaster UP writes the serial data into a tag or file on the PLC and provides a mechanism to synchronize the data flow between the PLC and the DeviceMaster UP. Use this method when you want to ensure that the tag or file is not overwritten before the PLC can consume the data. • *Polling* - The PLC requests data on a periodic basis. It provides the ability to control the received data flow. However, it does require periodic data requests and the request rate must be fast enough to ensure that the serial port receive queues on the DeviceMaster UP do not overflow.
PLC IP Address	Specifies the IP address for the PLC Modbus/TCP card. ***Note:*** *The Polling method does not use this attribute.*
PLC Controller Slot Number (ControlLogix Family)	Specifies the slot number on the PLC where the controller resides. The slot numbers typically start at zero for the first slot. This is only required for the ControlLogix family of PLCs. ***Note:*** *The Polling method does not use this attribute.*

Ethernet/IP Settings (Serial or Socket Port)	
Maximum PLC Update Rate (Write-To-Tag/ File)	The maximum rate (or minimum time interval) in milliseconds, that messages is sent to the PLC tag in the *Write-To-Tag/File receive* method. This setting configures the DeviceMaster UP to space the messages to the PLC in order to prevent overrunning of data before the PLC can process it.
Maximum Rx Data Packet Size	Specifies the maximum acceptable size of a received serial or Ethernet packet. Default is 440 bytes.
Oversize Rx Packet Handling	Specifies how to process oversized received packets. **Truncate** – truncate the packet to the **Maximum Rx Data Packet Size**. **Drop** – drop the packet. Default = Truncate
Rx (To PLC) Produced Data Tag/ File Name	Specifies the PLC tag or file name. It indicates where to write received data while operating in the *Write-to-Tag/File* or *Write-to-Tag/File-Synced receive* method. This column supports a name containing up to 40 characters. ***Note:*** *The Polling method does not use this attribute.* The maximum length for this tag name is 40 characters. File names for the PLC-5/SLC PLCs must begin with a "$" (i.e. **$N10:0**).File names for MicroLogix PLCs must begin with a "#" (i.e. **#10:0**).
Tx Sequence Number Checking	When you select this check box, the DeviceMaster UP checks the transmit sequence number and performs the following tasks: • Transmit messages with the expected sequence number (last sequence number plus one). • Rejects messages with duplicate sequence numbers (that is, the same sequence number as the previous transmit data message) and increments the *Duplicate Transmit Sequence Error Count*. • Transmits messages with unexpected transmit sequence numbers (that is, sequence numbers that are not the same as or are not equal to the previous sequence number plus one) and increments the *Unexpected Transmit Sequence Error Count*. This check box is clear by default. Clear the check box when you do not want DeviceMaster UP to check the transmit sequence number.
Disable Non-Filtered TO PLC Rx Queue	If filtering is disabled, only the last message received is sent to the PLC. This box is clear by default.
(PLC-5/SLC) Rx MS Byte First	When you select this check box, the DeviceMaster UP receives the Most Significant (MS) byte of a 16-bit integer first. This check box is clear by default. Clear the check box when you need to receive the Least Significant (LS) byte of a 16-bit integer first.
(PLC-5/SLC) Tx MS Byte First	When you select this check box, DeviceMaster UP transmits the Most Significant (MS) byte of a 16-bit integer first. This check box is clear by default. Clear the check box when you need to transmit the Least Significant (LS) byte of a 16-bit integer first.

3.6.2. Filtering/Data Extraction Configuration

Use this area to configure filtering or data extraction settings for a serial or socket port using the appropriate *Edit Port Configuration* page.



Filtering/Data Extraction Configuration

To PLC Filter Mode: Off

To PLC Filter Options (RFID Only): □ Antenna □ Filter Value □ Serial Number

To PLC Filter Options (RFID/Barcode): □ Company □ Product/Location □ Encoding/Numbering

To Application Filter Mode: Off

To Application Filter Options (RFID Only): □ Antenna □ Filter Value □ Serial Number

To Application Filter Options (RFID/Barcode): □ Company □ Product/Location □ Encoding/Numbering

RFID Antenna Grouping: None

RFID Reader Interface Type: Unspecified

Barcode UPC/EAN Standard 12-14 Digit Format: None

Barcode UPC/EAN Eight Digit Format: None

Filter Age Time (Time filtered after last read): 0 (min) 0 (sec) 100 (msec)

Discard Unrecognized Data (RFID/Barcode): Off

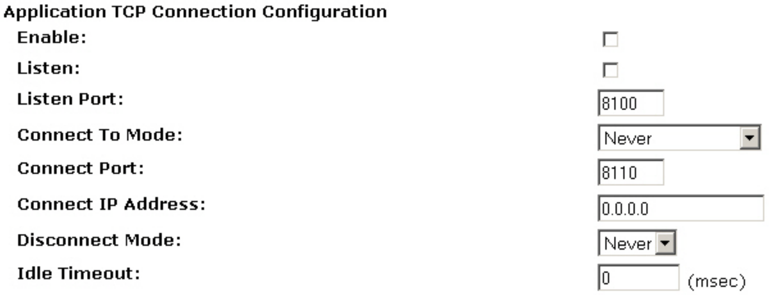
Filtering/Data Extraction Configuration (Serial or Socket Port)	
To PLC Filter Mode	Defines the filter/data extraction mode to be employed on data to be sent to the PLC. • **Off** • **String (128 char max) -** Raw/ASCII data is filtered up to 128 characters (or bytes) in length. • **RFID (EPCglobal formats) -** RFID data in any of the EPCglobal formats is filtered, the associated parameters are extracted, and the extracted data and RFID tag are sent to the PLC in a specified format. • **Barcode (UPC/EAN formats) -** Barcode data in specified UPC/EAN formats is filtered, the associated parameters are extracted, and the extracted data and barcode are sent to the PLC in a specified format. See the barcode format definitions in Attribute 41 on Page 26.
To PLC Filtering Options (RFID Only)	Defines the RFID filtering criteria to the PLC. If an option is enabled, it is used to decide when an RFID tag can be filtered or sent to the PLC. • **Antenna -** Include the antenna number in the filtering criteria. This is data from the RFID reader and not from the RFID tag itself. • **Filter Value -** Include the filter value in the filtering criteria, which is part of the RFID tag data. • **Serial Number -** Include the serial number in the filtering criteria, which is part of the RFID tag data.
To PLC Filtering Options (RFID/ Barcode)	Defines the RFID filtering criteria and the barcode filtering criteria to the application. If an option is enabled, it is used to decide when a valid RFID tag or barcode can be filtered or sent to the PLC. • **Company -** Include the company code in the filtering criteria, which is part of the RFID tag or barcode data. • **Product/Location -** Include the product/location code in the filtering criteria, which is part of the RFID tag or barcode data. • **Encoding/Numbering -** Include the encoding/numbering code in the filtering criteria, which is part of the RFID tag or barcode data.

Filtering/Data Extraction Configuration (Serial or Socket Port) (Continued)	
To Application Filter Mode	The filter/data extraction mode to be employed on data to be sent to the application. • **Off** • **String (128 char max) -** Raw/ASCII data is filtered up to 128 characters (or bytes) in length. • **RFID (EPCglobal formats) -** RFID data in any of the EPCglobal formats are filtered, the associated parameters are extracted, and the extracted data and RFID tag are sent to the application in a specified format. • **Barcode (UPC/EAN formats) -** Barcode data in specified UPC/EAN formats is filtered, the associated parameters are extracted, and the extracted data and barcode are sent to the application in a specified format. See the barcode format definitions in Attribute 41 on Page 26. ***Note:*** *The application filter mode can be set independently of the PLC filtering mode. The only exceptions are:* • *If the PLC filter mode is set to* ***RFID****, the application filter mode cannot be set to* ***Barcode****.* • *If the PLC filter mode is set to* ***Barcode****, the application filter mode cannot be set to* ***RFID****.*
To Application Filtering Options (RFID Only)	Defines the RFID filtering criteria to the application. If an option is enabled, it is used to decide when an RFID tag can be filtered or sent to the PLC. • **Antenna -** Include the antenna number in the filtering criteria. This is data from the RFID reader and not part of the RFID tag. • **Filter Value -** Include the filter value in the filtering criteria, which is part of the RFID tag data. • **Serial Number -** Include the serial number in the filtering criteria, which is part of the RFID tag data.
To Application Filtering Options (RFID/Barcode)	Defines the barcode filtering criteria and part of the RFID filtering criteria to the application. If an option is enabled, it is used to decide when a valid RFID tag or barcode can be filtered or sent to the application. • **Company -** Include the company code in the filtering criteria, which is part of the RFID tag or barcode data. • **Product/Location -** Include the product/location code in the filtering criteria, which is part of the RFID tag or barcode data. • **Encoding/Numbering -** Include the encoding/numbering code in the filtering criteria, which is part of the RFID tag or barcode data.
RFID Antenna Grouping	This setting is applicable only to RFID filtering and only if the antenna filtering option is enabled. It allows the DeviceMaster UP to filter RFID tags based on antenna groupings. The possible groupings are: SettingGroup 1Group 2Group 3Group N AntennasAntennasAntennasAntennas None1234 Groups of Twos1,23,45,6Etc. Groups of Threes1,2,34,5,67,8,9Etc. Groups of Fours1,2,3,45,6,7,89,10,11,12Etc. First Two Only1,234N+1 First Three Only1,2,345N+2

Filtering/Data Extraction Configuration (Serial or Socket Port) (Continued)	
RFID Reader Interface Type	Defines the expected RFID data format to be used while operating in the RFID filtering mode. Each Reader Interface Type is unique and pertains to the RFID reader manufacturer. If a different RFID reader is to be used and it provides a similar format to any of the RFID readers listed below, it can also be used in the RFID filtering mode. • **Unspecified -** The DeviceMaster UP will assume a HEX ASCII format and will attempt to locate the antenna number. • **Alien (Text Mode) -** Specifies the Alien RFID reader **Text Mode.** • **Alien (Terse Mode) -** Specifies the Alien RFID reader **Terse Mode.** • **Intermec (Hex ASCII Mode) -** Specifies the Intermec reader returning data in the **Hex ASCII Mode.** See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.
Barcode Formats: UPC/EAN Standard 12-14 Digit UPD/EAN Eight Digit	Defines barcode format to be used for both standard and eight digit UPC labels. The term “standard” refers to UPC-A, EAN-13, JAN, and EAN-14 barcodes which all have ten company/product digits. The standard and eight digit formats are selected independently and each operates independently. It is important to note that the barcode filtering/data extraction will not function if no format is selected. **FormatNumberingCompanyProductCheck** **DigitsDigitsDigitsDigit** ***Standard Formats*** NoneN/AN/AN/AN/A Company-5/ Product-51-3551 Company-6/ Product-41-3641 Company-7/ Product-31-3731 Company-8/ Product-21-3821 Company-9/ Product-11-3911 ***Eight Digit Formats*** EAN-8 Number-2/Product 52051 EAN-8 Number-3/Product 43041 UPC-E1VariableVariable1 See the *DeviceMaster UP Filtering and Data Extraction Reference Guide* (Page 10) for further details.
Filter Age Time (Time filtered after last read)	Defines the time a filter string, RFID tag, or barcode will continue to be filtered after the last time it was received. If an entry is received before the **Filter Age Time** has passed, the entry is filtered and the data will not be sent to the PLC and/or application. However, if the **Filter Age Time** has passed, it will pass filtering and be sent to the PLC and/or application.
Discard Unrecognized Data Mode (RFID/Barcode)	Specifies what to do with unrecognized RFID or barcode data. • **Off -** Sends unrecognized data to the PLC and/or application. • **To-PLC -** Discards unrecognized data to the PLC. Allows sending of unrecognized data to the application. • **To-Application -** Discards unrecognized data to the application. Allows sending of unrecognized data to the PLC. • **To-PLC/Application -** Discards unrecognized data to both the PLC and application.

3.6.3. Application TCP Connection Configuration

Use this area to configure application TCP connection settings for a serial or socket port using the appropriate *Edit Port Configuration* page.



Application TCP Connection Configuration

Enable: □

Listen: □

Listen Port: 8100

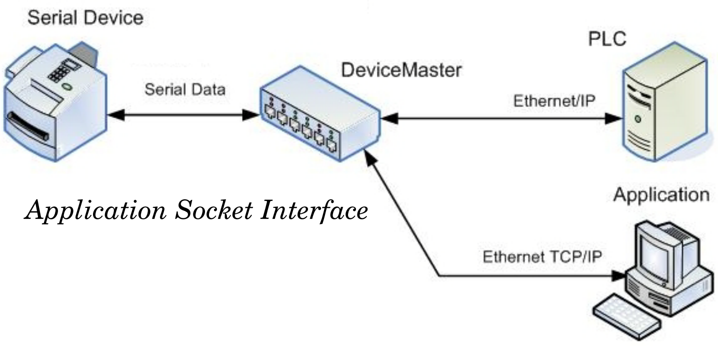
Connect To Mode: Never

Connect Port: 8110

Connect IP Address: 0.0.0.0

Disconnect Mode: Never

Idle Timeout: 0 (msec)

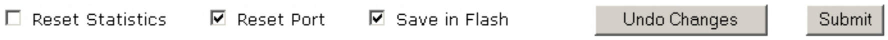
Application TCP Connection Configuration (Serial or Socket Port)	
Enable	Enables/disables the *Application Socket Interface*. Enabling this function allows an application to be connected to the device serial/socket port. If both the PLC and application are connected to the device serial/socket port, both can transmit to and receive data from the serial/socket port. However, the PLC and application cannot communicate directly to each other.  Serial Device Serial Data DeviceMaster PLC Ethernet/IP Application Socket Interface Application Ethernet TCP/IP
Listen	Enabling this setting allows the application to connect to the DeviceMaster UP via an Ethernet TCP/IP socket. • **Not selected -** Disables listening and the DeviceMaster UP will not accept connection attempts. • **Selected -** Enables listening and the DeviceMaster UP will accept connection attempts from the specified **Listen Port**.
Listen Port	The socket port number on the DeviceMaster UP the application will connect to if the **Application Listen Enable** is selected.
Connect To Mode	Specifies if and how the DeviceMaster UP attempts to connect to the application at the specified **Connect IP Address** and **Connect Port**. • **Never -** The DeviceMaster UP will not attempt to connect to the application. • **Connect-Always -** The DeviceMaster UP will attempt to connect to the application until a connection is made. • **Connect-On-Data** – The DeviceMaster UP will not attempt to connect to the application until there is data to send to the application. Once data is received from the serial/socket device, the DeviceMaster UP will attempt to connect to the application until a connection is made.
Connect Port	The application socket port number the DeviceMaster UP will connect to if the **Application Connect To Mode** is set to either **Connect-Always** or **Connect-On-Data**.
Connect IP Address	The application IP address the DeviceMaster UP will connect to if the **Application Connect To Mode** is set to either **Connect-Always** or **Connect-On-Data**.
Disconnect Mode	Controls if and how the DeviceMaster UP disconnects from an application. • **Never** – The DeviceMaster UP will not disconnect from the application. • **Idle -** The DeviceMaster UP will disconnect when there has been no transmit or received data between the serial/socket device and application for a specified **Idle Timer** period.

Application TCP Connection Configuration (Serial or Socket Port) (Continued)	
Idle Timer	The idle timeout period in milliseconds that is used if the application **Disconnect Mode** is set to **Idle**.

3.6.4. Saving Port Options

After configuring the serial/socket and protocol characteristics for the port, scroll to the bottom of the *Edit Serial Port Configuration* or *Edit Socket Port Configuration* page to save the changes.

The following options are available.



☐ Reset Statistics ☑ Reset Port ☑ Save in Flash

Saving Port Options	
Reset Statistics	Selecting this check box, clears the statistics counters for this port when you select **Submit**.
Reset Port	When you select this check box, the DeviceMaster UP resets the serial port hardware and statistics counters for this port when you click **Submit**. You must reset the port after modifying the serial port configuration options, including: baud rate, interface mode, parity, data bits, stop bits, flow control, or DTR control. Any socket port connections to a device or application will also be reset.
Save in Flash	When you select this check box, the DeviceMaster UP saves changes to port configuration settings in flash memory. These settings are restored when you reboot the DeviceMaster UP.
Undo Changes	Restores modified port settings to current values.
Submit	Saves changes to port in RAM. If **Save in Flash** was not selected when you clicked **Submit**, the changes will revert to original settings when you reboot the DeviceMaster UP.

3.7. Edit Network Configuration Page

You can use the *Edit Network Configuration* page to change the DeviceMaster UP network configuration after using PortVision Plus for initial network configuration.

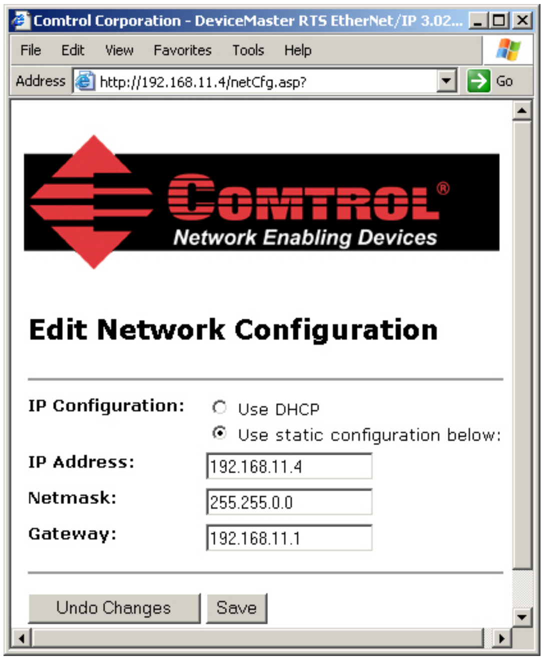
Use the following procedure to change the network configuration.

1. Select the IP configuration type (**DHCP** or **Static**).
2. If you select **Static**, enter a valid IP address, subnet mask, and IP gateway for your network. The network information is programmed into the DeviceMaster after applying the changes and rebooting the device. If necessary, see your network administrator for a valid IP address.

   Note: *The DeviceMaster family default IP address is 192.168.250.250, default subnet mask is 255.255.0.0, and the default IP gateway is 192.168.250.1.*

3. Select **Save** or **Undo Changes** to close the page.
4. If you selected **Save**, select **Reboot** to program the network information into the DeviceMaster UP or **Continue** if you want to reboot later.

Note: *Changed network settings will not take affect until the DeviceMaster UP is rebooted.*



Comtrol Corporation - DeviceMaster RTS EtherNet/IP 3.02...

Address http://192.168.11.4/netCfg.asp?

Edit Network Configuration

IP Configuration: ○ Use DHCP
● Use static configuration below:

IP Address: 192.168.11.4

Netmask: 255.255.0.0

Gateway: 192.168.11.1

Chapter 4. Embedded Diagnostic and Statistics Pages

You can access the *Serial/Ethernet Device Communication Statistics* and *PLC Interface Diagnostics* web pages from the following pages:

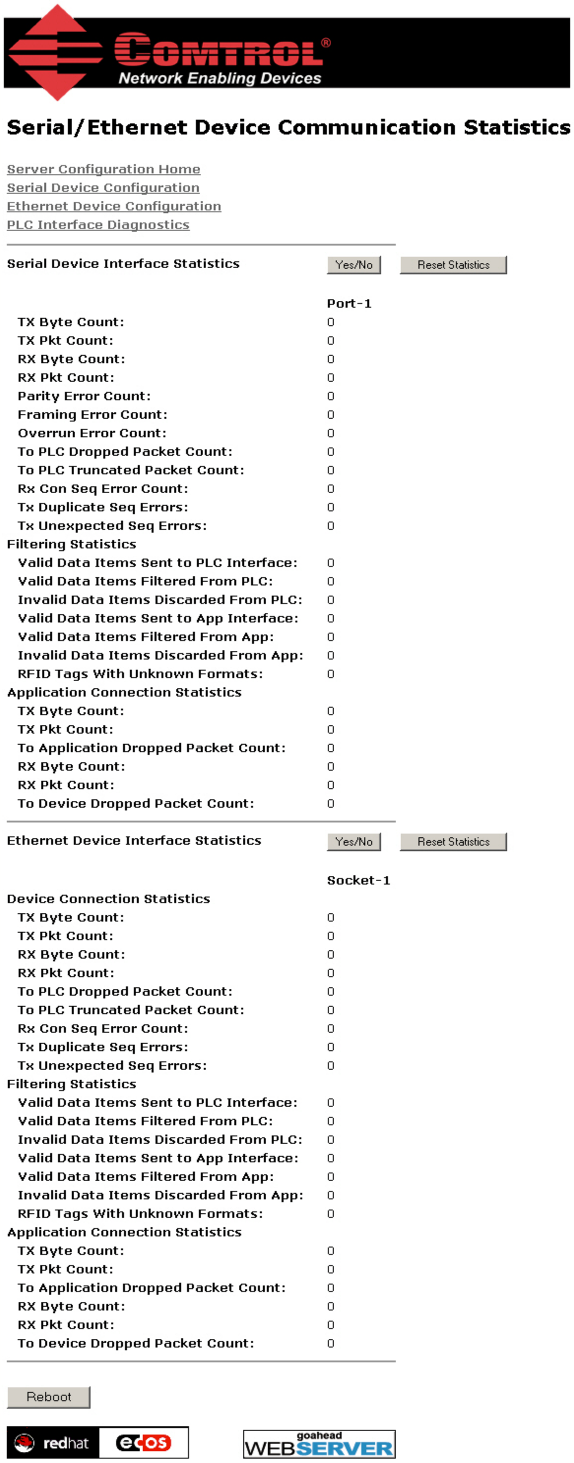
- *Server Configuration* (main)
- *Serial Device Configuration*
- *Ethernet Device Configuration (Raw-Data Only)*
- *Serial/Ethernet Device Communication Statistics and PLC Interface Diagnostics*

4.1. Serial/Ethernet Device Communication Statistics

The top portion of this page provides links to other pages. The displayed counters are the same as those specified in *2.3.3. Serial Port Statistics Object Definition (72 Hex)* on Page 30. Refer to the following table for definitions of the fields.

Note: *The refresh rate on this page is set to 20 seconds. To stop the page refresh, select **Refresh** in your browser. To restart refreshing the page display; exit and return to this page.*

Statistics Unique to Serial Device Interfaces (Top)	
Yes/No	Toggles to display or not to display serial statistics.
Reset Statistics	Clears the serial port statistics, which sets the value to 0 for all ports.
TX Byte Count	Displays the number of bytes sent out of the serial port.
TX Pkt Count	Displays the number of serial packets sent out of the serial port.
RX Byte Count	Displays the number of bytes received over the serial port.
RX Pkt Count	Displays the number of packets received over the serial port.
Parity Error Count	Displays the number of received serial packets dropped due to parity errors.
Framing Error Count	Displays the number of received serial packets dropped due to framing errors.
Overrun Error Count	Displays the number of received serial packets dropped due to overrun error incidents.
To PLC Dropped Packet Count	Displays the number of received serial packets intended for the PLC dropped: • No STX byte(s) found • No ETX byte(s) found • Time-outs • Packet to large • Receive buffer queue overflows
(Continued)	



Serial/Ethernet Device Communication Statistics

Server Configuration Home
Serial Device Configuration
Ethernet Device Configuration
PLC Interface Diagnostics

```
Serial Device Interface Statistics
                                            Port-1
  TX Byte Count:                            0
  TX Pkt Count:                             0
  RX Byte Count:                            0
  RX Pkt Count:                             0
  Parity Error Count:                       0
  Framing Error Count:                      0
  Overrun Error Count:                      0
  To PLC Dropped Packet Count:              0
  To PLC Truncated Packet Count:            0
  Rx Con Seq Error Count:                   0
  Tx Duplicate Seq Errors:                  0
  Tx Unexpected Seq Errors:                 0
Filtering Statistics
  Valid Data Items Sent to PLC Interface:   0
  Valid Data Items Filtered From PLC:       0
  Invalid Data Items Discarded From PLC:    0
  Valid Data Items Sent to App Interface:   0
  Valid Data Items Filtered From App:       0
  Invalid Data Items Discarded From App:    0
  RFID Tags With Unknown Formats:           0
Application Connection Statistics
  TX Byte Count:                            0
  TX Pkt Count:                             0
  To Application Dropped Packet Count:      0
  RX Byte Count:                            0
  RX Pkt Count:                             0
  To Device Dropped Packet Count:           0

Ethernet Device Interface Statistics
                                            Socket-1
Device Connection Statistics
  TX Byte Count:                            0
  TX Pkt Count:                             0
  RX Byte Count:                            0
  RX Pkt Count:                             0
  To PLC Dropped Packet Count:              0
  To PLC Truncated Packet Count:            0
  Rx Con Seq Error Count:                   0
  Tx Duplicate Seq Errors:                  0
  Tx Unexpected Seq Errors:                 0
Filtering Statistics
  Valid Data Items Sent to PLC Interface:   0
  Valid Data Items Filtered From PLC:       0
  Invalid Data Items Discarded From PLC:    0
  Valid Data Items Sent to App Interface:   0
  Valid Data Items Filtered From App:       0
  Invalid Data Items Discarded From App:    0
  RFID Tags With Unknown Formats:           0
Application Connection Statistics
  TX Byte Count:                            0
  TX Pkt Count:                             0
  To Application Dropped Packet Count:      0
  RX Byte Count:                            0
  RX Pkt Count:                             0
  To Device Dropped Packet Count:           0
```

Statistics Unique to Serial Device Interfaces (continued)	
To PLC Truncated Packet Count	Displays the number of received packets that were truncated before being sent to the PLC.
Rx Con Seq Errors Count	Displays the number of *received consumed sequenced number* errors. The DeviceMaster UP only increments this number when all of the following statements are true: • You selected the *Write-to-Tag-Sync* method of receive communication. • DeviceMaster UP receives a serial packet. • The *Consumed Sequence* number is out of sync. (It is not equal to the *Produced Sequence* number or equal to the *Produced Sequence* number minus one.)
Tx Duplicate Seq Errors	Displays the number of *Duplicate Transmit Sequence Number* errors. The DeviceMaster UP increments this number when the following statements are true: • You enabled the *Transmit Sequence Number Checking configuration* option. (See *Attribute 16 - Serial Port Transfer Options* on Page 21 for additional information.) • DeviceMaster UP receives a transmit message with a sequence number equal to the previous sequence number. (The DeviceMaster UP expects this sequence number to be incremented by one from the sequence number in the previous transmit message.)
Tx Unexpected Seq Errors	Displays the number of *Unexpected Transmit Sequence Number* errors. The DeviceMaster UP increments this number when the following statements are true: • You enabled the *Transmit Sequence Number Checking configuration* option. (See *Attribute 16 - Serial Port Transfer Options* on Page 21 for additional information.) • DeviceMaster UP receives a transmit message with a sequence number that is not equal to either the previous transmit sequence number or the previous transmit sequence number plus one. (The DeviceMaster UP expects this sequence number to be incremented by one with each new transmit message.)

Filtering Statistics (Serial or Ethernet Device Interfaces)	
Valid Data Items Sent To PLC	Displays the number of valid string, RFID, or barcode data sent to the PLC. Applies when filtering is enabled.
Valid Data Items Filtered From PLC	Displays the number of valid string, RFID, or barcode data filtered from (not sent) to the PLC. Applies when filtering is enabled.
Invalid Data Items Discarded From PLC	Displays the number of invalid RFID or barcode data not sent to the PLC. Applies when RFID or barcode filtering is enabled.
Valid Data Items Sent To Application	Displays the number of valid string, RFID, or barcode data sent to the application. Applies when filtering is enabled.
Valid Data Items Filtered From Application	Displays the number of valid string, RFID, or barcode data filtered from (not sent) to the application. Applies when filtering is enabled.
Invalid Data Items Discarded From Application	Displays the number of invalid RFID or barcode data not sent to the PLC. Applies when RFID or barcode filtering is enabled.
RFID Tags With Unknown Formats	Data received that was in the general form of 64 or 96 bit RFID tags, but was not in any of the EPCglobal formats. Applies only when RFID filtering is enabled.

Application Connection Statistics (Serial or Ethernet Device Interfaces)	
TX Byte Count	Displays the number of bytes sent out the application socket port.
TX Pkt Count	Displays the number of packets sent out the application socket port.
To Application Dropped Packet Count	Displays the number of received serial or Ethernet device packets intended for the application dropped: • No STX byte(s) found • No ETX byte(s) found • Time-outs • Packet to large • Receive buffer queue overflows • Application connection is offline
To PLC Truncated Packet Count	Displays the number of received packets that were truncated before being sent to the PLC.
RX Byte Count	Displays the number of bytes received over the application socket port.
RX Pkt Count	Displays the number of packets received over the application socket port.
To Device Dropped Packet Count	Displays the number of dropped packets that were intended for the device.

Statistics Unique to Ethernet Device Interfaces	
Yes/No	Toggles to display or not to display socket statistics.
Reset Statistics	Clears the socket port statistics, which sets the value to 0 for all ports.
TX Byte Count	Displays the number of bytes sent out the device socket port.
TX Pkt Count	Displays the number of packets sent out the device socket port.
RX Byte Count	Displays the number of bytes received over the device socket port.
RX Pkt Count	Displays the number of packets received over the device socket port.
To PLC Dropped Packet Count	Displays the number of dropped packets that were intended for the PLC.
To Application Dropped Packet Count	Displays the number of dropped packets that were intended for the application.
Rx Con Seq Error Count	Same as the serial port statistics, except the packet was received over a socket port (Page 81).
Tx Duplicate Seq Errors	Same as the serial port statistics (Page 81).
Tx Unexpected Seq Errors	Same as the serial port statistics (Page 81).

4.2. Serial Interface Logs

The *Serial Interface Logs* page provides a log of received and transmitted serial port messages. Up to 128 bytes per message and up to 128 messages are logged. It is intended to help with debugging serial connectivity problems, determining the proper start and end of transmission bytes, and diagnosing device problems.

The format is as follows:

```
Pkt(N): DDD:HH:MM:SS.mmm Rx/Tx:<data packet>
```

Where:

DDD – days since last system restart

HH – hours since last system restart

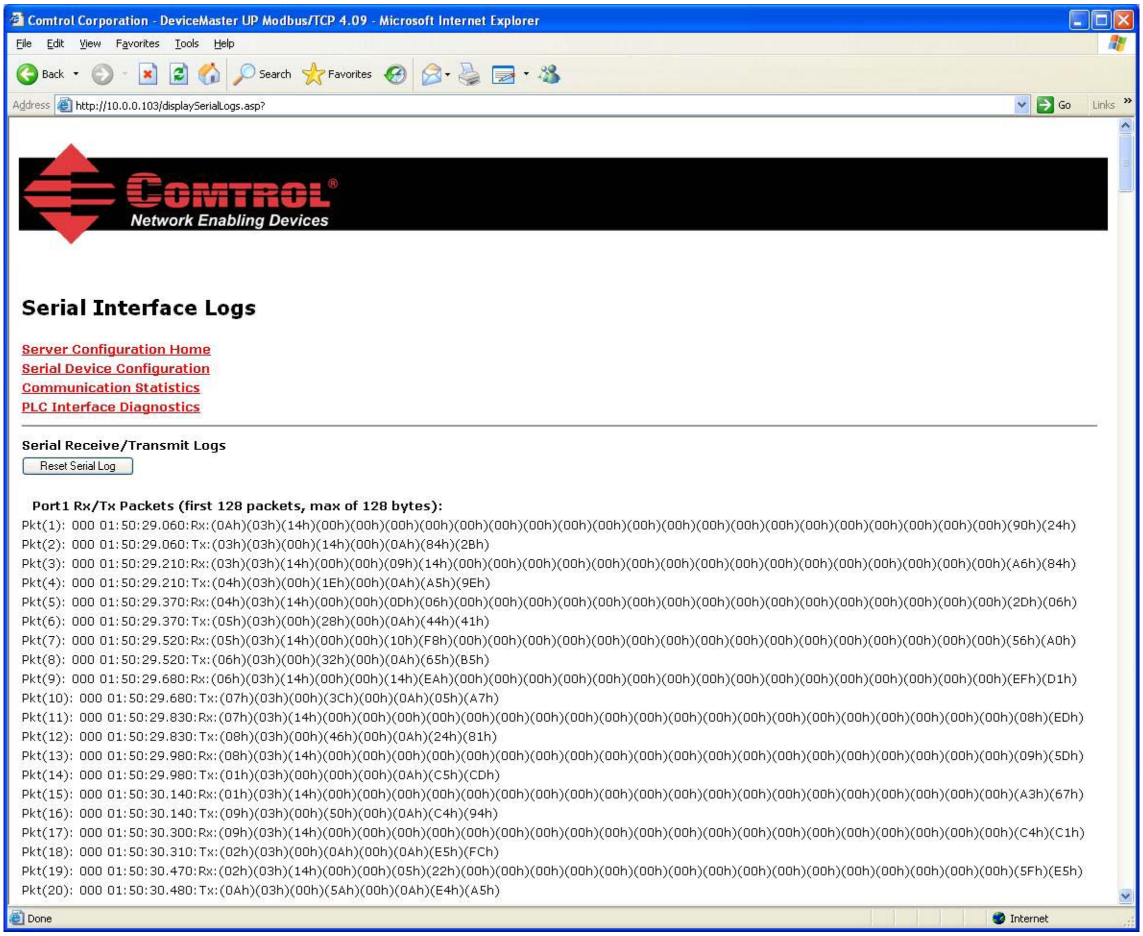
MM – minutes since last system restart

SS – seconds since last system restart

mmm – milliseconds since last system restart

<**data packet**> **-** Data packet received.

- For Modbus/RTU data, all data bytes shown in hex (xxh) format.
- For Raw/ASCII data
  - ASCII characters displayed as characters
  - Non-ASCII displayed in hex (xxh) format


Comtrol Corporation - DeviceMaster UP Modbus/TCP 4.09 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Search
Favorites
Address http://10.0.0.103/displaySerialLogs.asp?
Go
Links
COMTROL®
Network Enabling Devices
Done
Internet

Serial Interface Logs

Server Configuration Home
Serial Device Configuration
Communication Statistics
PLC Interface Diagnostics

Serial Receive/Transmit Logs

Reset Serial Log

Port1 Rx/Tx Packets (first 128 packets, max of 128 bytes):

```
Pkt(1): 000 01:50:29.060:Rx:(0Ah)(03h)(14h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(90h)(24h)
Pkt(2): 000 01:50:29.060:Tx:(03h)(03h)(00h)(14h)(00h)(0Ah)(84h)(2Bh)
Pkt(3): 000 01:50:29.210:Rx:(03h)(03h)(14h)(00h)(00h)(09h)(14h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(A6h)(84h)
Pkt(4): 000 01:50:29.210:Tx:(04h)(03h)(00h)(1Eh)(00h)(0Ah)(A5h)(9Eh)
Pkt(5): 000 01:50:29.370:Rx:(04h)(03h)(14h)(00h)(00h)(0Dh)(06h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(2Dh)(06h)
Pkt(6): 000 01:50:29.370:Tx:(05h)(03h)(00h)(28h)(00h)(0Ah)(44h)(41h)
Pkt(7): 000 01:50:29.520:Rx:(05h)(03h)(14h)(00h)(00h)(10h)(F8h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(56h)(A0h)
Pkt(8): 000 01:50:29.520:Tx:(06h)(03h)(00h)(32h)(00h)(0Ah)(65h)(B5h)
Pkt(9): 000 01:50:29.680:Rx:(06h)(03h)(14h)(00h)(00h)(14h)(EAh)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(EFh)(D1h)
Pkt(10): 000 01:50:29.680:Tx:(07h)(03h)(00h)(3Ch)(00h)(0Ah)(05h)(A7h)
Pkt(11): 000 01:50:29.830:Rx:(07h)(03h)(14h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(08h)(EDh)
Pkt(12): 000 01:50:29.830:Tx:(08h)(03h)(00h)(46h)(00h)(0Ah)(24h)(81h)
Pkt(13): 000 01:50:29.980:Rx:(08h)(03h)(14h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(09h)(5Dh)
Pkt(14): 000 01:50:29.980:Tx:(01h)(03h)(00h)(00h)(00h)(0Ah)(C5h)(CDh)
Pkt(15): 000 01:50:30.140:Rx:(01h)(03h)(14h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(A3h)(67h)
Pkt(16): 000 01:50:30.140:Tx:(09h)(03h)(00h)(50h)(00h)(0Ah)(C4h)(94h)
Pkt(17): 000 01:50:30.300:Rx:(09h)(03h)(14h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(C4h)(C1h)
Pkt(18): 000 01:50:30.310:Tx:(02h)(03h)(00h)(0Ah)(00h)(0Ah)(E5h)(FCh)
Pkt(19): 000 01:50:30.470:Rx:(02h)(03h)(14h)(00h)(00h)(05h)(22h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(00h)(5Fh)(E5h)
Pkt(20): 000 01:50:30.480:Tx:(0Ah)(03h)(00h)(5Ah)(00h)(0Ah)(E4h)(A5h)
```

4.3. Ethernet Device Interface Logs

The *Ethernet Device Interface* Logs page provides a log of received and transmitted Ethernet device messages. Up to 128 bytes per message and up to 128 messages are logged. It is intended to help with debugging Ethernet connectivity problems, determining the proper start and end of transmission bytes, and diagnosing device problems.

The format is as follows:

Pkt(N): `DDD:HH:MM:SS.mmm Rx/Tx:<data packet>`

Where:

DDD – days since last system restart

HH – hours since last system restart

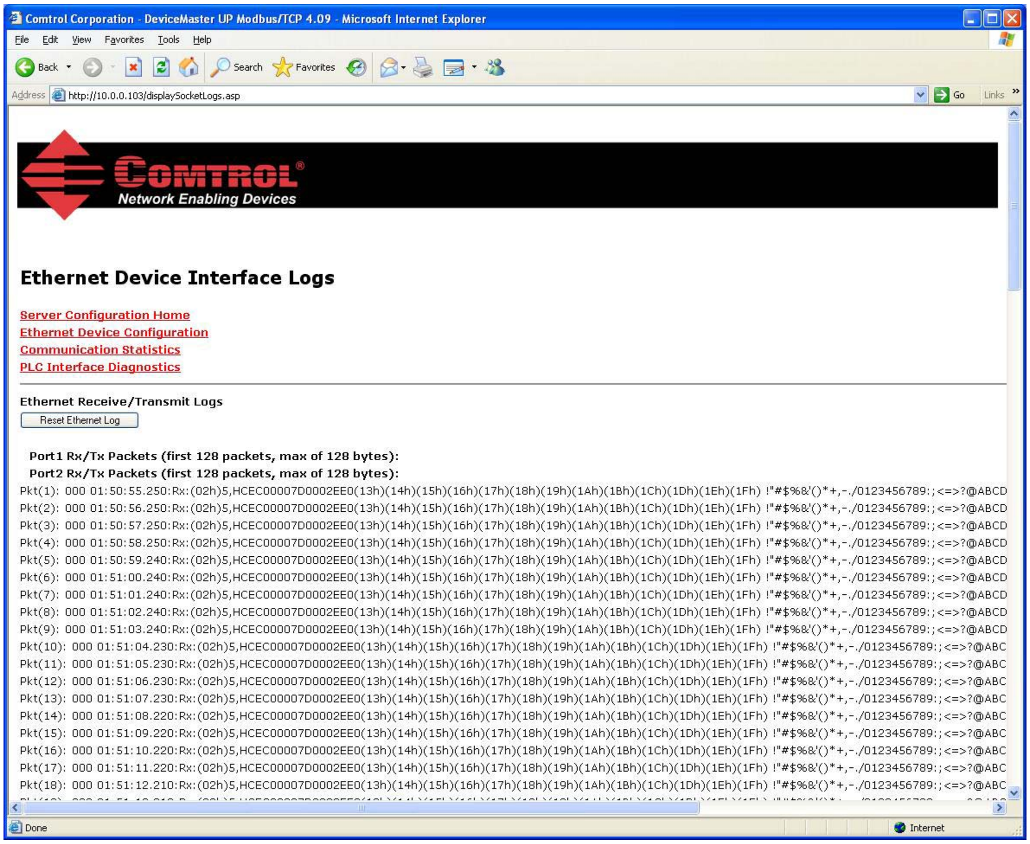
MM – minutes since last system restart

SS – seconds since last system restart

mmm – milliseconds since last system restart

<data packet> - Data packet received.

- ASCII characters displayed as characters
- Non-ASCII displayed in hex (xxh) format


Comtrol Corporation - DeviceMaster UP Modbus/TCP 4.09 - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back
Search
Favorites
Address http://10.0.0.103/displaySocketLogs.asp
Go
Links
COMTROL®
Network Enabling Devices
Done
Internet

Ethernet Device Interface Logs

Server Configuration Home
Ethernet Device Configuration
Communication Statistics
PLC Interface Diagnostics

Ethernet Receive/Transmit Logs

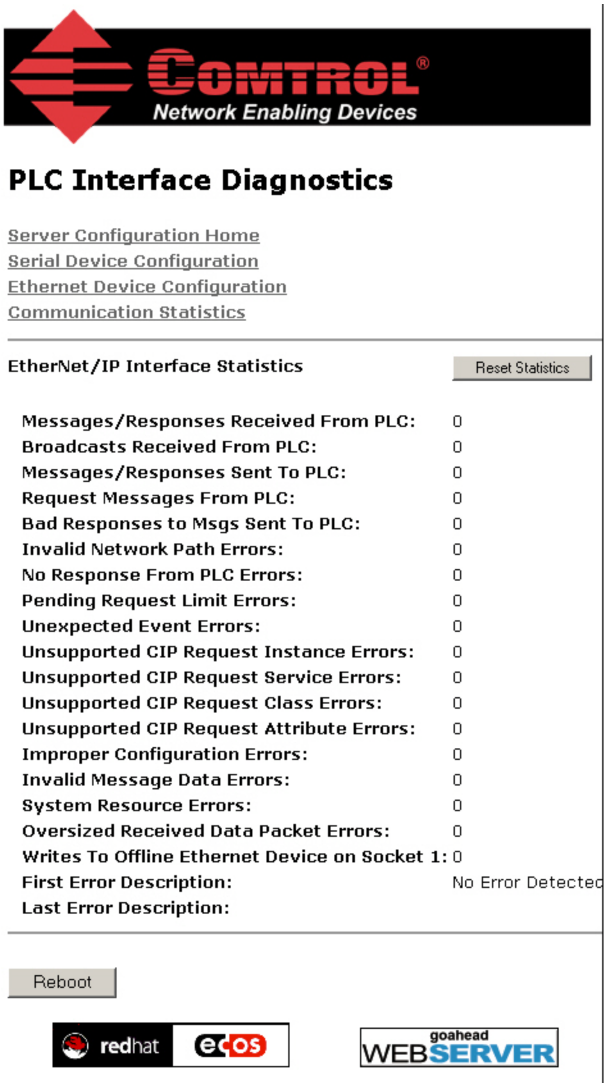
Reset Ethernet Log

```
  Port1 Rx/Tx Packets (first 128 packets, max of 128 bytes):
  Port2 Rx/Tx Packets (first 128 packets, max of 128 bytes):
Pkt(1): 000 01:50:55.250:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(2): 000 01:50:56.250:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(3): 000 01:50:57.250:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(4): 000 01:50:58.250:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(5): 000 01:50:59.240:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(6): 000 01:51:00.240:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(7): 000 01:51:01.240:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(8): 000 01:51:02.240:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(9): 000 01:51:03.240:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABCD
Pkt(10): 000 01:51:04.230:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
Pkt(11): 000 01:51:05.230:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
Pkt(12): 000 01:51:06.230:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
Pkt(13): 000 01:51:07.230:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
Pkt(14): 000 01:51:08.220:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
Pkt(15): 000 01:51:09.220:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
Pkt(16): 000 01:51:10.220:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
Pkt(17): 000 01:51:11.220:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
Pkt(18): 000 01:51:12.210:Rx:(02h)5,HCEC00007D0002EE0(13h)(14h)(15h)(16h)(17h)(18h)(19h)(1Ah)(1Bh)(1Ch)(1Dh)(1Eh)(1Fh) !"#$%&'()*+,-./0123456789:;<=>?@ABC
```

4.4. PLC Interface Diagnostics

The *PLC Interface Diagnostics* page provides detailed statistics and error reporting for the Modbus/TCP PLC interface. It is intended to help with debugging PLC programs, monitoring the PLC interface, and solving configuration problems.

PLC Interface Diagnostics	
Messages/ Responses Received From PLC	Displays the number of messages and responses received from the PLC(s).
Broadcasts Received From PLC	Displays the number of broadcast messages received from the PLC(s).
Messages/ Responses Sent To PLC	Displays the number of messages and responses sent to the PLC(s).
Request Messages From PLC	Displays the number of request messages received from the PLC(s).
Bad Responses To Msgs Sent To PLC	Displays the number of bad responses from messages sent to the PLC(s). Bad responses are typically returned for such errors as: • Incorrect tag or file names • incorrect tag or file data types • incorrect tag or file data sizes • PLC is overloaded and cannot handle the amount of Ethernet traffic • PLC malfunction
Invalid Network Path Errors	Displays the number of network path errors on messages sent to the PLC(s). These are typically caused by incorrect IP address settings.
No Response From PLC Errors	Displays the number of no responses from messages sent to the PLC(s). No responses are typically returned for such errors as: • Incorrect IP address • Incorrect PLC configuration • PLC malfunction • PLC is overloaded and cannot handle the amount of Ethernet traffic
Pending Request Limit Errors	Displays the number of pending request limit errors. These errors occur when the PLC is sending a continuous stream of messages to the DeviceMaster UP faster than the DeviceMaster UP can process them.
(Continued)	



PLC Interface Diagnostics

Server Configuration Home
Serial Device Configuration
Ethernet Device Configuration
Communication Statistics

EtherNet/IP Interface Statistics

```
Messages/Responses Received From PLC:          0
Broadcasts Received From PLC:                  0
Messages/Responses Sent To PLC:                0
Request Messages From PLC:                     0
Bad Responses to Msgs Sent To PLC:             0
Invalid Network Path Errors:                   0
No Response From PLC Errors:                   0
Pending Request Limit Errors:                  0
Unexpected Event Errors:                       0
Unsupported CIP Request Instance Errors:       0
Unsupported CIP Request Service Errors:        0
Unsupported CIP Request Class Errors:          0
Unsupported CIP Request Attribute Errors:      0
Improper Configuration Errors:                 0
Invalid Message Data Errors:                   0
System Resource Errors:                        0
Oversized Received Data Packet Errors:         0
Writes To Offline Ethernet Device on Socket 1: 0
First Error Description:                       No Error Detecte
Last Error Description:
```

PLC Interface Diagnostics (cont.)	
Unexpected Event Errors	Displays the number of unexpected event errors. Unexpected event errors occur when the DeviceMaster UP receives an unexpected message from the PLC such as an unexpected response or unknown message.
Unsupported CIP Request Instance Errors	Displays the number of unsupported CIP request instance errors. These errors occur when a message with an invalid instance is sent to the DeviceMaster UP.
Unsupported CIP Request Service Errors	Displays the number of unsupported CIP request instance errors. These errors occur when a message with an invalid service is sent to the DeviceMaster UP.
Unsupported CIP Request Class Errors	Displays the number of unsupported CIP request instance errors. These errors occur when a message with an invalid class is sent to the DeviceMaster UP.
Unsupported CIP Request Attribute Errors	Displays the number of unsupported CIP request instance errors. These errors occur when a message with an invalid attribute is sent to the DeviceMaster UP.
Improper Configuration Errors	Displays the number of improper configuration errors. These errors occur when the DeviceMaster UP receives a message that cannot be performed due to an invalid configuration.
Invalid Message Data Errors	Displays the number of invalid message data errors. These errors occur when the DeviceMaster UP receives a message that cannot be performed due to invalid data.
System Resource Errors	Displays the number of system resource errors. These errors indicate a system error on the DeviceMaster UP such as an inoperable serial port or a full transmit queue. These errors typically occur when the PLC(s) are sending data to the DeviceMaster UP faster than the DeviceMaster UP can process it.
Oversized Received Data Packet Errors	Displays the number of received Ethernet data packets that were larger than the configured maximum receive data packet.
Writes to Offline Ethernet Device on Socket N	Displays the number of write attempts by a PLC to the Ethernet device when the device was offline.
First Error Description	Text description of the first error that occurred.
Last Error Description	Text description of the last or most recent error that occurred.

Chapter 5. Programming the PLC

This chapter provides information to help you configure PLC programs for the DeviceMaster UP. It includes instructions for modifying the PLC program examples included with the DeviceMaster UP. The PLC program examples are designed to work with the ControlLogix line of PLCs, PLC-5s or SLCs.

5.1. Programming Guidelines

Choose the receive communication method that best suits your implementation. The following communication methods are available.

Communications Methods	Description
Unsolicited - Write-to-Tag/File (*Recommended Method*)	DeviceMaster UP writes the serial/socket data directly into a tag or file on the PLC. Use this method along with the **Maximum PLC Update Rate** configuration setting to ensure the PLC can scan and consume serial/socket data faster than the DeviceMaster UP can send it
Unsolicited - Write-to-Tag/File-Synced	DeviceMaster UP writes the serial/socket data into a tag or file on the PLC and provides a mechanism to synchronize the data flow between the PLC and DeviceMaster UP. Use this method when you want to ensure that the tag or file is not overwritten before the PLC can consume the data.
Polling	The PLC requests data on a periodic basis. It provides the ability to control the received data flow. However, it does require periodic data requests and the request rate must be fast enough to ensure that the serial/socket port receive queues on the DeviceMaster UP do not overflow.

- *For ControlLogix PLCs*: The receive data tags must be large enough to handle the largest packet that can be received from your serial/socket device.
    - For *Polling receive* method: Including the sequence number and length parameters, the DeviceMaster UP can return a received data message up to 444 bytes.
    - For *Write-to-Tag* and *Write-to-Tag-Synced receive* methods: If the data is larger than the maximum of 440 bytes (up to 1518 serial bytes and 2048 socket bytes), the DeviceMaster UP will send the data to a series of tags.

  See *2.3.2. Serial Port Data Transfer Object Definition (71 Hex)* on Page 28 and *2.3.5. Socket Port Data Transfer Definition Object (74 Hex)* on Page 43 for more information.

- *For PLC-5/SLC PLCs*: The receive data file area must be large enough to handle the largest packet that can be received from your serial/socket device.
    - For *Polling receive* method: Including the sequence number and length parameters, the DeviceMaster UP can return a received data message up to approximately 224 bytes.
    - For *Write-to-File* and *Write-to-File-Synced receive* methods: If the data size is large (up to 1518 serial bytes and 2048 socket bytes), the DeviceMaster UP will send the data to a series of files in sequential order.

  See *2.4.3. Receive Data Message* on Page 54 for details.

- Only one PLC generated EtherNet/IP message may be active at any one time in a PLC program.

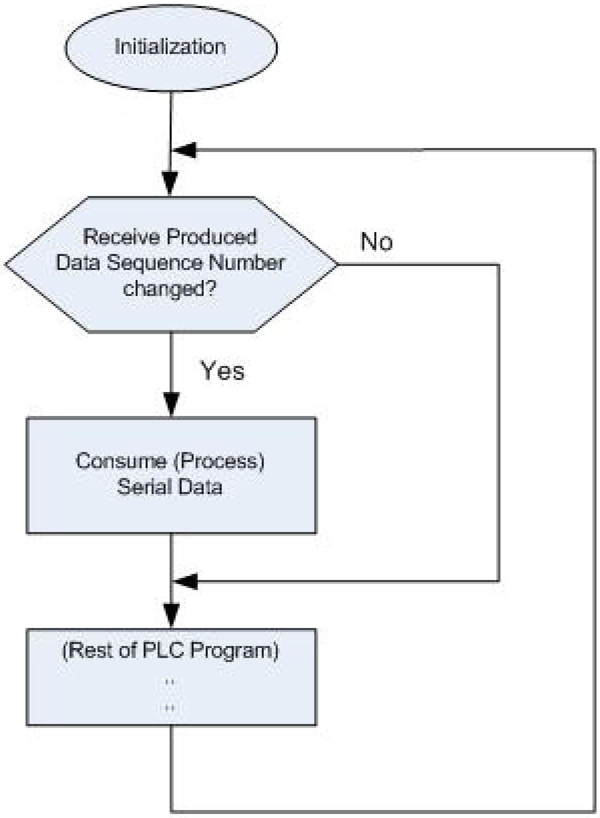
5.2. PLC Algorithms

This section displays the following PLC algorithms:

- *Unsolicited - Write-to-Tag/File PLC Algorithm* on Page 88
- *Unsolicited - Write-to-Tag/File-Synced PLC Algorithm* on Page 89
- *Polling PLC Algorithm* on Page 90

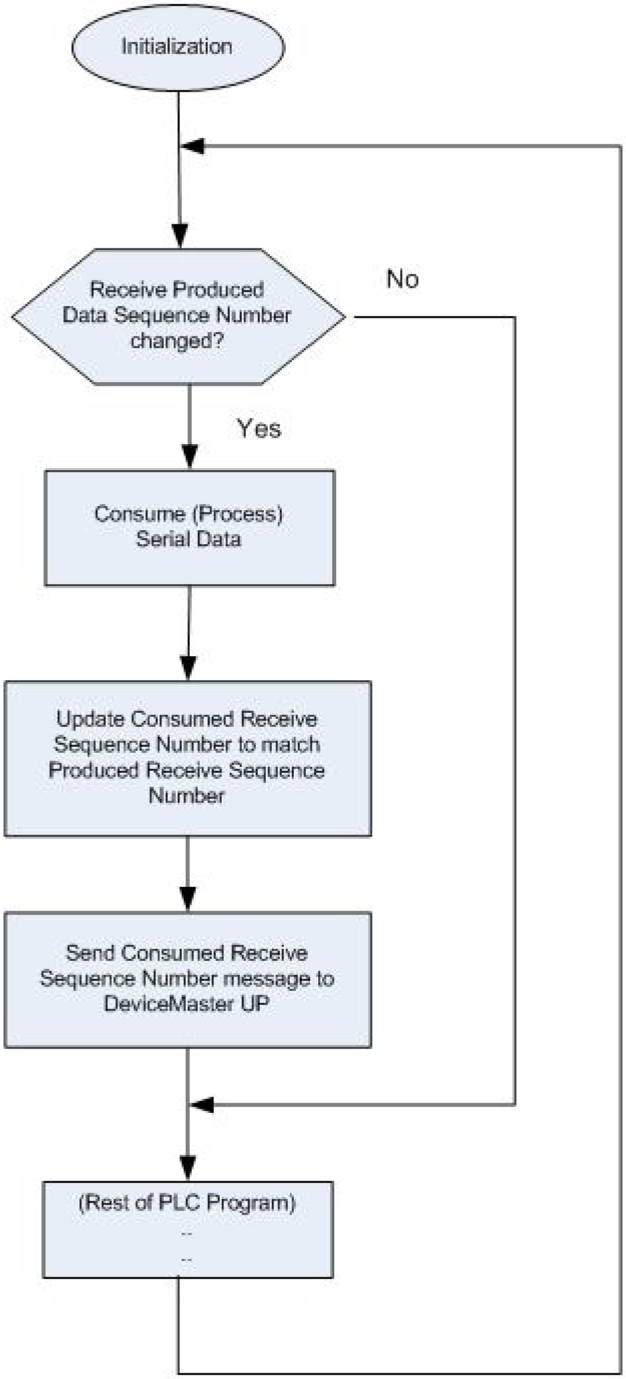
5.2.1. Unsolicited - Write-to-Tag/File PLC Algorithm

Use the following algorithm to receive data in the *Unsolicited - Write-to-Tag/File* mode.


Initialization
Receive Produced Data Sequence Number changed?
No
Yes
Consume (Process) Serial Data
(Rest of PLC Program)
..
..

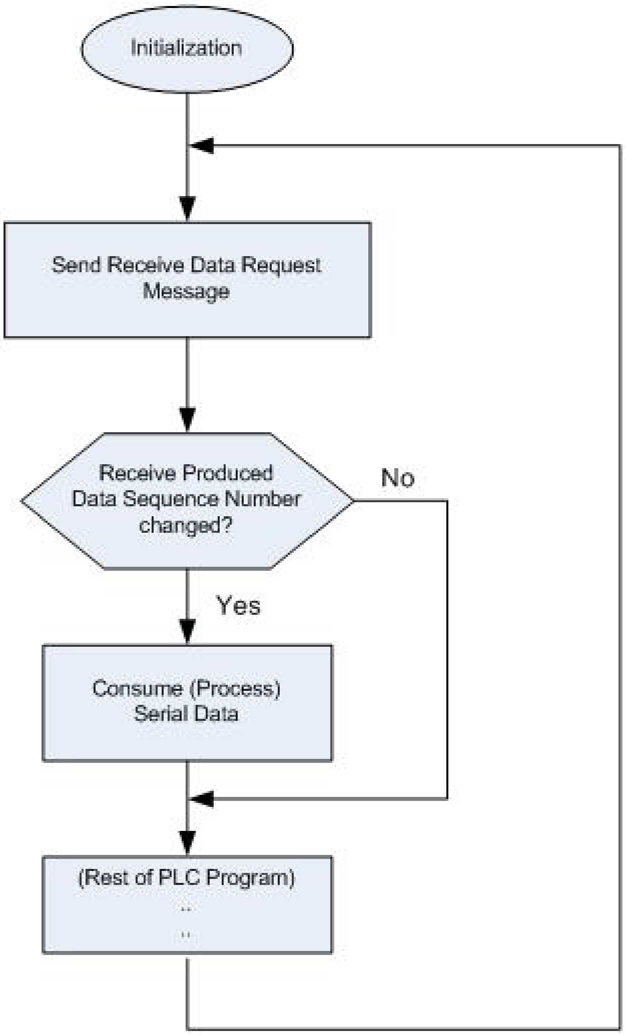
5.2.2. Unsolicited - Write-to-Tag/File-Synced PLC Algorithm

Use the following algorithm to receive data in the *Unsolicited - Write-to-Tag/File-Synced* mode.


Initialization
Receive Produced Data Sequence Number changed?
No
Yes
Consume (Process) Serial Data
Update Consumed Receive Sequence Number to match Produced Receive Sequence Number
Send Consumed Receive Sequence Number message to DeviceMaster UP
(Rest of PLC Program)
--
--

5.2.3. Polling PLC Algorithm

Use the following algorithm to *Receive Data in the Polling* mode.


Initialization
Send Receive Data Request Message
Receive Produced Data Sequence Number changed?
No
Yes
Consume (Process) Serial Data
(Rest of PLC Program)
..
..

5.3. ControlLogix PLC Programming Example Instructions

This topic describes how to use RSLogix 5000 to configure and run the DeviceMaster UP in a ControlLogix environment.

You can configure the RSLogix 5000 PLC program examples to your site's requirements. These programs are included in the self-installing file (**.MSI**) and are copied to the **Comtrol/EtherNetIP** directory on your computer when you open the **.MSI** file and follow the prompts. The self-installing file includes the following RSLogix 5000 PLC program examples:

- *5.3.3. loopbackExampleTagWrite.L5K* on Page 92
- *5.3.4. loopbackExampleTagWriteSynced.L5K* on Page 93
- *5.3.5. loopbackExamplePolling.L5K* on Page 94

These program examples are intended to aid the PLC programmer. The PLC programmer can use and modify these PLC program examples to suit their needs.

Note: *The PLC program examples are designed to interface with a DeviceMaster UP 1-port or on Port 1 of a 2-port or 4-port. Additional programming is required to use all ports on a 2-port or 4-port.*

Caution

Disclaimer: **Comtrol supplies example PLC programs for demonstration purposes only. They are intended for the sole purpose of an example loop-back demonstration in a controlled lab environment. They are not intended for use in a production environment and may not function correctly on all PLCs. Comtrol does not warrant these example programs or any part thereof. The user assumes all liability for any modification to and use of a modified example program.**

5.3.1. What is RSLogix 5000?

RSLogix 5000 is a programming application that is designed to interface with the ControlLogix line of PLCs. You can use it for sequential, process, drive, and motion control programming. It provides an easy-to-use interface, symbolic programming with structures and arrays and an instruction set that serves many types of applications. It simplifies plant maintenance by providing one programming environment for all of your applications.

Note: *See the RSLogix 5000 Help for more information on this product.*

5.3.2. Requirements

- The DeviceMaster UP must be installed and configured as described in the *DeviceMaster UP Hardware Installation Guide*.
- The DeviceMaster UP must be installed on the same Ethernet network segment as the PLC.
- RSLogix 5000 must be installed on a computer. Note that the instructions in this guide require that you have some familiarity with this programming application.
- A loopback plug is required for each port on the DeviceMaster UP. See the *DeviceMaster UP Hardware Installation Guide* for information on loopback plugs.
- The PLC program (**.L5K** files) examples are required. You can copy the PLC program examples from the CD or download the latest program examples from the Internet. See *1.4. Locating Updated Software and Documents* on Page 10 for the location of the PLC program examples.

5.3.3. loopbackExampleTagWrite.L5K

This example program demonstrates an RSLogix 5000 loopback PLC program using the *Unsolicited - Write-to-Tag receive* method. This program configures a DeviceMaster UP 1-port at startup and then loops data by means of the loopback plug on the serial port. The **Com1_RxData** tag transmits and receives the data and increments the sequence numbers.

You can configure and run the **loopbackExampleTagWrite.L5K** program through RSLogix 5000. For additional information on the RSLogix 5000, see *5.3.7. RSLogix 5000 Screen Examples* on Page 96.

1. Attach a loopback plug to the serial port. (If necessary, see the *DeviceMaster UP Hardware Installation Guide*.)
2. Open **RSLogix 5000**.
3. Import the **loopbackExampleTagWrite.L5K** file.

   Note: *If you have problems loading the PLC program example, see 5.3.8. Modifying an RSLogix 5000 PLC Program Example (Older Versions) on Page 103 for a solution.*

4. Modify the PLC program (**loopbackExampleTagWrite.L5K**) for your system. *2.3. EtherNet/IP Interface Profile (ControlLogix)* on Page 15 provides a description of the objects in the PLC program.

   This PLC program is configured to run on a ControlLogix 5550 controller, so you may need to make the following changes:

   a. From the **Controller Organizer** panel, click **Controller ComtrolCLX** and select **Properties**.

   b. Click **Change Controller**, select your PLC controller and revision.

   c. Right-click the **I/O Configuration**, select **New Module**, and add your EtherNet/IP interface to the project.

   d. Double-click **MainRoutine** under **Tasks** > **MainTask** > **MainProgram** in the **Controller Organizer** panel and modify the message communication paths. Click each message and change the communication path to:

   ```
   <Ethernet Interface Name>,2,<DeviceMaster UP IP Address>
   ```

   Where <**Ethernet Interface Name**> specifies the name of your Ethernet interface and <**DeviceMaster UP IP Address**> specifies the IP address for this device.

5. Use one of the following procedures:

   For embedded web page configuration (recommended): Perform the steps outlined in *5.3.6. Configuring the DeviceMaster UP for the RSLogix 5000 Example Programs Using the Web Page* on Page 95.

   For the optional PLC Configuration:

   a. Double-click **Controller Tags** and click the plus sign (**+**) next to **Com1_SetConfigData** to expand the option and change the serial port configuration tag.

   b. Change the **plcSlotNumber** parameter to match the PLC slot number on your PLC chassis.

   c. Change the **plcIPAddress** parameter to match the IP address of your PLC EtherNet/IP card. (The value must be entered in 32-bit hex format.

   d. Enable **DoSetConfig** on rung one of the example PLC program.

6. Download the PLC program to your PLC and run the program.

5.3.4. loopbackExampleTagWriteSynced.L5K

This example program demonstrates an RSLogix 5000 loopback PLC program using the *Write-to-Tag-Synced receive* method. This program configures a DeviceMaster UP 1-port at startup and then loops data through the loopback plug on the serial port. The **Com1_RxData** tag transmits and receives the data, increments the sequence numbers, and sends the consumed receive sequence number to the DeviceMaster UP after each received data packet.

You can configure and run the **loopbackExampleTagWriteSynced.L5K** program through RSLogix 5000. For additional information on the RSLogix 5000, see *5.3.7. RSLogix 5000 Screen Examples* on Page 96.

1. Attach a loopback plug to the serial port. (If necessary, see the *DeviceMaster UP Hardware Installation Guide*.)
2. Open **RSLogix 5000**.
3. Import the **loopbackExampleTagWriteSynced.L5K** file.

   Note: *If you have problems loading the PLC program example, see 5.3.8. Modifying an RSLogix 5000 PLC Program Example (Older Versions) on Page 103 for a solution.*
4. Modify the PLC program (**loopbackExampleTagWriteSynced.L5K**) for your system.

   2.3. EtherNet/IP Interface Profile (ControlLogix) on Page 15 provides a description of the objects in the PLC program. This PLC program is configured to run on a ControlLogix 5550 controller, so you may need to make the following changes:

   a. From the **Controller Organizer** panel, click **Controller ComtrolCLX** and select **Properties**.

   b. Click **Change Controller**, select your PLC controller and revision.

   c. Right-click the **I/O Configuration**, select **New Module**, and add your EtherNet/IP interface to the project.

   d. Double-click **MainRoutine** under **Tasks** > **MainTask** > **MainProgram** in the **Controller Organizer** panel and modify the message communication paths. Click each message and change the communication path to:

   ```
   <Ethernet Interface Name>,2,<DeviceMaster UP IP Address>
   ```

   Where <**Ethernet Interface Name**> specifies the name of your Ethernet interface and <**DeviceMaster UP IP Address**> specifies the IP address for this device.
5. Use one of the following procedures:

   For embedded Web page configuration (recommended): Perform the steps outlined in *5.3.6. Configuring the DeviceMaster UP for the RSLogix 5000 Example Programs Using the Web Page* on Page 95.

   For the optional PLC Configuration:

   a. Double-click **Controller Tags** and click the plus sign (**+**) next to **Com1_SetConfigData** to expand the option and change the serial port configuration tag.

   b. Change the **plcSlotNumber** parameter to match the PLC slot number on your PLC chassis.

   c. Change the **plcIPAddress** parameter to match the IP address of your PLC EtherNet/IP card. (The value must be entered in 32-bit hex format.

   d. Enable **DoSetConfig** on rung one of the example PLC program.
6. Download the PLC program to your PLC and run the program.

5.3.5. loopbackExamplePolling.L5K

This example program demonstrates an RSLogix 5000 loopback PLC program using the *Polling receive* method. This program configures a DeviceMaster UP 1-port at startup and then loops data through the loopback plug on the serial port. The *Request Data Message* transmits and receives the data and increments the sequence numbers.

You can configure and run the **loopbackExamplePolling.L5K** program through RSLogix 5000. For additional information on the RSLogix 5000, see *5.3.7. RSLogix 5000 Screen Examples* on Page 96.

1. Attach a loopback plug to the serial port. (If necessary, see the *DeviceMaster UP Hardware Installation Guide*.)
2. Open **RSLogix 5000**.
3. Import the **loopbackExamplePolling.L5K** file.

   Note: *If you have problems loading the PLC program example, see 5.3.8. Modifying an RSLogix 5000 PLC Program Example (Older Versions) on Page 103 for a solution.*

4. Modify the PLC program (**loopbackExamplePolling.L5K**) for your system.

   2.3. EtherNet/IP Interface Profile (ControlLogix) on Page 15 provides a description of the objects in the PLC program.

   Note that this PLC program is configured to run on a ControlLogix 5550 controller Virtual Chassis, so you may need to make the following changes:

   a. From the **Controller Organizer** panel, click **Controller ComtrolCLX** and select **Properties**.
   b. Click **Change Controller**, select your PLC controller and revision.
   c. Right-click the **I/O Configuration**, select **New Module**, and add your EtherNet/IP interface to the project.
   d. Double-click **MainRoutine** under **Tasks** > **MainTask** > **MainProgram** in the **Controller Organizer** panel and modify the message communication paths. Click each message and change the communication path to:

      ```
      <Ethernet Interface Name>,2,<DeviceMaster UP IP Address>
      ```

      Where <**Ethernet Interface Name**> specifies the name of your Ethernet interface and <**DeviceMaster UP IP Address**> specifies the IP address for this device.

5. Use one of the following procedures:

   For the embedded Web page configuration (recommended): Perform the steps outlined in *5.3.6. Configuring the DeviceMaster UP for the RSLogix 5000 Example Programs Using the Web Page* on Page 95.

   For the optional PLC Configuration: Enable **DoSetConfig** on rung one of the example PLC program.

6. Download the PLC program to your PLC and run the program.

5.3.6. Configuring the DeviceMaster UP for the RSLogix 5000 Example Programs Using the Web Page

The following procedure configures the DeviceMaster UP for the RSLogix 500 example programs. You must perform this task before you configure and run the RSLogix 500 example program. For more information on the *Server Configuration* web pages, see *Chapter 3. Embedded Configuration Pages* on Page 61.

1. Attach a loopback plug to the serial port.
2. Access the *Server Configuration* web page, using one of these methods.
   - Open PortVision Plus, right-click on the DeviceMaster UP for which you want to program network information and select **Web Manager.**
   - Open a browser and type the IP address for the DeviceMaster UP in the **Address** box.
3. Click **Port *n***. Where ***n*** is the port number.
4. Set the serial port settings under **Serial Configuration** to the following values.

Field	Setting
Mode	RS-232
Baud	57600
Parity	none
Data Bits	8
Stop Bits	1
Flow Control	none
DTR	off
Rx Timeout Between Packets	200

5. Set the serial port settings under **Serial Packet Identification** to these values.

Field	Setting
STX RX Detect	Set to one byte and Byte 1 to 2.
ETX Rx Detect	Set to one byte and Byte 1 to 3.
STX Tx Append	Set to one byte and Byte 1 to 2.
ETX Tx Append	Set to one byte and Byte 1 to 3.
Strip Rx STX/ETX	Select
Discard Rx Packets With Errors	Select

6. Set the serial port settings under **Ethernet/IP Settings** to the following values:

Field	Selection
TX Sequence Number Checking	Select.
Rx (To PLC) Ethernet Transfer Method	• Set to Polling for lpbkExamplePolling. • Set to Write-to-Tag/File for lpbkExampleTagWrite. • Set to Write-to-Tag/File-Synced for lpbkExampleTagWriteSynced.
PLC IP Address	• Leave blank for Polling. • Set to IP Address of PLC for Write-to-File and Write-to-File-Synced.
PLC Controller Slot Number	Set to PLC Controller slot number which typically starts at zero. (Set to zero for CompactLogix PLC.)
Rx (To PLC) Produced Data Tag/File Name	• Leave blank for Polling. • Set to Com1_RxData, the PLC receive filename for Write-to-Tag and Write-to-Tag-Synced.
Reset Port	Select.
Save in Flash	Select.

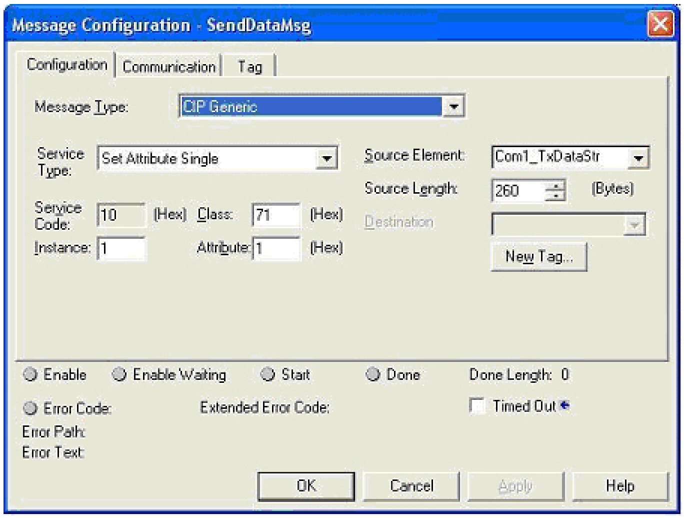
7. Click **Submit**.

5.3.7. RSLogix 5000 Screen Examples

The following subsections explain how to configure the DeviceMaster UP through RSLogix 5000.

5.3.7.1. Transmit Data to the DeviceMaster UP

Use the **Configuration** tab on the **Message Configuration** dialog to set options for transmitting data through a specified port on the DeviceMaster UP.


Message Configuration - SendDataMsg

Configuration | Communication | Tag

Message Type: CIP Generic

Service Type: Set Attribute Single

Service Code: 10 (Hex) Class: 71 (Hex)

Instance: 1 Attribute: 1 (Hex)

Source Element: Com1_TxDataStr

Source Length: 260 (Bytes)

Destination

New Tag...

○ Enable ○ Enable Waiting ○ Start ○ Done Done Length: 0

○ Error Code: Extended Error Code: □ Timed Out

Error Path:

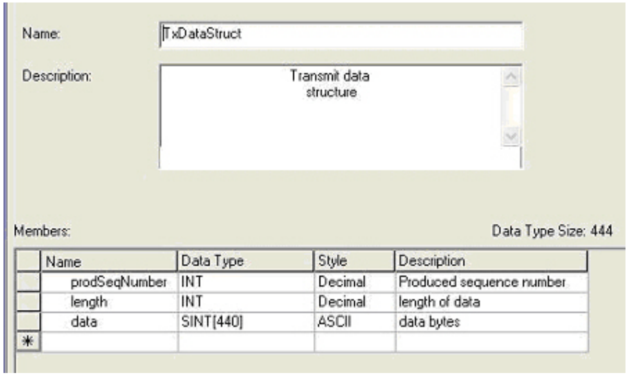
Error Text:

OK Cancel Apply Help

Provide the following information.

Field	Selection
Message Type	CIP Generic
Service Type	Set Attribute Single
Service Code	10 Hex (Set Attribute Single)
Class	71 Hex (Serial Port Data Transfer object)
Instance	1 (Port 1)
Attribute	1 (Transmit message data attribute)
Source Element	**Com1_TxDataStr** The transmit data structure includes: • Optional produced data sequence number (one INT) • Data Length in bytes (one INT) • Data array (one to 440-bytes)
Source Length	Specifies the length of the transmit data structure. (In this example, the value is 260 to transmit 256 data bytes. Since the maximum data size is 440-bytes, the maximum transmit data structure size is 444-bytes.)

The following image displays the user defined data type for transmit data.


Name: TxDataStruct

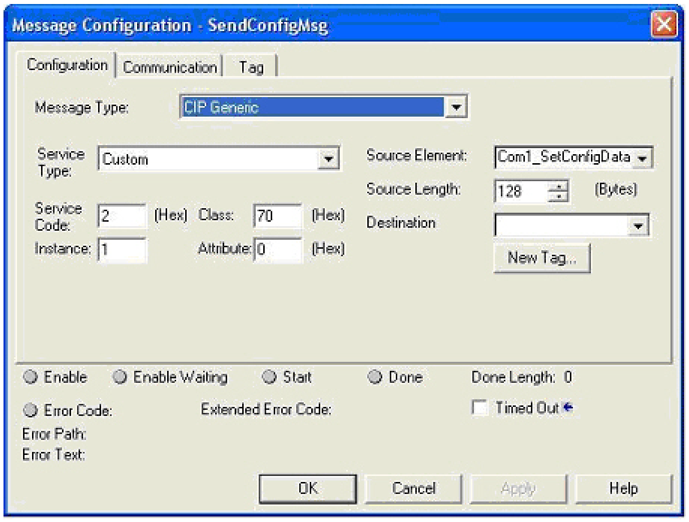
Description: Transmit data structure

Members: Data Type Size: 444

Name	Data Type	Style	Description
prodSeqNumber	INT	Decimal	Produced sequence number
length	INT	Decimal	length of data
data	SINT[440]	ASCII	data bytes
*			

5.3.7.2. Send Configuration to DeviceMaster UP

Use the **Configuration** tab on the **Message Configuration** dialog for sending a serial port configuration to the DeviceMaster UP.



Message Configuration - SendConfigMsg

Message Type: CIP Generic

Service Type: Custom

Service Code: 2 (Hex) Class: 70 (Hex)

Instance: 1 Attribute: 0 (Hex)

Source Element: Com1_SetConfigData

Source Length: 128 (Bytes)

Destination:

○ Enable ○ Enable Waiting ○ Start ○ Done Done Length: 0

○ Error Code: Extended Error Code: □ Timed Out

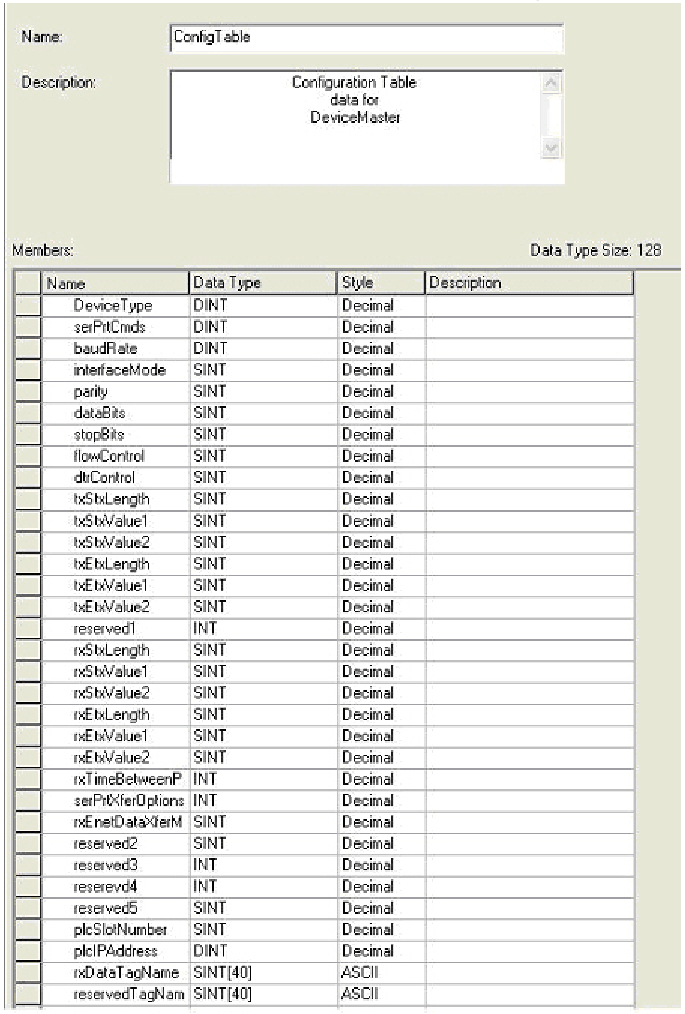
Error Path:

Error Text:

Provide the following information.

Field	Selection
Message Type	CIP Generic
Service Type	Custom
Service Code	2 Hex (Set Attribute All)
Class	70 Hex (Serial Port Configuration object)
Instance	1 (Port 1)
Attribute	0 (Unused)
Source Element	**Com1_SetConfigData** (Configuration data structure.)

The following image displays the user defined data type for a serial port configuration.



Name: ConfigTable

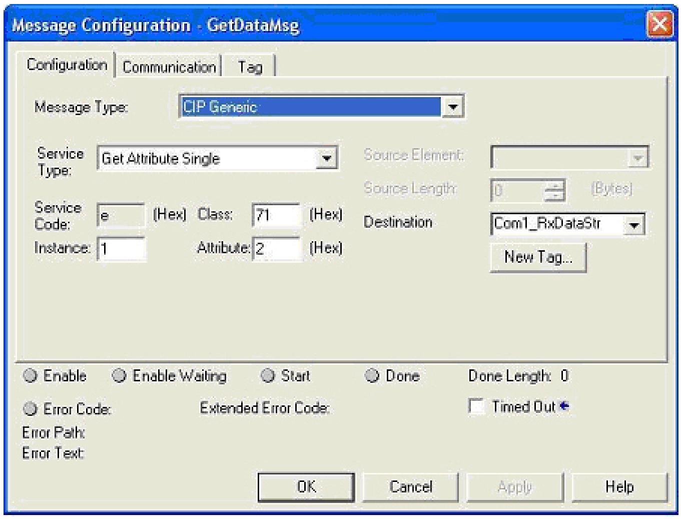
Description: Configuration Table
data for
DeviceMaster

Members: Data Type Size: 128

Name	Data Type	Style	Description
DeviceType	DINT	Decimal	
serPrtCmds	DINT	Decimal	
baudRate	DINT	Decimal	
interfaceMode	SINT	Decimal	
parity	SINT	Decimal	
dataBits	SINT	Decimal	
stopBits	SINT	Decimal	
flowControl	SINT	Decimal	
dtrControl	SINT	Decimal	
txStxLength	SINT	Decimal	
txStxValue1	SINT	Decimal	
txStxValue2	SINT	Decimal	
txEtxLength	SINT	Decimal	
txEtxValue1	SINT	Decimal	
txEtxValue2	SINT	Decimal	
reserved1	INT	Decimal	
rxStxLength	SINT	Decimal	
rxStxValue1	SINT	Decimal	
rxStxValue2	SINT	Decimal	
rxEtxLength	SINT	Decimal	
rxEtxValue1	SINT	Decimal	
rxEtxValue2	SINT	Decimal	
rxTimeBetweenP	INT	Decimal	
serPrtXferOptions	INT	Decimal	
rxEnetDataXferM	SINT	Decimal	
reserved2	SINT	Decimal	
reserved3	INT	Decimal	
reserevd4	INT	Decimal	
reserved5	SINT	Decimal	
plcSlotNumber	SINT	Decimal	
plcIPAddress	DINT	Decimal	
rxDataTagName	SINT[40]	ASCII	
reservedTagNam	SINT[40]	ASCII	

5.3.7.3. Request Data from DeviceMaster UP

Use the **Configuration** tab on the **Message Configuration** dialog to request data from a specified serial port on the DeviceMaster UP. Only the *Polling receive* method uses this feature.



Message Type: CIP Generic

Service Type: Get Attribute Single

Service Code: e (Hex) Class: 71 (Hex)

Instance: 1 Attribute: 2 (Hex)

Source Element:

Source Length: 0 (Bytes)

Destination: Com1_RxDataStr

○ Enable ○ Enable Waiting ○ Start ○ Done Done Length: 0

○ Error Code: Extended Error Code: □ Timed Out

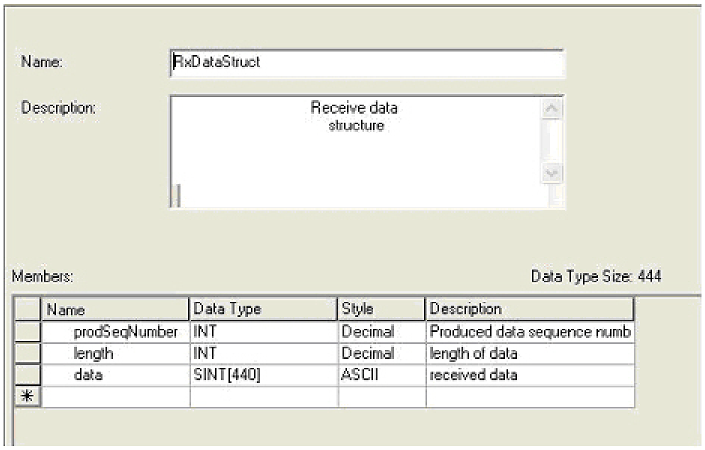
Error Path:

Error Text:

Provide the following information.

Field	Selection
Message Type	CIP Generic
Service Type	Get Attribute Single
Service Code	0E Hex (Get Attribute Single)
Class	71 Hex (Serial Port Data Transfer object)
Instance	1 (Port 1)
Attribute	2 (Receive message data attribute)
Destination	**Com1_RxDataStr** (Receive data structure) The Receive data structure includes: • Produced data sequence number (one INT). A change indicates new data. • Data length in bytes (one INT). • Data array (zero to 440-bytes)
Source Length	128 (Length of the configuration data structure.)

The following image displays the user defined data type for received data.



Name: RxDataStruct

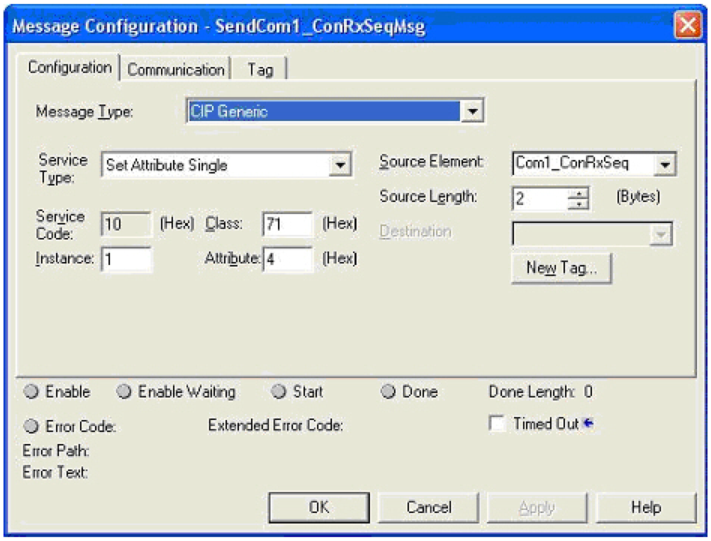
Description: Receive data structure

Members: Data Type Size: 444

Name	Data Type	Style	Description
prodSeqNumber	INT	Decimal	Produced data sequence numb
length	INT	Decimal	length of data
data	SINT[440]	ASCII	received data

5.3.7.4. Send Consumed Sequence Number to DeviceMaster UP

Use the **Configuration** tab on the **Message Configuration** dialog to update the consumed sequence number for a specified port on the DeviceMaster UP. Only the *Write-to-Tag-Synced receive* method uses this feature.



Message Configuration - SendCom1_ConRxSeqMsg

Message Type: CIP Generic

Service Type: Set Attribute Single

Service Code: 10 (Hex) Class: 71 (Hex)

Instance: 1 Attribute: 4 (Hex)

Source Element: Com1_ConRxSeq

Source Length: 2 (Bytes)

Destination:

Done Length: 0

Error Code:

Extended Error Code:

□ Timed Out

Error Path:

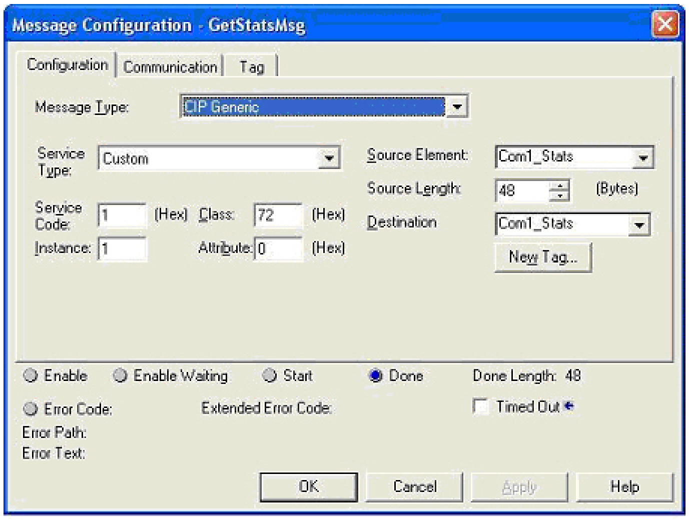
Error Text:

Provide the following information:

Field	Selection
Message Type	CIP Generic
Service Type	Set Attribute Single
Service Code	10 Hex (Set Attribute Single)
Class	71 Hex (Serial Port Data Transfer object)
Instance	1 (Port 1)
Attribute	4 (Receive consumed sequence number attribute)
Source Element	**Com1_ConRxSeq** (one INT)
Source Length	2 (one INT)

5.3.7.5. Request Statistics from DeviceMaster UP

Use the **Configuration** tab on the **Message Configuration** dialog for requesting statistics for a specified port from the DeviceMaster UP.



Message Type: CIP Generic

Service Type: Custom

Service Code: 1 (Hex) Class: 72 (Hex)

Instance: 1 Attribute: 0 (Hex)

Source Element: Com1_Stats

Source Length: 48 (Bytes)

Destination: Com1_Stats

○ Enable ○ Enable Waiting ○ Start ● Done Done Length: 48

○ Error Code: Extended Error Code: □ Timed Out

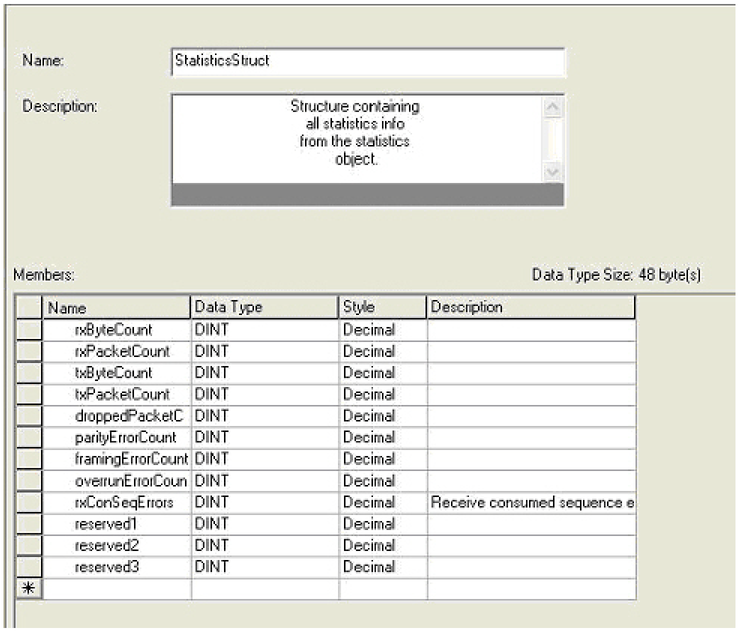
Error Path:

Error Text:

Provide the following information.

Field	Selection
Message Type	CIP Generic
Service Type	Custom
Service Code	1 Hex (Get Attribute All)
Class	72 Hex (Serial Port Statistics object)
Instance	1 (Port 1)
Attribute	0 (Unused)
Source Element	Com1_Stats (not actually used)
Source Length	48 (size of Statistics data structure)
Destination	**Com1_Stats** (Statistics data structure)

The following image displays the user defined data type for statistics.



Name: StatisticsStruct

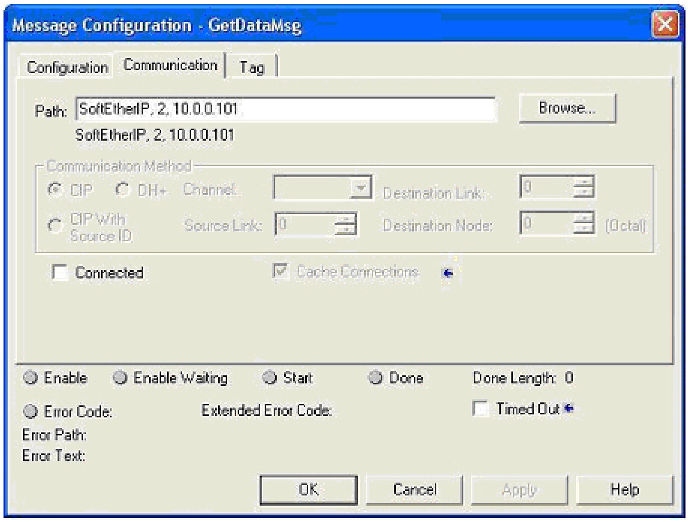
Description: Structure containing all statistics info from the statistics object.

Members: Data Type Size: 48 byte(s)

	Name	Data Type	Style	Description
	rxByteCount	DINT	Decimal	
	rxPacketCount	DINT	Decimal	
	txByteCount	DINT	Decimal	
	txPacketCount	DINT	Decimal	
	droppedPacketC	DINT	Decimal	
	parityErrorCount	DINT	Decimal	
	framingErrorCount	DINT	Decimal	
	overrunErrorCoun	DINT	Decimal	
	rxConSeqErrors	DINT	Decimal	Receive consumed sequence e
	reserved1	DINT	Decimal	
	reserved2	DINT	Decimal	
	reserved3	DINT	Decimal	
*				

5.3.7.6. Communication Window for all Messages sent to the DeviceMaster UP

Use the **Communication** tab on the **Message Configuration** dialog for sending all EtherNet/IP messages to the DeviceMaster UP.



Message Configuration - GetDataMsg

Path: SoftEtherIP, 2, 10.0.0.101

SoftEtherIP, 2, 10.0.0.101

Communication Method

● CIP ○ DH+ Channel: Destination Link: 0

○ CIP With Source ID Source Link: 0 Destination Node: 0 (Octal)

□ Connected ☑ Cache Connections

○ Enable ○ Enable Waiting ○ Start ○ Done Done Length: 0

○ Error Code: Extended Error Code: □ Timed Out

Error Path:

Error Text:

Provide the following information.

Field	Selection
Path	Provide the following information in this box: • **SoftEtherIP -** Specifies the name of the EtherNet/IP interface • **2 -** Required for routing on ControlLogix PLCs. • **10.0.0.101 -** Specifies the IP address on the DeviceMaster UP used to create the example programs.

5.3.8. Modifying an RSLogix 5000 PLC Program Example (Older Versions)

The EtherNet/IP PLC example programs included in the firmware software assembly (**.msi**) file were developed on version 13.03 of RSLogix 5000 and may not load properly into older versions of RSLogix 5000. You can use the following procedure to modify a PLC example program for older versions of RSLogix 5000 when the PLC example program does not load properly.

1. Start RSLogix 5000 and load a known functional PLC program. (Preferably one with an EtherNet/IP interface.)
2. Create an **.L5K** file by saving the file to the **.L5K** format.
3. Open the known functional **.L5K** file with a text editor.
4. Open the example **.L5K** file with a text editor.
5. Make the following modifications to the **.L5K** file:
   - Modify the version number (**IE_VER**) of the example **.L5K** file to match the version number of the known functional **.L5K** file (line 8 of the example **.L5K** file).
   - Modify the **Major** revision number of the example **.L5K** file to match the **Major** revision number in the known functional **.L5K** file (line 11 of the example **.L5K** file).
6. Load the example **.L5K** file into RSLogix 5000.
   - If it loads without errors, follow the appropriate process to modify the example program to run on your system. The following topics describes how to modify the example **.L5K** files:
     - *5.3.3. loopbackExampleTagWrite.L5K* on Page 92
     - *5.3.4. loopbackExampleTagWriteSynced.L5K* on Page 93
     - *5.3.5. loopbackExamplePolling.L5K* on Page 94
   - If you still have problems loading the example **.L5K** file, go to the next step.
7. Make the following modifications to the **.L5K** file:
   - Modify the **ProcessorType** setting in the example **.L5K** file to match the **ProcessorType** in the known functional **.L5K** file (line 10 of the example **.L5K** file).
   - Replace the **MODULE local** section of the example **.L5K** file with the **Module local** section in the known functional **.L5K** file (lines 89 to 102).
   - Choose one of the following options:
     - Replace the **MODULE EnetBridge** section of the example **.L5K** file with the EtherNet/IP interface section from the known functional **.L5K** file.
     - Delete the **MODULE EnetBridge** section from the example file (lines 104 to 117).
8. Load the example **.L5K** file into RSLogix 5000.
   - If it loads without errors, follow the appropriate process to modify the example program to run on your system. The following topics describes how to modify the example**.L5K** files:
     - *5.3.3. loopbackExampleTagWrite.L5K* on Page 92
     - *5.3.4. loopbackExampleTagWriteSynced.L5K* on Page 93
     - *5.3.5. loopbackExamplePolling.L5K* on Page 94
   - If you still have problems loading the example**.L5K** file, remove or modify all references to **EnetBridge** in the example **.L5K** file and re-load the example **.L5K** file into RSLogix 5000.

5.4. SLC or MicroLogix PLC Programming Example Instructions

This topic describes how to use RSLogix 500 to configure and run the DeviceMaster UP in an SLC or MicroLogix PLC environment.

You can configure the RSLogix 500 PLC program examples to your site's requirements. These programs are included in the self-installing file (**.MSI**) and are copied to the **Comtrol/EtherNetIP** directory on your computer when you open the **.MSI** file and follow the prompts. The self-installing file includes the following RSLogix 500 PLC program examples:

- *5.4.3.1. lpbkExampleSlcMsgPollRS500 - SLC PLC*
- *5.4.3.2. lpbkExamplePlc5MsgPollRS500 - SLC PLC*

These program examples are intended to aid the PLC programmer. These program examples were developed with version 6.30.00 (CPR 6) of RSLogix 500 and a C series SLC 5/05 with FRN 9 firmware.

Note: *The PLC program examples are designed to interface with a DeviceMaster UP 1-port or on Port 1 of a 2-port or 4-port. Additional programming is required to use all ports on a 2-port or 4-port.*

⚠ Caution

***Disclaimer:* Comtrol supplies example PLC programs for demonstration purposes only. They are intended for the sole purpose of an example loop-back demonstration in a controlled lab environment. They are not intended for use in a production environment and may not function correctly on all PLCs. Comtrol does not warrant these example programs or any part thereof. The user assumes all liability for any modification to and use of a modified example program.**

5.4.1. What is RSLogix 500?

RSLogix 500 is a Windows ladder logic programming package for the SLC 500 and MicroLogix PLCs.

Note: *See the RSLogix 500 Help for more information on this product.*

5.4.2. Requirements

- The DeviceMaster UP must be installed and configured as described in the *DeviceMaster UP Hardware Installation Guide*.
- The DeviceMaster UP must be installed on the same Ethernet network segment as the PLC.
- RSLogix 500 must be installed on your computer. Note that the instructions in this guide require that you have some familiarity with this programming application.
- A loopback plug is required for the first port on the DeviceMaster UP when running an example PLC program. If necessary, see the *DeviceMaster UP Hardware Installation Guide* for information on loopback plugs.
- The PLC program examples (**.SLC**, **.SY5** and **.SY6** files) are optional. You can copy the PLC program examples from the CD or download the latest program examples from the Internet. See *1.4. Locating Updated Software and Documents* on Page 10, for the location of the PLC program examples.

5.4.3. Example Program Considerations

- While the RSLogix example programs are simple in nature, they include retry mechanisms for timed-out messages. You may or may not want to include the time-out mechanism in your application.
- While the receive and transmit sequence numbers are cleared on the DeviceMaster UP at the start of the programs, the only requirement is that the sequence numbers be in sync between the PLC and DeviceMaster UP.
- Statistics retrieval is not included in the example programs, but you can easily add it by inserting a request statistics message.

5.4.3.1. lpbkExampleSlcMsgPollRS500 - SLC PLC

This example program demonstrates an RSLogix 500 loopback PLC program using the SLC Typed messages in the *Polling receive* method. This program initializes receive and transmit produced data sequence numbers at startup on the DeviceMaster UP and then loops data through a loopback plug on the serial port. The SLC Typed Write data messages transmit the data, the SLC Typed Read Data messages receive the data and the sequence numbers are incremented.

This example program includes the following files:

- **lpbkExampleSlcMsgPollRS500.SLC -** Ladder logic in ASCII format.
- **lpbkExampleSlcMsgPollRS500.SY5 -** Symbol definitions for RSLogix 500 Version 5.xx.xx.
- **lpbkExampleSlcMsgPollRS500.SY6 -** Symbol definitions for RSLogix 500 Version 6.xx.xx.

5.4.3.2. lpbkExamplePlc5MsgPollRS500 - SLC PLC

This example program demonstrates an RSLogix 500 loopback PLC program using the PLC-5 Typed messages in the *Polling receive* method. This program initializes receive and transmit produced data sequence numbers at startup on the DeviceMaster UP and then loops data through a loopback plug on the serial port. The PLC-5 Typed Write data messages transmit the data, the PLC-5 Typed Read Data messages receive the data and the sequence numbers are incremented.

This example program includes the following files:

- **lpbkExamplePlc5MsgPollRS500.SLC -** Ladder logic in ASCII format.
- **lpbkExamplePlc5MsgPollRS500.SY5 -** Symbol definitions for RSLogix 500 Version 5.xx.xx.
- **lpbkExamplePlc5MsgPollRS500.SY6 -** Symbol definitions for RSLogix 500 Version 6.xx.xx.

5.4.3.3. lpbkExampleSlcMsgFileRS500 - SLC PLC

This example program demonstrates a loop-back RSLogix 500 PLC program using SLC Typed messages in the *Write-to-File receive* method. This program initializes the produced receive and transmit data sequence numbers at startup and then loops data via a loop-back plug on the serial port. The data is transmitted via SLC Typed Write data messages and received automatically via a write to file message from the DeviceMaster UP. The sequence numbers are incremented with each message.

The following files apply:

- **lpbkExampleSlcMsgFileRS500.SLC** – ladder logic in ASCII form
- **lpbkExampleSlcMsgFileRS500.SY5** – symbol definitions for RSLogix 500 Version 5.xx.xx.
- **lpbkExampleSlcMsgFileRS500.SY6** – symbol definitions for RSLogix 500 Version 6.xx.xx.

5.4.3.4. lpbkExampleSlcMsgFileSyncRS500 - SLC PLC

This example program demonstrates a loop-back RSLogix 500 PLC program using SLC Typed messages in the *Write-to-File-Synced receive* method. This program initializes the produced receive and transmit sequence numbers as well as the consumed receive sequence number at startup and then loops data via a loop-back plug on the serial port. The data is transmitted via SLC Typed Write data messages and received automatically via a write to file message from the DeviceMaster UP. The consumed receive sequence number is updated to match the produced receive sequence number and sent to the DeviceMaster UP to complete the synchronization process. All sequence numbers are incremented with each message.

The following files apply:

- **lpbkExampleSlcMsgFileSyncRS500.SLC** – ladder logic in ASCII form
- **lpbkExampleSlcMsgFileSyncRS500.SY5** – symbol definitions for RSLogix 500 Version 5.xx.xx.
- **lpbkExampleSlcMsgFileSyncRS500.SY6** – symbol definitions for RSLogix 500 Version 6.xx.xx.

5.4.3.5. LPBKEXAMPLESLCMSGFILERS500_MICROLGX - MicroLogix PLC

This example program demonstrates a loop-back RSLogix 500 PLC program using SLC Typed messages in the *Write-to-File receive* method. This program initializes the produced receive and transmit data sequence numbers at startup and then loops data via a loop-back plug on the serial port. The data is transmitted via SLC Typed Write data messages and received automatically via a write to file message from the DeviceMaster UP. The sequence numbers are incremented with each message.

The following file applies: **LPBKEXAMPLESLCMSGFILERS500_MICROLGX.RSS** , a MicroLogix PLC example program.

5.4.3.6. LPBKEXAMPLESLCMSGPOLLRS500_MICROLGX - MicroLogix PLC

This example program demonstrates an RSLogix 500 loopback PLC program using the SLC Typed messages in the *Polling receive* method. This program initializes receive and transmit produced data sequence numbers at startup on the DeviceMaster UP and then loops data through a loopback plug on the serial port. The SLC Typed Write data messages transmit the data, the SLC Typed Read Data messages receive the data and the sequence numbers are incremented.

The following file applies: **LPBKEXAMPLESLCMSGPOLLRS500_MICROLGX.RSS,** a MicroLogix PLC example program.

5.4.4. Configure the DeviceMaster UP for the RSLogix 500 Example Program - SLC PLC

The following procedure configures the DeviceMaster UP for the RSLogix 500 example programs. You must perform this task before you configure and run the RSLogix 500 example program. For more information on the *Server Configuration* web pages, see *Chapter 3. Embedded Configuration Pages* on Page 61.

1. Attach a loopback plug to the serial port.
2. Access the *Server Configuration* web page, using one of these methods.
   - Open PortVision Plus, right-click on the DeviceMaster UP for which you want to program network information and select **Web Manager.**
   - Open a browser and type the IP address for the DeviceMaster UP in the **Address** box.
3. Click **Port *n***. Where ***n*** is the port number.
4. Set the serial port settings under **Serial Configuration** to the following values.

Field	Setting
Mode	RS-232
Baud	57600
Parity	none
Data Bits	8
Stop Bits	1
Flow Control	none
DTR	off
Rx Timeout Between Packets	200

5. Set the serial port settings under **Serial Packet Identification** to these values.

Field	Setting
STX RX Detect	Set to one byte and Byte 1 to 2.
ETX Rx Detect	Set to one byte and Byte 1 to 3.
STX Tx Append	Set to one byte and Byte 1 to 2.
ETX Tx Append	Set to one byte and Byte 1 to 3.
Strip Rx STX/ETX	Select
Discard Rx Packets With Errors	Select
(PLC-5/SLC) Rx MS Byte First	Optionally, select
(PLC-5/SLC) Tx MS Byte First	Optionally, select

6. Set the serial port settings under **Ethernet/IP Settings** to the following values:

Field	Selection
TX Sequence Number Checking	Select.
Rx (To PLC) Ethernet Transfer Method	• Set to **Polling for lpbkExampleSlcMsgPollRS500** and **lpbkExamplePlc5MsgPollRS500**. • Set to Write-to-Tag/File for lpbkExampleSlcMsgFileRS500. • Set to Write-to-Tag/File-Synced for lpbkExampleSlcMsgFileSyncRS500.
PLC IP Address	• Leave blank for Polling. • Set to IP Address of PLC for Write-to-File and Write-to-File-Synced.
PLC Controller Slot Number	Unused and can remain blank.
Rx (To PLC) Produced Data Tag/ File Name	• Leave blank for Polling. • For SLC PLCs, set to **$N10:0** and for MicroLogix PLCs, set to **#N10:0**; the PLC receive filename for *Write-to-File* and *Write-to-File-Synced*.
Reset Port	Select.
Save in Flash	Select.

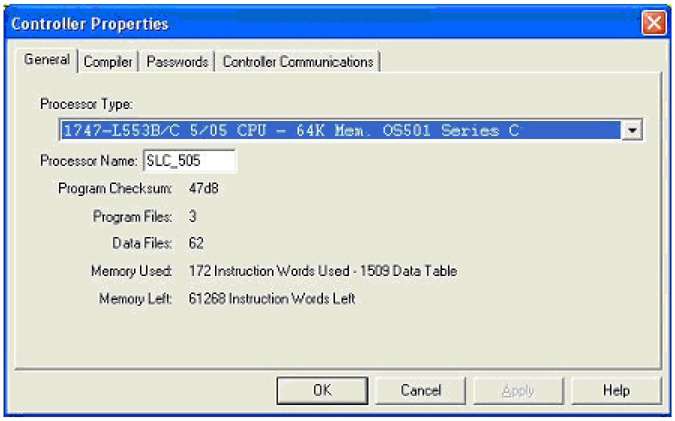
7. Click **Submit**.

5.4.5. Configure and Run the RSLogix 500 Example Program - SLC PLC

You can configure and run the RSLogix 500 example programs through RSLogix 500. For additional information on the RSLogix 500, see *5.4.6. RSLogix 500 Screen Examples - SLC PLC* on Page 111.

Note: *Configure the DeviceMaster UP before you configure and download the RSLogix 500 example program. For instructions on configuring DeviceMaster UP, see 5.4.4. Configure the DeviceMaster UP for the RSLogix 500 Example Program - SLC PLC, earlier in this chapter.*

1. Select the appropriate message type example programs (SLC or PLC-5 typed messages) and copy the files (**.SLC**, **.SY5** and **.SY6**) to the desired directory.
2. Start RSLogix 500 and open the **.SLC** file through RSLogix 500.
3. To modify the PLC program for your system, double-click **Controller Properties**.
4. In the **General** tab, select your SLC processor type under **Processor Type** and provide a **Processor Name**.



Processor Type: 1747-L553B/C 5/05 CPU - 64K Mem. OS501 Series C

Processor Name: SLC_505

Program Checksum: 47d8

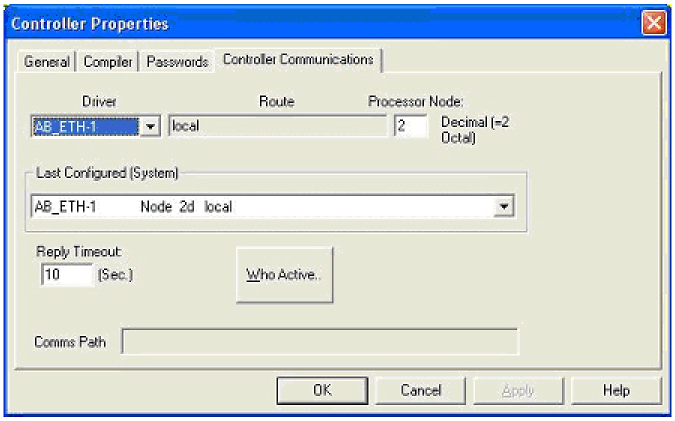
Program Files: 3

Data Files: 62

Memory Used: 172 Instruction Words Used - 1509 Data Table

Memory Left: 61268 Instruction Words Left

5. Select the **Controller Communications** tab and select the following options:
   a. Set **Driver** to the appropriate type to allow RSLogix 500 to communicate with the SLC processor.
   b. Type the processor node number in the **Processor Node** box. (You may reference the **Last Configured (System)** node or select **Who Active**.)



Driver: AB_ETH-1

Route: local

Processor Node: 2 Decimal (=2 Octal)

Last Configured (System): AB_ETH-1 Node 2d local

Reply Timeout: 10 (Sec.)

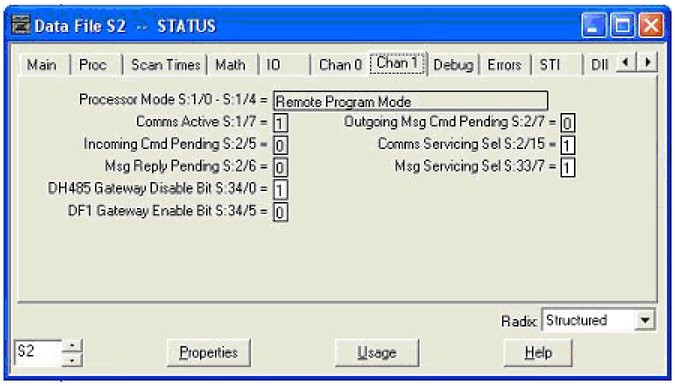
Comms Path:

6. Click **OK** to apply your changes and close the **Controller Properties** dialog.
7. Double-click **Processor Status**, select the **Chan 1** tab on the **Data File S2 -- STATUS** dialog and verify the following:
   a. **DH485 Gateway Disable Bit S:34/0** option is set to **1.**
   b. **DF1 Gateway Enable Bit S:34/5** option is set to **0** (zero).
   c. **Comms Servicing Sel S:2/15** option is set to **1.**
   d. **Msg Servicing Sel S:33/7** option is set to **1.**
8. Close the **Data File S2 -- Status** dialog.
9. Double-click **I/O Configuration** and select your chassis type in the **Racks** panel.
10. Close the **I/O Configuration** dialog.

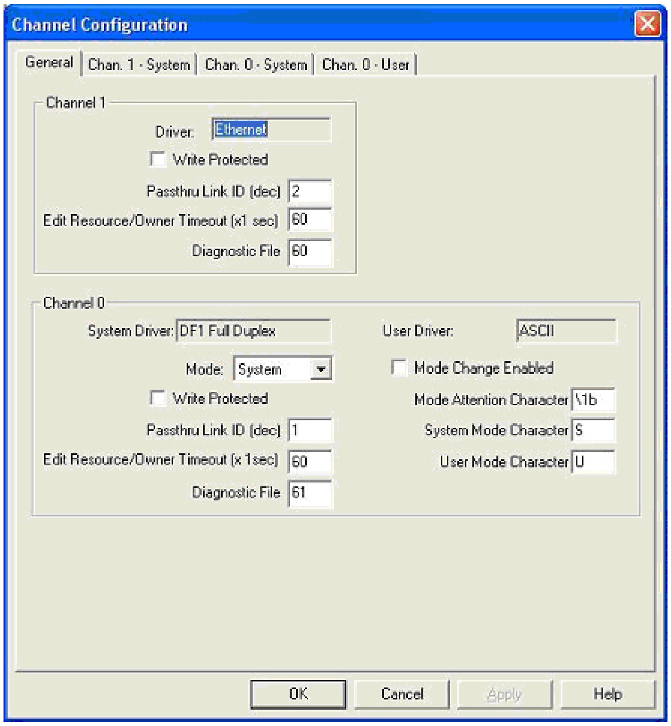
11. Double-click **Channel Configuration**, and select the following in the **General** tab:

    a. In the **Channel 1** panel, type 60 in the **Diagnostic File** box.

    b. In the **Channel 0** panel, type 61 in the **Diagnostic File** box.



Processor Mode S:1/0 - S:1/4 = Remote Program Mode
Comms Active S:1/7 = 1
Incoming Cmd Pending S:2/5 = 0
Msg Reply Pending S:2/6 = 0
DH485 Gateway Disable Bit S:34/0 = 1
DF1 Gateway Enable Bit S:34/5 = 0
Outgoing Msg Cmd Pending S:2/7 = 0
Comms Servicing Sel S:2/15 = 1
Msg Servicing Sel S:33/7 = 1
Radix: Structured
S2



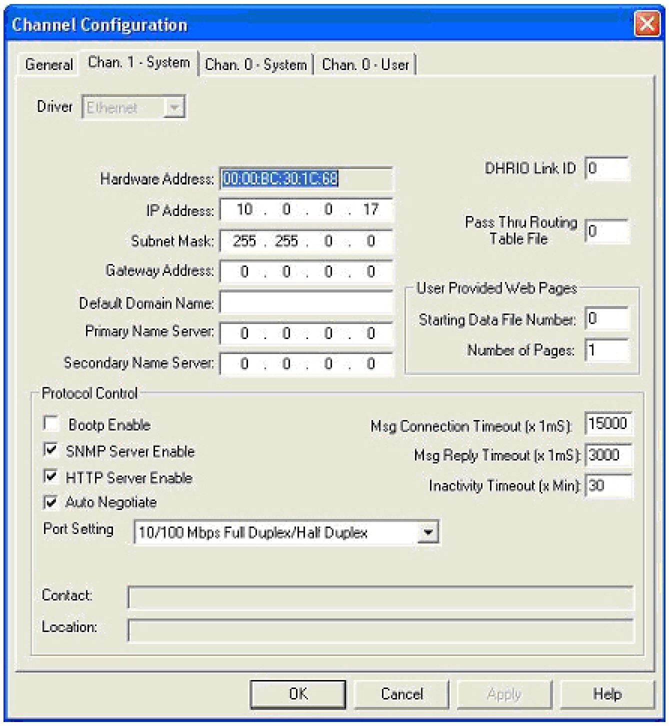
Channel 1
Driver: Ethernet
□ Write Protected
Passthru Link ID (dec) 2
Edit Resource/Owner Timeout (x1 sec) 60
Diagnostic File 60

Channel 0
System Driver: DF1 Full Duplex
Mode: System
□ Write Protected
Passthru Link ID (dec) 1
Edit Resource/Owner Timeout (x 1sec) 60
Diagnostic File 61
User Driver: ASCII
□ Mode Change Enabled
Mode Attention Character \1b
System Mode Character S
User Mode Character U

12. Select the **Chan. 1 System** tab on the **Channel Configuration** dialog and select the following options.
    a. Type the IP address for your PLC in the **IP Address** box if you are not using **Bootp**.
    b. Type the subnet mask for your PLC in the **Subnet Mask** box.
    c. Type the gateway address for your PLC in the **Gateway Address** box.
    d. Select **Bootp Enable** if you are using Bootp to initialize your network settings.
    e. Select **SNMP Server Enable**.
    f. Select **HTTP Server Enable**.
    g. Select **Auto Negotiate** if your network is capable of Ethernet auto-negotiation.

       If you select **Auto Negotiate**, set the **Port Setting** to **10/100 Mbps Full Duplex/Half Duplex**.

       If you do not select **Auto Negotiate**, select the speed and duplex for your network connection.
13. Click **OK** to apply your changes and close the **Channel Configuration** dialog.
14. In the ladder logic, double-click **Setup Screen** in an **MSG** instruction.



Driver: Ethernet

Hardware Address: 00:00:BC:30:1C:68

IP Address: 10 . 0 . 0 . 17

Subnet Mask: 255 . 255 . 0 . 0

Gateway Address: 0 . 0 . 0 . 0

Default Domain Name:

Primary Name Server: 0 . 0 . 0 . 0

Secondary Name Server: 0 . 0 . 0 . 0

DHRIO Link ID: 0

Pass Thru Routing Table File: 0

Starting Data File Number: 0

Number of Pages: 1

□ Bootp Enable

☑ SNMP Server Enable

☑ HTTP Server Enable

☑ Auto Negotiate

Port Setting: 10/100 Mbps Full Duplex/Half Duplex

Msg Connection Timeout (x 1mS): 15000

Msg Reply Timeout (x 1mS): 3000

Inactivity Timeout (x Min): 30

Contact:

Location:

15. Select the **MultiHop** tab and make the following changes.
    a. On the first line, type the IP address for the DeviceMaster UP in the **To Address** box.
    b. If you are using an SLC 5/03 or 5/04 with an EtherNet/IP sidecar, you may need to add additional hops here.
16. Close the **MSG** dialog.
17. Repeat steps 14 through 16 for each **MSG** instruction in the ladder logic.
18. Download the PLC program to your PLC and run the program.

5.4.6. RSLogix 500 Screen Examples - SLC PLC

The following subsections explain how to configure the DeviceMaster UP through RSLogix 500. Use the screens to set up the PLC and program the various messages.

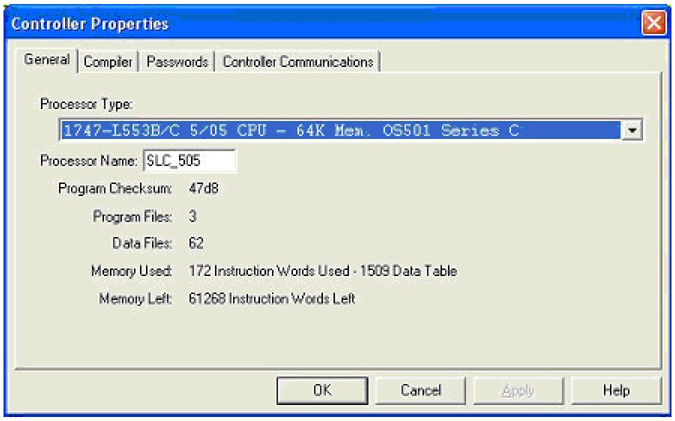
5.4.6.1. Setting up Processor and Ethernet (Channel 1)

You must set up the Processor and Ethernet communication port properly for EtherNet/IP to function. Read the information and follow the procedures provided in the following Rockwell documents:

- SLC 5/03, 5/04 and 5/05 Modular Processors Installation Instructions (publication 1747-IN009D-MU-P)
- SLC 500 Instruction Set (publication 1747-RM001D-EN-P, pages 13-22 through 13-47).

The following screens show the recommended settings that allow EtherNet/IP to function properly on an SLC or MicroLogix PLC.

1. Start **RSLogix 500**.
2. Double-click **Controller Properties** and select the correct processor type from the **General** tab on the **Controller Properties** dialog.



Processor Type: 1747-L553B/C 5/05 CPU - 64K Mem. OS501 Series C

Processor Name: SLC_505

Program Checksum: 47d8

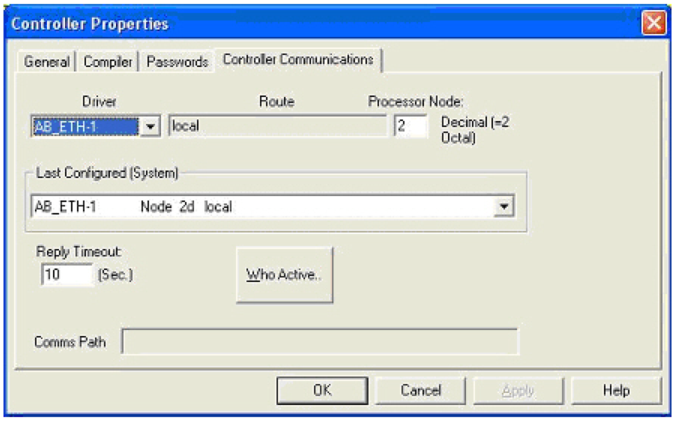
Program Files: 3

Data Files: 62

Memory Used: 172 Instruction Words Used - 1509 Data Table

Memory Left: 61268 Instruction Words Left

3. Select the **Controller Communications** tab and select the proper driver for RSLogix 500.



Driver: AB_ETH-1 Route: local Processor Node: 2 Decimal (=2 Octal)

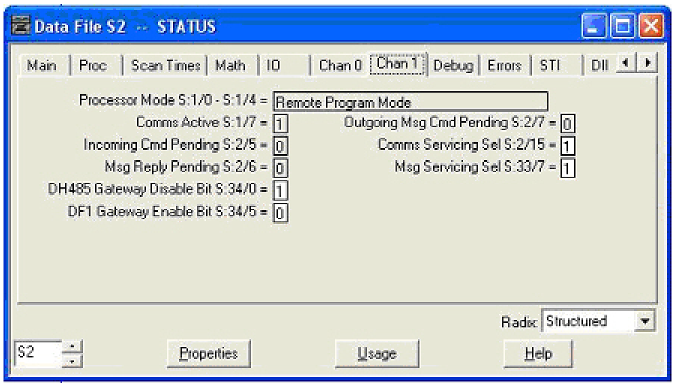
Last Configured (System): AB_ETH-1 Node 2d local

Reply Timeout: 10 (Sec.)

Comms Path:

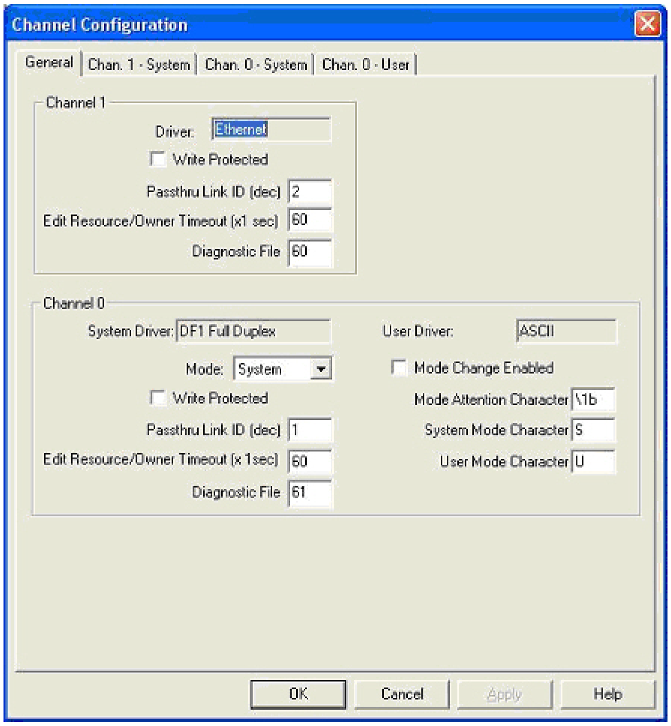
4. Click **OK** to apply your changes and close the **Controller Properties** dialog.

5. Double-click **Processor Status**, and select the **Chan 1** tab on the **Data File S2 -- STATUS** dialog.
6. Make the following recommended changes.
   a. Select the **DH485 Gateway Disable Bit S:34/0** option.
   b. Clear the **DF1 Gateway Enable BIT S:34/5** option.
   c. Select the **Comms Servicing Sel S:2/15** option.
   d. Select the **Msg Servicing Sel S:33/7** option. (You must enable this option if you want to run EtherNet/IP.)


Data File S2 -- STATUS

Processor Mode S:1/0 - S:1/4 = Remote Program Mode
Comms Active S:1/7 = 1
Incoming Cmd Pending S:2/5 = 0
Msg Reply Pending S:2/6 = 0
DH485 Gateway Disable Bit S:34/0 = 1
DF1 Gateway Enable Bit S:34/5 = 0
Outgoing Msg Cmd Pending S:2/7 = 0
Comms Servicing Sel S:2/15 = 1
Msg Servicing Sel S:33/7 = 1
Radix: Structured
S2

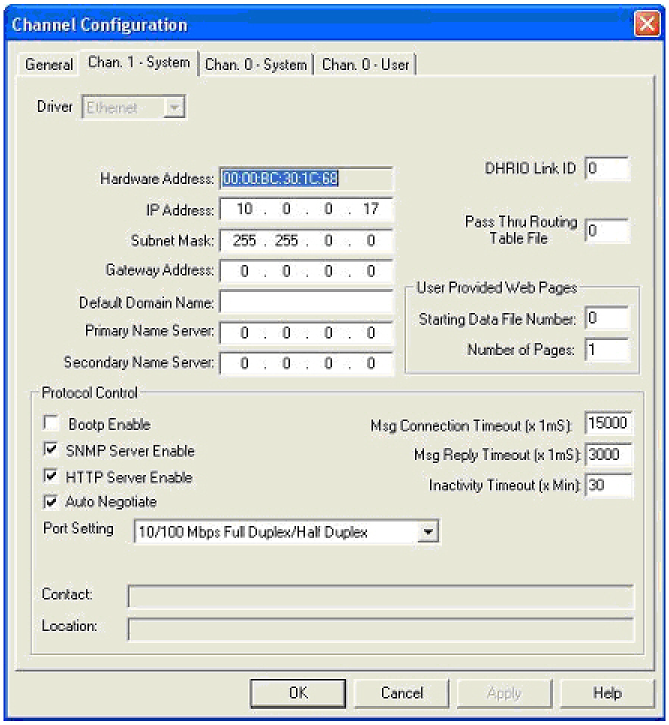
7. Optionally, double-click **Channel Configuration** and type a value (between 0 and 256) in the **Diagnostic File** box for an integer diagnostic file. You can use the diagnostic file to help solve any network-related problems.


Channel Configuration

Channel 1
Driver: Ethernet
□ Write Protected
Passthru Link ID (dec) 2
Edit Resource/Owner Timeout (x1 sec) 60
Diagnostic File 60

Channel 0
System Driver: DF1 Full Duplex
Mode: System
□ Write Protected
Passthru Link ID (dec) 1
Edit Resource/Owner Timeout (x 1sec) 60
Diagnostic File 61
User Driver: ASCII
□ Mode Change Enabled
Mode Attention Character \1b
System Mode Character S
User Mode Character U

8. Select the **Chan. 1 System** tab on the **Channel Configuration** dialog.
9. Make the following recommended changes.
   a. Select the **SNMP server Enable** option. (EtherNet/IP may not function without this setting.)
   b. Select the **HTTP Server Enable** option. (EtherNet/IP may not function without this setting.)
   c. To automatically select the proper Ethernet speed and duplex settings:
      - Select the **Auto Negotiate** option.
      - Select the **10/100 Mbps Full Duplex/Half Duplex** option.
10. Click **OK** to apply your changes and close the **Channel Configuration** dialog.



Driver: Ethernet

Hardware Address: 00:00:BC:30:1C:68
IP Address: 10 . 0 . 0 . 17
Subnet Mask: 255 . 255 . 0 . 0
Gateway Address: 0 . 0 . 0 . 0
Default Domain Name:
Primary Name Server: 0 . 0 . 0 . 0
Secondary Name Server: 0 . 0 . 0 . 0

DHRIO Link ID: 0
Pass Thru Routing Table File: 0

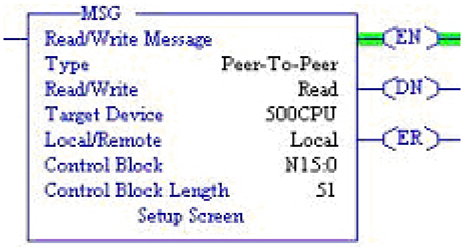
User Provided Web Pages
Starting Data File Number: 0
Number of Pages: 1

Protocol Control
□ Bootp Enable
☑ SNMP Server Enable
☑ HTTP Server Enable
☑ Auto Negotiate
Port Setting: 10/100 Mbps Full Duplex/Half Duplex
Msg Connection Timeout (x 1mS): 15000
Msg Reply Timeout (x 1mS): 3000
Inactivity Timeout (x Min): 30

Contact:
Location:

5.4.6.2. SLC Typed Read - Receive Data Message - SLC PLC

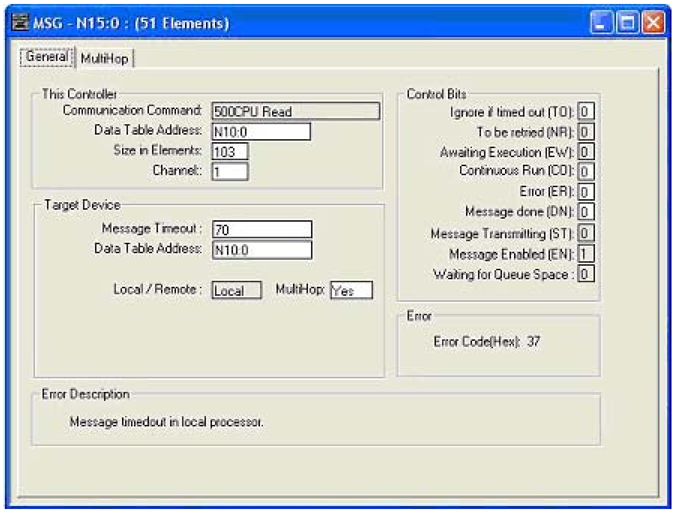
The following screen depicts an *SLC Typed Read - Receive Data* message in ladder logic.



MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Read
Target Device 500CPU
Local/Remote Local
Control Block N15:0
Control Block Length 51
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Read** option.
2. Select the **500CPU** option.
3. Select **Local**.
4. Assign a dedicated integer file of 51 integers to the **Control** block.



MSG - N15:0 : (51 Elements)

This Controller
Communication Command: 500CPU Read
Data Table Address: N10:0
Size in Elements: 103
Channel: 1

Target Device
Message Timeout : 70
Data Table Address: N10:0
Local / Remote : Local MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 1
Waiting for Queue Space : 0

Error
Error Code(Hex): 37

Error Description
Message timedout in local processor.

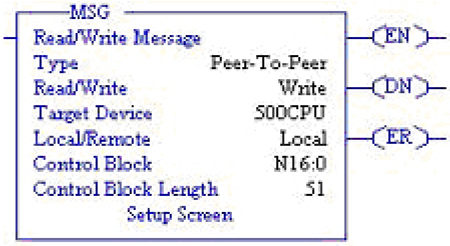
5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
6. Make the following changes:
    a. Specify the file address to receive data information in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
    b. Specify a size in the **Size of Elements** box that is large enough to receive the entire data message including the sequence number and length fields.
    c. Set the **Channel** parameter to **1** to use the Ethernet port.
    d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.
    e. Specify the port-specific read file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
    f. Set the **MultiHop** option to **Yes**.

5.4.6.3. SLC Typed Write - Transmit Data Message - SLC PLC

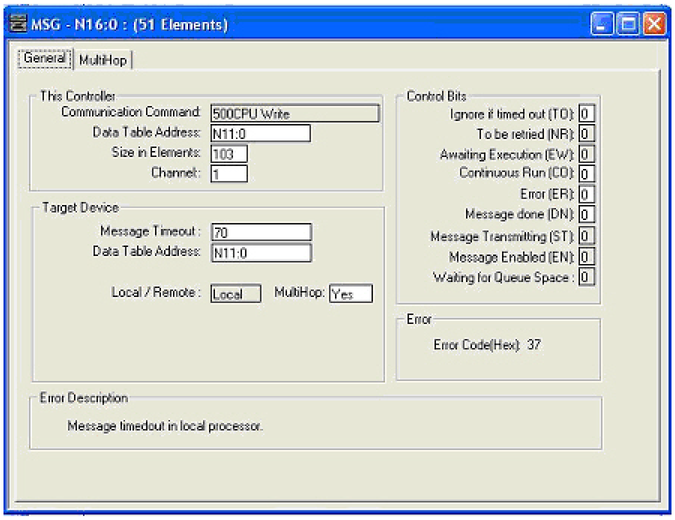
The following screen depicts an *SLC Typed Write - Transmit Data* message in ladder logic.

Make the following changes to the ladder logic.

1. Select the **Write** option.
2. Select the **500CPU** option.
3. Select **Local**.
4. Assign a dedicated integer file of 51 integers to the **Control** block.


MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Write
Target Device 500CPU
Local/Remote Local
Control Block N16:0
Control Block Length 51
Setup Screen

5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
6. Make the following changes:
   a. Specify the file address to transmit data information in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Specify a size in the **Size of Elements** box that is large enough to send the entire data message including the sequence number and length fields.
   c. Set the **Channel** parameter to **1** to use the Ethernet port.
   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.


MSG - N16:0 : (51 Elements)

This Controller
Communication Command: 500CPU Write
Data Table Address: N11:0
Size in Elements: 103
Channel: 1

Target Device
Message Timeout : 70
Data Table Address: N11:0
Local / Remote : Local MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0
Waiting for Queue Space : 0

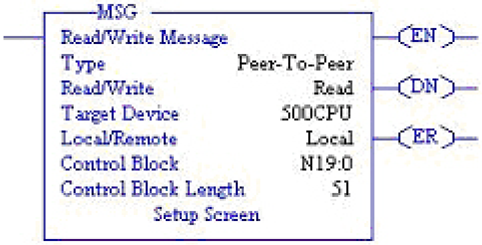
Error
Error Code(Hex): 37

Error Description
Message timedout in local processor.

   e. Specify the port-specific transmit file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   f. Set the **MultiHop** option to **Yes.**

5.4.6.4. SLC Typed Read - Retrieve Statistics Message - SLC PLC

The following screen depicts an *SLC Typed Read - Retrieve Statistics* message in ladder logic.


MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Read
Target Device 500CPU
Local/Remote Local
Control Block N19:0
Control Block Length 51
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Read** option.
2. Select the **500CPU** option.
3. Select **Local**.
4. Assign a dedicated integer file of 51 integers to the **Control** block.
5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
6. Make the following changes:

   a. Specify the file address to receive statistics data information in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.

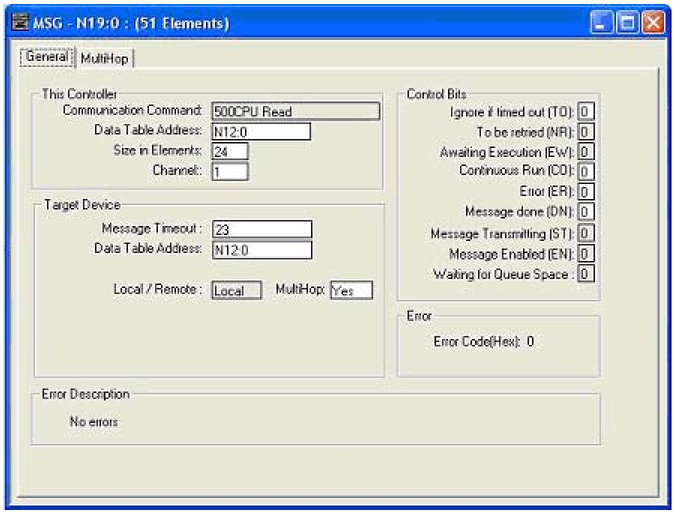
   b. Type **24** (twelve 32-bit integers) in the **Size of Elements** box.

   c. Set the **Channel** parameter to **1** to use the Ethernet port.

   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.

   e. Specify the port-specific statistics file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.

   f. Set the **MultiHop** option to **Yes**.


MSG - N19:0 : (51 Elements)

This Controller
Communication Command: 500CPU Read
Data Table Address: N12:0
Size in Elements: 24
Channel: 1

Target Device
Message Timeout : 23
Data Table Address: N12:0
Local / Remote : Local
MultiHop: Yes

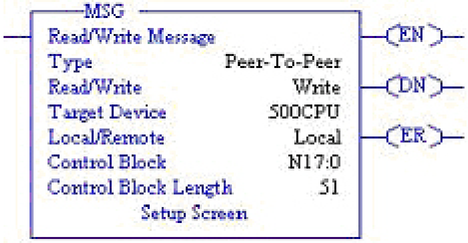
Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0
Waiting for Queue Space : 0

Error
Error Code(Hex): 0

Error Description
No errors

5.4.6.5. SLC Typed Write - Set Receive Produced Sequence Number Message - SLC PLC

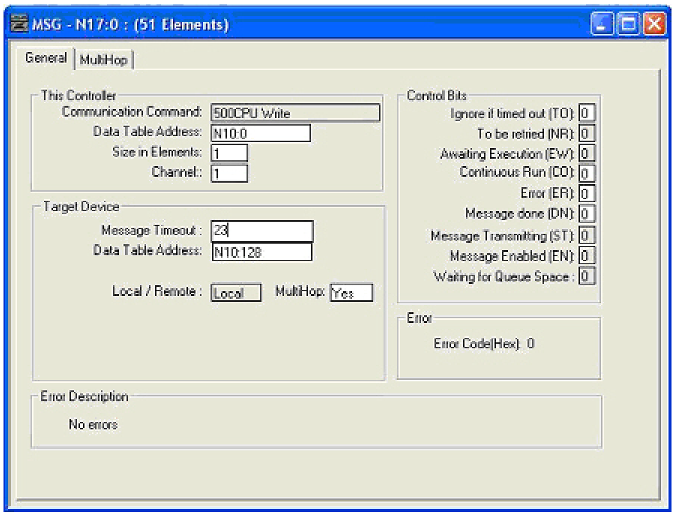
The following screen depicts an *SLC Typed Write - Set Receive Produced Sequence Number* message in ladder logic.



Read/Write Message
Type Peer-To-Peer
Read/Write Write
Target Device 500CPU
Local/Remote Local
Control Block N17:0
Control Block Length 51
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Write** option.
2. Select the **500CPU** option.
3. Select **Local**.
4. Assign a dedicated integer file of 51 integers to the **Control** block.
5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
6. Make the following changes.
   a. Specify the file address where the receive sequence number resides in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.
   b. Type **1** in the **Size of Elements** box.
   c. Set the **Channel** parameter to **1** to use the Ethernet port.
   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.
   e. Specify the port-specific receive sequence file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.
   f. Set the **MultiHop** option to **Yes**.



This Controller
Communication Command: 500CPU Write
Data Table Address: N10:0
Size in Elements: 1
Channel:: 1

Target Device
Message Timeout : 23
Data Table Address: N10:128
Local / Remote : Local
MultiHop: Yes

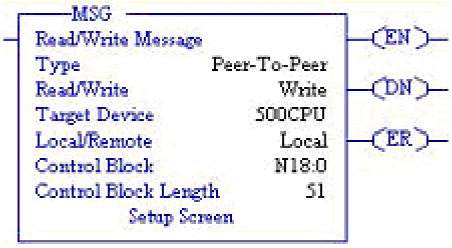
Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0
Waiting for Queue Space : 0

Error
Error Code(Hex): 0

Error Description
No errors

5.4.6.6. SLC Typed Write - Set Transmit Produced Sequence Number Message - SLC PLC

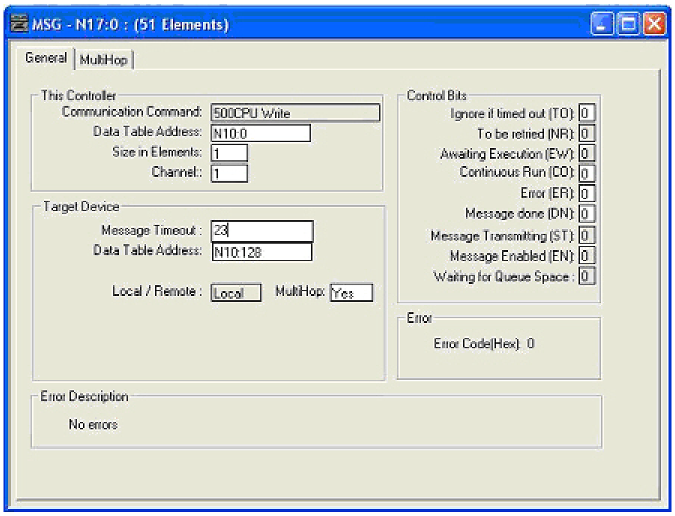
The following screen depicts an *SLC Typed Write - Set Transmit Produced Sequence Number* message in ladder logic.



MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Write
Target Device 500CPU
Local/Remote Local
Control Block N18:0
Control Block Length 51
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Write** option.
2. Select the **500CPU** option.
3. Select **Local**.
4. Assign a dedicated integer file of 51 integers to the **Control** block.
5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
6. Make the following changes:
   a. Specify the file address where the transmit sequence number resides in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Type **1** in the **Size of Elements** box.
   c. Set the **Channel** parameter to **1** to use the Ethernet port.
   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.
   e. Specify the port-specific transmit sequence number file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   f. Set the **MultiHop** option to **Yes**.



MSG - N17:0 : (51 Elements)

This Controller
Communication Command: 500CPU Write
Data Table Address: N10:0
Size in Elements: 1
Channel: 1

Target Device
Message Timeout : 23
Data Table Address: N10:128
Local / Remote : Local
MultiHop: Yes

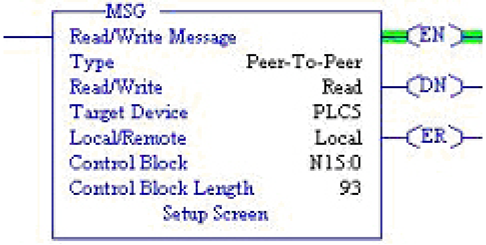
Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0
Waiting for Queue Space : 0

Error
Error Code(Hex): 0

Error Description
No errors

5.4.6.7. PLC-5 Typed Read - Receive Data Message - SLC PLC

The following screen depicts a *PLC-5 Typed Read - Receive Data* message in ladder logic.

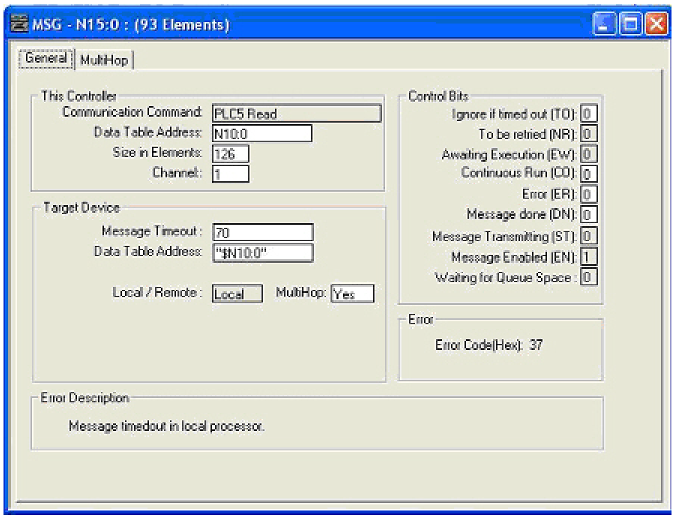


MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Read
Target Device PLC5
Local/Remote Local
Control Block N15:0
Control Block Length 93
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Read** option.
2. Select the **PLC5** option.
3. Select **Local**.
4. Assign a dedicated integer file of 93 integers to the **Control** block.

In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.



MSG - N15:0 : (93 Elements)

This Controller
Communication Command: PLC5 Read
Data Table Address: N10:0
Size in Elements: 126
Channel: 1

Target Device
Message Timeout : 70
Data Table Address: "$N10:0"
Local / Remote : Local MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 1
Waiting for Queue Space : 0

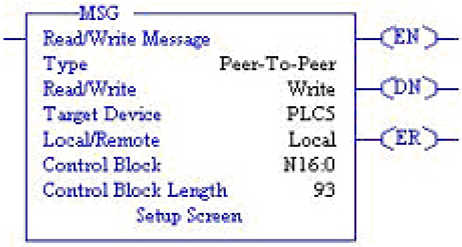
Error
Error Code(Hex): 37

Error Description
Message timedout in local processor.

5. Make the following changes.
   a. Specify the file address to receive data information in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Specify a size in the **Size of Elements** box that is large enough to receive the entire data message including the sequence number and length fields.
   c. Set the **Channel** parameter to **1** to use the Ethernet port.
   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.
   e. Specify the port-specific receive file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The receive file address must be specified in logical ASCII format. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   f. Set the **MultiHop** option to **Yes.**

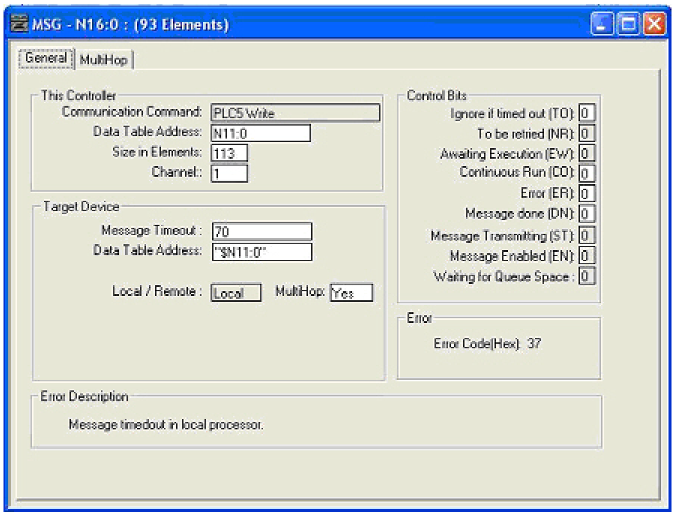
5.4.6.8. PLC-5 Typed Write - Transmit Data Message - SLC PLC

The following screen depicts a PLC-5 Typed Write - Transmit Data message in ladder logic.


MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Write
Target Device PLC5
Local/Remote Local
Control Block N16:0
Control Block Length 93
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Write** option.
2. Select the **PLC5** option.
3. Select **Local**.
4. Assign a dedicated integer file of 93 integers to the **Control** block.
5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.


MSG - N16:0 : (93 Elements)

This Controller
Communication Command: PLC5 Write
Data Table Address: N11:0
Size in Elements: 113
Channel:: 1

Target Device
Message Timeout : 70
Data Table Address: "$N11:0"
Local / Remote : Local MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0
Waiting for Queue Space : 0

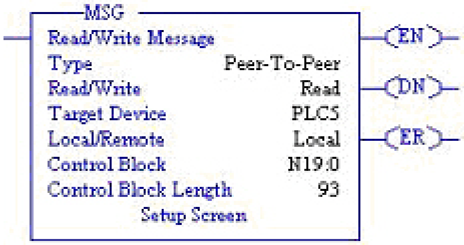
Error
Error Code(Hex): 37

Error Description
Message timedout in local processor.

6. Make the following changes:
   a. Specify the file address to transmit data information in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.
   b. Specify a size in the **Size of Elements** box that is large enough to send the entire data message including the sequence number and length fields.
   c. Set the **Channel** parameter to **1** to use the Ethernet port.
   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.
   e. Specify the port-specific transmit file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The transmit file address must be specified in logical ASCII format. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.
   f. Set the **MultiHop** option to **Yes**.

5.4.6.9. PLC-5 Typed Read - Retrieve Statistics Message - SLC PLC

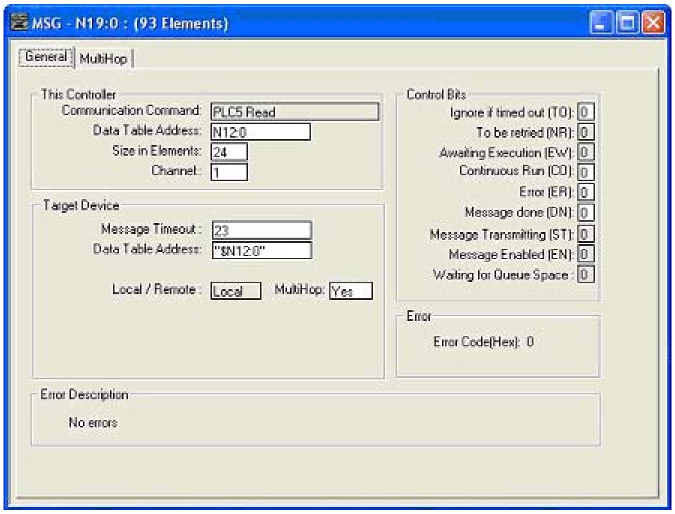
The following screen depicts an *PLC-5 Typed Read - Retrieve Statistics* message in ladder logic.



MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Read
Target Device PLC5
Local/Remote Local
Control Block N19:0
Control Block Length 93
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Read** option.
2. Select the **PLC5** option.
3. Select **Local**.
4. Assign a dedicated integer file of 93 integers to the **Control** block.
5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.



MSG - N19:0 : (93 Elements)

This Controller
Communication Command: PLC5 Read
Data Table Address: N12:0
Size in Elements: 24
Channel: 1

Target Device
Message Timeout : 23
Data Table Address: "$N12:0"
Local / Remote : Local MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0
Waiting for Queue Space : 0

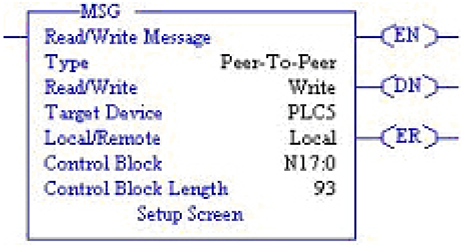
Error
Error Code(Hex): 0

Error Description
No errors

6. Make the following changes:
   a. Specify the file address to receive statistics data information in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Type **24** (twelve 32-bit integers) in the **Size of Elements** box.
   c. Set the **Channel** parameter to **1** to use the Ethernet port.
   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.
   e. Specify the port-specific statistics file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The statistics file address must be specified in logical ASCII format. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   f. Set the **MultiHop** option to **Yes.**

5.4.6.10. PLC-5 Typed Write - Set Receive Produced Sequence Number Message - SLC PLC

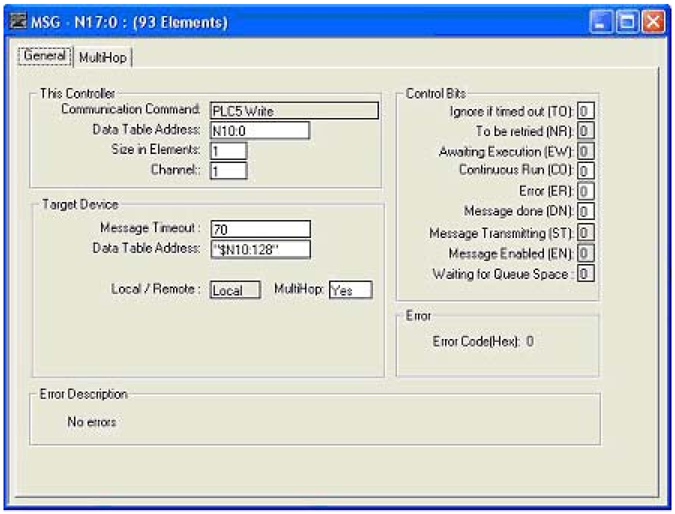
The following screen depicts an *PLC-5 Typed Write - Set Receive Produced Sequence Number* message in ladder logic.



MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Write
Target Device PLC5
Local/Remote Local
Control Block N17:0
Control Block Length 93
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Write** option.
2. Select the **PLC5** option.
3. Select **Local**.
4. Assign a dedicated integer file of 93 integers to the **Control** block.
5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.



MSG - N17:0 : (93 Elements)

This Controller
Communication Command: PLC5 Write
Data Table Address: N10:0
Size in Elements: 1
Channel:: 1

Target Device
Message Timeout : 70
Data Table Address: "$N10:128"
Local / Remote : Local MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0
Waiting for Queue Space : 0

Error
Error Code(Hex): 0

Error Description
No errors

6. Make the following changes.

   a. Specify the file address where the receive sequence number resides in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.

   b. Type **1** in the **Size of Elements** box.

   c. Set the **Channel** parameter to **1** to use the Ethernet port.

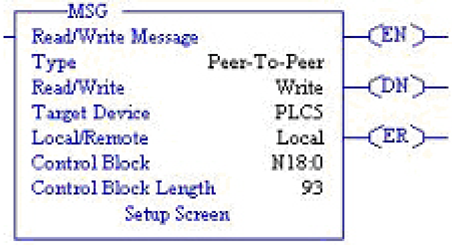
   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.

   e. Specify the port-specific receive sequence file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel.
   The receive sequence file address must be specified in logical ASCII format. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.

   f. Set the **MultiHop** option to **Yes**.

5.4.6.11. PLC-5 Typed Write - Set Transmit Produced Sequence Number Message - SLC PLC

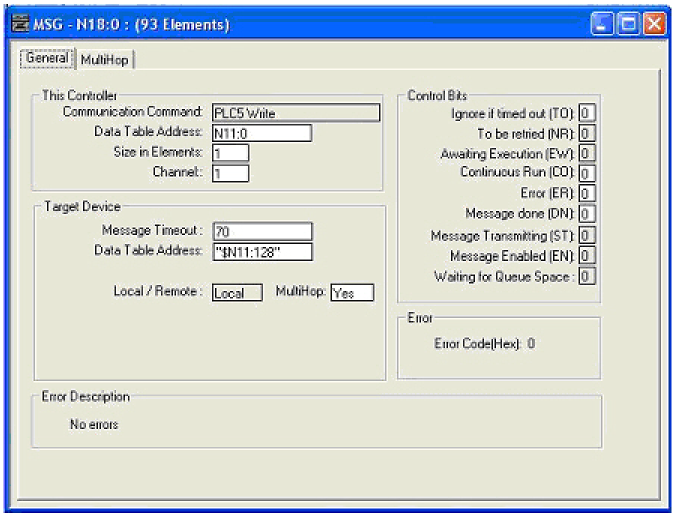
The following screen depicts an *PLC-5 Typed Write - Set Transmit Produced Sequence Number* message in ladder logic.



MSG
Read/Write Message
Type Peer-To-Peer
Read/Write Write
Target Device PLC5
Local/Remote Local
Control Block N18:0
Control Block Length 93
Setup Screen

Make the following changes to the ladder logic.

1. Select the **Write** option.
2. Select the **PLC5** option.
3. Select **Local**.
4. Assign a dedicated integer file of 93 integers to the **Control** block.
5. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
6. Make the following changes.
   a. Specify the file address where the transmit sequence number resides in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Type **1** in the **Size of Elements** box.
   c. Set the **Channel** parameter to **1** to use the Ethernet port.
   d. Note that the **Message Timeout** parameter is not actually configurable. RSLogix 500 will set the value in this box based on the Ethernet timeout settings.
   e. Specify the port-specific transmit sequence number file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The transmit sequence number file address must be specified in logical ASCII format. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   f. Set the **MultiHop** option to **Yes.**



MSG - N18:0 : (93 Elements)

General | MultiHop

This Controller
Communication Command: PLC5 Write
Data Table Address: N11:0
Size in Elements: 1
Channel: 1

Target Device
Message Timeout : 70
Data Table Address: "$N11:128"
Local / Remote : Local MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0
Waiting for Queue Space : 0

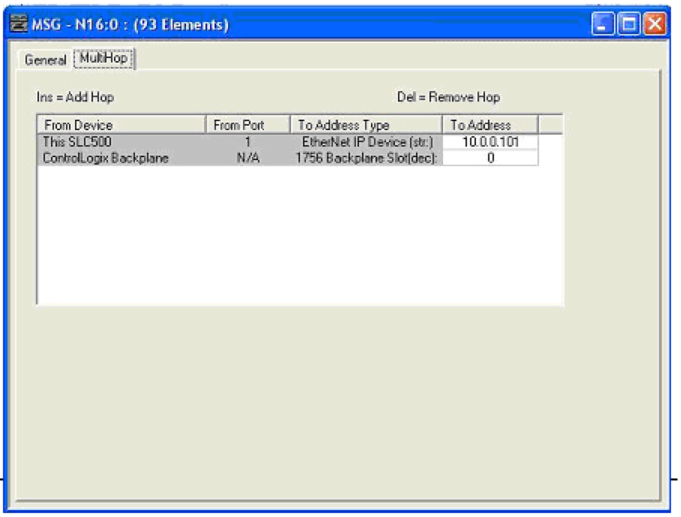
Error
Error Code(Hex): 0

Error Description
No errors

5.4.6.12. MultiHop Screen

1. Select the **MultiHop** tab on the **MSG** dialog.
2. Make the following changes.
   a. Type the IP address for the DeviceMaster UP (the designated EtherNet/IP Device) in the **To Address** box.
   b. Type **0** (zero) in the **To Address** box for the ControlLogix Backplane.

Note: *If you are using an SLC 5/03 or SLC 5/04 with an EtherNet/IP sidecar, you may need to add Hops to route the message on your PLC.*



MSG - N16:0 : (93 Elements)

General | MultiHop

Ins = Add Hop Del = Remove Hop

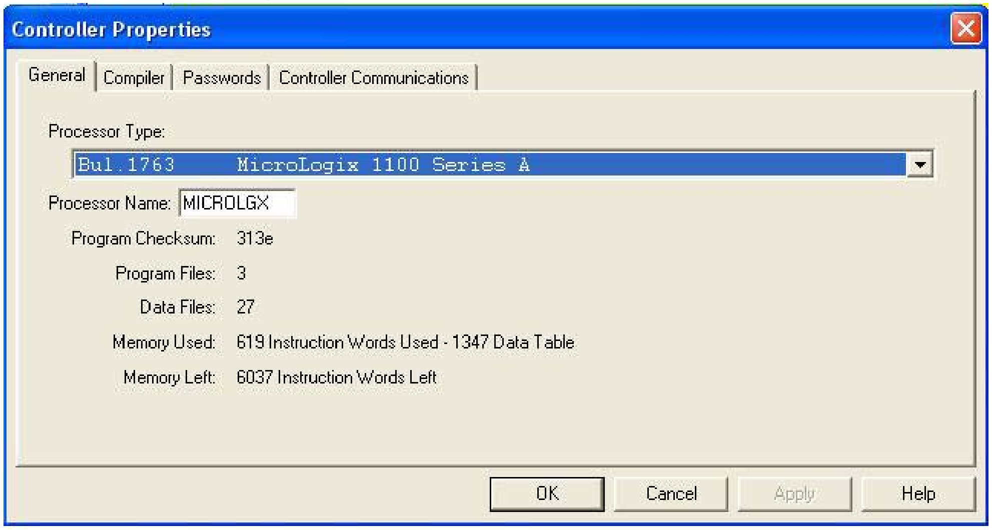
From Device	From Port	To Address Type	To Address
This SLC500	1	EtherNet IP Device (str.)	10.0.0.101
ControlLogix Backplane	N/A	1756 Backplane Slot(dec):	0

5.4.7. Configuring and Running the MicroLogix RSLogix 500 Example Program

1. Select the appropriate message type example programs (_MICROLGX) and copy the files (**.RSS**) to the desired directory.
2. Start RSLogix 500 and open the **.RSS** file through RSLogix 500.

3. To modify the PLC program for your system, double-click **Controller Properties**.

In the **General** tab, select your MicroLogix processor type under **Processor Type** and provide a **Processor Name.**



Controller Properties

Processor Type: Bul.1763 MicroLogix 1100 Series A

Processor Name: MICROLGX

Program Checksum: 313e

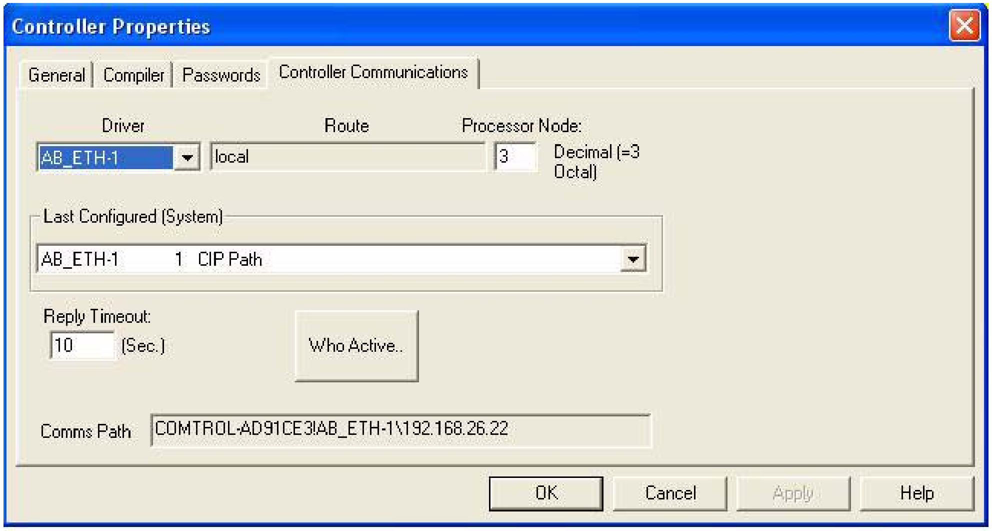
Program Files: 3

Data Files: 27

Memory Used: 619 Instruction Words Used - 1347 Data Table

Memory Left: 6037 Instruction Words Left

4. Select the **Controller Communications** tab and select the following options:
   a. Set **Driver** to the appropriate type to allow RSLogix 500 to communicate with the MicroLogix processor.
   b. Type the processor node number in the **Processor Node** box. (You may reference the **Last Configured (System)** node or select **Who Active.**).
5. Click **OK** to apply your changes and close the **Controller Properties** dialog.



Controller Properties

Driver: AB_ETH-1

Route: local

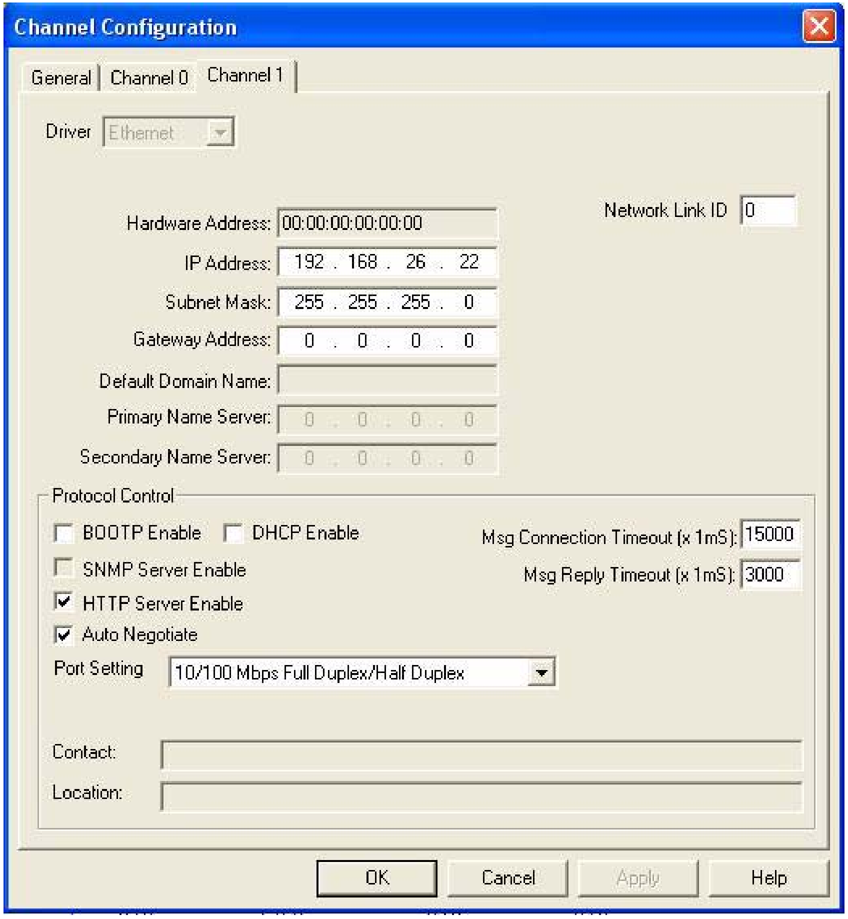
Processor Node: 3 Decimal (=3 Octal)

Last Configured (System): AB_ETH-1 1 CIP Path

Reply Timeout: 10 (Sec.)

Comms Path: COMTROL-AD91CE3!AB_ETH-1\192.168.26.22

6. Double-click **Processor Status**, select the **Chan. 1 System** tab on the **Channel Configuration** dialog and select the following options.
   a. Type the IP address for your PLC in the **IP Address** box if you are not using **Bootp.**
   b. Type the subnet mask for your PLC in the **Subnet Mask** box.
   c. Type the gateway address for your PLC in the **Gateway Address** box.
   d. Select **Bootp Enable** if you are using Bootp to initialize your network settings.
   e. Select **HTTP Server Enable.**
   f. Select **Auto Negotiate** if your network is capable of Ethernet auto-negotiation. If you select **Auto Negotiate**, set the **Port Setting** to **10/100 Mbps Full Duplex/Half Duplex.** If you do not select **Auto Negotiate**, select the speed and duplex for your network connection.
   g. Click **OK** to apply your changes and close the **Channel Configuration** dialog.
7. In the ladder logic, double-click **Setup Screen** in an **MSG** instruction.
8. Select the **MultiHop** tab and make the following changes.
9. On the first line, type the IP address for the DeviceMaster UP in the **To Address** box.
10. Close the **MSG** dialog.
11. Repeat steps 14 through 17 for each **MSG** instruction in the ladder logic.
12. Download the PLC program to your PLC and run the program.



Driver: Ethernet

Hardware Address: 00:00:00:00:00:00

IP Address: 192 . 168 . 26 . 22

Subnet Mask: 255 . 255 . 255 . 0

Gateway Address: 0 . 0 . 0 . 0

Default Domain Name:

Primary Name Server: 0 . 0 . 0 . 0

Secondary Name Server: 0 . 0 . 0 . 0

Network Link ID: 0

□ BOOTP Enable □ DHCP Enable

□ SNMP Server Enable

☑ HTTP Server Enable

☑ Auto Negotiate

Port Setting: 10/100 Mbps Full Duplex/Half Duplex

Msg Connection Timeout (x 1mS): 15000

Msg Reply Timeout (x 1mS): 3000

Contact:

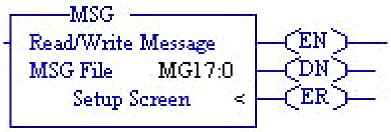
Location:

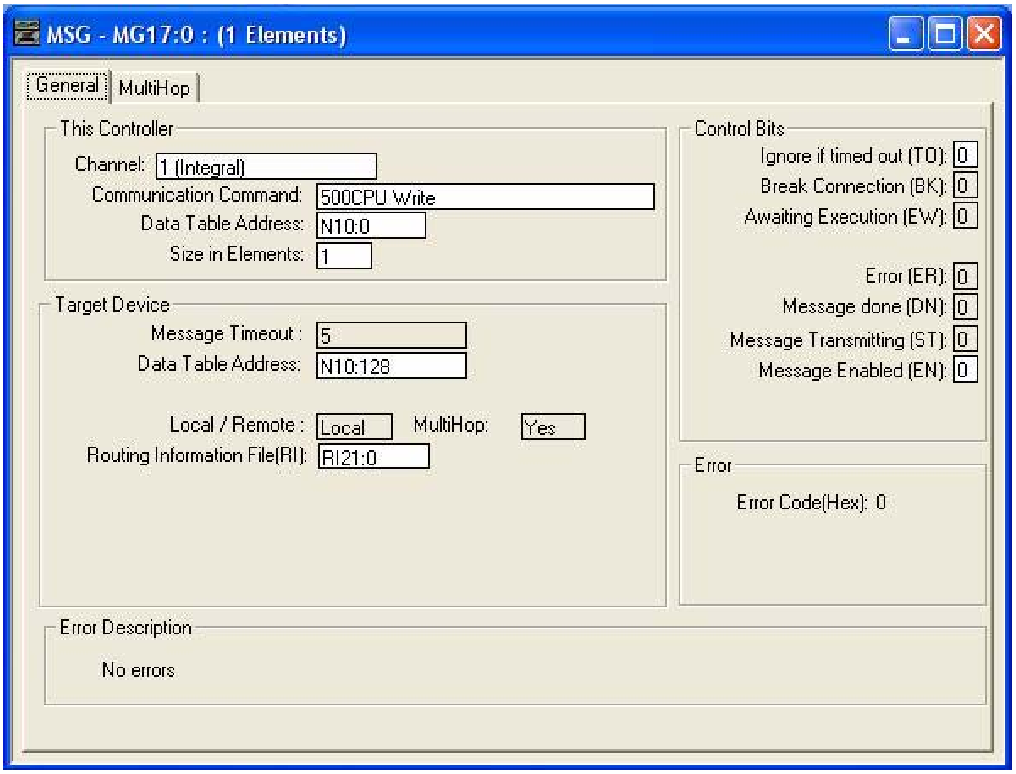
5.4.7.1. Receive Sequence Number Init Message

The following screen depicts a *SLC Typed Read - Receive Sequence Number Init* message in ladder logic. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.

Make the following changes:

1. Set the **Channel** parameter to **1** to use the Ethernet port.
2. Specify the file address where the transmit sequence number resides in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
3. Type **1** in the **Size of Elements** box.
4. Specify the port-specific transmit sequence number file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
5. Set the **Routing Information File (RI)** to that of your PLC program.
6. Select the **MultiHop** pane. On the first line, type the IP address for the DeviceMaster UP in the **To Address** box.





MSG - MG17:0 : (1 Elements)

General | MultiHop

This Controller

Channel: 1 (Integral)

Communication Command: 500CPU Write

Data Table Address: N10:0

Size in Elements: 1

Target Device

Message Timeout : 5

Data Table Address: N10:128

Local / Remote : Local MultiHop: Yes

Routing Information File(RI): RI21:0

Control Bits

Ignore if timed out (TO): 0

Break Connection (BK): 0

Awaiting Execution (EW): 0

Error (ER): 0

Message done (DN): 0

Message Transmitting (ST): 0

Message Enabled (EN): 0

Error

Error Code(Hex): 0

Error Description

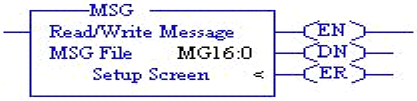
No errors

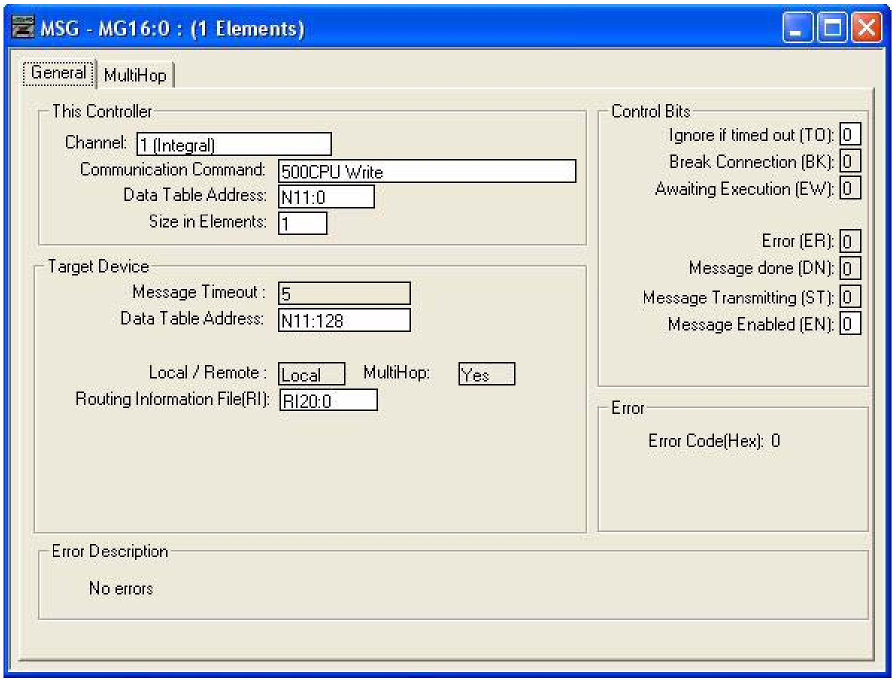
5.4.7.2. Transmit Sequence Number Init Message

The following screen depicts a *SLC Typed Read - Transmit Sequence Number Init* message in ladder logic. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.

Make the following changes:

1. Set the **Channel** parameter to **1** to use the Ethernet port.
2. Specify the file address where the transmit sequence number resides in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
3. Type **1** in the **Size of Elements** box.
4. Specify the port-specific transmit sequence number file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
5. Set the **Routing Information File (RI)** to that of your PLC program.
6. Select the **MultiHop** pane. On the first line, type the IP address for the DeviceMaster UP in the **To Address** box.





This Controller

Channel: 1 (Integral)
Communication Command: 500CPU Write
Data Table Address: N11:0
Size in Elements: 1

Target Device

Message Timeout : 5
Data Table Address: N11:128
Local / Remote : Local MultiHop: Yes
Routing Information File(RI): RI20:0

Control Bits

Ignore if timed out (TO): 0
Break Connection (BK): 0
Awaiting Execution (EW): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

Error

Error Code(Hex): 0

Error Description

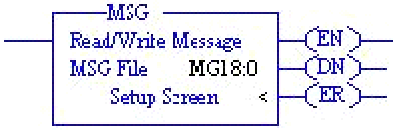
No errors

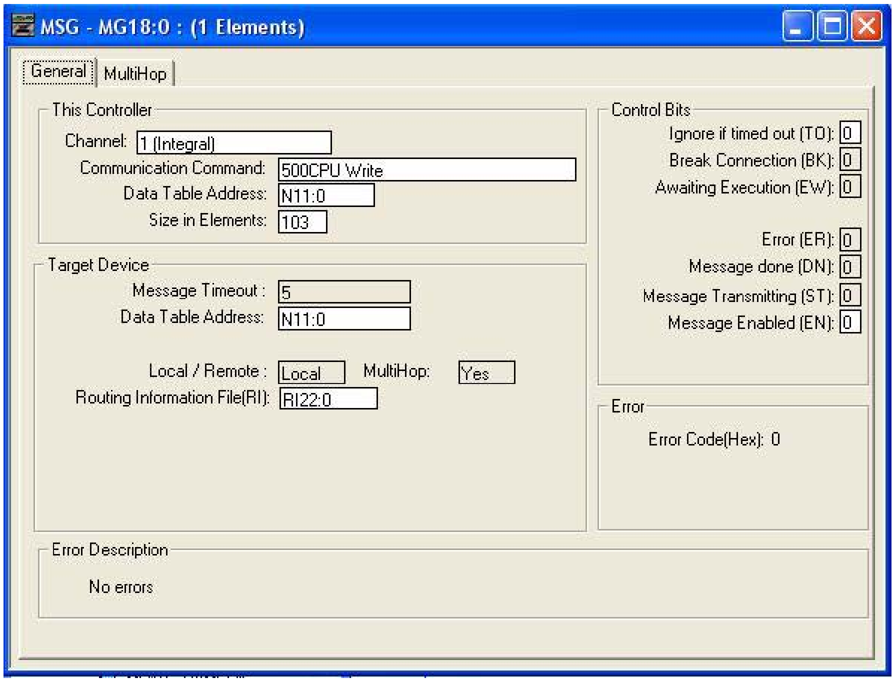
5.4.7.3. Transmit Data Message

The following screen depicts an *SLC Typed Write - Transmit Data* message in ladder logic. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.

Make the following changes:

1. Set the **Channel** parameter to **1** to use the Ethernet port.
2. Specify the file address where the transmit sequence number resides in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
3. Type **103** in the **Size of Elements** box to transmit receive the maximum data size for this type of message. This size must be large enough to include the sequence number (one integer), length (one integer), and enough integers to transmit all of your data.
4. Specify the port-specific transmit sequence number file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
5. Set the **Routing Information File (RI)** to that of your PLC program.
6. Select the **MultiHop** pane. On the first line, type the IP address for the DeviceMaster UP in the **To Address** box.





MSG - MG18:0 : (1 Elements)

This Controller

Channel: 1 (Integral)

Communication Command: 500CPU Write

Data Table Address: N11:0

Size in Elements: 103

Target Device

Message Timeout : 5

Data Table Address: N11:0

Local / Remote : Local MultiHop: Yes

Routing Information File(RI): RI22:0

Control Bits

Ignore if timed out (TO): 0

Break Connection (BK): 0

Awaiting Execution (EW): 0

Error (ER): 0

Message done (DN): 0

Message Transmitting (ST): 0

Message Enabled (EN): 0

Error

Error Code(Hex): 0

Error Description

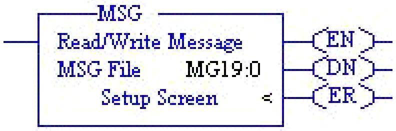
No errors

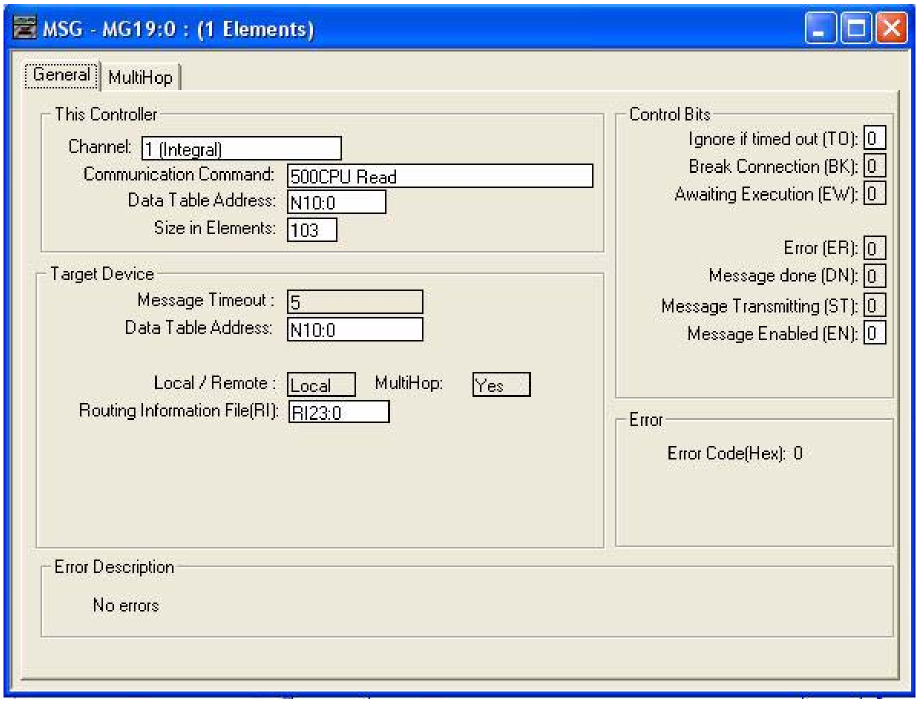
5.4.7.4. Receive Data Message

The following screen depicts an *SLC Typed Read - Receive Data* message in ladder logic. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.

Make the following changes:

1. Set the **Channel** parameter to **1** to use the Ethernet port.
2. Specify the file address where the transmit sequence number resides in the **Data Table Address** box on **This Controller** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
3. Type **103** in the **Size of Elements** box to receive the maximum sized data size for this type of message. This size must be large enough to include the sequence number (one integer), length (one integer), and enough integers to receive all of your data.
4. Specify the port-specific transmit sequence number file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
5. Set the **Routing Information File (RI)** to that of your PLC program.
6. Select the **MultiHop** pane. On the first line, type the IP address for the DeviceMaster UP in the **To Address** box.




MSG - MG19:0 : (1 Elements)

This Controller

Channel: 1 (Integral)
Communication Command: 500CPU Read
Data Table Address: N10:0
Size in Elements: 103

Target Device

Message Timeout : 5
Data Table Address: N10:0
Local / Remote : Local
MultiHop: Yes
Routing Information File(RI): RI23:0

Control Bits

Ignore if timed out (TO): 0
Break Connection (BK): 0
Awaiting Execution (EW): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

Error

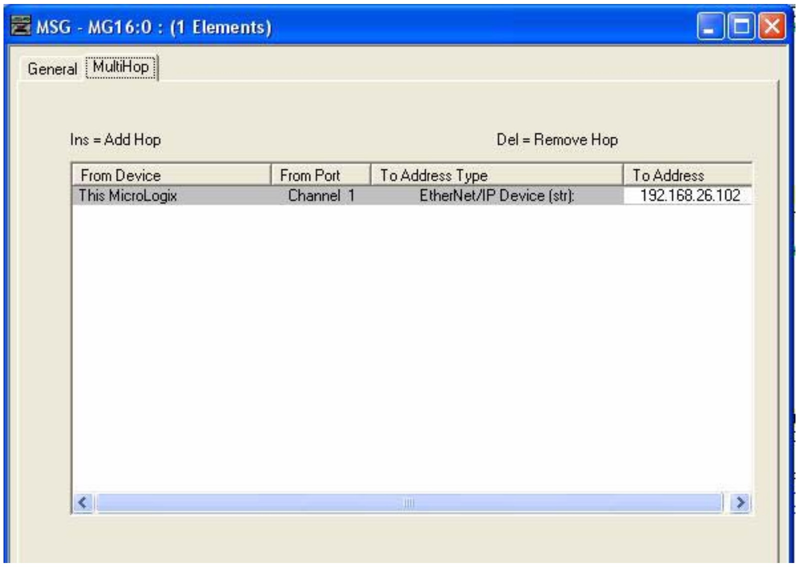
Error Code(Hex): 0

Error Description

No errors

5.4.7.5. MultiHop Screen

Select the **MultiHop** tab on the **MSG** dialog. 2. Make the following changes. a. Type the IP address for the DeviceMaster UP (the designated EtherNet/IP Device) in the **To Address** box.



From Device	From Port	To Address Type	To Address
This MicroLogix	Channel 1	EtherNet/IP Device (str):	192.168.26.102

5.5. PLC-5 PLC Programming Example Instructions

This topic describes how to use RSLogix 5 to configure and run the DeviceMaster UP in a PLC-5 PLC environment.

You can configure the RSLogix 5 PLC program examples to your site's requirements. This program is included in the self-installing file (**.MSI**) and is copied to the **Comtrol/EtherNetIP** directory on your computer when you open the **.MSI** file and follow the prompts. The self-installing file includes the following RSLogix 5 PLC program examples:

- *5.5.4. lpbkExampleSlcMsgPollRS5*
- *5.5.5. lpbkExamplePlc5MsgPollRS5*

These program examples are intended to aid the PLC programmer. These program examples were developed with:

- RSLogix 5 (version 6.00.00)
- Enhanced PLC-5/20 (series E with revision J firmware)
- Ethernet sidecar (version Enet/B)

Note: *The PLC program examples are designed to interface with a DeviceMaster UP 1-port or on Port 1 of a 2-port or 4-port. Additional programming is required to use all ports on a 2-port or 4-port.*

***Disclaimer:* Comtrol supplies example PLC programs for demonstration purposes only. They are intended for the sole purpose of an example loop-back demonstration in a controlled lab environment. They are not intended for use in a production environment and may not function correctly on all PLCs. Comtrol does not warrant these example programs or any part thereof. The user assumes all liability for any modification to and use of a modified example program.**

5.5.1. What is RSLogix 5?

RSLogix 5 is a Windows ladder logic programming package for the PLC-5 PLCs.

Note: *See the RSLogix 5 Help for more information on this product.*

5.5.2. Requirements

- The EtherNet/IP firmware must be installed on the DeviceMaster UP and configured as described in the *DeviceMaster UP Hardware Installation Guide*.
- The DeviceMaster UP must be installed on the same Ethernet network segment as the PLC.
- RSLogix 5 must be installed on your computer. Note that the instructions in this guide require that you have some familiarity with this programming application.
- A loopback plug is required for the first port on the DeviceMaster UP when running an example PLC program. See the *DeviceMaster UP Hardware Installation Guide* for information on loopback plugs.
- The PLC program examples (**.PC5**, **.SY5** and **.SY6** files) are optional. You can copy the PLC program examples from the CD or download the latest program examples from the Internet. See *1.4. Locating Updated Software and Documents* on Page 10, for the location of the PLC program examples.

5.5.3. Example Program Considerations

- While the RSLogix example programs are simple in nature, they include error counters and transmit retry mechanisms for timed-out messages. You may or may not want to include the error counters and transmit retry mechanisms in your own application.
- The receive and transmit sequence numbers are cleared on the DeviceMaster UP when you start the programs. However, the sequence numbers must be in sync between the PLC and DeviceMaster UP for the programs to operate correctly.
- Statistics retrieval is not included in the example programs, but you can easily add it by inserting a request statistics message.
- The socket ports can be accessed the same way as the serial ports and return the data in the same manner. To access a socket port, just change the associated DeviceMaster UP file addresses.

5.5.4. lpbkExampleSlcMsgPollRS5

This example program demonstrates an RSLogix 5 loopback PLC program using the SLC Typed messages in the *Polling receive* method. This program initializes receive and transmit produced data sequence numbers at startup on the DeviceMaster UP and then loops data through a loopback plug on the serial port. The SLC Typed Write data messages transmit the data and the SLC Typed Read Data messages receive the data and the sequence numbers are incremented.

This example program includes the following files:

- **lpbkExampleSlcMsgPollRS5.PC5 -** Ladder logic in ASCII format.
- **lpbkExampleSlcMsgPollRS5.SY5 -** Symbol definitions for RSLogix 5 Version 5.xx.xx.
- **lpbkExampleSlcMsgPollRS5.SY6 -** Symbol definitions for RSLogix 5 Version 6.xx.xx.

5.5.5. lpbkExamplePlc5MsgPollRS5

This example program demonstrates an RSLogix 5 loopback PLC program using the PLC-5 Typed messages in the *Polling receive* method. This program initializes receive and transmit produced data sequence numbers at startup on the DeviceMaster UP and then loops data through a loopback plug on the serial port. The PLC-5 Typed Write data messages transmit the data and the PLC-5 Typed Read Data messages receive the data and the sequence numbers are incremented.

This example program includes the following files:

- **lpbkExamplePlc5MsgPollRS5.PC5 -** Ladder logic in ASCII format.
- **lpbkExamplePlc5MsgPollRS5.SY5 -** Symbol definitions for RSLogix 5 Version 5.xx.xx.
- **lpbkExamplePlc5MsgPollRS5.SY6 -** Symbol definitions for RSLogix 5 Version 6.xx.xx.

5.5.6. lpbkExamplePlc5MsgFileRS500

This example program demonstrates a loop-back RSLogix 5 PLC program using PLC-5 Typed messages in the *Write-to-File receive* method. This program initializes the produced receive and transmit data sequence numbers at startup and then loops data via a loop-back plug on the serial port. The data is transmitted via PLC-5 Typed Write data messages and received automatically via a write to file command from the DeviceMaster UP. The sequence numbers are incremented with each message.

The following files apply:

- **lpbkExamplePlc5MsgFileRS5.PC5** – ladder logic in ASCII form.
- **lpbkExamplePlc5MsgFileRS5.SY5** – symbol definitions for RSLogix 5 Version 5.xx.xx.
- **lpbkExamplePlc5MsgFileRS5.SY6** – symbol definitions for RSLogix 5 Version 6.xx.xx.

5.5.7. lpbkExamplePlc5MsgFileSyncRS5

This example program demonstrates a loop-back RSLogix 5 PLC program using PLC-5 Typed messages in the *Write-to-File-Synced receive* method. This program initializes the produced receive and transmit sequence numbers as well as the consumed receive sequence number at startup and then loops data via a loop-back plug on the serial port. The data is transmitted via PLC-5 Typed Write data messages and received automatically via a write to file command from the DeviceMaster UP. The consumed receive sequence number is updated to match the produced receive sequence number and sent to the DeviceMaster UP to complete the synchronization process. All sequence numbers are incremented with each message.

The following files apply:

- **lpbkExamplePlc5MsgFileSyncRS5.PC5** – ladder logic in ASCII form.
- **lpbkExamplePlc5MsgFileSyncRS5.SY5** – symbol definitions for RSLogix 5 Version 5.xx.xx.
- **lpbkExamplePlc5MsgFileSyncRS5.SY6** – symbol definitions for RSLogix 5 Version 6.xx.xx.

5.5.8. Configure the DeviceMaster UP for the RSLogix 5 Program

The following procedure configures the DeviceMaster UP for PLC-5 and SLC PLCs. You must perform this task before you configure and run the example RSLogix 5 program. For more information on the embedded web pages, see *Chapter 3. Embedded Configuration Pages* on Page 61.

1. Attach a loopback plug to the serial port.
2. Access the *Server Configuration* web page, using one of these methods:
   - Open PortVision Plus, right-click the DeviceMaster UP and select **Web Manager.**
   - Open a browser and type the IP address for the DeviceMaster UP in the **Address** box.
3. Click **Port *n***. Where ***n*** is the port number.
4. Set the serial port settings under **Serial Configuration** to the following values

Field	Setting
Mode	RS-232
Baud	57600
Parity	none
Data Bits	8
Stop Bits	1
Flow Control	none
DTR	off
Rx Timeout Between Packets	200

5. Set the serial port settings under **Serial Packet Identification** to the following values.

Field	Settings
STX RX Detect	Set to **one byte** and **Byte 1** to **2**.
ETX Rx Detect	Set to **one byte** and **Byte 1** to **3**.
STX Tx Append	Set to **one byte** and **Byte 1** to **2**.
ETX Tx Append	Set to **one byte** and **Byte 1** to **3**.
Strip Rx STX/ETX	Select.
Discard Rx Packets With Errors	Select.
(PLC-5/SLC) Rx MS Byte First	Optionally, select.
(PLC-5/SLC) Tx MS Byte First	Optionally, select.

6. Set the serial port settings under **EtherNet/IP Settings** to the following values.

Field	Settings
TX Sequence Number Checking.	Select
Rx (To PLC) Ethernet Transfer Method	• Set to Polling for lpbkExampleSlcMsgPollRS5 and lpbkExamplePlc5MsgPollRS5. • Set to Write-to-Tag/File for lpbkExamplePlc5MsgFileRS5. • Set to Write-to-Tag/File-Synced for lpbkExamplePlc5MsgFileSyncRS5.
PLC IP Address	• Leave blank for Polling. • Set to IP Address of PLC for Write-to-Tag/File and Write-to-Tag/File-Synced.
PLC Controller Slot Number	Unused and can remain blank.
Rx (To PLC) Produced Data Tag/ File Name	• Leave blank for Polling. • Set to $N10:0, the PLC receive filename for Write-to-File and Write-to-File-Synced.
Reset Port	Select
Save in Flash	Select

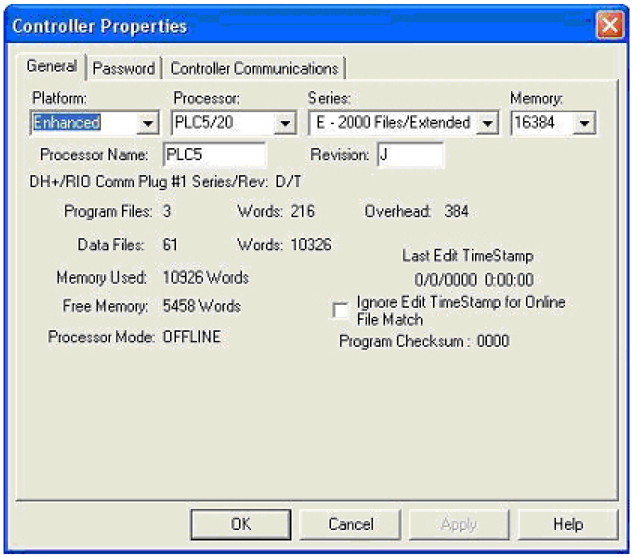
7. Click **Submit**.

5.5.9. Configure and Run the Example RSLogix 5 Program

You can configure and run the RSLogix 5 example programs through RSLogix 5. For additional information on the RSLogix 5, see *5.5.10. RSLogix 5 Screen Examples* on Page 137.

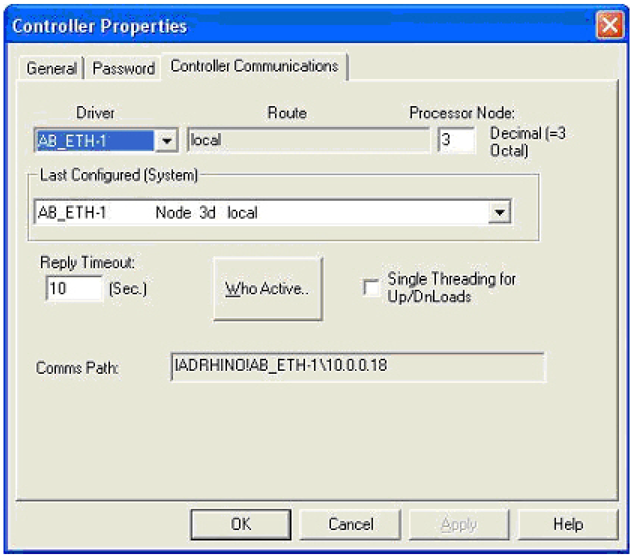
Note: *The DeviceMaster UP must be configured for PLC-5/SLC before you can configure and download the example RSLogix 5 program. For instructions on configuring DeviceMaster UP, see 5.5.8. Configure the DeviceMaster UP for the RSLogix 5 Program, earlier in this section.*

1. Select the appropriate message type example programs (SLC or PLC-5) and copy the files (**.PC5**, **.SY5** and **.SY6**) to the desired directory.
2. Start RSLogix 5 and open the **.PC5** file.
3. To modify the PLC program for your system, double-click **Controller Properties.**
4. In the **General** tab, select your PLC-5 processor type under **Processor Type** and provide a **Processor Name.**
5. Select your PLC-5 series in the **Series** box and select your firmware revision in the **Revision** box.



Platform: Enhanced
Processor: PLC5/20
Series: E - 2000 Files/Extended
Memory: 16384
Processor Name: PLC5
Revision: J
DH+/RIO Comm Plug #1 Series/Rev: D/T
Program Files: 3 Words: 216 Overhead: 384
Data Files: 61 Words: 10326
Last Edit TimeStamp 0/0/0000 0:00:00
Memory Used: 10926 Words
Free Memory: 5458 Words
□ Ignore Edit TimeStamp for Online File Match
Processor Mode: OFFLINE
Program Checksum : 0000

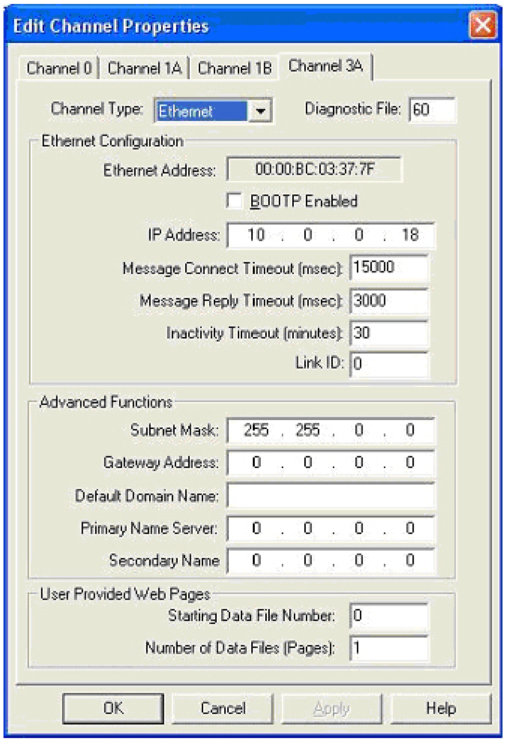
6. Select the **Controller Communications** tab and select the following options.
   a. Set **Driver** to the appropriate type to allow RSLogix 5 to communicate with the PLC-5 processor.
   b. Type the processor node number in the **Processor Node** box. (You may reference the **Last Configured (System)** node or select **Who Active.**)
7. Click **OK** to apply your changes and close the **Controller Properties** dialog.
8. Double-click **I/O Configuration** and verify your chassis and PLC-5 type. If the chassis type is not correct:
   a. Right-click the chassis type (for example, **1771-A1B (4 Slots)**) and select **Properties.**
   b. Select your chassis.
   c. Optionally, select the appropriate DIP switch settings for your system from the **DIP Switches** panel.
   d. Click **OK** to save settings.
9. Click **OK** to save settings.



Driver: AB_ETH-1
Route: local
Processor Node: 3 Decimal (=3 Octal)
Last Configured (System): AB_ETH-1 Node 3d local
Reply Timeout: 10 (Sec.)
□ Single Threading for Up/DnLoads
Comms Path: !ADRHINO!AB_ETH-1\10.0.0.18

10. Double-click **Channel Configuration** and click the **Channel 3A** tab.

    Note: *The port number for the Ethernet channel may be different on your PLC-5.*



Edit Channel Properties

Channel Type: Ethernet

Diagnostic File: 60

Ethernet Configuration

Ethernet Address: 00:00:BC:03:37:7F

☐ BOOTP Enabled

IP Address: 10 . 0 . 0 . 18

Message Connect Timeout (msec): 15000

Message Reply Timeout (msec): 3000

Inactivity Timeout (minutes): 30

Link ID: 0

Advanced Functions

Subnet Mask: 255 . 255 . 0 . 0

Gateway Address: 0 . 0 . 0 . 0

Default Domain Name:

Primary Name Server: 0 . 0 . 0 . 0

Secondary Name 0 . 0 . 0 . 0

User Provided Web Pages

Starting Data File Number: 0

Number of Data Files (Pages): 1

11. In the **Ethernet Configuration** panel, make the following changes:

    a. Set **Channel Type** to **Ethernet**.

    b. Type **60** in the **Diagnostic File** box. You can use the diagnostic file to help solve any network-related problems.

    c. Type the IP address for your PLC-5 in the **IP address** box.

    d. Type the subnet mask for your PLC-5 in the **Subnet Mask** box.

    e. Type the gateway address for your PLCI-5 in the **Gateway Address** box.

    f. If applicable to your network, type the addresses for the **Primary Name Server** and **Secondary Name Server**.

12. Click **OK** to apply your changes and close the **Channel Configuration** dialog.
13. In the ladder logic, double-click **Setup Screen** in an **MSG** instruction.
14. Select the **MultiHop** tab and type the IP address for the DeviceMaster UP in the **To Address** box.
15. Close the **MSG** dialog.
16. Repeat steps 13 through 15 for each MSG instruction in the ladder logic.
17. Download the PLC program to your PLC and run the program.

5.5.10.RSLogix 5 Screen Examples

The following subsections explain how to configure the DeviceMaster UP through RSLogix 5.

Use these screens to set up PLC and program the various messages.

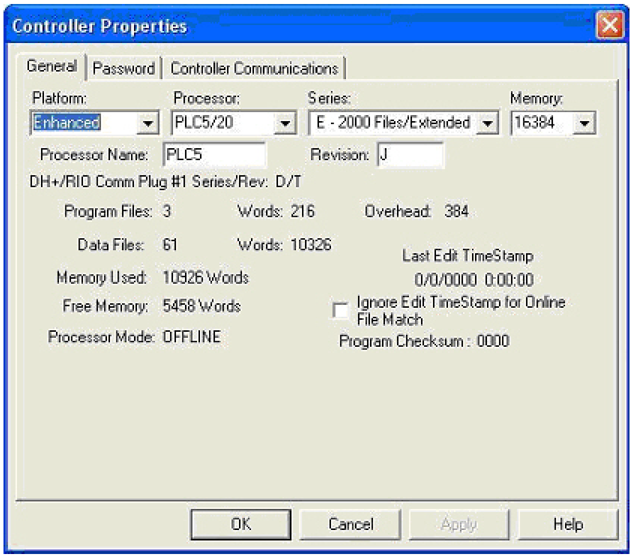
5.5.10.1. Requirements

- PLC-5 PLCs require EtherNet/IP firmware 2.01 or later running on the DeviceMaster UP.
- The PLC-5 PLC firmware must support MultiHop, ControlLogix devices and EtherNet/IP. The tables in *2.4.1. Requirements* on Page 52 list PLCs that support EtherNet/IP and the required firmware version for each PLC.
- The PLC program examples (**.SLC**, **.SY5** and **.SY6** files) are required. You can copy the PLC program examples from the CD or download the latest program examples from the Internet. See *1.4. Locating Updated Software and Documents* on Page 10 for the location of the PLC program examples.
- You must set up the Processor and Ethernet communication port properly for EtherNet/IP to function. Read and follow the instructions in the appropriate Rockwell product documents.
  - Enhanced and Ethernet PLC-5 Programmable Control, Publication 1785-6.5.12
  - ControlNet PLC-5 Programmable Controllers User Manual, Publication 1785-UM022B-EN-P
  - PLC-5 Ethernet Interface Module, Publication 1785-ENET

5.5.10.2. Setting up Processor and Ethernet Channel

The following screens show the recommended settings that allow EtherNet/IP to function properly on a PLC-5 PLC.

1. Start **RSLogix 5**.
2. Double-click **Controller Properties** and select the correct processor type and revision from the **General** tab on the **Controller Properties** dialog.



Platform: Enhanced

Processor: PLC5/20

Series: E - 2000 Files/Extended

Memory: 16384

Processor Name: PLC5

Revision: J

DH+/RIO Comm Plug #1 Series/Rev: D/T

Program Files: 3 Words: 216 Overhead: 384

Data Files: 61 Words: 10326

Memory Used: 10926 Words

Free Memory: 5458 Words

Processor Mode: OFFLINE

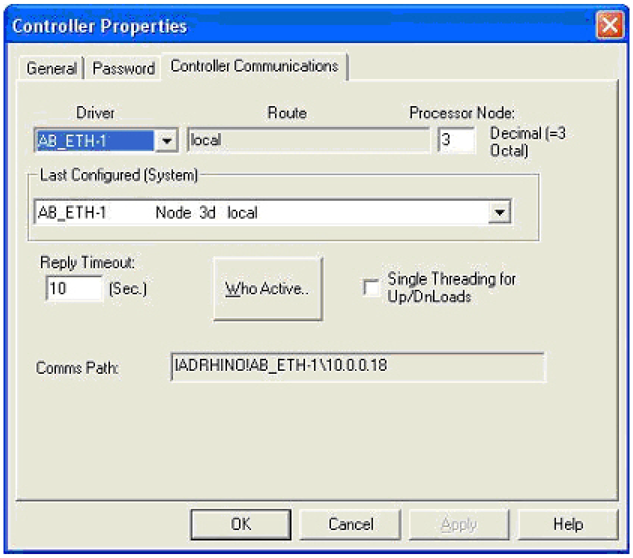
Last Edit TimeStamp

0/0/0000 0:00:00

□ Ignore Edit TimeStamp for Online File Match

Program Checksum : 0000

3. Select the **Controller Communications** tab and select the proper driver for RSLogix 5.
4. Click **OK** to apply your changes and close the **Controller Properties** dialog.



Controller Properties

Driver: AB_ETH-1
Route: local
Processor Node: 3 Decimal (=3 Octal)

Last Configured (System): AB_ETH-1 Node 3d local

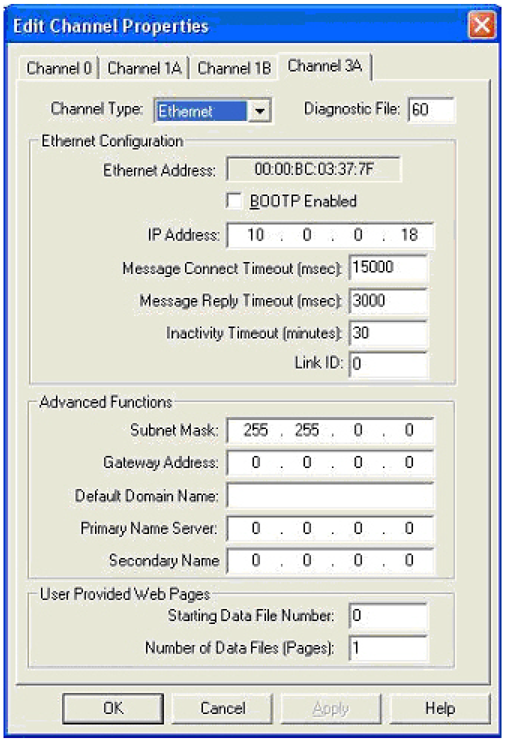
Reply Timeout: 10 (Sec.)

□ Single Threading for Up/DnLoads

Comms Path: \ADRHINO\AB_ETH-1\10.0.0.18

5. Double-click **Channel Configuration**, click the **Channel 3A** tab and make the following changes.
   a. Type a value (between 0 and 256) in the **Diagnostic File** box for an integer diagnostic file. (This example uses Diagnostic file 60.) You can use the diagnostic file to help solve any network-related problems.
   b. Type the IP address in the **IP address** box.
   c. Type the subnet mask in the **Subnet Mask** box.
   d. Type the gateway address in the **Gateway Address** box.

   Note: *The Ethernet channel may be different on your PLC-5.*
6. Click **OK** to apply your changes and close the **Edit Channel Properties** dialog.



Edit Channel Properties

Channel Type: Ethernet
Diagnostic File: 60

Ethernet Configuration
Ethernet Address: 00:00:BC:03:37:7F
□ BOOTP Enabled
IP Address: 10 . 0 . 0 . 18
Message Connect Timeout (msec): 15000
Message Reply Timeout (msec): 3000
Inactivity Timeout (minutes): 30
Link ID: 0

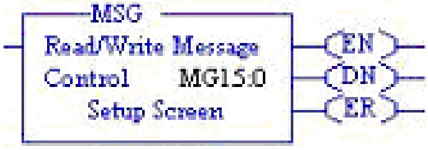
Advanced Functions
Subnet Mask: 255 . 255 . 0 . 0
Gateway Address: 0 . 0 . 0 . 0
Default Domain Name:
Primary Name Server: 0 . 0 . 0 . 0
Secondary Name: 0 . 0 . 0 . 0

User Provided Web Pages
Starting Data File Number: 0
Number of Data Files (Pages): 1

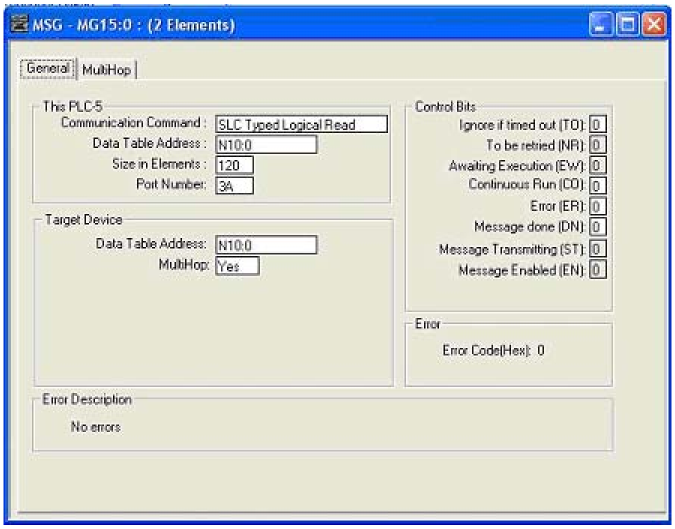
5.5.10.3. SLC Typed Read - Receive Data Message

The following screen depicts an *SLC Typed Read - Receive Data* message in ladder logic.

1. Assign a dedicated message file to the **Control** block in the ladder logic.



2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
3. Make the following changes:
   a. Specify the file address to receive data information in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Specify a size in the **Size of Elements** box that is large enough to receive the entire data message including the sequence number and length fields.
   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.
   d. The port number for the Ethernet channel may be different on your PLC-5.
   e. Specify the port-specific read file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   f. Set the **MultiHop** option to **Yes.**



MSG - MG15:0 : (2 Elements)

General | MultiHop

This PLC-5

Communication Command: SLC Typed Logical Read

Data Table Address: N10:0

Size in Elements: 120

Port Number: 3A

Target Device

Data Table Address: N10:0

MultiHop: Yes

Control Bits

Ignore if timed out (TO): 0

To be retried (NR): 0

Awaiting Execution (EW): 0

Continuous Run (CO): 0

Error (ER): 0

Message done (DN): 0

Message Transmitting (ST): 0

Message Enabled (EN): 0

Error

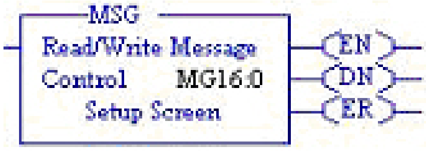
Error Code(Hex): 0

Error Description

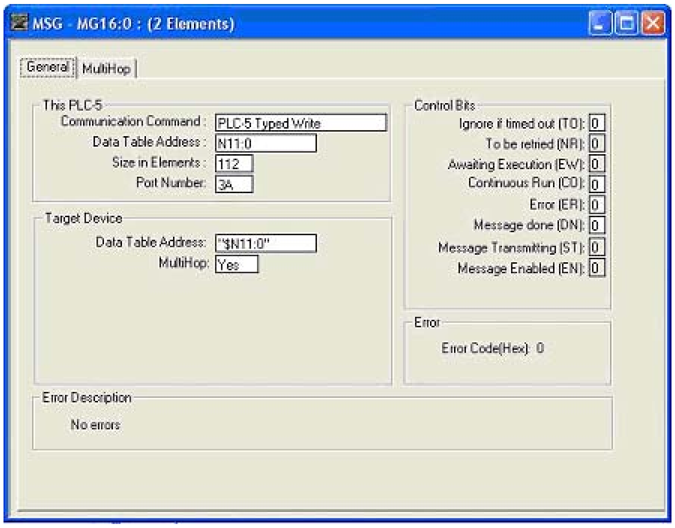
No errors

5.5.10.4. SLC Typed Write - Transmit Data Message

The following screen depicts an *SLC Typed Write - Transmit Data* message in ladder logic.



1. Assign a dedicated message file to the **Control** block in the ladder logic (as shown above).
2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.



MSG - MG16:0 : (2 Elements)

General | MultiHop

This PLC-5
Communication Command : PLC-5 Typed Write
Data Table Address : N11:0
Size in Elements : 112
Port Number: 3A

Target Device
Data Table Address: "$N11:0"
MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

Error
Error Code(Hex): 0

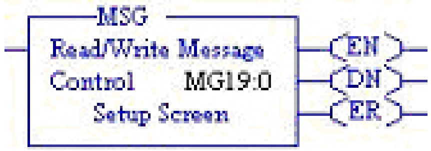
Error Description
No errors

3. Make the following changes:
   a. Specify the file address to transmit data information in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Specify a size in the **Size of Elements** box that is large enough to send the entire data message including the sequence number and length fields.
   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.
   d. The port number for the Ethernet channel may be different on your PLC-5.
   e. Specify the port-specific transmit file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   f. Set the **MultiHop** option to **Yes**.

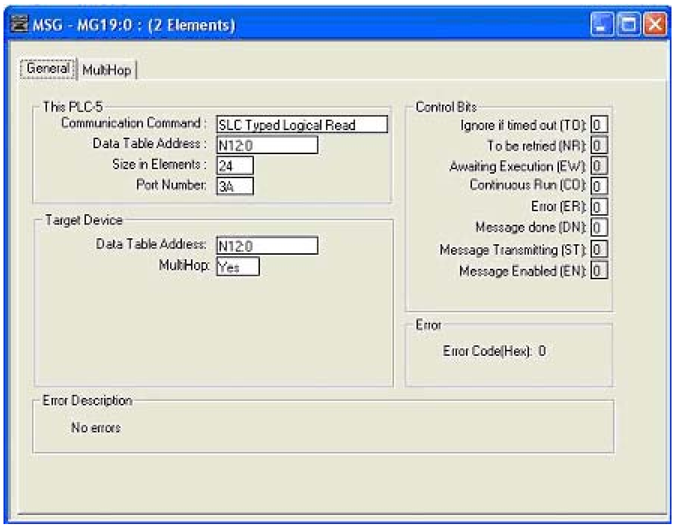
5.5.10.5. SLC Typed Read - Retrieve Statistics Message

The following screen depicts an *SLC Typed Read - Retrieve Statistics* message in ladder logic.

1. Assign a dedicated message file to the **Control** block in the ladder logic.



2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.



MSG - MG19:0 : (2 Elements)

This PLC-5
Communication Command : SLC Typed Logical Read
Data Table Address : N12:0
Size in Elements : 24
Port Number: 3A

Target Device
Data Table Address: N12:0
MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

Error
Error Code(Hex): 0

Error Description
No errors

3. Make the following changes:

   a. Specify the file address to receive statistics data information in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.

   b. Type **24** (twelve 32-bit integers) in the **Size of Elements** box.

   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.

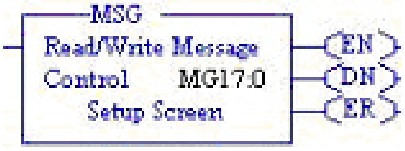
   d. The port number for the Ethernet channel may be different on your PLC-5.

   e. Specify the port-specific statistics file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.

   f. Set the **MultiHop** option to **Yes.**

5.5.10.6. SLC Typed Write - Set Receive Produced Sequence Number Message

The following screen depicts an *SLC Typed Write - Set Receive Produced Sequence Number* message in ladder logic.



1. Assign a dedicated message file to the **Control** block in the ladder logic (as shown above).

2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.

3. Make the following changes:

   a. Specify the file address where the receive sequence number resides in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see [2.4.2.1. DeviceMaster UP File Addressing]() on Page 53.

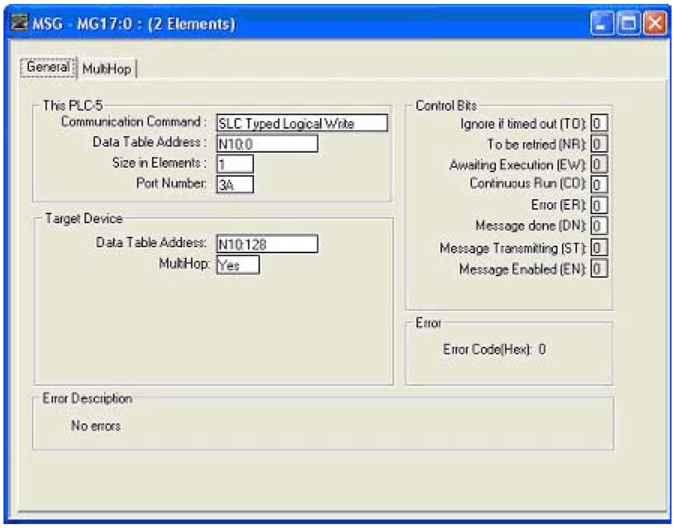
   b. Type **1** in the **Size of Elements** box.

   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.

   Note: *The port number for the Ethernet channel may be different on your PLC-5.*

   d. Specify the port-specific receive sequence file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see [2.4.2.1. DeviceMaster UP File Addressing]() on Page 53.

   e. Set the **MultiHop** option to **Yes.**



MSG - MG17:0 : (2 Elements)

This PLC-5

Communication Command : SLC Typed Logical Write
Data Table Address : N10:0
Size in Elements : 1
Port Number: 3A

Target Device

Data Table Address: N10:128
MultiHop: Yes

Control Bits

Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

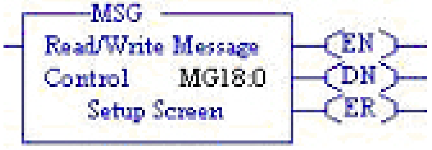
Error

Error Code(Hex): 0

Error Description

No errors

5.5.10.7. SLC Typed Write - Set Transmit Produced Sequence Number Message



The following screen depicts an *SLC Typed Write - Set Transmit Produced Sequence Number* message in ladder logic.

1. Assign a dedicated message file to the **Control** block in the ladder logic (as shown above).

2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.

3. Make the following changes:

   a. Specify the file address where the file address where the transmit sequence number resides in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.

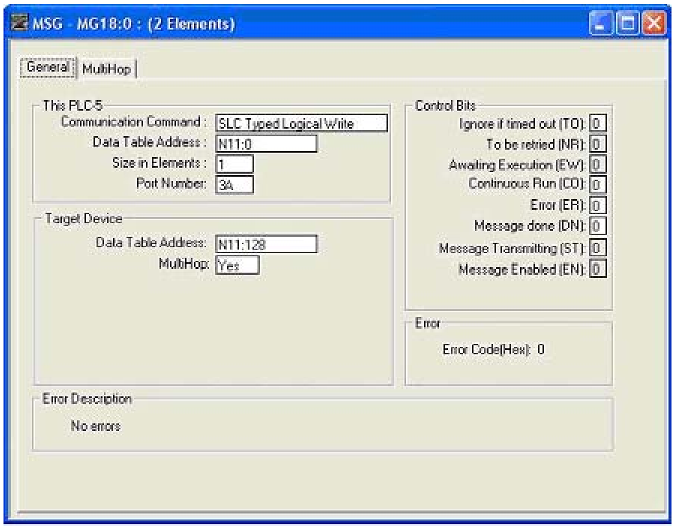
   b. Type **1** in the **Size of Elements** box.

   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.

      Note: *The port number for the Ethernet channel may be different on your PLC-5.*

   d. Specify the port-specific transmit sequence number file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.

   e. Set the **MultiHop** option to **Yes.**



This PLC-5
Communication Command : SLC Typed Logical Write
Data Table Address : N11:0
Size in Elements : 1
Port Number: 3A

Target Device
Data Table Address: N11:128
MultiHop: Yes

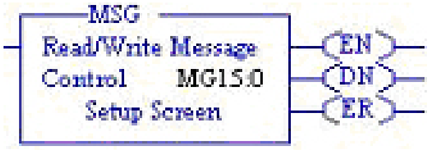
Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

Error
Error Code(Hex): 0

Error Description
No errors

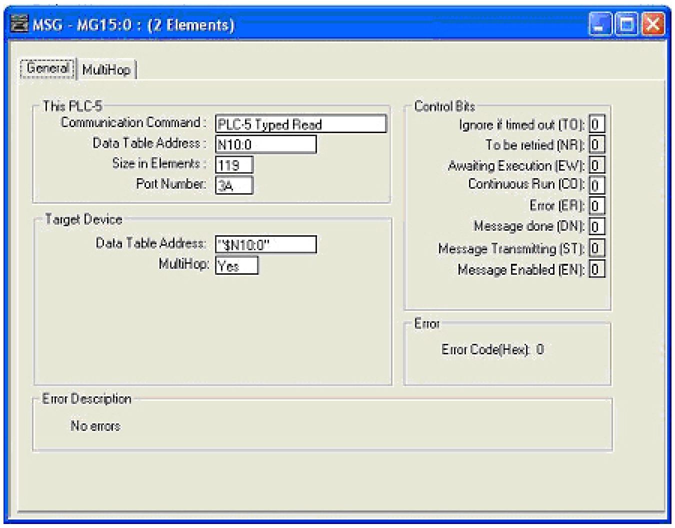
5.5.10.8. PLC-5 Typed Read - Receive Data Message

The following screen depicts a *PLC-5 Typed Read - Receive Data* message in ladder logic.



1. Assign a dedicated message file to the **Control** block in the ladder logic (as shown above).
2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
3. Make the following changes:
   a. Specify the file address to receive data information in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see [2.4.2.1. DeviceMaster UP File Addressing](#) on Page 53.
   b. Specify a size in the **Size of Elements** box that is large enough to receive the entire data message including the sequence number and length fields.
   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.

      Note: *The port number for the Ethernet channel may be different on your PLC-5.*
   d. Specify the port-specific receive file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The receive file address must be specified in logical ASCII format. For more information on file addresses, see [2.4.2.1. DeviceMaster UP File Addressing](#) on Page 53.
   e. Set the **MultiHop** option to **Yes.**



MSG - MG15:0 : (2 Elements)

This PLC-5
Communication Command : PLC-5 Typed Read
Data Table Address : N10:0
Size in Elements : 119
Port Number: 3A

Target Device
Data Table Address: "$N10:0"
MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

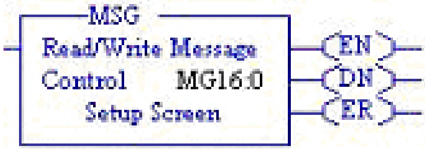
Error
Error Code(Hex): 0

Error Description
No errors

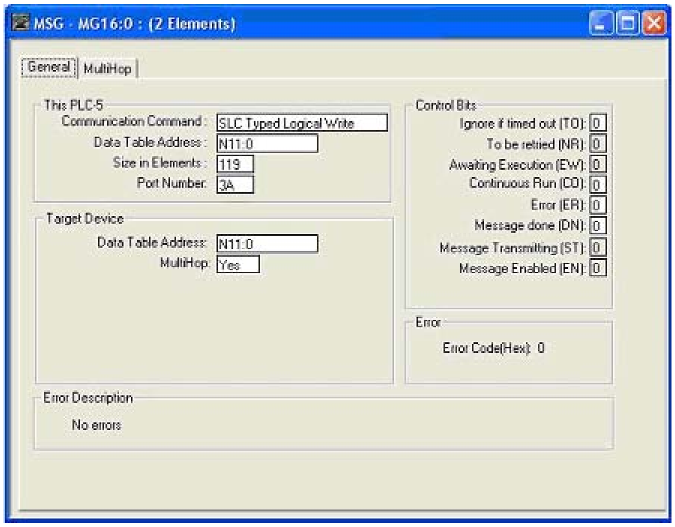
5.5.10.9. PLC-5 Typed Write - Transmit Data Message

The following screen depicts a *PLC-5 Typed Write - Transmit Data* message in ladder logic.

1. Assign a dedicated message file to the **Control** block in the ladder logic (as shown above).



2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.



MSG - MG16:0 : (2 Elements)

General | MultiHop

This PLC-5
Communication Command : SLC Typed Logical Write
Data Table Address : N11:0
Size in Elements : 119
Port Number: 3A

Target Device
Data Table Address: N11:0
MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

Error
Error Code(Hex): 0

Error Description
No errors

3. Make the following changes:

   a. Specify the file address to transmit data information in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.

   b. Specify a size in the **Size of Elements** box that is large enough to send the entire data message including the sequence number and length fields.

   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.

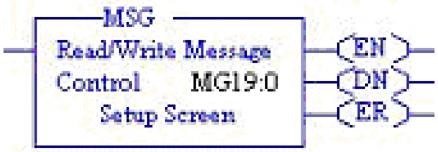
      Note: *The port number for the Ethernet channel may be different on your PLC-5.*

   d. Specify the port-specific transmit file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The transmit file address must be specified in logical ASCII format. For more information on file addresses, see 2.4.2.1. DeviceMaster UP File Addressing on Page 53.

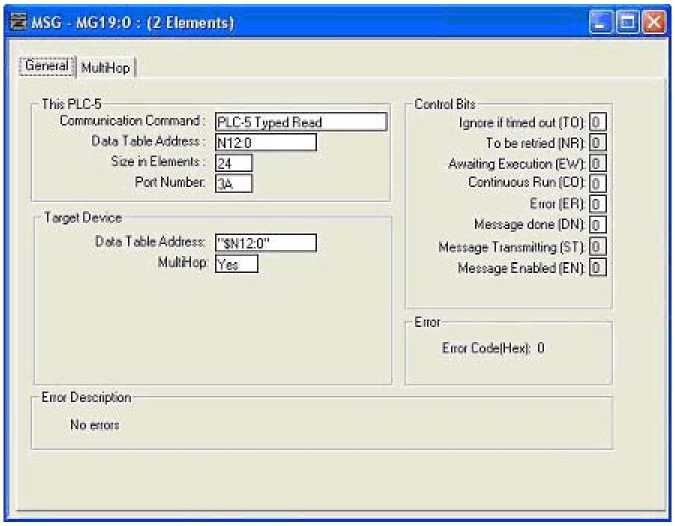
   e. Set the **MultiHop** option to **Yes.**

5.5.10.10. PLC-5 Typed Read - Retrieve Statistics Message

The following screen depicts an PLC-5 Typed Read - Retrieve Statistics message in ladder logic.



1. Assign a dedicated message file to the **Control** block in the ladder logic (as shown above).



This PLC-5
Communication Command : PLC-5 Typed Read
Data Table Address : N12:0
Size in Elements : 24
Port Number: 3A

Target Device
Data Table Address: "$N12:0"
MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

Error
Error Code(Hex): 0

Error Description
No errors

2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
3. Make the following changes:
   a. Specify the file address to receive statistics data information in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Type **24** (twelve 32-bit integers) in the **Size of Elements** box.
   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.

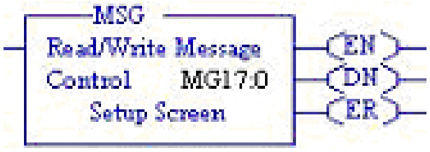
      Note: *The port number for the Ethernet channel may be different on your PLC-5.*

   d. Specify the port-specific statistics file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The statistics file address must be specified in logical ASCII format. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   e. Set the **MultiHop** option to **Yes.**

5.5.10.11. PLC-5 Typed Write - Set Receive Produced Sequence Number Message

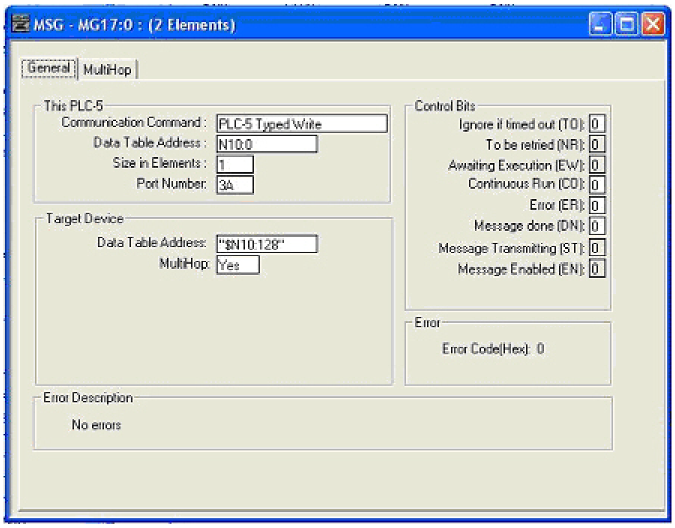
The following screen depicts an *PLC-5 Typed Write - Set Receive Produced Sequence Number* message in ladder logic.

1. Assign a dedicated message file to the **Control** block in the ladder logic.



2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
3. Make the following changes:
   a. Specify the file address where the receive sequence number resides in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see [2.4.2.1. DeviceMaster UP File Addressing]() on Page 53.
   b. Type **1** in the **Size of Elements** box.
   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.

      Note: *The port number for the Ethernet channel may be different on your PLC-5.*
   d. Specify the port-specific receive sequence file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The receive sequence file address must be specified in logical ASCII format. For more information on file addresses, see [2.4.2.1. DeviceMaster UP File Addressing]() on Page 53.
   e. Set the **MultiHop** option to **Yes**.



This PLC-5
Communication Command : PLC-5 Typed Write
Data Table Address : N10:0
Size in Elements : 1
Port Number: 3A

Target Device
Data Table Address: "$N10:128"
MultiHop: Yes

Control Bits
Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

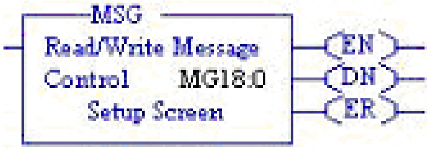
Error
Error Code(Hex): 0

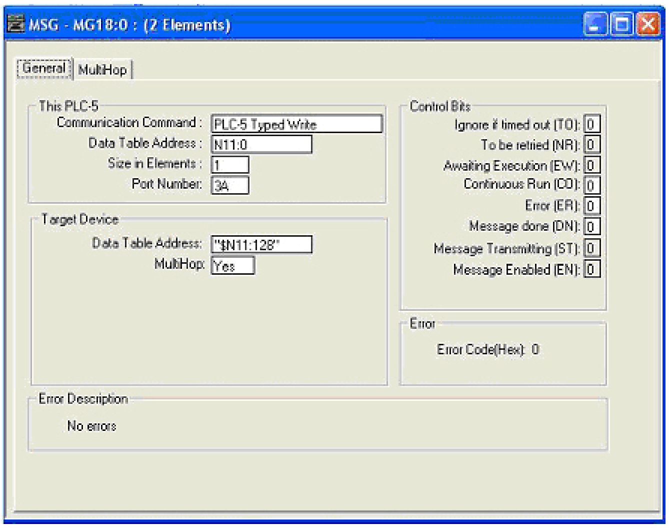
Error Description
No errors

5.5.10.12. PLC-5 Typed Write - Set Transmit Produced Sequence Number Message

The following screen depicts an *PLC-5 Typed Write - Set Transmit Produced Sequence Number* message in ladder logic.

1. Assign a dedicated message file to the **Control** block in the ladder logic.





This PLC-5

Communication Command : PLC-5 Typed Write
Data Table Address : N11:0
Size in Elements : 1
Port Number: 3A

Target Device

Data Table Address: "$N11:128"
MultiHop: Yes

Control Bits

Ignore if timed out (TO): 0
To be retried (NR): 0
Awaiting Execution (EW): 0
Continuous Run (CO): 0
Error (ER): 0
Message done (DN): 0
Message Transmitting (ST): 0
Message Enabled (EN): 0

Error

Error Code(Hex): 0

Error Description

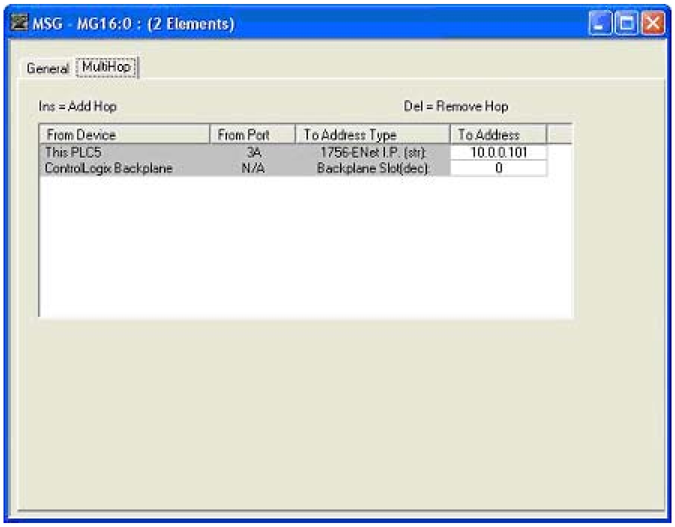
No errors

2. In the ladder logic, double-click the **Setup Screen** in the **MSG** instruction.
3. Make the following changes:
   a. Specify the file address where the transmit sequence number resides in the **Data Table Address** box on **This PLC-5** panel. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   b. Type **1** in the **Size of Elements** box.
   c. Set the **Port Number** parameter to **3A** to use the Ethernet port.

      Note: *The port number for the Ethernet channel may be different on your PLC-5.*
   d. Specify the port-specific transmit sequence number file address for the DeviceMaster UP in the **Data Table Address** box on the **Target Device** panel. The transmit sequence number file address must be specified in logical ASCII format. For more information on file addresses, see *2.4.2.1. DeviceMaster UP File Addressing* on Page 53.
   e. Set the **MultiHop** option to **Yes.**

5.5.10.13. MultiHop Screen

1. Select the **MultiHop** tab on the **MSG** dialog.
2. Make the following changes:
   a. Type the IP address for the DeviceMaster UP (the designated EtherNet/IP Device) in the **To Address** box.
   b. Type **0** (zero) in the **To Address** box for the ControlLogix Backplane.



Ins = Add Hop   Del = Remove Hop

From Device	From Port	To Address Type	To Address
This PLC5	3A	1756-ENet I.P. (str):	10.0.0.101
ControlLogix Backplane	N/A	Backplane Slot(dec):	0

5.6. EDS Files

You do not need to add DeviceMaster UP to RSLinx for normal DeviceMaster UP-to-PLC communications. However, you can easily add the DeviceMaster UP and its associated Electronic Data Sheet (EDS) files to RSLinx.

5.6.1. Requirements

EDS files and the associated icons are included in the self-installing file (**.MSI**) and are copied to the **Comtrol/EtherNetIP** directory on your computer when you open the **.MSI** file and follow the prompts.

The files named **DeviceMaster UP_*.ico** are icon files and files named **DeviceMaster UP_dd_NNNN-x.xx.eds** are ODVA electronic data sheet files where **dd** is the model name, **NNNN** is the product ID number, and **x.xx** is the version number.

5.6.2. Adding DeviceMaster UP to RSLinx

1. Open **RSLinx**.
2. Under **Communications**, select **Configure Drivers**.
3. Under **Available Drivers**, select **Remote Devices via Linx Gateway**.
4. Select **Add New**.
5. Use the default driver name or type your own driver name and click **OK** to continue.
6. Type the IP address for the device under **Server's IP Address or Hostname** and select **OK**.
7. Select **RSWho** to verify that RSLinx can communicate with the DeviceMaster UP.

   Note: *A yellow question mark appears by the DeviceMaster UP(s) in the RSWho window when the associated EDS file(s) are not installed.*

5.6.3. Adding EDS Files to RSLinx

1. Open the EDS Hardware Installation Tool. (Select **Start** > **All Programs** > **Rockwell Software** > **RSLinx Tools**.)
2. Click **Add**.
3. Click **Register a directory of EDS files**.
4. Browse to the **Comtrol/EtherNetIP** directory and click **Next** to continue.
5. Verify that there is a green check beside each EDS file name and select **Next** to continue.
6. To change the icons, perform the following tasks.
   a. Select a DeviceMaster UP.
   b. Select **Change icon**.
   c. Browse to the **Comtrol/EtherNetIP** directory and select the icon associated with your DeviceMaster UP.

      Note: *You may also select your own icon stored elsewhere.*
7. Click **Next** to continue.
8. Click **Finish** to exit.

5.6.4. Troubleshooting RSLinx

If RSLinx does not display the device after adding DeviceMaster UP and the EDS files to RSLinx, perform the following procedure:

1. Select **File** > **Exit and Shutdown** to exit and shutdown RSLinx.
2. Remove the following files from your hard drive:
   - **\Program Files\Rockwell Software\RSCOMMON\Harmony.hrc**
   - **\Program Files\Rockwell Software\RSCOMMON\Harmony.rsh**
3. Restart RSLinx. The DeviceMaster UP unit or units should now appear with the associated icon or icons.

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