Communications Application Note

CAN-6, rev. 1, 6/23/2009

Applicable Products: Epsilon EP-P, FM3E, FM4E

Ethernet Explicit Messaging from Allen Bradley MicroLogic 1100 PLC to Epsilon EP-P, FM3E or FM4E

Objective

Develop an application solution to allow the low cost, Ethernet enabled MicroLogix PLC to communicate to Control Techniques Ethernet drives

Overview

The MicroLogix 1100 PLC is Allen Bradley's lowest cost Ethernet enabled PLC. A very powerful distributed control system can be implemented by using this low end PLC with the fully programmable Control Techniques drive product.

This application note is designed as a basis for basic reading and writing of an EP-P user variable to the PLC.

This application file will show the user how to configure the drive and PLC to:

- Read EP-P user variable var.var0 into PLC data file L12:0
- Write PLC data file L13:0 to EP-P user variable var.var1

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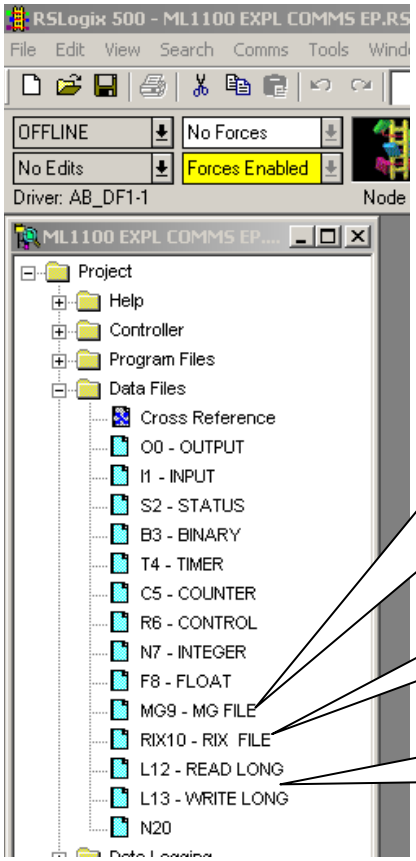
Setup the PLC

The MicroLogix 1100 PLC uses RS Logix 500 programming software. Only RS500 version 8.0 or higher can be used to configure the MSG instruction needed to communicate to the drives.

Step 1: Create the appropriate PLC data files within your RSLogix 500 application

- Create a Long Integer file to receive data from the drive
- Create a Long Integer file to hold data that will be sent to the drive
- Create a Message Data file to receive data from the drive
- Create an Extended Routing file to hold data that will be sent to the drive



Create a Message 'MG' data file.
At a minimum the size of the file should be 2 elements.

A single MG element will be needed for every MSG instruction used in the PLC code

Create an Extended Routing Information 'RIX' data file. This file type is used to store information used by the MSG instruction.
At a minimum the size of the file should be 2 elements.

A single RIX element will be needed for every MSG instruction used in the PLC code

Create two Long Integer 'L' data files, one for reading data and one for holding data.
At a minimum the size of the file should be 2 elements.

L data types are 32 bit integers.

Most data in the EP-P is also 32 bit integer; however some EP data is single bit or 16 bit integer

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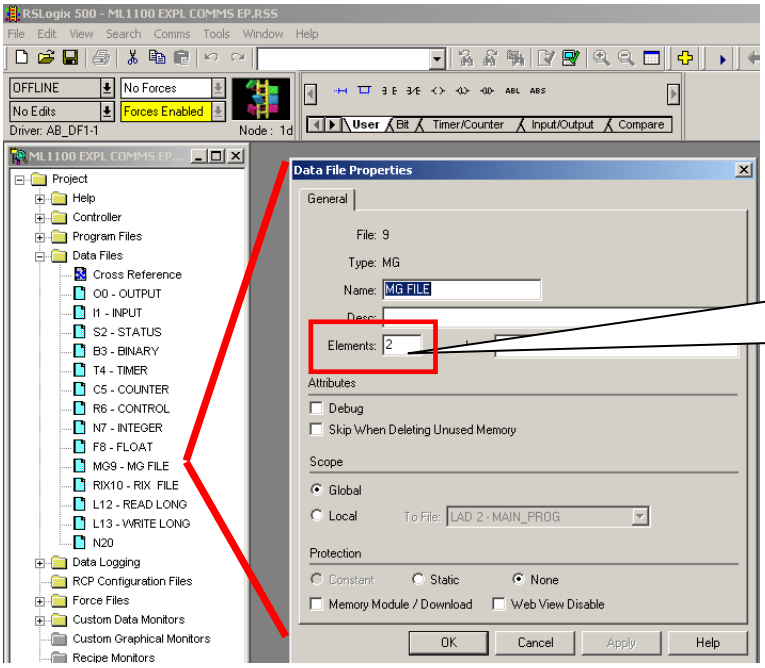
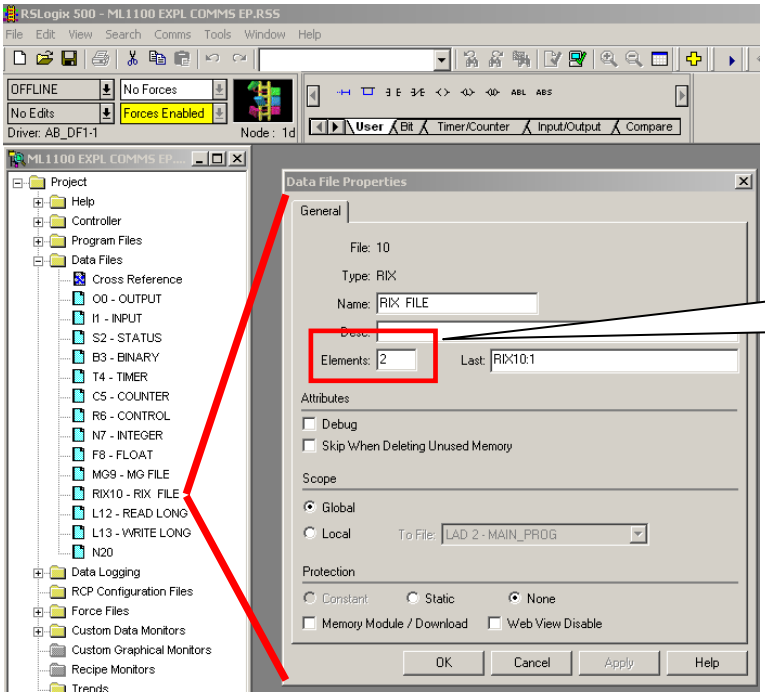
MG and RIX files:



MG file element setting: One element for each MSG instruction is needed



RIX file element setting: One element for each MSG instruction is needed

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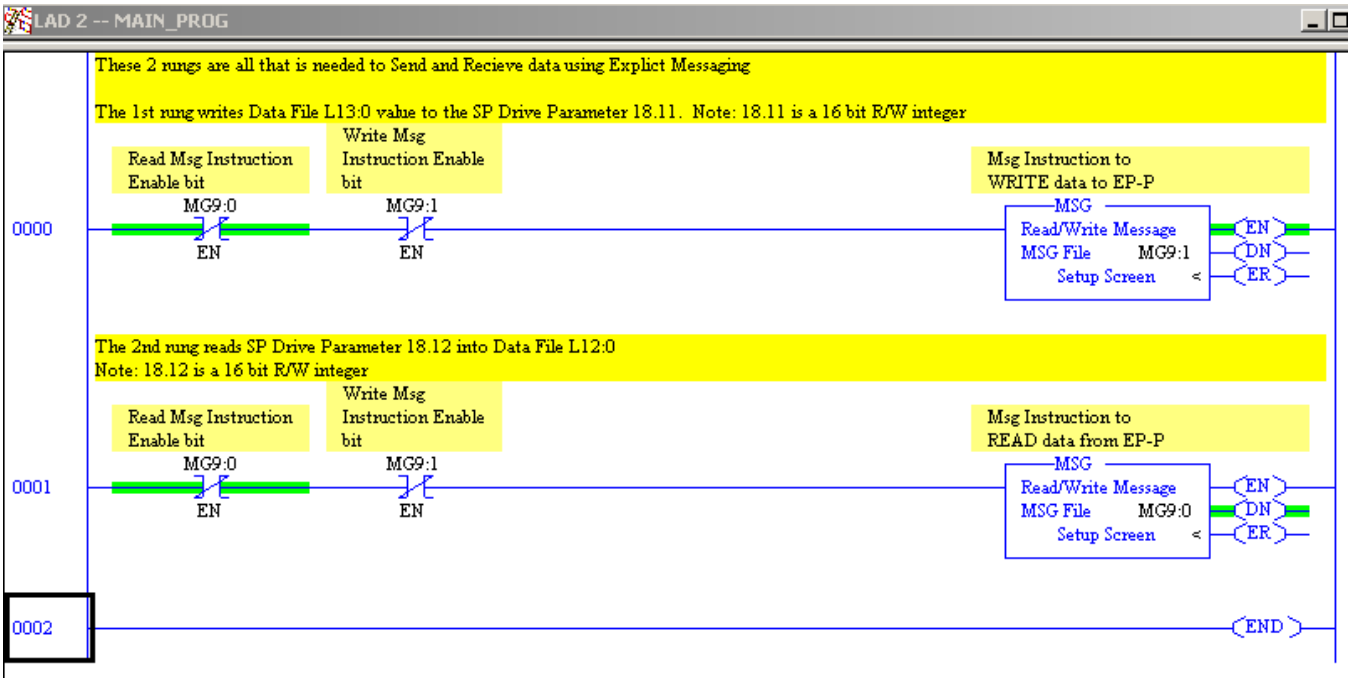
Step 2: Program the PLC

Program the ladder diagram as follows:

SP file !!!



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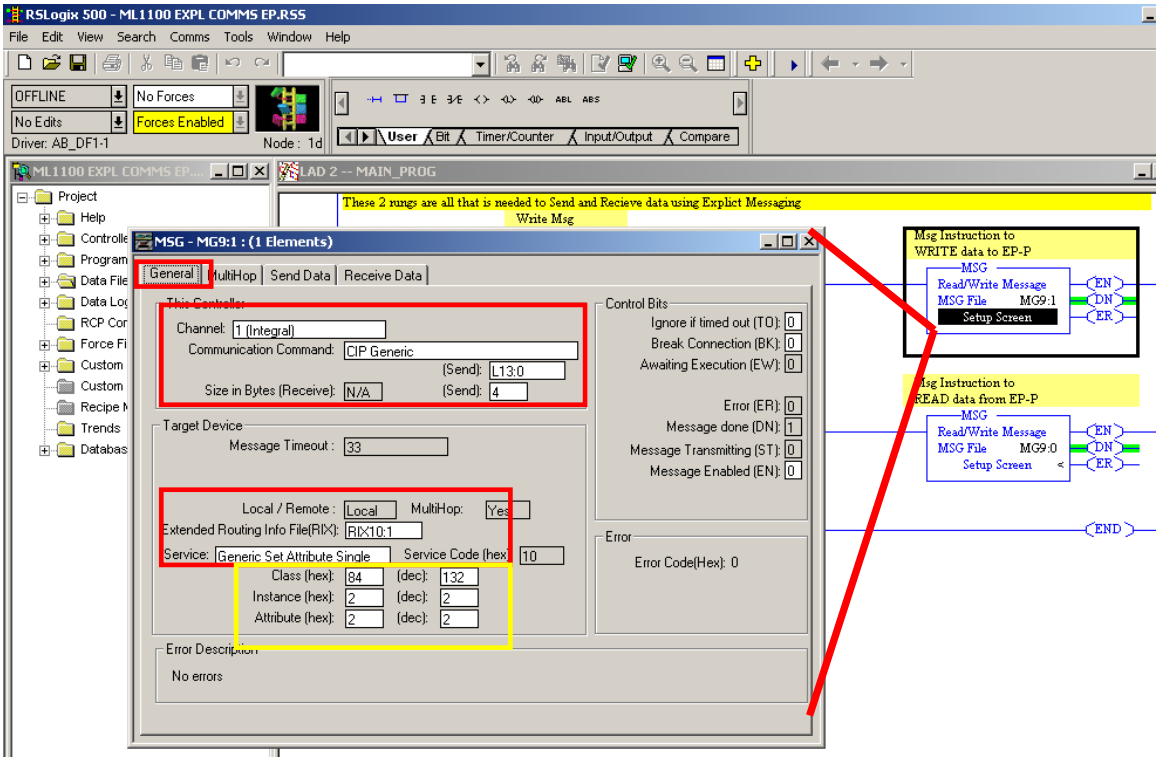
The Setup Screen for the Write MSG is shown here:

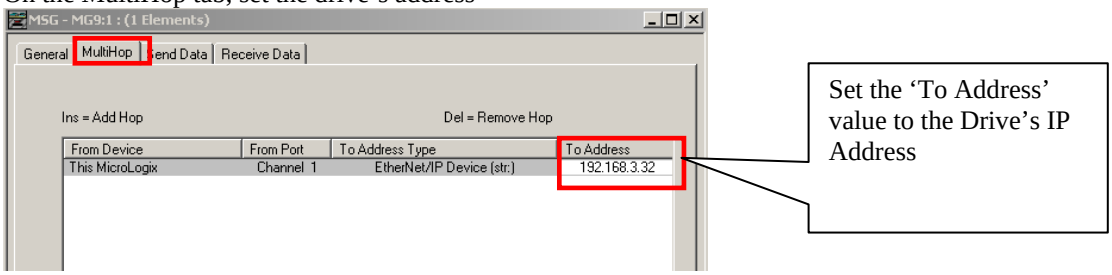
Set these values as shown:

- Channel
- Communications Command
- Send data file
- Size in Bytes (Send)
- Extended Routing Info
- Service

The Class, Instance and Attribute (C,I,A) values will be application dependent. Each drive parameter will have a unique Class, Instance and Attribute. See the ExplicitMessageMapping.PDF file located in the PowerTools installation directory for details. In our example C,I,A values of 132,2,2 (decimal) defines the user variable var.var1



On the MultiHop tab, set the drive's address



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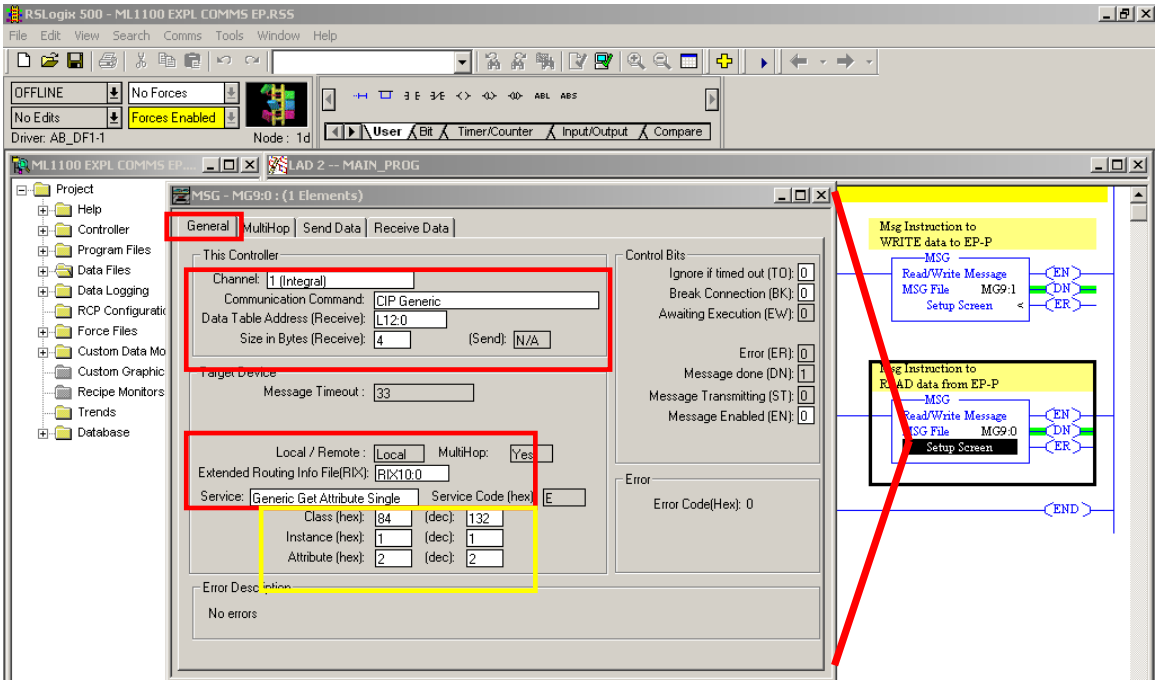
The Setup Screen for the READ MSG is shown here:

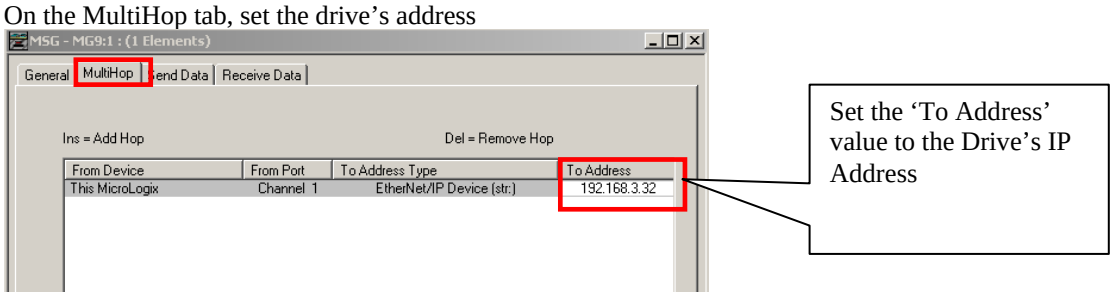
Set these values as shown

- Channel
- Communications Command
- Data Table Address (Receive)
- Size in Bytes (Receive)
- Extended Routing Info
- Service

The Class, Instance and Attribute values will be application dependent. Each drive parameter will have a unique Class, Instance and Attribute. See the ExplicitMessageMapping.PDF file located in the PowerTools installation directory for details. In our example C,I,A values of 132,1,2 (decimal) defines the user variable var.var0



On the MultiHop tab, set the drive's address



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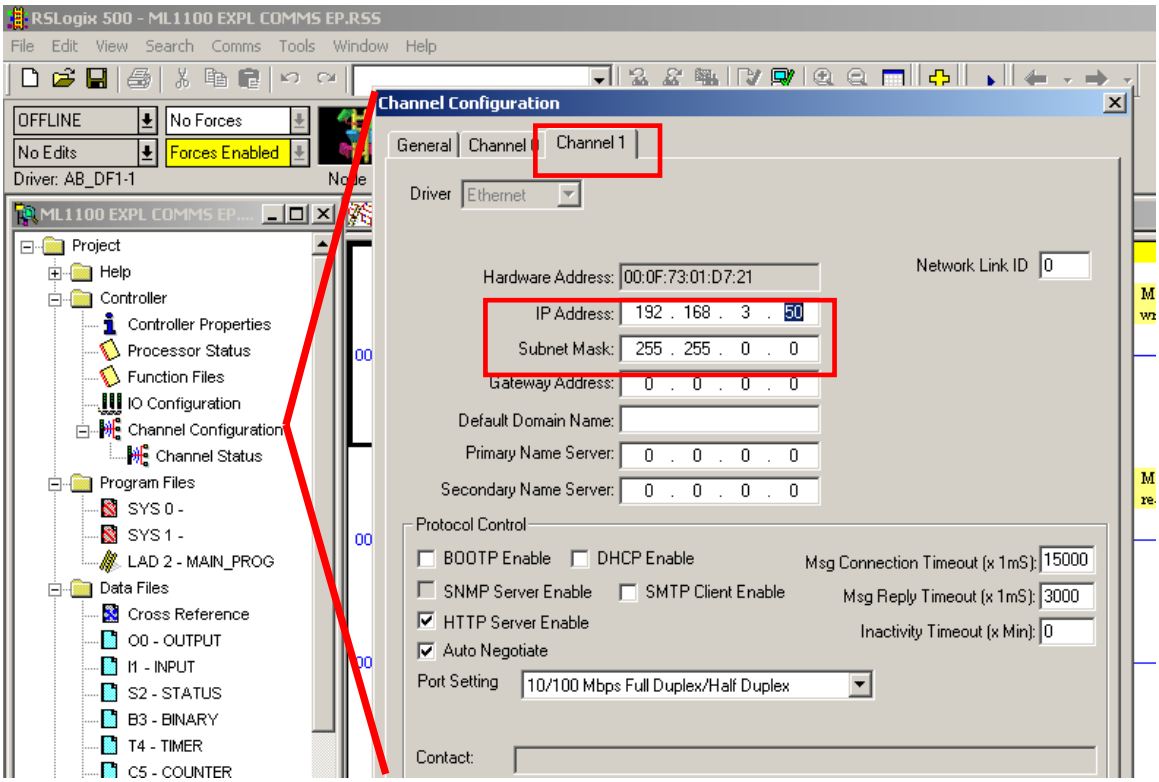
Step 3: Set the PLC's ethernet address

The PLC comes defaulted with no ethernet address. You will need to set the address to an appropriate value for your system and download the application through the PLC's serial port. Once the ethernet address has been assigned to the PLC, you will be able to use the ethernet port as the programming terminal



Download the PLC file and place the PLC in the Run condition.

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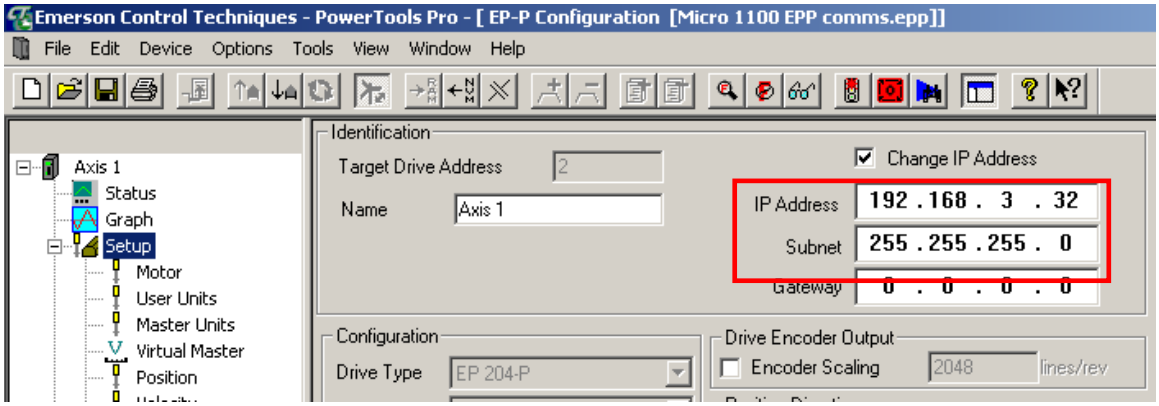
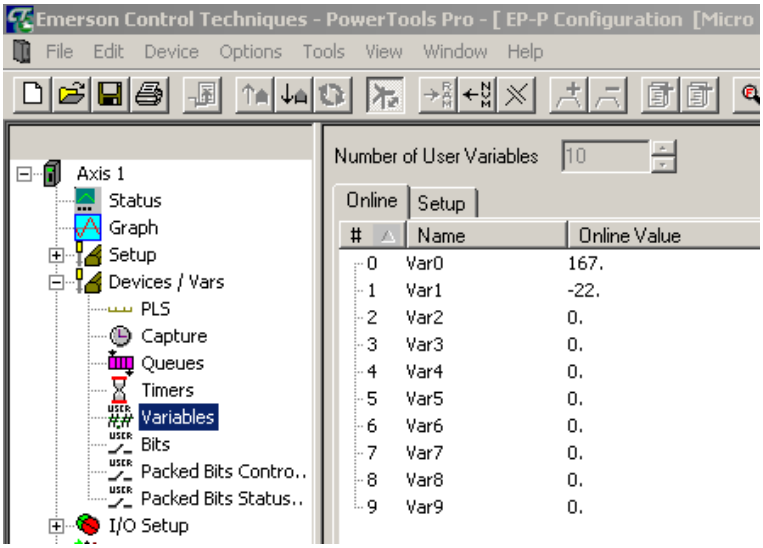
Set the EP-P Configuration

Set the Ethernet IP and Subnet:



Monitor the communications in the drive

Use the Variable View found under Devices/Vars within PowerTools to monitor the communications



Write variable values to the PLC

Use the Watch Window setup to write (force) variable to a specific value

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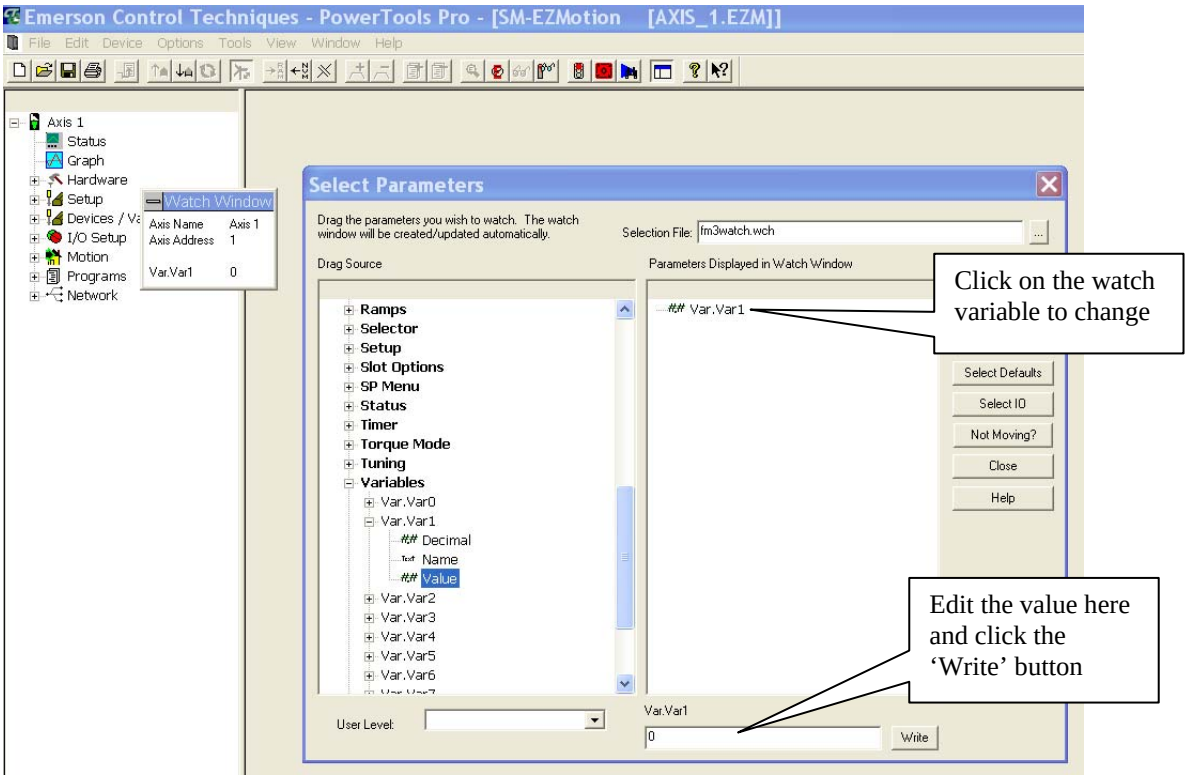
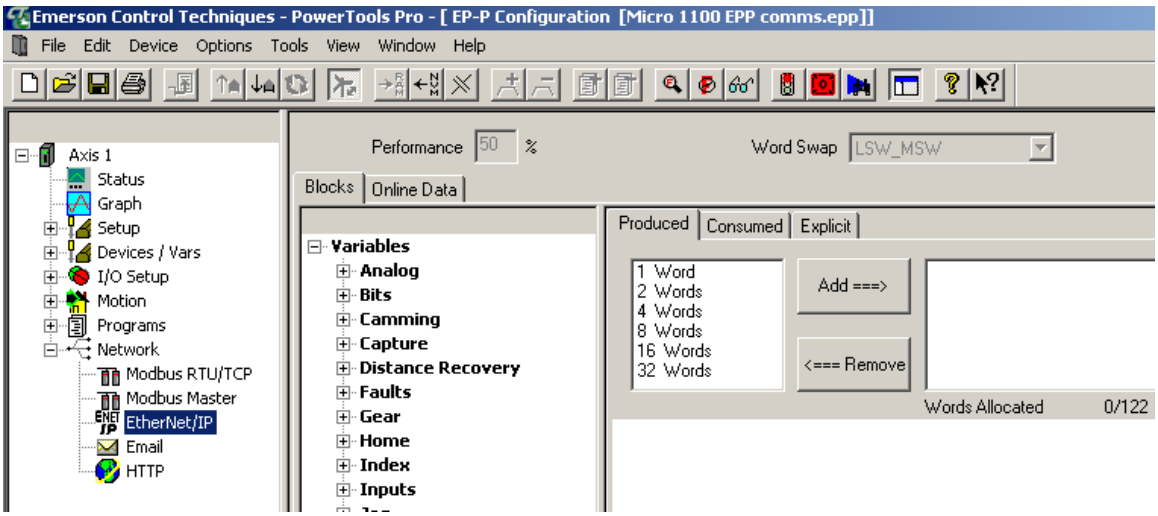


Most likely a user program will automate this updating of variables to the PLC, this watch window method is for commissioning and debug purposes.

Notice that PowerTools has an Ethernet/IP setup view.
For the purposes of this application note, No Ethenet/IP view setup are needed.



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