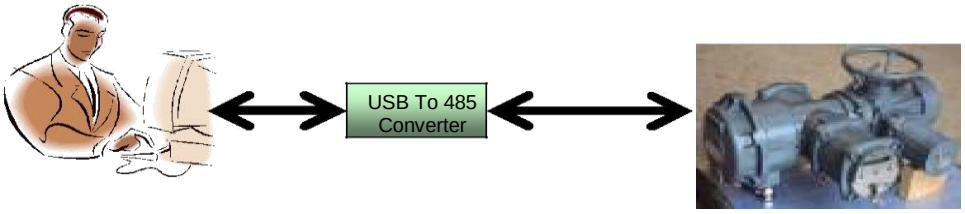
TESTING MODBUS FUNCTIONALITY OF EPAC-3.XMP MODULES

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

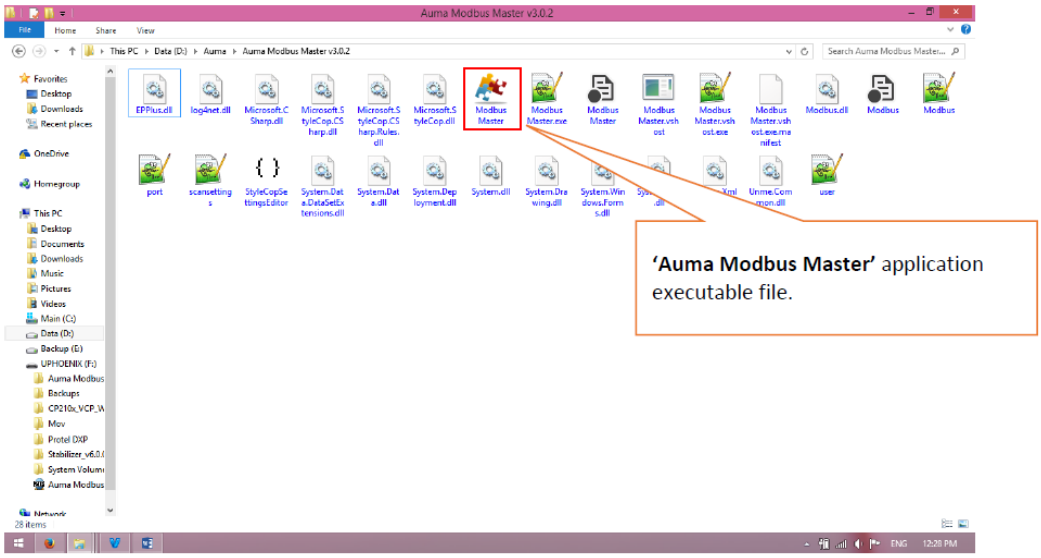
AUMA MODBUS MASTER

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.



2.2 Enter the user name and password in login screen and press 'Login' button.
Username: user
Password: user@123

2.3 The image below shows the main screen of the Modbus Master application. Carry out the slave settings as shown in figure below. The COM port connected to RS485 must also be selected appropriately. Select slave ID range and timeout duration per actuator.

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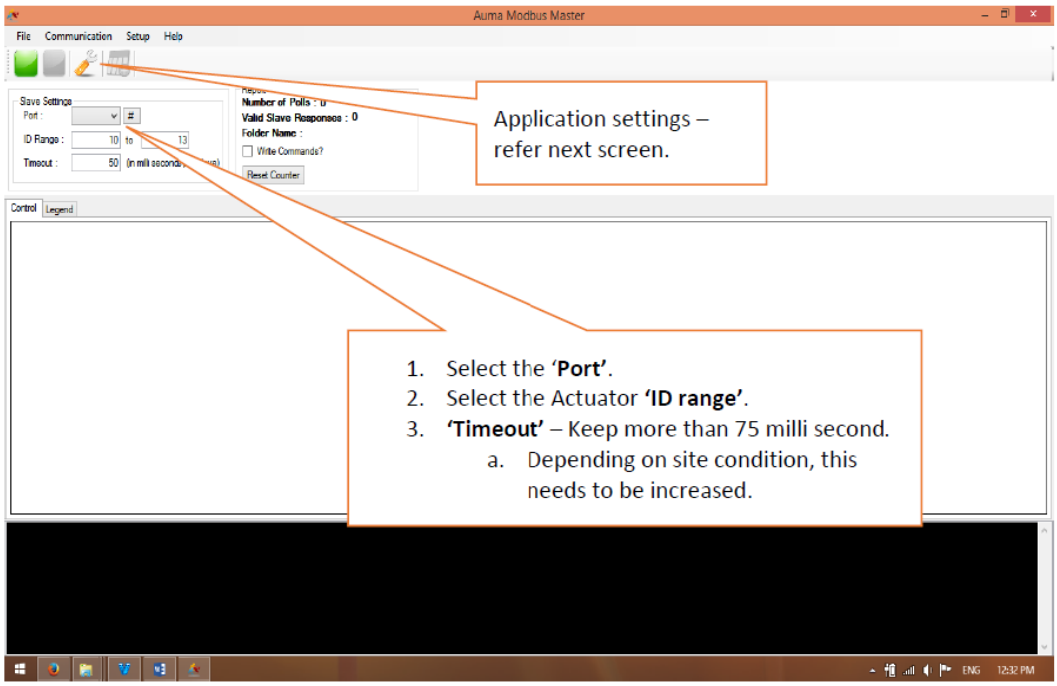
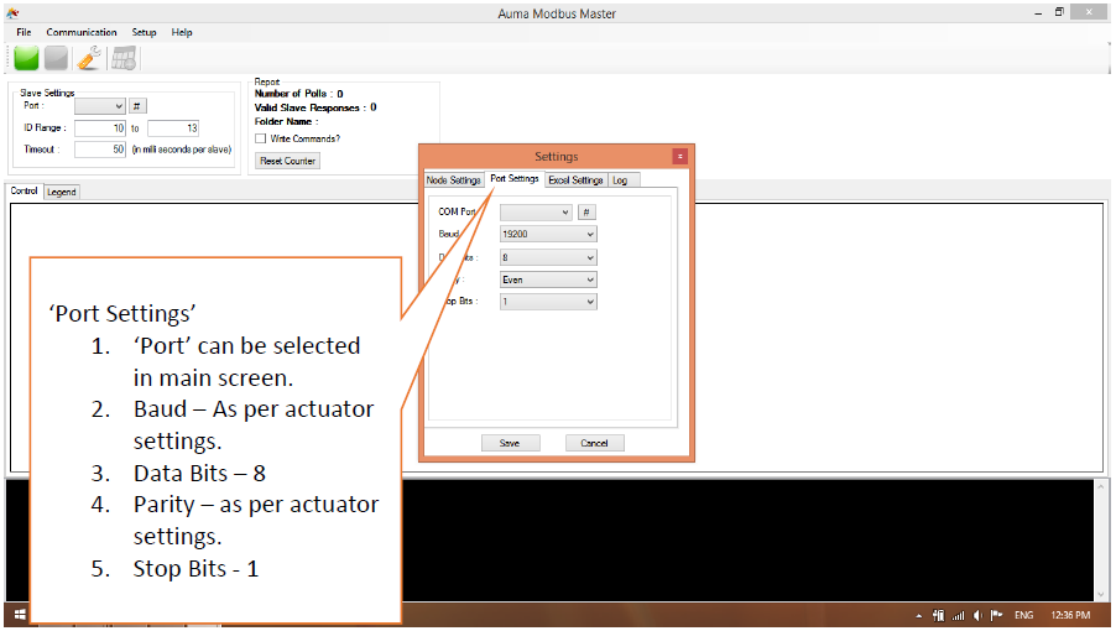
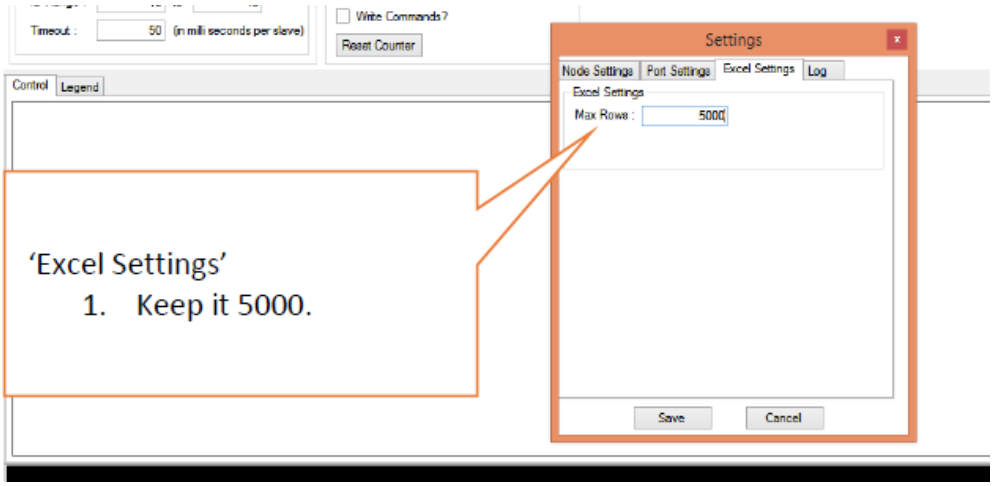


2.4 Application Settings: Go to 'Setup' on the Toolbar and click on 'Settings'/ click on the settings icon. Choose the parameters such as COM port, Baud Rate, Parity, Slave Address and Stop bits. Remember that this should match the Modbus internal settings of 3.XMP modules which is to be checked. Also ensure that the 3.XMP module is in Remote: Two-Wire-Modbus mode.

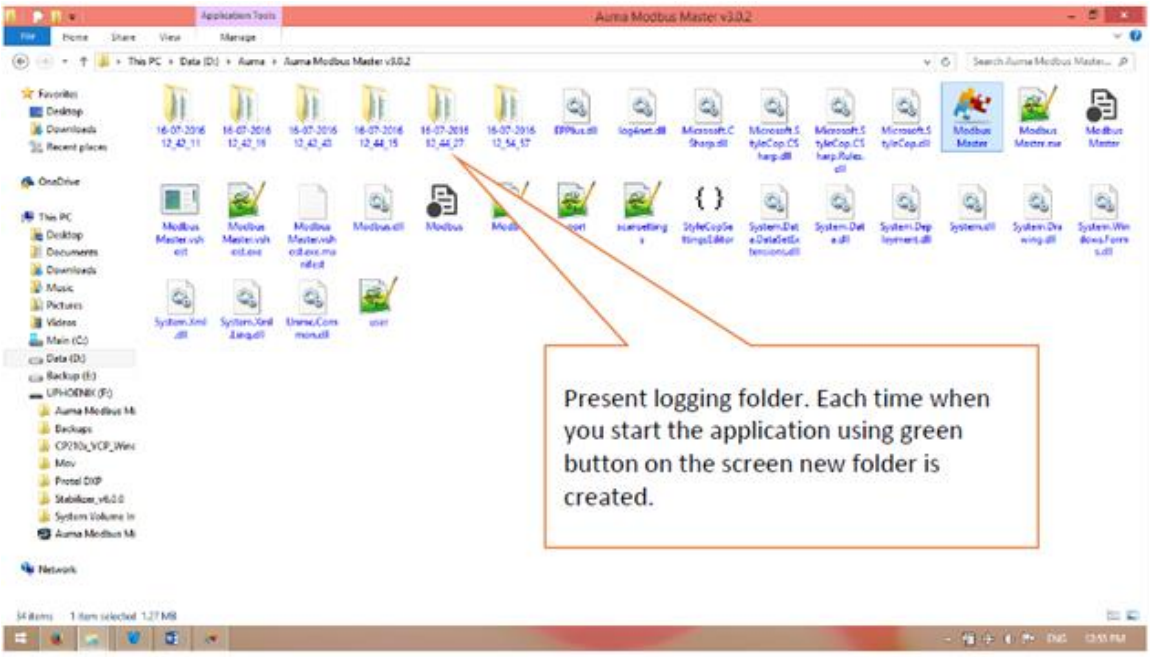


REV NO.	REVISION	SIGN	DATE	REV NO.	REVISION	SIGN	DATE
auma india pvt ltd BANGALORE - 560058					DRAWN	KR	07.7.18
					CHECKED	KMC	07.7.18
					APPROVED	YMJ	07.7.18

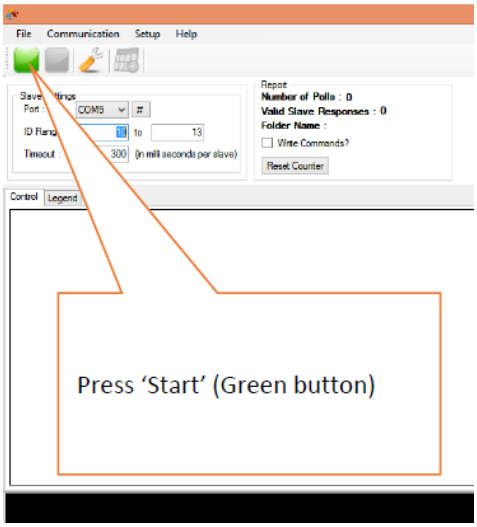
2.5 Excel Settings: Set the settings at 5000.

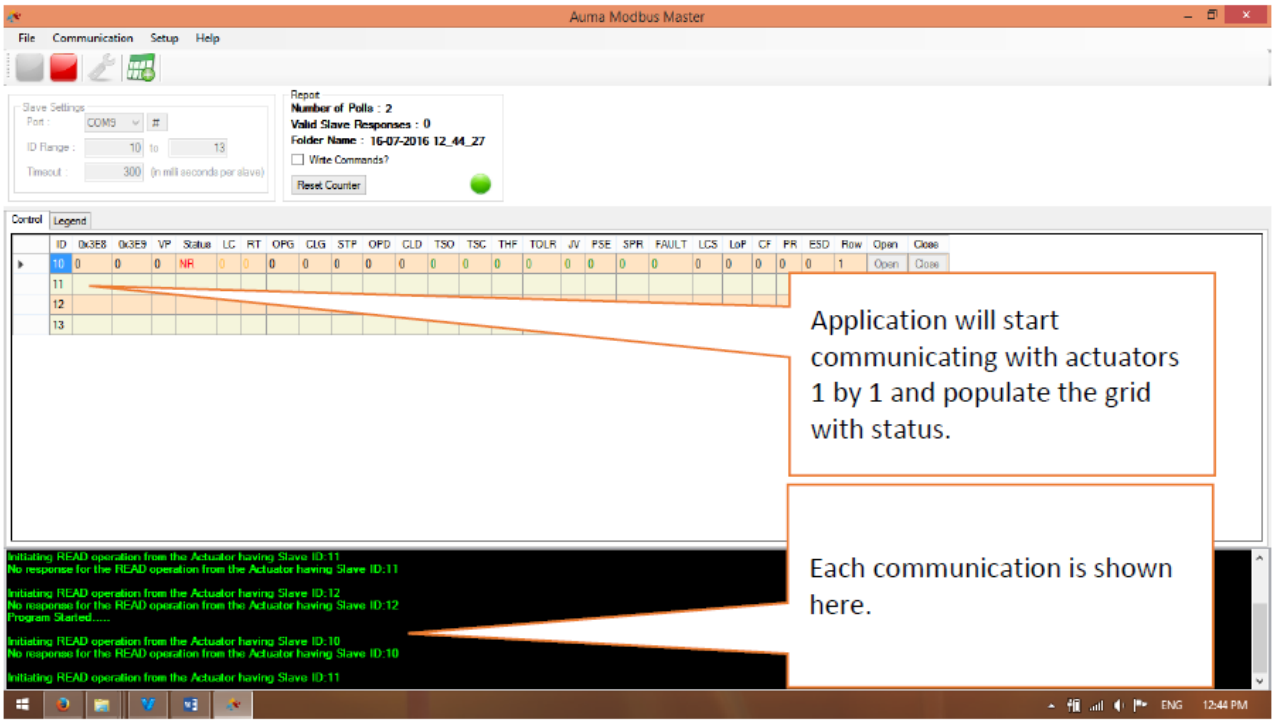


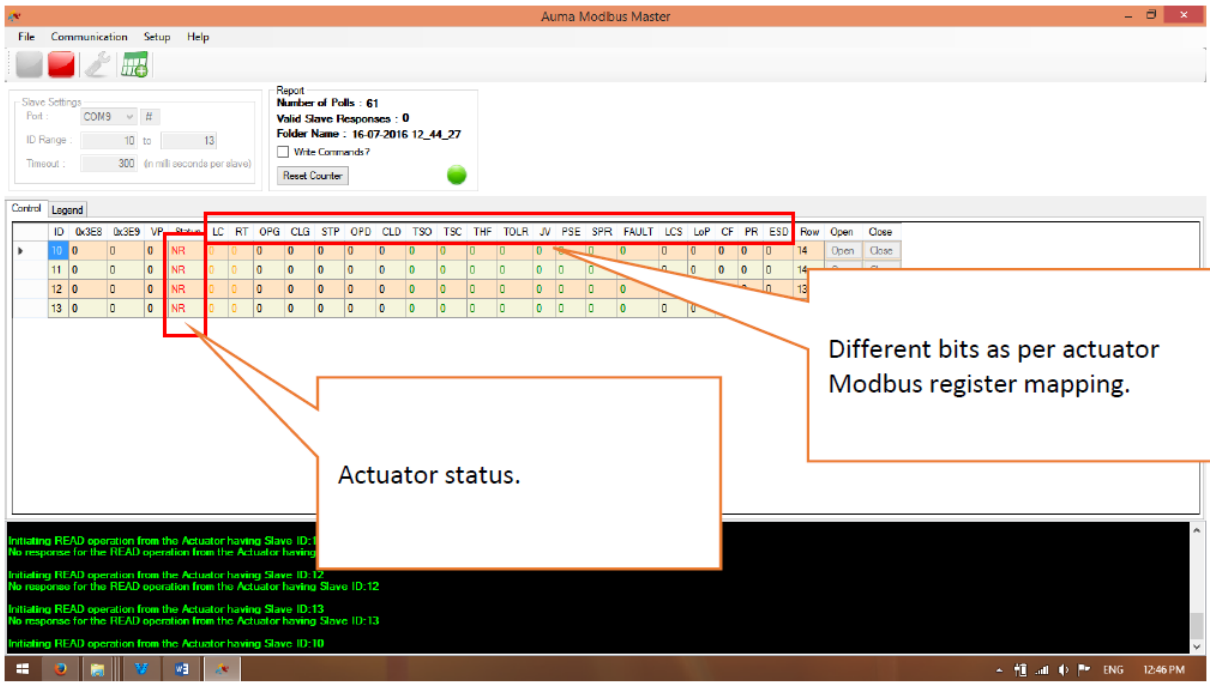
When application is running, it creates excel log file for each actuator and all the events logged. The present excel files folder is mentioned as shown in the figure below. One file per actuator is created and on every start of the operation new set of files are created. Remember not to open the excel files from the folder mentioned in the main screen as the application might crash. The transaction are logged into these files. Each time when you start the application using green button on the screen new folder is created that gets updated on the screen. The excel files from the previous folder can then be used.



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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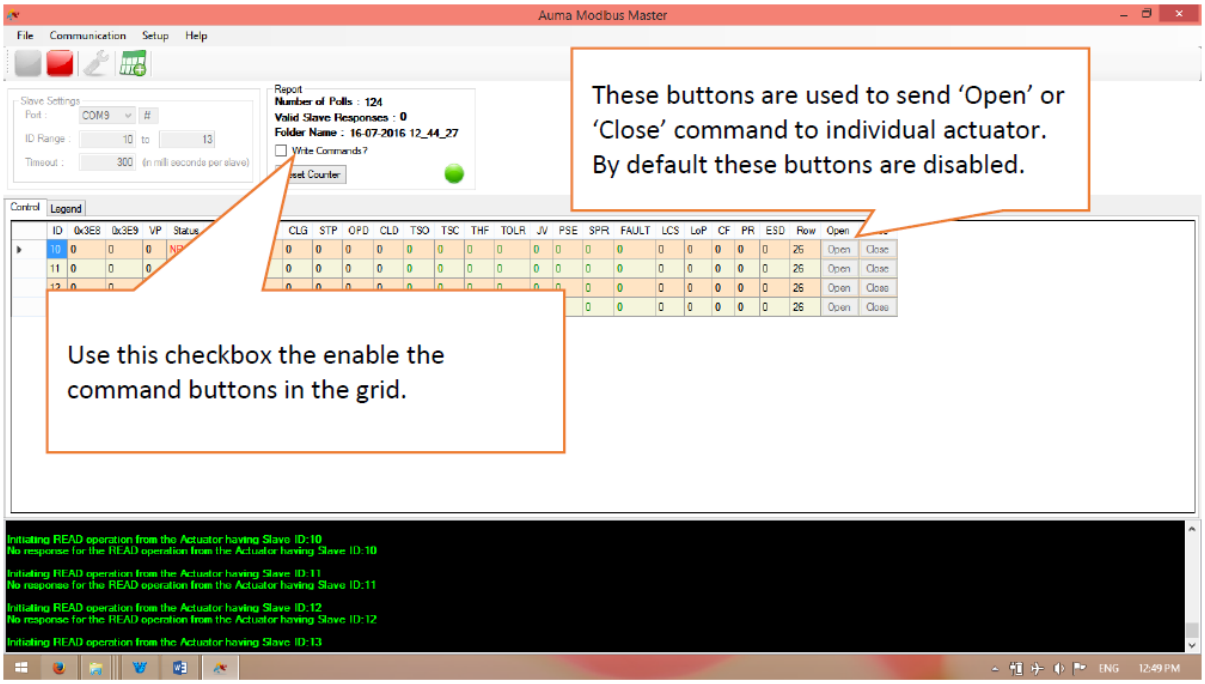
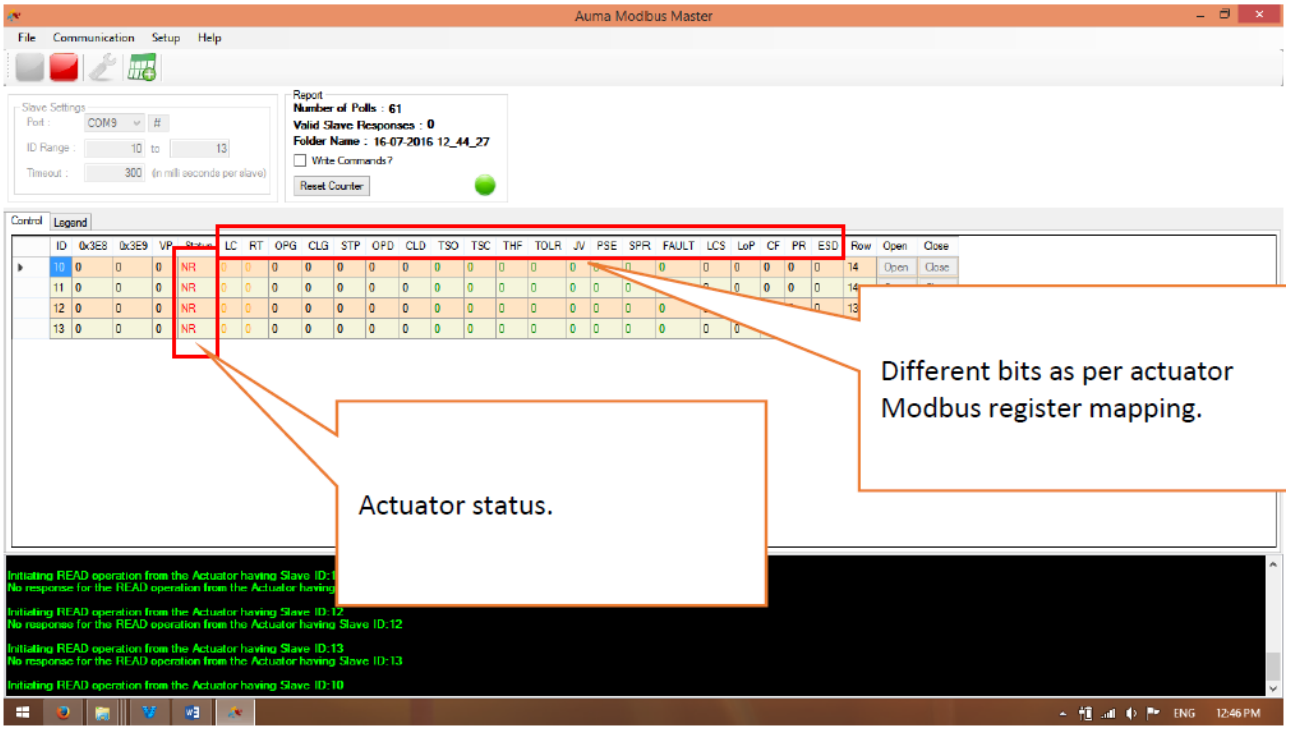
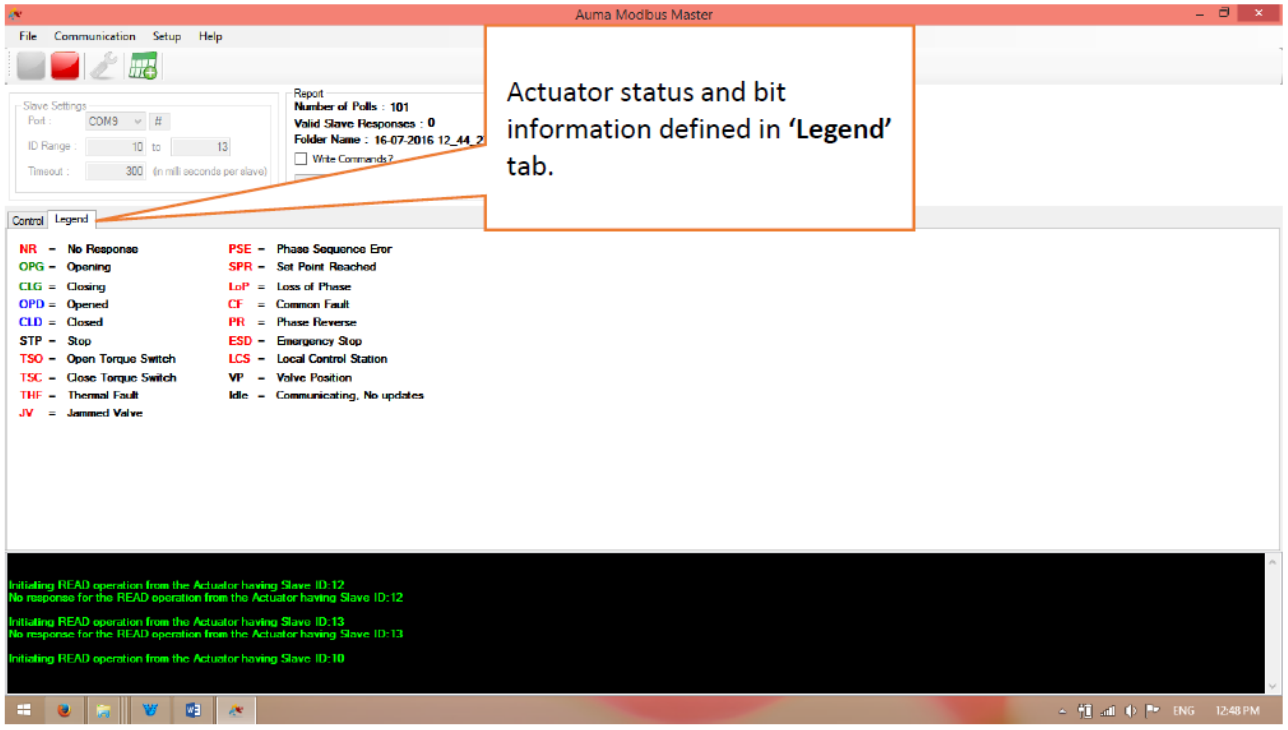
2.7 In order to send 'OPEN' or 'CLOSE' command to the actuator, enable the 'Write Commands?' checkbox. Open and Close commands are used for Opening and Closing of the actuator.



2.8 The grid in the screen below shows the status/fault of the actuator according to Modbus Register Mapping. Create conditions/faults to check if the respective status/fault bits are set on occurrence. If the actuator is responding, the respective status of the actuator appears in the Actuator status box. The legend for different status/faults is as given below. One can reset the counter if required by clicking on the 'Reset Counter' Button.





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BANGALORE - 560058

DRAWN	KR	07.7.18
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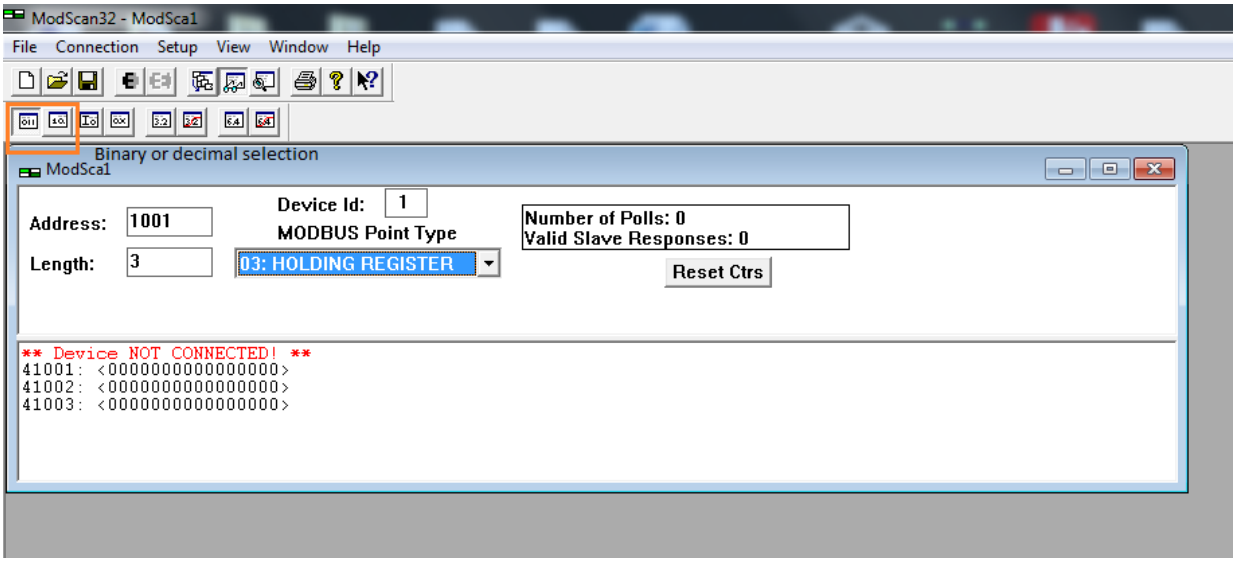
APPROVED	YMJ	07.7.18

MODSCAN32

PREREQUISITES:

Download MODSCAN32 .exe file online.

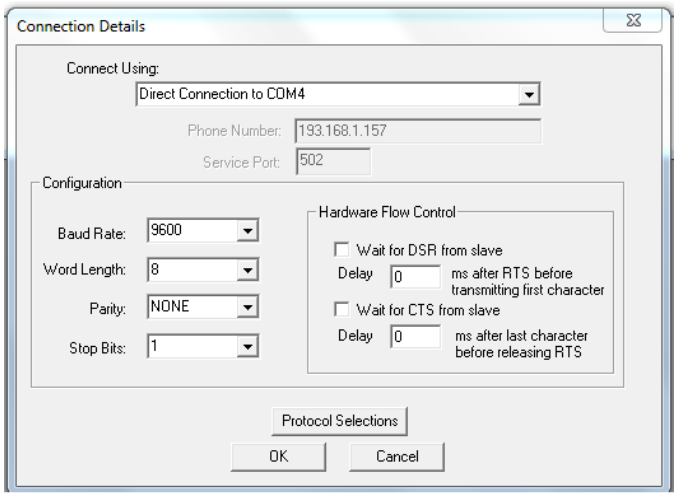
1. Open MODSCAN 32 application then following window appears for configuration.



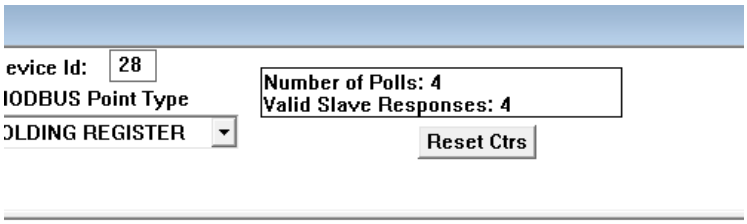
2. Configure the actuator to work in MODBUS – 2 Wire mode. Enter the Address as 1001 and Length as 3. Type in the correct device ID (Slave ID configured in the actuator). Select Modbus Point Type as ***03: Holding Register***. Choose binary/decimal format(Marked in the above image) for viewing the register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

ADDRESS		**DATA**			
DESCRIPTION	**VALUE**	**RANGE (MIN-MAX)**	**STD. VALUE**	**NOTE (MEANING)**	
REMOTE CONTROL	0x3E8			BIT 0=1	ESD
				BIT 2=1	PVST
				BIT 8=1	OPEN
				BIT 9=1	CLOSE
				BIT 12=1	STOP
				BIT 10=1	SET POINT BIT
READ VALVE POSITION	0x3E9	0-1000			
SET VALVE POSITION	0x3EA	0-1000			

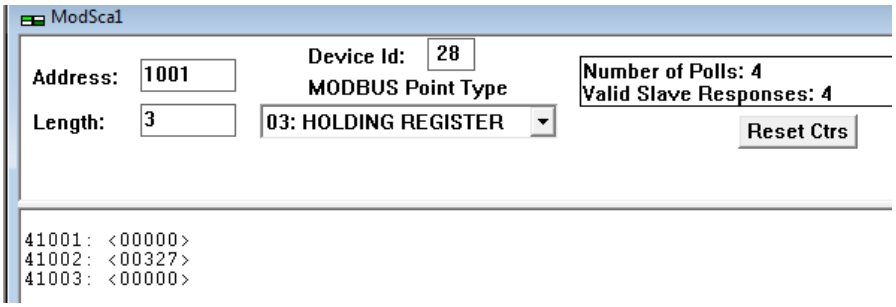
3. Click on 'Connection' in Toolbar and the Connections Window opens as below. Select the COM PORT, Baud Rate, Parity, Data and Stop bits for communication. Verify the settings set in the actuator and the MODSCAN32 are same. This settings can be seen by pressing the Close key in the Remote mode and Modbus enabled. Click OK to connect if correct. If not, go to program mode to configure.



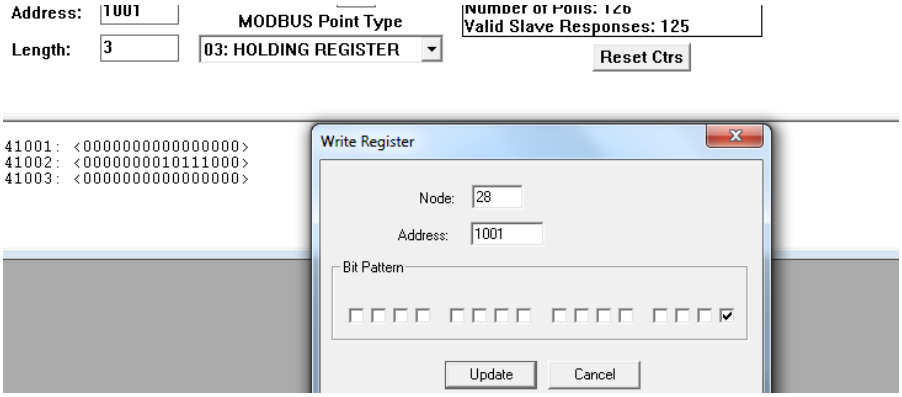
4. Proper connection can be verified by counter given for valid slave response which gets incremented after each successful communication. Reset this counter if required to verify the same.



5. When decimal mode is selected as discussed in Step 2, the Valve Position can be seen in address 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.



6. For giving Remote Operation commands, change the decimal view to bit wise binary view as discussed in Step 2. Double click on the value of the address 41001 you will get the window as shown below.



7. Select the bit according to the table given below for operation (Ex: The above image represents bit 0 selected).

Bit 12	Bit 10	Bit 9	Bit 8	Bit 2	Bit 0
Stop	Set Point	Close	Open	PVST	Soft ESD

8. Select the bit for the operation(Open, Close, Stop , PVST or Set-Point or ESD) to be carried out and click on update button. Verify if the selected operation is carried out correctly.

9. For Set Point, the valve percentage should be updated in the address 41003 and then setpoint bit should be updated. Note: If the set valve percentage is to be 40%, the Modbus register should be updated as 400.

10. For PVST, make sure the PVST is enabled in the actuator and its parameters are set before enabling the PVST bit in MODSCAN.

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	Valve Position (0-1000)	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		
Bit 8	TSC	COMMON FAULT		
Bit 9	TH	FAULT PHASE REVERSE		
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