

TESTING MODBUS FUNCTIONALITY OF EPAC-3.XMP MODULES

BASIC REQUIREMENTS:

- 1. Desktop or Laptop with windows OS & USB port
- 2. USB to 485 Converter
- 3. MODBUS MASTER Utility (Provided by AUMA INDIA PVT LTD.) or any other freeware.

Other Modbus testing softwares freely available can be also be used and they work similarly. Ex: ModSCAN32 or MODBUS TESTER Utility. The procedure to check with ModSCAN32 is explained after discussing the procedure to test with Auma Modbus Master.

The following block diagram shows the overview of connection to actuator from PC.



Data+ and Data - Lines

AUMA MODBUS MASTER

PREREQUISITES:

1. To run the 'Auma Modbus Master', Dot Net Framework 4.0 should be installed in the PC.

2. Once Dot Net Framework 4.0 installed, copy the Modbus Master to PC and run 'Modbus Master.exe' file.

2.1 Run the "Modbus Master.exe" (below image) program from the Modbus Master Folder.

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Remember that this should match the Modbus internal settings of 3.XMP modules which is to be checked. Also ensure that the 3.XMP module is in Remote: Two-Wire-Modbus mode.

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2.6 Press the start (Green) button to start communication. Application will start communicating with actuators 1 by 1 and populate the grid with status from each actuator. Each communication is shown at the bottom of the screen. The Red button is used to stop the communication between actuators.



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clicking on the 'Reset Counter' Button.

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MODBUS TESTING FUNCTIONALITY for EPAC – 3.XMP MODULES

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SHEET 9 OF 12

MODSCAN32

PREREQUISITES:

Download MODSCAN32 .exe file online.

1. Open MODSCAN 32 application then following window appears for configuration.

ModScan32 - ModSca1
File Connection Setup View Window Help
Binary or decimal selection
Address: 1001 MODBUS Point Type Valid Slave Responses: 0
Length: 3 03: HOLDING REGISTER
** Device NOT CONNECTED! **
41001: <00000000000000> 41002: <0000000000000> 41003: <00000000000000>

Configure the actuator to work in MODBUS – 2 Wire mode. Enter the Address as 1001 and Length as 3. Type in the correct device ID (Slave ID configured in the actuator). Select Modbus Point Type as *03: Holding Register*. Choose binary/decimal format(Marked in the above image) for viewing the register values. The Holding Registers are as follows.

	ADDRESS				DATA		
DESCRIP	TION	VALUE	RANGE (MIN-MAX)	STD. VALUI		MEANING)	
					BIT 0=1	ES	SD
					BIT 2=1	PV	′ST
REMO	OTE CONTROL	0x3E8			BIT 8=1	OP	'EN
					BIT 9=1	CLC	DSE
					BIT 12=1	ST	OP
					BIT 10=1	SET PO	INT BIT
READ V POSIT	alve Ton	0x3E9	0-1000				
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3. Click on 'Connection' in Toolbar and the Connections Window opens as below. Select the CO PORT, Baud Rate, Parity, Data and Stop bits for communication. Verify the settings set in t actuator and the MODSCAN32 are same. This settings can be seen by pressing the Close key in t Remote mode and Modbus enabled. Click OK to connect if correct. If not, go to program mode configure. 4. Proper connection can be verified by counter given for valid slave response which go incremented after each successful communication. Reset this counter if required to verify to same. 5. When decimal mode is selected as discussed in Step 2, the Valve Position can be seen in addre 41002 as shown below. As shown in the below image, the valve position is 327 which means 32.7 and this can be verified in the LCD display on the control module.	1 U			FUNCTIO	NALITY for E	PAC –	SHEET	10 O	- 12
 3. Click on 'Connection' in Toolbar and the Connections Window opens as below. Select the CO PORT, Baud Rate, Parity, Data and Stop bits for communication. Verify the settings set in t actuator and the MODSCAN32 are same. This settings can be seen by pressing the Close key in t Remote mode and Modbus enabled. Click OK to connect if correct. If not, go to program mode configure. Control Connection Control Control				3.XN	1P MODULE	S	011221		
Source decimal mode is selected as discussed in Step 2, the Valve Position is 327 which means 32.7 and this can be verified in the LCD display on the control module.	3. Clic POF actu Ren con	k on 'Connectio RT, Baud Rate, uator and the M note mode and figure.	on' in Toolb Parity, Data 10DSCAN32 Modbus en	ar and the C a and Stop b are same. Th abled. Click C	onnections W its for commu is settings can DK to connect	indow opens unication. Ver be seen by p if correct. If n	as below. Tify the set ressing the ot, go to p	Select th ttings set Close ke rogram n	ie CO in th y in th node t
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4. Proper connection can be verified by counter given for valid slave response which ge incremented after each successful communication. Reset this counter if required to verify t same. •••••••••••••••••••••••••••••				Phone Numbe Service Por	er: 193.168.1.157 t: 502				
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Step Bit: The step Bit: Th			Word Lengt	h: 8 🗸	Delay 0	ms after RTS before transmitting first character			
4. Proper connection can be verified by counter given for valid slave response which ge incremented after each successful communication. Reset this counter if required to verify t same. •••••••••••••••••••••••••••••••••••			Parit	y: NONE	Delay 0	rom slave ms after last character			
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đu			FUNCTIO 3.X	DNALITY for E	S PAC –	SHEET	11 OF	12
6. For disc sho	ModScal ddress: 1001 ength: 3 001: <00000> 002: <00327> 003: <00000> giving Remote step wn below.	Devi MOD 03: HOLD e Operation 2. Double	ce Id: 28 BUS Point Type DING REGISTER	Number of F Valid Slave	Polls: 4 Responses: 4 Reset Ctrs ecimal view t dress 41001 y	o bit wise ou will get	binary vie the windo	ew as ow as
7. 6.1	Address: 10 Length: 3 41001: <0000 41002: <0000 41003: <0000	U1 M(DDBUS Point Type	Number of Polis: Valid Slave Resp Node: 28 dress: 1001 Update Cancel	I 20 onses: 125 Reset Ctrs			
bit () selected).				LIOIT (EX. THE	above image	erepreser	113
	Bit 12	Bit 10	Bit 9	Bit 8 Bi	t 2 Bit	0		
	Stop	Set Point	Close	Upen P	vsi Sof	TESD		
8. Sele and 9. For bit sho 10. For	ect the bit for t click on updat Set Point, the should be upd uld be updated PVST, make s bling the PVST	the operation e button. V valve perce lated. Note d as 400. ure the PV bit in MOD	on(Open, Closerify if the se entage should the set w ST is enabled SCAN	se, Stop , PVST of lected operation d be updated in valve percentag d in the actuato	or Set-Point on is carried out the address 4 e is to be 409 or and its par	r ESD) to be correctly. 1003 and th %, the Mod ameters are	e carried o nen setpoi bus regist e set befo	int ter ore
			JCAN.					
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REV NO.	REVISION	SIGN	DATE	REV NO.		SIGN		TE 7 1 9
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						KIVIC	07.7	.18



11. Change Modbus point type to **04.** *Input Registers*. Change Length to 4 and verify the bits in the registers as per the table below. Each bit represents a status or a fault and is set when it occurs. It resets when the fault/status resets. Ensure if the bits are set correctly.

NOTE: PVST operation can be carried out only using MODSCAN32. The respective PVST input register can also be checked using the same software.

	Input Registers						
	0x3E8	0x3E9	0x3EA	0x3EB			
Bit 0	LOCAL POSITION	TSC		PVST Active			
Bit 1	REMOTE POSITION	TSO		PVST from Open EN			
Bit 2	RUNNING OPEN	LCS		PVST from Close EN			
Bit 3	RUNNING CLOSE	LSO		PVST percent 5			
Bit 4	STOPPED	LOCAL POSITION		PVST percent 10			
Bit 5	OPENED POSITION	REMOTE POSITION		PVST percent 15			
Bit 6	CLOSED POSITION	LOSS OF PHASE					
Bit 7	TSO	TH FAULT	Valve				
Bit 8	TSC	COMMON FAULT	(0-1000)				
Bit 9	TH	FAULT PHASE REVERSE	(0 1000)				
Bit 10	TOLR	RUNNING CLOSE					
Bit 11	JAMMED VALVE	RUNNING OPEN					
Bit 12	PHASE SEQ ERROR	ESD-HARDWIRED		PVST Running			
Bit 13	SET POINT REACHED	SET POINT REACHED		PVST Abort			
Bit 14	FAULT	CLOSED		PVST Fault			
Bit 15	LCS ACTIVATED	OPENED		PVST Complete			

REV NO.	REVISION	SIGN	DATE	REV NO.	REVISION	SIGN	DATE		
DRAWN KR 07.7.									
au	ma II		CHECKED	KMC	07.7.18				
	BANGAL	ORE -	APPROVED	YMJ	07.7.18				