

10000 SE Pine Street

Portland, OR 97216

TEL: 800.852.1368

FAX: 503.262.3410

www.aimco-global.com

Configuring a Rockwell PLC with Modbus TCP

Authors: Kade Olson and Sam Stewart

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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

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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

TEL: 800.852.1368		Choose Mod	ule Type				-X
				Produ	uct Line Filter		
FAX: 503.262.3410		C AII	 C PLX4000 C PLX5000 C MVI69E 	 PLX6000 PLX30 MVI69L 	 MVI46 MVI69 	O MVI56 O MVI56E	C MVI71 C PTQ
				Search	Module Type-		
www.aimco-global.com		STEP 1: :	Select Module Tr MNET	ype	Module Defini MODBUS TCP MODULE	tion: //IP COMMUNIC	ATION
		Sectio		Status	Acti	ion Pequired	
		√ Moi √ MN √ STJ √ Coi	dule et Client 0 et Servers ATIC ARP TABLE mment	Used Used Used Used Used			
						ОК	Cancel
				Figure 1 PC	B Module T	уре	
	Click 'OK' when fi	nished. T	he followin	ng screen s	hould mat	tch Figure 2	2.



File View Project Tools Help					
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B- ☐ Default Project ☆ @ Default Location ⊕- ┣ MV269-MN27	Name ✓ MVI69-MNET MVI69 Module MVet Client 0 MVet Servers STATIC ARP TABLE Comment WATTCP	Name Information ✓ MM95-MNET Configured MM95 MM95 MM16 1.57 Module Value: 0K MM16 MM4t Client0 Value: 0K MM16 STATIC APP TABLE Value: 0K STATIC APP TABLE Value: 0K WattCD Value: 0K WATTCP Value: 0K Value: 0K			
	•		III		
	<pre># Mogule Information # Last Changes Never # Last Download: Nev # Application Rev: # 05 Rev: # Last Download: Nev # Last Download: Nev # Last Download: Nev # Coder Rev: # Last Changes # ConfigEdit Version # EtherNet Configura</pre>	er : 4.3.4 Build 5 tion			
	my_ip netmask gateway # Module Configuratio	on	192.168.0.100 255.255.255.0 192.168.0.1		
	[Module] Module Type : MVI69- Module Name : MVI69-	MNET			

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'

Error/Status Pointer Read Register Start Read Register Count	4500 0 300	Write Register Start
Write Register Start Write Register Count Failure Flag Count Block Transfer Size Initialize Output Data Pass-Through Mode Duplex/Speed Code	1000 300 60 No 0 Auto-negotiate	Comment: Definition: Starting DB address where write data accessed.
		Reset Tag Reset A

Figure 3 PCB Edit Modbus Module

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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'.



Edit -	MNet Clien	t 0 Commands									
	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 (DK)	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	
						III					
Interv	val Value Stat	tus - OK									
t to D	efaults	Add Row In	sert Row	Delete Row	Move Up	Move Down					
Edit F	10W	Copy Row	aste How		UK	Cancel					

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		
Bit Input Offset Holding Register Offset		15		
Word Input Offset Connection Timeout	0 600	Comment:		
		Definition:		
		0 to 4999 This parameter defines the start register for Modbus Command data in the interna 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 s to 3000, data requests for Modbus Coil register address		
		Reset Tag Reset		

Figure 6 PCB Modbus TCP MNet Servers

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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.

	Edit - WATTCP			X
10000 SE Pine Street	my_ip netmask gateway	10.10.30.21 255.255.224.0 10.10.0.1	my_ip	. 30 . 21
Portland, OR 97216			Comment:	
TEL: 800.852.1368			Definition:	ass 3 address 🔺
FAX: 503.262.3410				
/w.aimco-global.com				
			Reset Tag	TReset All
			ОК	Cancel
	Save your settings. Rig	Figure 7 PCB Modbus TCP Ethernet Cor ht click on 'MVI69-MNET' and select 'E	figuration Download from PC t	o Device'.

