Ethernet/IP Installation Quick Start

The *Quick Start* is intended to provide you with a way to locate software and installation documentation for the DeviceMaster UP.

Use the *Quick Start* to quickly configure:

- Read-only devices such as barcode scanners and some RFID readers
- Read/write devices such as printers and some weigh scales

BLUE CAPS link to external documents, which function if reading this document from the web/ftp site or CD. Red, underlined links go to the web site and *blue*, underlined links jump within the document and provide a page number.

Installation Overview

You can use the following steps to install the DeviceMaster UP.

1. INSTALL THE HARDWARE.
2. Install PortVision Plus from the CD or download and install the latest version.
3. CONFIGURE THE DEVICEMASTER UP network settings using PortVision Plus.
4. Install the software assembly (.msi) from the CD or download and install the latest file, which contains the EtherNet/IP firmware and supporting files.
5. UPLOAD the EtherNet/IP firmware into the DeviceMaster UP using PortVision Plus.

Note: Do not perform Step 6 before Steps 1 through 5.

6. CONFIGURE the serial or Ethernet TCP/IP socket port characteristics using the DeviceMaster UP embedded web page (*Server Configuration*).

Software and Documentation	Download
DeviceMaster UP Hardware Installation Guide	
PortVision Plus	
EtherNet/IP firmware	
EtherNet/IP Installation Quick Start	
EtherNet/IP User Guide	
DeviceMaster UP Filtering and Data Extraction Reference Guide	

If you have *Read-only or read/write* devices, you can use the appropriate procedures for your device, which are located in this *Quick Start*:

- Read-only devices (barcode scanners and some RFID readers), go to *Configuring Read-Only Serial Devices* on Page 2 or *Configuring Read-Only Ethernet TCP/IP Devices* on Page 4.
- Read/write devices (printers and some weigh scales), first perform the appropriate procedure for a read-only device and then go to *Configuring Read/Write Devices* on Page 7.

You may want to reference the PROGRAMMING INTERFACE chapter in the *DeviceMaster UP EtherNet/IP User Guide*.

7. Optionally, reference the EXAMPLE PLC PROGRAMS in the *DeviceMaster UP EtherNet/IP User Guide*.
8. CONNECT any serial device or devices.
9. Verify any Ethernet TCP/IP devices are connected to the same subnet as the DeviceMaster UP.

Data Type Definitions

The following data type definitions apply.

Data Type	Definition
USINT	Unsigned short integer (8-bit)
UINT	Unsigned integer (16-bit)
UDINT	Unsigned double integer (32-bit)
BYTE	Bit string (8-bit)

Configuring Read-Only Serial Devices

Use the following procedure to configure read-only serial ports.

1. Access the *Server Configuration* web page by entering the IP address in your web browser or by selecting **Web Manager** on the PortVision Plus toolbar.

   Note: *If you are using Internet Explorer and it does not display the web page correctly, select **Tools**/**Internet Options…**/**Clear History**/**Delete Files…** and refresh the DeviceMaster UP web page.*

2. Select *Serial Device Configuration*.

3. Open the *Edit Serial Port Configuration* page for each port by clicking on **Port** *N*.

4. Set up the serial port configuration. (**Mode**, **Baud rate**, etc.)

5. Set up the *Serial Packet Identification*.

   a. Set **STX (Start of transmission) Rx Detect** in decimal format.

   b. Set **ETX (End of transmission) Rx Detect** in decimal format.

   c. Set the PLC specific **Strip Rx STX/ETX Chars** setting if you do not wish to receive the STX/ETX bytes in the received data packet.

Note: *Refer to your serial device's User Manual for these settings.*

6. Set up the *Ethernet/IP Settings*.

   a. Set **Rx (To PLC) Ethernet Transfer Mode** to **Write-to-Tag/File**.

   b. Set **PLC IP Address** in **xxx.xxx.xxx.xxx** format.

   c. If ControlLogix, set the **PLC Controller Slot Number**. This varies from zero to (max slot number −1), but *must* always be zero for

Ethernet/IP Settings

Rx (To PLC) Ethernet Transfer Method:	Write-to-Tag/File
PLC IP Address:	192.168.2.60
PLC Controller Slot Number (ControlLogix Family):	0
Maximum PLC Update Rate (Write-To-Tag/File):	40 (msec)
Rx (To PLC) Produced Data Tag/File Name:	Com1_RxData

Note: File names for SLC/PLC-5 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:	☐

   CompactLogix. For example, if the PLC has seven slots, the slot number range would be zero to six. (This field is ignored for SLC/PLC-5 PLCs.)

   ControlLogix PLCs: Set the **Rx (To PLC) Produced Tag Name** to the name of the tag where you want the data placed. The tag must be an array of SINTs (bytes) large enough to hold the maximum sized data plus four bytes for the sequence number and length fields. The maximum size is 444 SINTs.

   SLC or PLC-5 PLCs:

   • Set the **Rx (To PLC) Produced Tag Name** to the file number where you want the data placed. This must be an integer file or files in sequence large enough for the maximum sized data plus two integers for the sequence number and length fields.

   • Set **(PLC-5/SLC) Rx MS Byte First** if you wish to receive data MS byte first (left to right in integer format).

7. Set the *Filtering/Data Extraction Configuration*:

   • If no filtering/data extraction is required, leave all filtering/data extraction settings to defaults.

   • If filtering/data extraction is required, go to *Filtering/Data Extraction Configuration (Patent Pending)* on Page 12.

8. Set the *Application TCP Connection Configuration*.

   • If no application socket interface is required, leave all application socket interface settings at defaults and the **Application Enable** option unselected.

   • If an application socket interface is required, go to *Application Socket Configuration (Patent Pending)* on Page 17.

9. Verify **Reset Port** and **Save in Flash** are selected and click on **Submit**.

If all is set up correctly, the DeviceMaster UP will place the data packets into the specified tag(s) or file locations. The first integer received is the sequence number. This is incremented with each new data packet. The next integer is the length, which indicates the number of bytes of data received. The rest is data.

The format of data sent to ControlLogix family PLCs:

Name	Data Type	Data Value(s)
Receive (DeviceMaster to PLC message data. **Structure of:** Produced data sequence Data length (in bytes) Data array	UINT UINT Array of USINT	0-65535 (FFFF Hex) 0-1024 0-255

For large received data packets over 440 bytes in size:

• Data larger than 440 SINTs require a series of tags of 444 SINT in size.

• The last tag can be smaller in size as long as the total length of all tags in the sequence is sufficient to hold the largest receive packet, plus four bytes for the sequence number and length parameters.

• Each tag must be named in sequence with the second tag having a **2** appended, the third having a **3** appended and so on. An example series of tags to hold large packets of received data would be: **Com1_RxData**, **Com1_RxData2**, **Com1_RxData3**, etc.

• All data will have been transferred to the PLC when the sequence number is updated.

The format of data sent to SLC/PLC-5 PLCs:

Name	Data Type	Data Value(s)
Receive (DeviceMaster to PLC message data. **Structure of:**		
Produced data sequence	UINT	0-65535 (FFFF Hex)
Data length (in bytes)	UINT	0-1024
Data array	Array of UINT	0-65535

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.

Configuring Read-Only Ethernet TCP/IP Devices

Use the following procedure to configure read-only socket devices.

1. Access the *Server Configuration* web page by entering the IP address in your web browser or by selecting **Web Manager** on the PortVision Plus toolbar.

   Note: *If you are using Internet Explorer and it does not display the web page correctly, select **Tools**/**Internet Options…**/**Clear History**/**Delete Files…** and refresh the DeviceMaster UP web page.*

2. Verify the Software is Ethernet/IP 3.02 or greater.

3. Click on **Ethernet Device Configuration** to open the *Ethernet Device Configuration* page.)

4. Open the configuration for each socket port by clicking on **Socket** *N*.

5. Under *Device TCP Connection Configuration*, select **Enable**.

   - If your Ethernet TCP/IP device requires another device to connect to it, configure the socket port on the DeviceMaster UP to **Connect** mode:

     - Leave **Listen** unselected.

     - Set **Connect To Mode** to **Connect-Always**.

     - Set the **Connect Port** to the socket port number of your Ethernet device.

     - Set the **Connect IP Address** to the IP address of your Ethernet device.

     - Set **Disconnect Mode** to **Never**.

   - If your Ethernet TCP/IP device is configured to connect to another device, configure the socket port on the DeviceMaster UP to **Listen** mode:

     - Select **Listen**.

     - Use the default **Listen Port** on the DeviceMaster UP of *8xxx* or designate your own.

     - Set **Connect To Mode** to **Never**.

     - Set **Disconnect Mode** to **Never**.

- Configure your Ethernet device to connect to the DeviceMaster UP at the DeviceMaster UP IP address and **Listen Port**.

- If you do not know if your device will connect to another Ethernet device, but do know your device's socket port and IP address, you can do the following to enable both the **Listen** and **Connect** modes:

Device TCP Connection Configuration

Enable:	☑
Listen:	☑
Listen Port:	8100
Connect To Mode:	Connect-Always ▼
Connect Port:	9100
Connect IP Address:	192.168.2.50
Disconnect Mode:	Never ▼
Idle Timer:	0 (msec)

  - Select **Listen**.
  - Use the default **Listen Port** on the DeviceMaster UP of *8xxx* or designate your own.
  - Set **Connect To Mode** to **Connect-Always**.
  - Set the **Connect Port** to the port number of your Ethernet device.
  - Set the **Connect IP Address** to the IP address of your Ethernet device.
  - Set **Disconnect Mode** to **Never**.
  - Optionally configure your Ethernet device to connect to the DeviceMaster UP at the DeviceMaster UP IP address and **Listen Port**.

6. Under *Ethernet/IP Settings*:

   a. Set **Rx (To PLC) Ethernet Transfer Mode** to **Write-to-Tag/File**.

   b. Set the **PLC IP Address** in **xxx.xxx.xxx.xxx** format.

   c. ControlLogix, set the **PLC Controller Slot Number**. This varies from zero to (max slot number –1), but must always be zero for CompactLogix. For example, if the PLC has seven slots, the slot number range would be zero to six.

      (This field is ignored for SLC/PLC-5 PLCs.)

Ethernet/IP Settings

Rx (To PLC) Ethernet Transfer Method:	Write-to-Tag/File ▼
PLC IP Address:	192.168.2.60
PLC Controller Slot Number (ControlLogix Family):	0
Maximum PLC Update Rate (Write-To-Tag/File):	40 (msec)
Rx (To PLC) Produced Data Tag/File Name:	Skt1_RxData

Note: File names for SLC/PLC-5 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:	☐

   d. Set the **Rx (To PLC) Produced Tag Name** for the appropriate environment.

      ControlLogix family PLCs: Set this field to the name of the tag where you want the data placed. The tag must be an array of SINTs (bytes) large enough to hold the maximum sized data plus four bytes for the sequence number and length fields. The maximum size is 444 SINTs.

      SLC or PLC-5 PLCs:

      - Set the **Rx (To PLC) Produced Tag Name** to the File number where you want the data placed. This must be an Integer file or files in sequence large enough for the maximum sized data plus two integers for the sequence number and length fields.

      - Set **(PLC-5/SLC) Rx MS Byte First** if you wish to receive data MS byte first (left to right in integer format).

      - For transmit only: set **(PLC-5/SLC) Tx MS Byte First** if you wish to transmit data MS byte first (left to right in integer format).

7. Set the *Filtering/Data Extraction Configuration*:

   - If no filtering/data extraction is required, leave all filtering/data extraction settings to defaults.

   - If filtering/data extraction is required, go to *Filtering/Data Extraction Configuration (Patent Pending)* on Page 12.

8. Set the *Application TCP Connection Configuration*:
   - If no application socket interface is required, leave all application socket interface settings at defaults and the **Enable** option unselected.
   - If an application socket interface is required, go to *Application Socket Configuration (Patent Pending)* on Page 17.

9. Verify **Reset Port** and **Save in Flash** are selected and click on **Submit**.

If all is set up correctly, the DeviceMaster UP will place the data packets into the specified tag(s) or file locations. The first integer received is the sequence number. This is incremented with each new data packet. The next integer is the length, which indicates the number of bytes of data received. The rest is data.

The format of data sent to ControlLogix family PLCs:

Name	Data Type	Data Value(s)
Receive (DeviceMaster to PLC) message data. **Structure of:**		
Produced data sequence	UINT	0-65535 (FFFF Hex)
Data length (in bytes)	UINT	0-2048
Data array	Array of USINT	0-255

For large received data packets over 440 bytes in size:

- Data larger than 440 SINTs require a series of tags of 444 SINT in size.
- The last tag can be smaller in size as long as the total length of all tags in the sequence is sufficient to hold the largest receive packet, plus four bytes for the sequence number and length parameters.
- Each tag must be named in sequence with the second tag having a **2** appended, the third having a **3** appended and so on.
- An example series of tags to hold large packets of received data would be: **Com1_RxData**, **Com1_RxData2**, **Com1_RxData3**, etc.
- All data will have been transferred to the PLC when the sequence number is updated.

The format of data sent to SLC/PLC-5 PLCs:

Name	Data Type	Data Value(s)
Receive (DeviceMaster to PLC) message data. **Structure of:**		
Produced data sequence	UINT	0-65535 (FFFF Hex)
Data length (in bytes)	UINT	0-2048
Data array	Array of UINT	0-65535

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.

Configuring Read/Write Devices

Follow the procedures in *Configuring Read-Only Serial Devices* on Page 2 or *Configuring Read-Only Ethernet TCP/IP Devices* on Page 4 and use the following procedure to complete the procedure for read/write devices.

1. Access the *Server Configuration* web page by entering the IP address in your web browser or by selecting **Web Manager** on the PortVision Plus toolbar.

    *Note: If you are using Internet Explorer and it does not display the web page correctly, select **Tools/Internet Options…/Clear History/Delete Files…** and refresh the DeviceMaster UP web page.*

2. Open the embedded web page for the serial or socket port.

    *   **Serial ports**: Set up the transmit serial packet identification.
        -   If desired, set the **STX (Start of transmission) Tx Append** in decimal format for the PLC and/or the application. This will append the STX byte(s) to your transmitted message. Refer to your *serial device's User Manual* for this setting.
        -   If desired, set the **ETX (End of transmission) Tx Append** in decimal format for the PLC and/or the application. This will append the ETX byte(s) to your transmitted message. Refer to your *serial device's User Manual* for this setting.
        -   **PLC-5/SLC PLCs**: set (**PLC-5/SLC) Tx MS Byte First** if you wish to transmit data MS byte first (left to right in integer format).
    *   **Socket ports**: **PLC-5/SLC PLCs**: set **(PLC-5/SLC) Tx MS Byte First** if you wish to transmit data MS byte first (left to right in integer format).

3. If any embedded web page settings have changed, verify **Reset Port** and **Save in Flash** are selected and click **Submit**.

4. Go to the appropriate discussion for your environment:

    *   *ControlLogix family PLCs* on Page 7
    *   *SLC/PLC-5 PLCs* on Page 10

ControlLogix family PLCs

1. Import the example PLC program l**oopbackExampleTagWrite.L5K** into RSLogix5000.

2. Copy the *User-Defined* data type **TxDataStruct** into your PLC program. The data format is as follows:
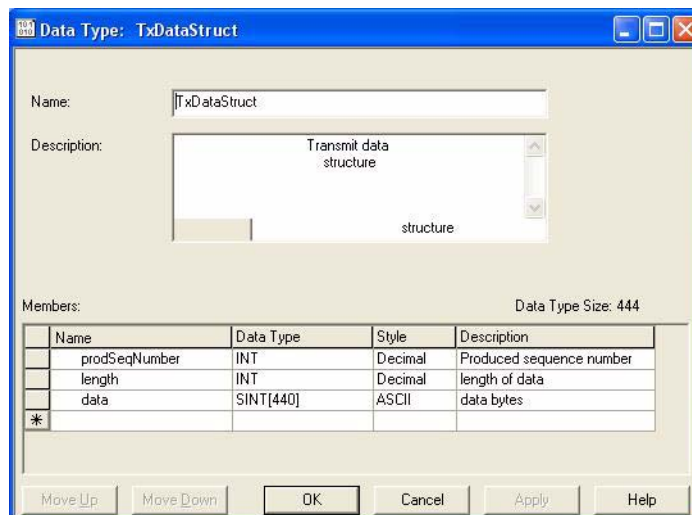
INT – Produced Sequence Number.

INT – Length of data filed in bytes.

SINT[440] – Data field (max size is 440, but that size may not be necessary for your application).

3. Create a **Controller** or **Program** tag with the **TxDataStruct** data type. Call it **Com1_TxDataStr** for a serial port and **Skt1_TxDataStr** for a socket port.

4. Open the **TX data tag**.

|						
▶	− Com1_TxDataStr	{...}	{...}		TxDataStruct	Transmit data stru...
	+ Com1_TxDataStr.prodSeqNumber	0		Decimal	INT	Transmit data stru...
	+ Com1_TxDataStr.length	256		Decimal	INT	Transmit data stru...
	+ Com1_TxDataStr.data	{...}	{...}	ASCII	SINT[440]	Transmit data stru...

   - Set the **TX tag** field length to the number of bytes you wish to transmit out the serial or socket port.
   - Input the data to transmit into the data array.
   - You can optionally increment the transmit sequence number prodSeqNumber with each message you transmit, but it is not required.

5. Create a message instruction for transmitting the data or copy **SendDataMsg** from **loopbackExampleTagWrite.L5K**.

6. Add the transmit message to your PLC program. It may help to reference rung 3 of **loopbackExampleTagWrite.L5K**.

7. Open the transmit message.

8. On the *Configuration Controller* pane:
   - Set **Message Type** to **CIP Generic**.
   - Set **Service Type** to **Set Attribute Single**.
   - Set **Class** to:
     - Serial ports: Set to **71 Hex**.
     - Socket ports: Set to **74 Hex**.
   - Set **Instance** to the serial or socket number.
   - Set **Attribute** to **1**.
   - Set **Source Element** to **Com1_TxDataStr** (or **Skt1_TxDataStr**).
   - Set **Source Length** to at least the length **TxDataStr.length** (or **Skt1_TxDataStr.length**) plus 4.
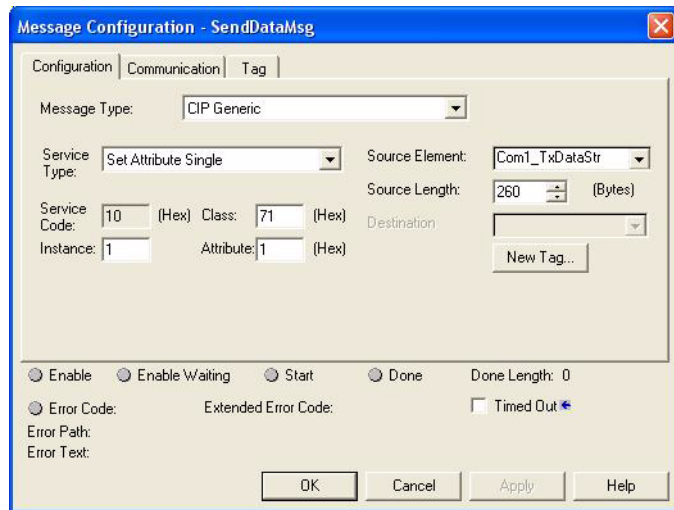
9. On the **Communication** pane:
   - Set **Path** to: **<Ethernet IP Card Name>,2,<IP Address>**. For CompactLogic PLCs, this must be **<Ethernet IP Card Name>,0,<IP Address>**.
   - Leave **Connected** unchecked.
   - Click **OK**.

10. Add controlling logic to your PLC program to control when to transmit the message. You may wish to use **loopbackExampleTagWrite.L5K** as a reference.
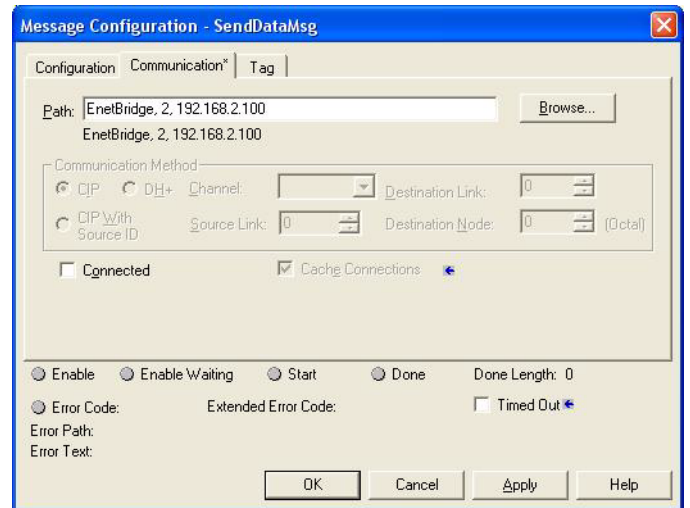
SLC/PLC-5 PLCs

1. Create a **Data File** to send the transmit data. It will have the form of:

   • Integer - Produced Sequence Number

   • Integer - Length of data field in bytes.

   • Integer[] - Data field array large enough to hold all data to transmit (two bytes or characters per integer).

2. Open the **TX Data** File.

3. Set the second integer to the length of data to transmit in bytes.

4. Input the data to transmit starting at the third integer. It can be entered from left to right in each integer, MS Byte First, or from right to left which is LS Byte First.
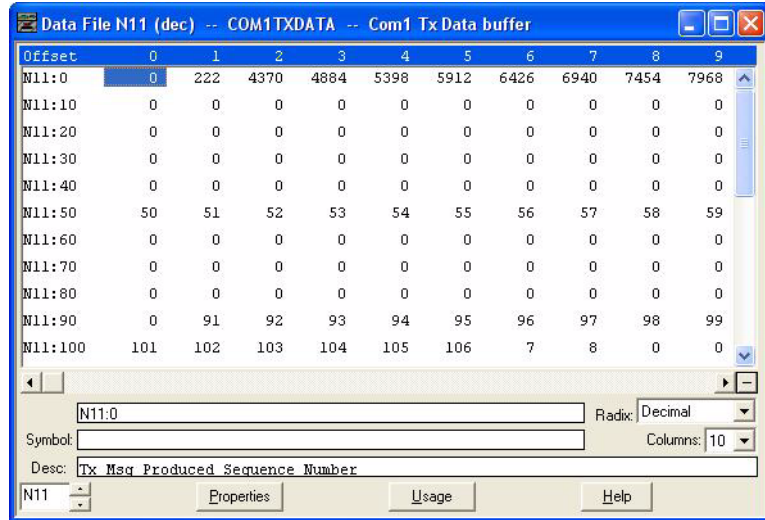
   For operating in the MS Byte First mode, you must set the **(PLC-5/SLC) Rx MS Byte First** and **(PLC-5/SLC) Tx MS Byte First** settings on the corresponding serial or socket port on the DeviceMaster UP embedded web page.

5. Optionally, increment the transmit sequence number in the first **TX Data File** integer with each message you transmit.

6. Create a transmit message of either **PLC5** or **SLC (500CPU) Write**.

7. Set up a control message block of the appropriate length.

8. Add the message to your ladder logic.
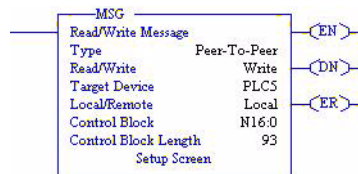
9. Open the *Setup* screen and in the *General* pane, under *This Controller*:

   a. Set **Data Table Address** to that of the **TX Data File** in your PLC program. (i.e. **N11:0**)

   b. Set **Size in Elements** to be at least large enough to contain the entire **TX Data message**. That will include the sequence number, length, and data integers. The DeviceMaster UP will only send the number of bytes specified in the second message integer and will ignore any extra data.

   c. Set **Channel** to that of your Ethernet channel.
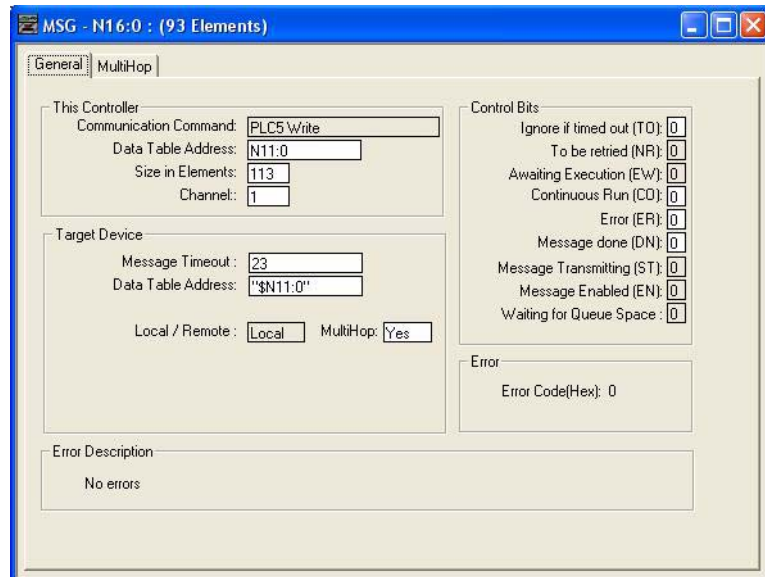
10. In the *General* pane, under *Target Device*:

    a. Leave **Message Timeout** to the default value.

    b. Set **Data Table Address** to that of the corresponding transmit address of the serial or socket port on the DeviceMaster UP.

       Serial Port 1 = N11:0
       Serial Port 2 = N21:0
       Serial Port 3 = N31:0
       Serial Port 4 = N41:0
       Socket Port 1 = N51:0
       Socket Port 2 = N61:0
       Socket Port 3 = N71:0
       Socket Port 4 = N81:0

11. In the *MultiHop* pane:

    a. First line: set the IP address to that of the DeviceMaster UP.

    b. Second line: set the ControlLogix Backplane to 0 (zero).

12. Add controlling logic to your PLC program to control when to transmit the message. You may wish to use one of the write-to-file example programs as a reference:

- PLC-5: **lpbkExamplePlc5MsgFileRS5**

- SLC: **lpbkExampleSlcMsgFileRS500**
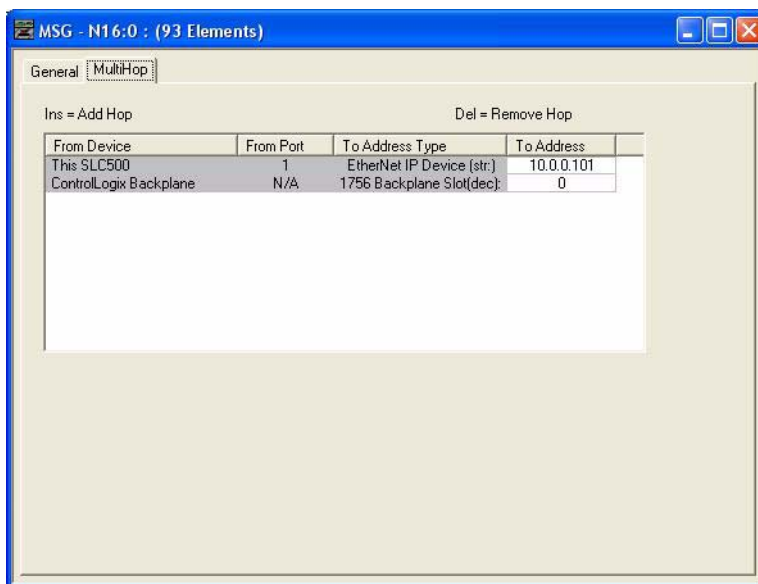
Filtering/Data Extraction Configuration (Patent Pending)

Select your filtering mode(s):

- Use *String* Filtering if:
    - Your received data can be no greater than 128 bytes in length.
    - Your received data is not in EPCglobal or barcode UPC/EAN formats or you do not want the DeviceMaster UP to extract the RFID tag or barcode parameters.
    - You want to filter and eliminate duplicate received messages.
- Use *RFID* filtering if:
    - You have an Alien or Intermec RFID reader or another reader that can provide RFID tag data is ASCII hex format similar to either an Alien or Intermec reader.
    - Your data is in EPCglobal format and you want the DeviceMaster UP to extract the RFID tag data parameters and filter based on those parameters.
- Use *Barcode* filtering if your barcode data is in UPC-A, UPC-E, EAN-13, JAN, EAN-14, or EAN-8 formats and you want the DeviceMaster UP to extract the barcode data parameters and filter based on those parameters.

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

PLC Filtering/Data Extraction

Under the *Filtering/Data Extraction Configuration* section corresponding to the desired serial or socket port:

1. Set **To PLC Filter Mode** to the desired mode.
2. **For String (128 char max**): set the **Filter Age Time** to how long after the last read you want an entry to be filtered.
3. Go to the appropriate discussion for your environment.
    - *RFID (EPCglobal Formats)* on Page 13
    - *Barcode (UPC/EAN Formats)* on Page 14

RFID (EPCglobal Formats)

1. Set any or all of the **To PLC Filter Options (RFID Only)** filtering options.
2. Set any or all of the **To PLC Filter Options (RFID/Barcode)** filtering options.

   Note: *You must select at least one filtering option for filtering/data extraction to function.*
3. If **Antenna Grouping** is desired, set **RFID Antenna Grouping** option to reflect your antenna configuration.
4. Set the **RFID Reader Interface Type** to that of your RFID Reader configuration. If your RFID Reader is not listed, refer to the *DeviceMaster UP Filtering and Data Extraction Reference Guide* for the supported RFID reader interfaces. If your RFID reader format matches one of the listed formats, then set the **RFID Reader Interface Type** to that format.
5. Set the **Filter Age Time** to how long after the last read you want an entry to be filtered.
6. If you want the DeviceMaster UP to discard any non-RFID tag messages, set the **Discard Unrecognized Data** to either **To-PLC** or **To-PLC/Application**.

   Refer to the *DeviceMaster UP Filtering and Data Extraction Reference Guide* for more information.

   To PLC RFID Data Format: When the PLC interface is operating in RFID filtering mode, all data sent to the PLC will be in the following format:

Field	Data Type	Description
Produced data sequence number	UINT Values = 0-65535 (FFFF Hex)	Sequence number that is incremented with each new message.
Length of RFID message	UINT Values = 20-148	Length in bytes of following data.
Company Code	UDINT[2]	Company Code extracted from tag data. Depending on encoding scheme, this field may include Company Prefixes, Company Prefix Indexes, or Government Managed Identifier.
Product/Location Code	UDINT[2]	Product Code extracted from tag data Depending on encoding scheme, this field may include the Item Reference, Location Reference, Asset Reference, Object Class, or be set to zero.
Serial Number	UDINT[2]	Serial Number extracted from tag data. Depending on the encoding scheme, this field may include the Serial Number or Individual Asset Reference.
Encoding Scheme	UINT	Encoding Scheme from tag data.
Filtering Value	UINT	Filtering value from tag data.
Antenna Number	UINT	Antenna number on RFID reader/scanner.
Tag Data Length	UINT	Length of RFID tag string in bytes
Tag Data	BYTE[128]	Tag data string (variable length field). May also include non-tag messages, which can optionally be sent to the PLC and/or application

Barcode (UPC/EAN Formats)

1. Set any or all of the **To PLC** filter options **(RFID/Barcode)** filtering options.

   Note: You must select at least one for the filtering/data extraction to function.

2. If you are using *standard* twelve to fourteen digit UPC/EAN barcodes, set the **Barcode UPC/EAN 12-14 Digit Format** to match that of your barcodes. The **Company-5/Product-5** is the most popular format.

3. If you are using *eight* digit UPC/EAN barcodes, set the **Barcode UPC/EAN 8 Digit Format** to match that of your barcodes.

4. If you want the DeviceMaster UP to discard any non-RFID tag messages, set the **Discard Unrecognized Data** to either **To-PLC** or **To-PLC/Application**.

Refer to the *DeviceMaster UP Filtering and Data Extraction Reference Guide* for more information:

To PLC Barcode Data Format: When the PLC interface is operating in barcode filtering mode, all data sent to the PLC will be in the following format:

Field	Size	Description
Produced data sequence number	UINT Values = 0-65535 (FFFF Hex)	Sequence number that is incremented with each new message.
Length	UINT Values = 12-140	Length in bytes of following data.
Company Code	UDINT	Company Code.
Product Code	UDINT	Product Code.
Numbering Code	UINT	Numbering code (from first byte(s) of barcode data).
Barcode Data Length	UINT	Length of barcode string in bytes.
Barcode Data	BYTE[128]	Barcode data string (variable length field).

   Note: The Company Code will be set to zero for all EAN-8 codes.

Application Filtering/Data Extraction

Access the *Filtering/Data Extraction Configuration* section corresponding to the desired serial or socket port:

1. Set **To Application Filter Mode** to the desired mode.

2. For **String (128 char max)**: set the **Filter Age Time** to how long after the last read you want an entry to be filtered.

3. Use the appropriate procedure for your environment:
   - *RFID (EPCglobal Formats)* on Page 15
   - *Barcode (UPC/EAN Formats)* on Page 16

RFID (EPCglobal Formats)

1. Set any or all of the **To Application Filter Options (RFID Only)** filtering options.

2. Set any or all of the **To Application Filter Options (RFID/Barcode)** filtering options.

   Note: *You must select at least one filtering option for filtering/data extraction to function.*

3. If **Antenna Grouping** is desired, set **RFID Antenna Grouping** option to reflect your antenna configuration.

4. Set the **RFID Reader Interface Type** to that of your RFID reader configuration. If your RFID reader is not listed, refer to the *DeviceMaster UP Filtering and Data Extraction Reference Guide* for the supported RFID reader interfaces. If your RFID reader format matches one the listed formats, the set the **RFID Reader Interface Type** to that format.

5. Set the **Filter Age Time** to how long after the last read you want an entry to be filtered.

6. If you want the DeviceMaster UP to discard any non-RFID tag messages, set the **Discard Unrecognized Data** to either **To-Application** or **To-PLC/Application**.

Refer to the *DeviceMaster UP Filtering and Data Extraction Reference Guide* for more information.

To Application RFID Data Format: When the application interface is operating in RFID filtering mode, all data sent to the application is in the following format:

Field	Data Type	Description
Company Code	UDINT[2]	Company Code extracted from tag data. Depending on encoding scheme, this field may include Company Prefixes, Company Prefix Indexes, or Government Managed Identifier.
Product/Location Code	UDINT[2]	Product Code extracted from tag data. Depending on encoding scheme, this field may include the Item Reference, Location Reference, Asset Reference, Object Class, or be set to zero.
Serial Number	UDINT[2]	Serial Number extracted from tag data. depending on the encoding scheme, this field may include the Serial Number or Individual Asset Reference.
Encoding Scheme	UINT	Encoding Scheme from tag data.
Filtering Value	UINT	Filtering Value from tag data.
Antenna Number	UINT	Antenna Number on RFID reader/scanner.
Tag Data Length	UINT	Length of RFID tag string in bytes.
Tag Data	BYTE[128]	Tag data string (variable length field). May also include non-tag messages, which can optionally be sent to the PLC and/or application

Note: *The RFID parameters will be sent to the application in big-endian format. All parameters, with the exception of the tag data string, will have to be byte-swapped for use on a little-endian system.*

Barcode (UPC/EAN Formats)

1. Set any or all of the **To Application Filter Options (RFID/Barcode)** filtering options.

   Note: *You must select at least one for the filtering/data extraction to function.)*

2. If you are using *standard* twelve to fourteen digit UPC/EAN barcodes, set the **Barcode UPC/EAN 12-14 Digit Format** to match that of your barcodes. The **Company-5/Product-5** is the most popular format.

3. If you are using *eight* digit UPC/EAN barcodes, set the **Barcode UPC/EAN 8 Digit Format** to match that of your barcodes.

4. If you want the DeviceMaster UP to discard any non-RFID tag messages, set the **Discard Unrecognized Data** to either **To-Application** or **To-PLC/Application**.

Refer to the *DeviceMaster UP Filtering and Data Extraction Reference Guide* for more information.

To Application Barcode Data Format: When the application interface is operating in barcode filtering mode, all data sent to the application is in the following format:

Field	Size	Description
Company Code	UDINT	Company Code
Product Code	UDINT	Product Code
Numbering Code	UINT	Numbering Code (from first byte(s) of barcode data)
Barcode Data Length	UINT	Length of barcode string in bytes
Barcode Data	BYTE[128]	Barcode data string (variable length field)

Note: *The Company Code will be set to zero for all EAN-8 codes. The Barcode parameters will be sent to the application in big-endian format. All parameters, with the exception of the barcode data string, will have to be byte-swapped for use on a little-endian system.*

Application Socket Configuration (Patent Pending)

Access the *Application TCP Connection Configuration* section corresponding to the desired serial or socket port:

1. Select **Enable**.

2. If your Ethernet TCP/IP application requires another device to connect to it, configure the socket port on the DeviceMaster UP to **Connect** mode:

   a. Leave **Listen** unselected.

   b. Set **Connect To Mode** to **Connect-Always**.

   c. Set the **Connect Port** to the socket port number of your Ethernet application.

   d. Set the **Connect IP Address** to the IP address of your Ethernet application.

   e. Set **Disconnect Mode** to **Never**.

3. If your Ethernet TCP/IP application is configured to connect to another device, configure the socket port on the DeviceMaster UP to *Listen* mode:

   a. Select **Listen**.

   b. Use the default **Listen Port** on the DeviceMaster UP of *8xxx* or designate your own.

   c. Set **Connect To Mode** to **Never**.

   d. Set **Disconnect Mode** to **Never**.

   e. Configure your Ethernet application to connect to the DeviceMaster UP at the DeviceMaster UP IP address and **Listen Port**.

4. If you do not know if your application will connect to another Ethernet device, but do know your application's socket port and IP address, you can do the following to enable both the *Listen* and *Connect* modes:

   a. Select **Listen**.

   b. Use the default **Listen Port** on the DeviceMaster UP of *8xxx* or designate your own.

   c. Set **Connect To Mode** to **Connect-Always**.

   d. Set the **Connect Port** to the socket port number of your Ethernet application.

   e. Set the **Connect IP Address** to the IP address of your Ethernet application.

   f. Set **Disconnect Mode** to **Never**.

   g. Optionally configure your Ethernet application to connect to the DeviceMaster UP at the DeviceMaster UP IP address and **Listen Port**.

This page was left intentionally blank.