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Configuring a Rockwell PLC with Modbus TCP

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Introduction

Many AIMCO torque controllers come standard with Modbus TCP. A common use is interfacing them to an Allen-Bradley PLC for error proofing and data collection. This document is intended to configure a Rockwell PLC with Modbus TCP.

Equipment/Software

- Modbus capable controller from AIMCO.
 - Generation 4 controller (iEC4EGVP).
- 1769-L32E CompactLogix5332E Controller Rev 16.20.
- MVI69-MNET Modbus TCP/IP Master Module.
- ProSoft Configuration Builder version 4.1.0 (Build 4).
- RS-232 to RJ-45 Adapter.

Initial Setup

- Connect RS-232 to RJ-45 adapter to the Profibus module 'CFG' port.

ProSoft Configuration Builder

This document was developed in parallel with 'Using an AIMCO Controller on a Rockwell PLC with Modbus TCP'. It will establish the connection between the Modbus TCP Master Network Interface Module and the Modbus TCP capable slave.

Configuring the Connection

Open the ProSoft Configuration Builder (PCB) software. Open a new project, right click on 'Default Module' and select 'Choose Module Type'. The module we are using in this example is the MVI69-MNET. Mark the correct field in 'Product Line Filter' as well as the drop down menu under 'Select Module Type'. See Figure 1

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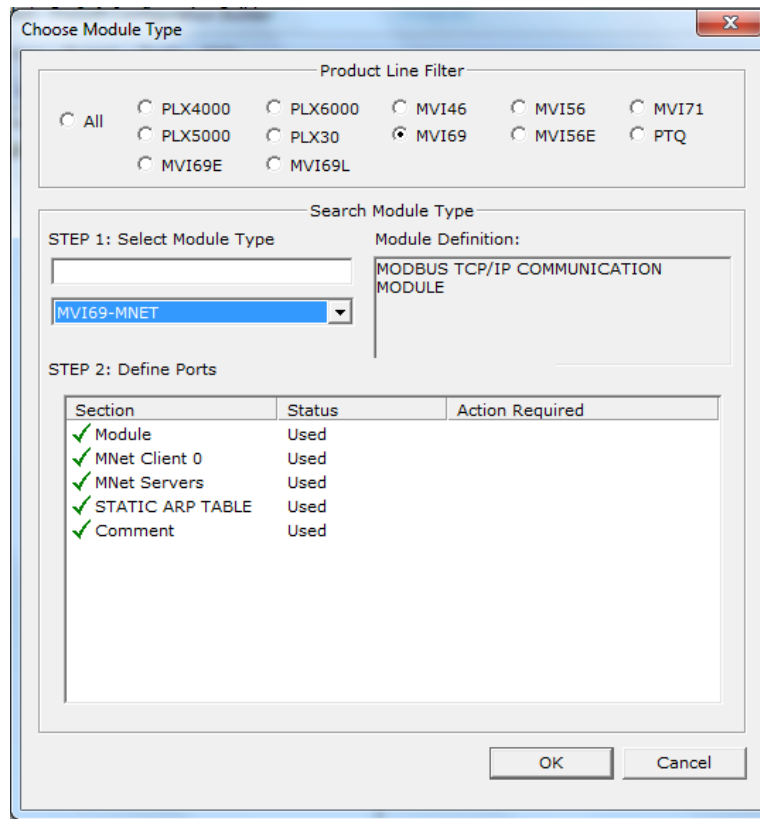


Figure 1 PCB Module Type

Click 'OK' when finished. The following screen should match Figure 2.

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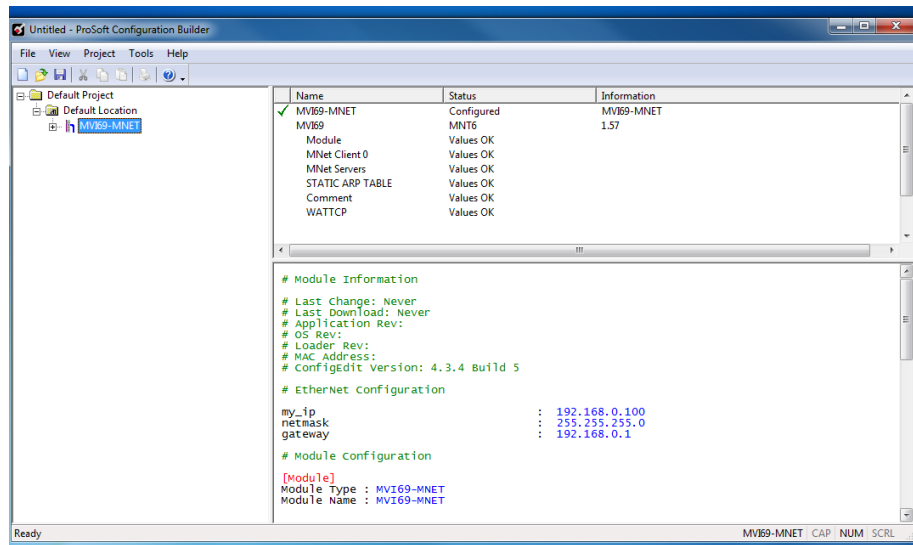


Figure 2 PCB Main Screen

Expand the 'MVI69-MNET' tree under 'Default Location' that now replaces the existing 'Default Module'. In that menu, expand 'Module' and double click 'Module'. Change the 'Read Register Count' and 'Write Register Count' to 300. Also change the 'Write Register Start' to 1000. See Figure 3. Click 'OK'

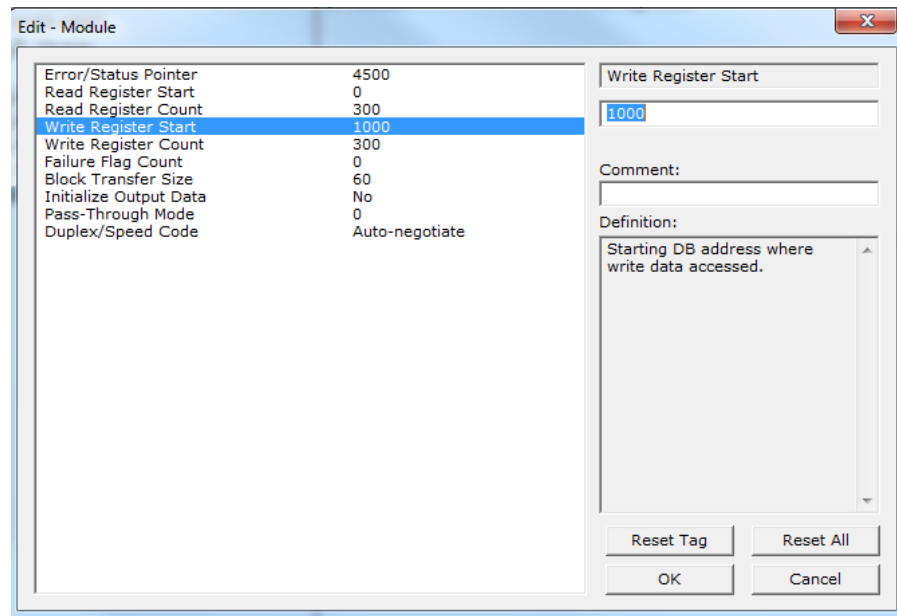


Figure 3 PCB Edit Modbus Module

Now expand 'MNET Client 0' and double click 'MNet Client 0'. Change the following:

- Error/Status Pointer - 4800
- Command Error Pointer - 4810
- Minimum Command Delay - 100
- Response Timeout - 100
- Retry Count - 1

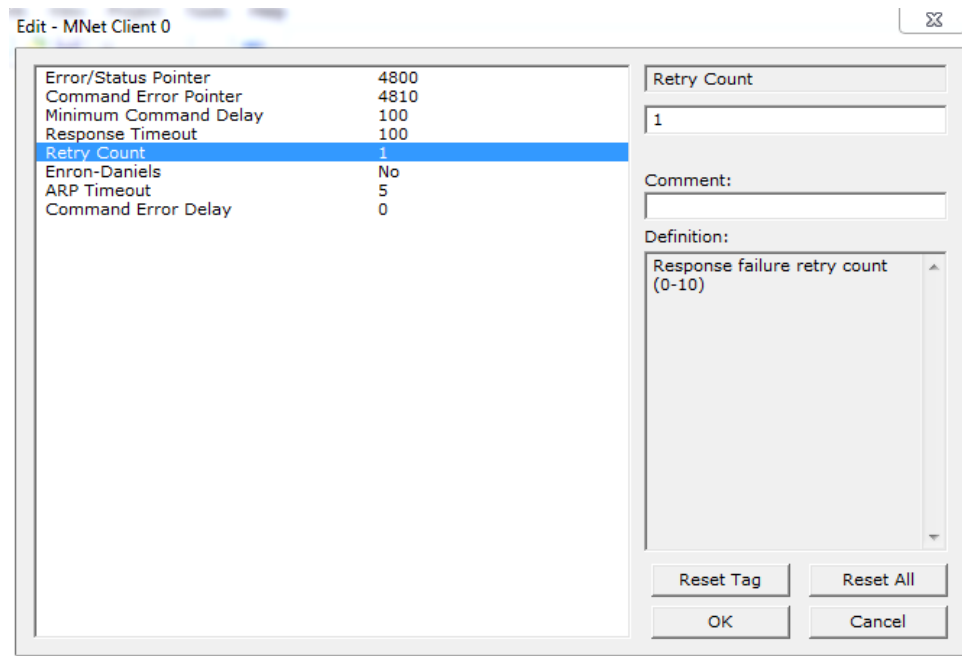
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Click 'OK'.

Figure 4 PCB Modbus TCP Client

Expand 'MNet Client 0 Commands'. To create a command, simply click 'Add Row' and make editions using 'Edit Row'. Configure the commands according to Figure 5. Click 'OK'.



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	Enable	Internal Address	Poll Interval	Reg Count	Swap Code	Node IP Address	Serv Port	Slave Address	ModBus Function	MB Address in Device	Comment
✓ 1	No	0	0	20	No Change	10.10.13.117	502	1	FC 1 - Read Coil (0x)	1000	
✓ 2	No	0	0	20	No Change	10.10.13.117	502	1	FC 2 - Read Input (1x)	0	
✓ 3	No	0	0	20	No Change	10.10.13.117	502	1	FC 3 - Read Holding Registers(4x)	1000	
✓ 4	Yes	0	0	20	No Change	10.10.13.117	502	1	FC 4 - Read Input Registers(3x)	0	
✓ 5	No	1000	0	20	No Change	10.10.13.117	502	1	FC 5 - Force (Write) Single Coil (2x)	1000	
✓ 6	No	1000	0	20	No Change	10.10.13.117	502	1	FC 6 - Preset (Write) Single Register(4x)	1000	
✓ 7	Yes	1000	0	20	No Change	10.10.13.117	502	1	FC 16 - Preset (Write) Multiple Register (4x)	1000	
✓ 8	Yes	30	0	20	No Change	10.10.13.117	502	1	FC 4 - Read Input Registers(3x)	0	

Figure 5 PCB Modbus TCP Client Commands

Expand 'MNet Servers' and double click 'MNet Servers'. The only value to change here is 'Output Offset' from 0 to 15. Click 'OK'.

Enron-Daniels	No
Output Offset	15
Bit Input Offset	0
Holding Register Offset	0
Word Input Offset	0
Connection Timeout	600

Output Offset: 15

Comment:

Definition:
 0 to 4999
 This parameter defines the start register for Modbus Command data in the internal database. This parameter is enabled when a value greater than 0 is set. For example, if the Output Offset value is set to 3000, data requests for Modbus Coil register address 00001 will use the internal database register 3000, bit 0. If the Output Offset value is set to 3000, data requests for Modbus Coil register address

Figure 6 PCB Modbus TCP MNet Servers



The last step in this process is to change the 'Ethernet Configuration' under the 'MVI69-MNET' tree. These values need to match the values on the Modbus module. If this does not match up, there will be no communication between the two devices. Click 'OK' when finished.

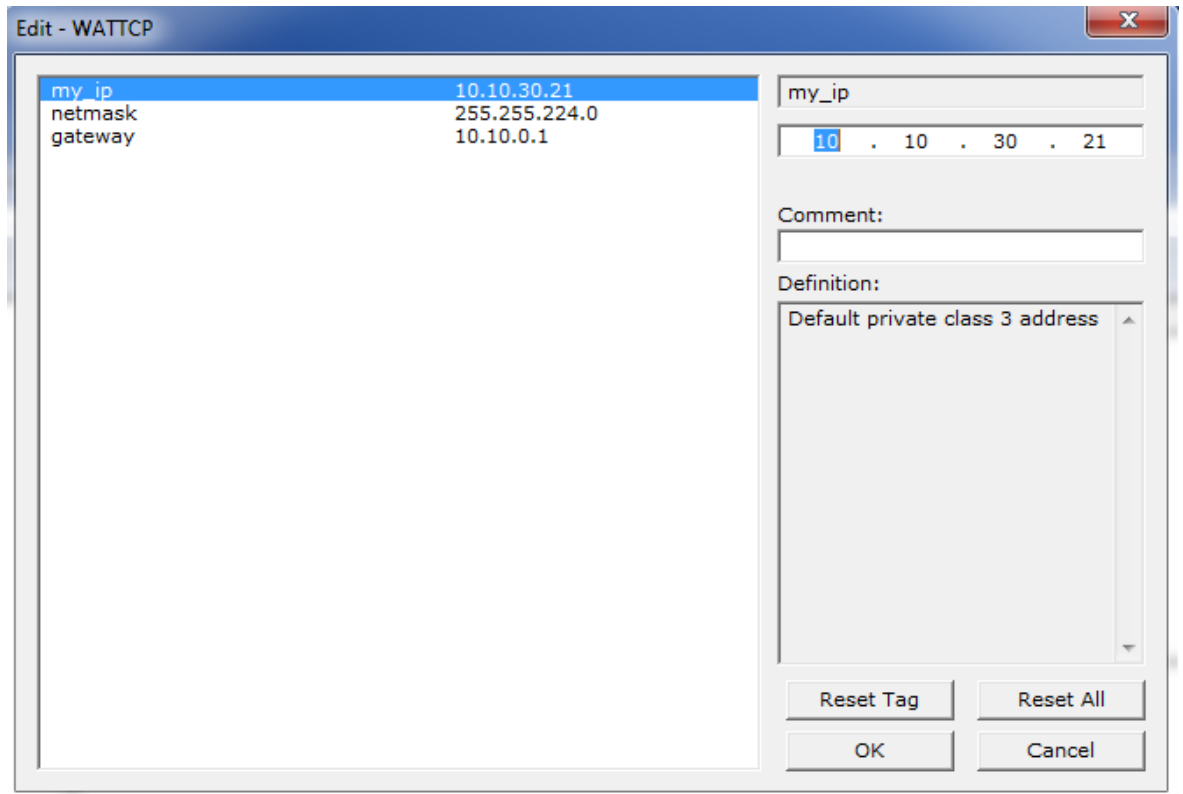


Figure 7 PCB Modbus TCP Ethernet Configuration

Save your settings. Right click on 'MVI69-MNET' and select 'Download from PC to Device'.

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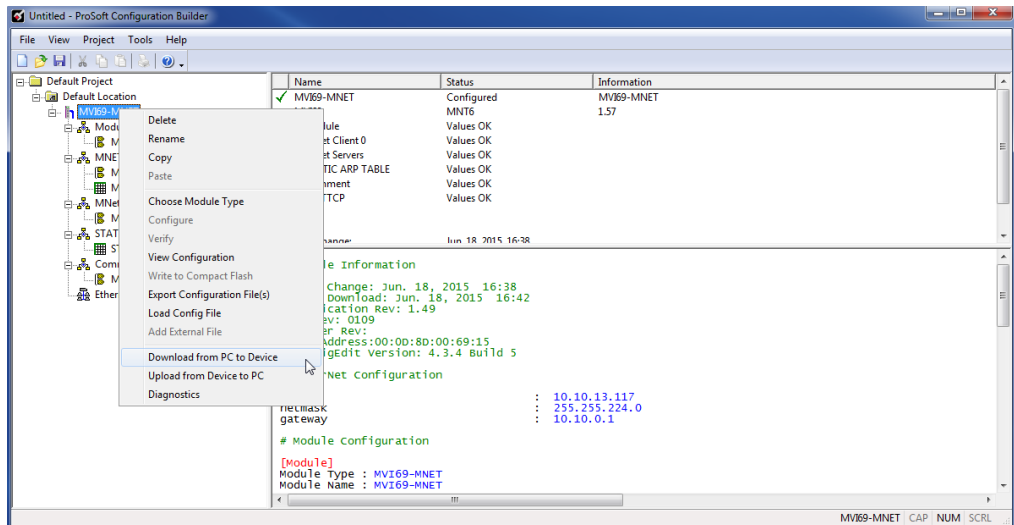


Figure 8 PCB Download

Select the 'Com' port being used to communicate with the Modbus master module. Click 'Download' when ready.

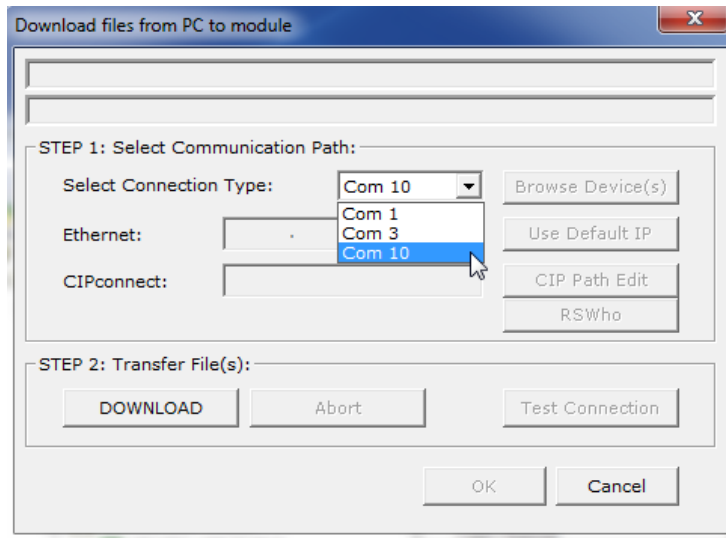


Figure 11 PCB Download

The AIMCO controller may need to be rebooted when the download has finished.