



AC20 Series

Modbus TCP Onboard

Configuration and Programming with Schneider EcoStruxure Machine Expert

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Non-warranty clause

We checked the contents of this publication for compliance with the associated hardware and software. We can, however, not exclude discrepancies and do therefore not accept any liability for the exact compliance. The information in this publication is regularly checked, necessary corrections will be part of the subsequent publications.

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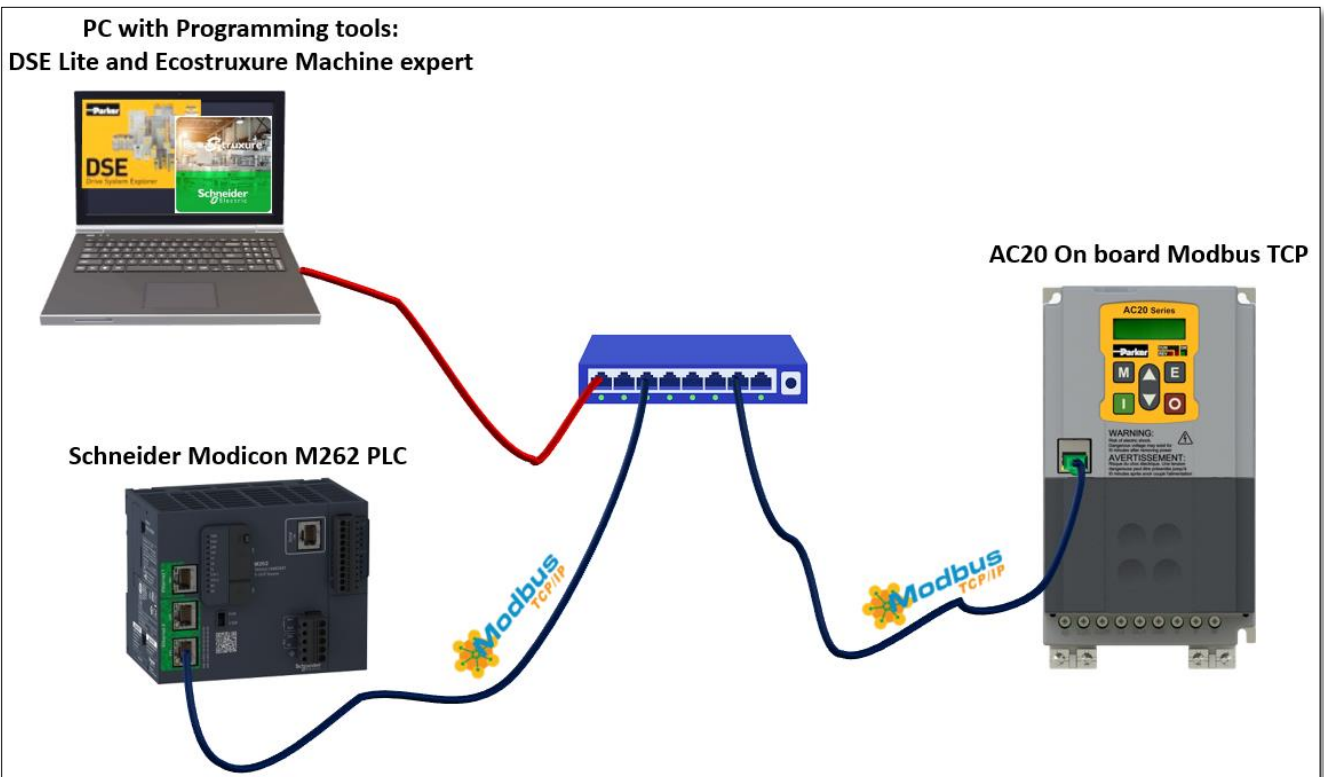
1 Introduction

1.1 About this document

This application note describes how to set up communication between AC20 driver and Schneider Modicon M262 Controllers through the Modbus TCP Onboard communication.

1.2 Tools

	Name	Firmware Version
Hardware	AC20 Drive	1.2.1
	Schneider Electric Modicon M262 Contrôleur logique TM262L20MESE8T	V5.1.7.10
Software	Parker DSE Lite	3.13
	Schneider EcoStruxure Machine Expert	2.0.1



1.3 Abstract

The parker AC20 drive can be easily integrated into a Schneider Modicon control architecture via the Modbus TCP communication. The communication requires the configuration of **network parameters** and **data exchange** for both the AC20 and the Modicon Controllers.

2 Setting up the AC20 Communication parameters

The configuration of the AC20 drive communication can be performed with AC20 keypad or Parker DSE Lite application or the AC20 Webserver.

Parameters listed in the tables below must be set to establish communication with master.

➤ Ethernet Parameters

Keypad Menu Path	DSE-Lite Function Block	Webserver

No.	Name	Default Value	Description
0640	ADDRESS METHOD (Method for assigning the IP address)	AUTOMATIC	Address assigned by DHCP server
		LINK LOCAL	Address assigned link-local by the inverter
		FIXED	Ip address must be set manually via parameters "0641", "0642", "0643".
0641	SET IP ADDRESS	0.0.0.0	IP address of the inverter
0642	SET SUBNET MASK	0.0.0.0	Subnet Mask of the inverter
0643	SET GATEWAY ADDR	0.0.0.0	Gateway address of the inverter

➤ Modbus TCP Parameters

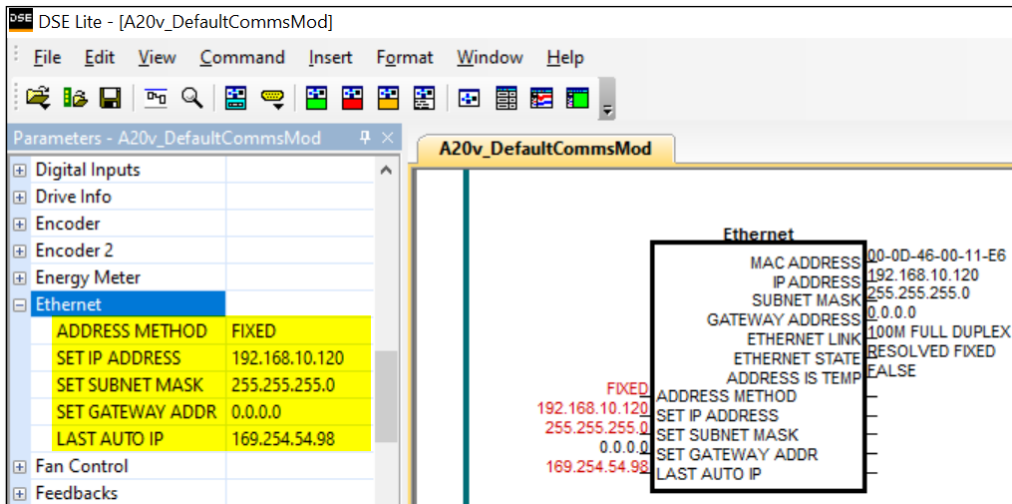
Keypad Menu Path	DSE-Lite Function Block	Webserver

No.	Name	Default Value	Description
0656	MAX CONNECTIONS	0	Max number of Modbus TCP connection allowed
0657	HIGH WORD FIRST	FALSE	Modbus TCP "WORD" order of 32-bit network data
0658	PROCESS TIMEOUT	3	Process Active Timeout in seconds
0659	PROCESS ACTV REG	0	Register to read/write to maintain process active
0660	MODBUS TIMEOUT	66	Modbus connection timeout
0661	MODBUS PASSWORD		manage the register data access
0662	MODBUS MAPPING	TAG ID of the parameter	Defined the process data exchange between the Modbus PLC and the AC20. Data are defined into the parameter range [0663 ... 0678]

2.1 Config the drive using Parker DSE Lite Application

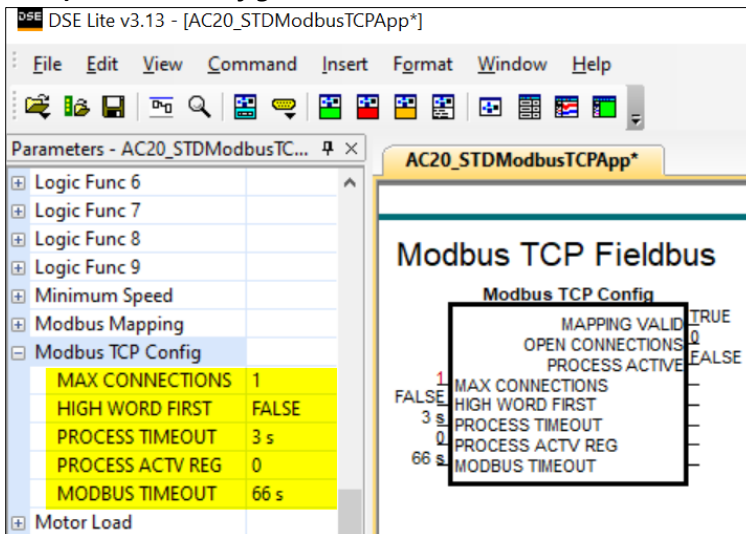
Display your configuration page in DSE Lite, click the plus sign [+] at the left of function block “Ethernet” and “Fieldbus Config” to set the appropriate communication parameters or double click the function Blocks to open parameters tab in the configuration interface. (The sample config code “AC20_STDModbusTCPApp.AC20” can be downloaded from Parker website).

➤ Ethernet Config



➤ Fieldbus Modbus TCP Config

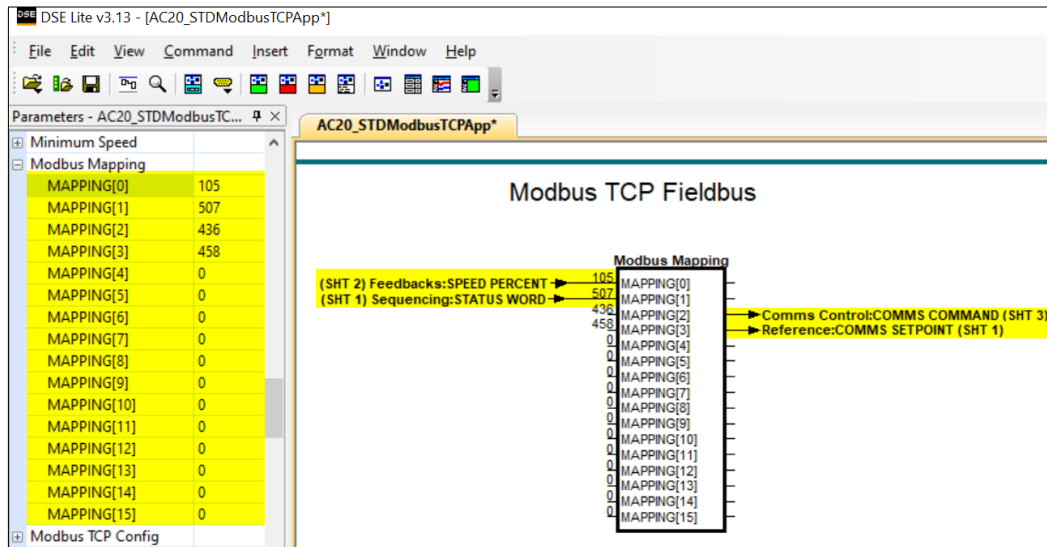
a) Comms Config



b) Mapping

the function block “**Modbus Mapping**” array is used to map the process data, the array allows parameters to be grouped together and packs the registers, the 1-byte and 2-byte parameters use only 1 register. the mapping is done by adding parameters TAG ID into the table or by using link connection from parameter to the table array. If an invalid parameter (including a password parameter) is entered in the table, then the diagnostic parameter Mapping Valid will show the mapping as being invalid. However, all the valid entries in the table will be mapped. Invalid entries will be ignored, and no register allocated.

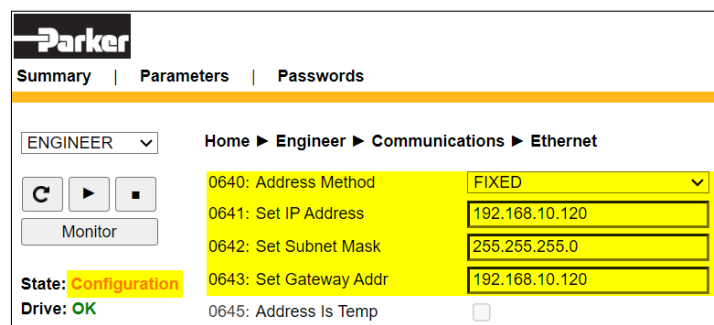
- An array parameter number will be considered as invalid mapping, rather the parameter numbers of individual elements within the array should be used.
- A string parameter must be modified from the first register in the string.



2.2 Config the drive using AC20 Webserver

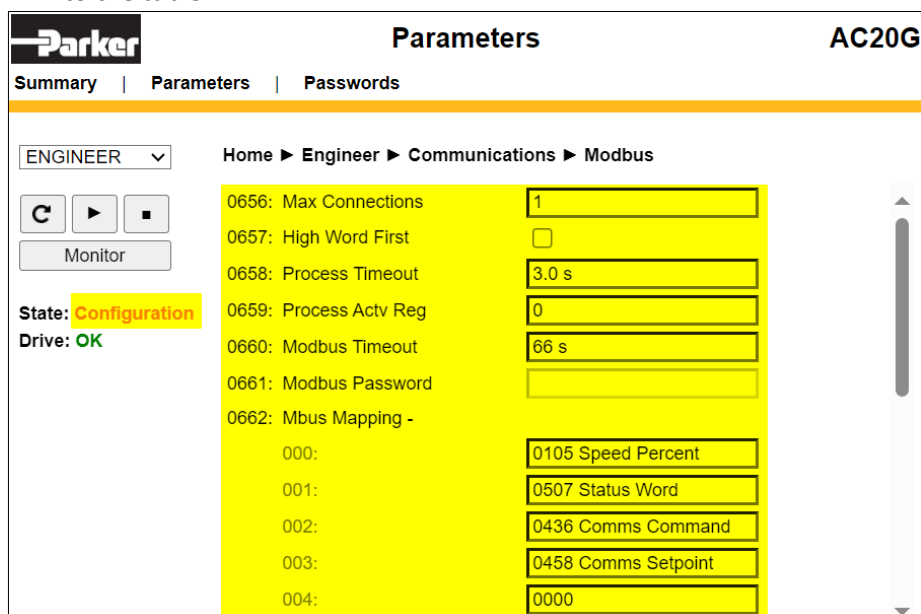
Access the AC20 webserver by typing the IP-Address of the drive into a web browser. Switch the driver state from “Operational” to “Configuration” by clicking on stop button, then set the parameters.

➤ Ethernet Config



➤ Fieldbus Modbus TCP Config

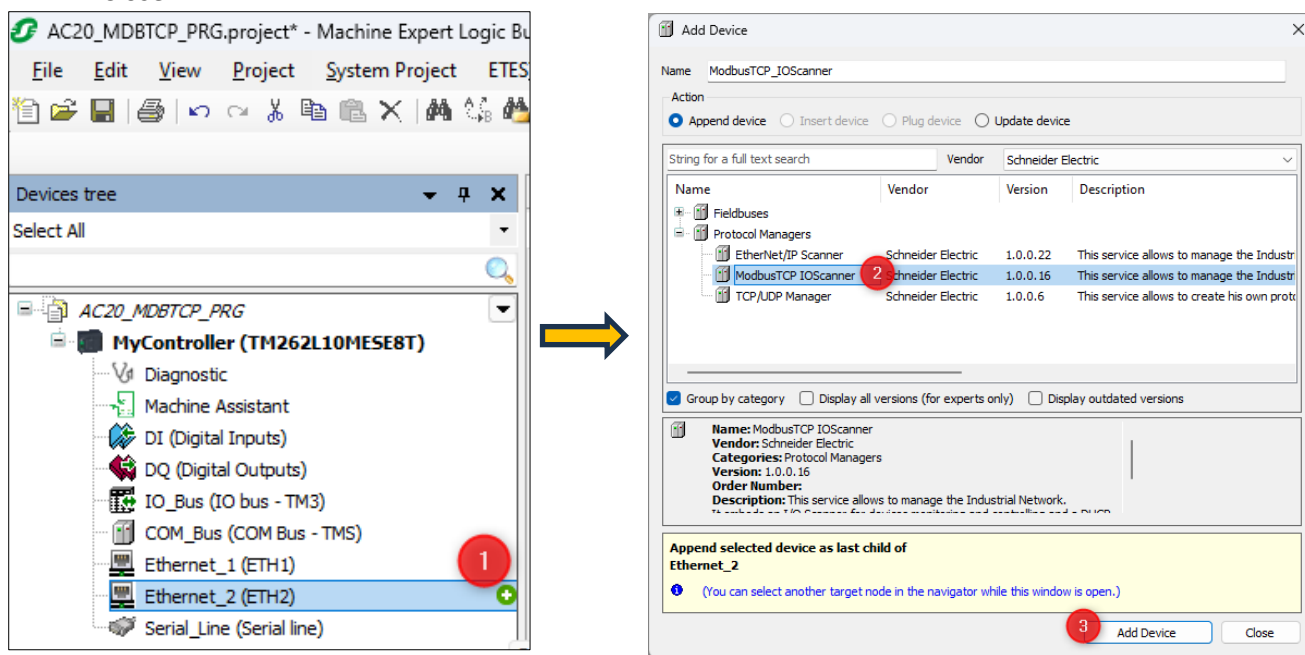
Set the Modbus communication and use the “Mbus Mapping” Table to set the process data mapping. Add the parameters TAG ID into the table.



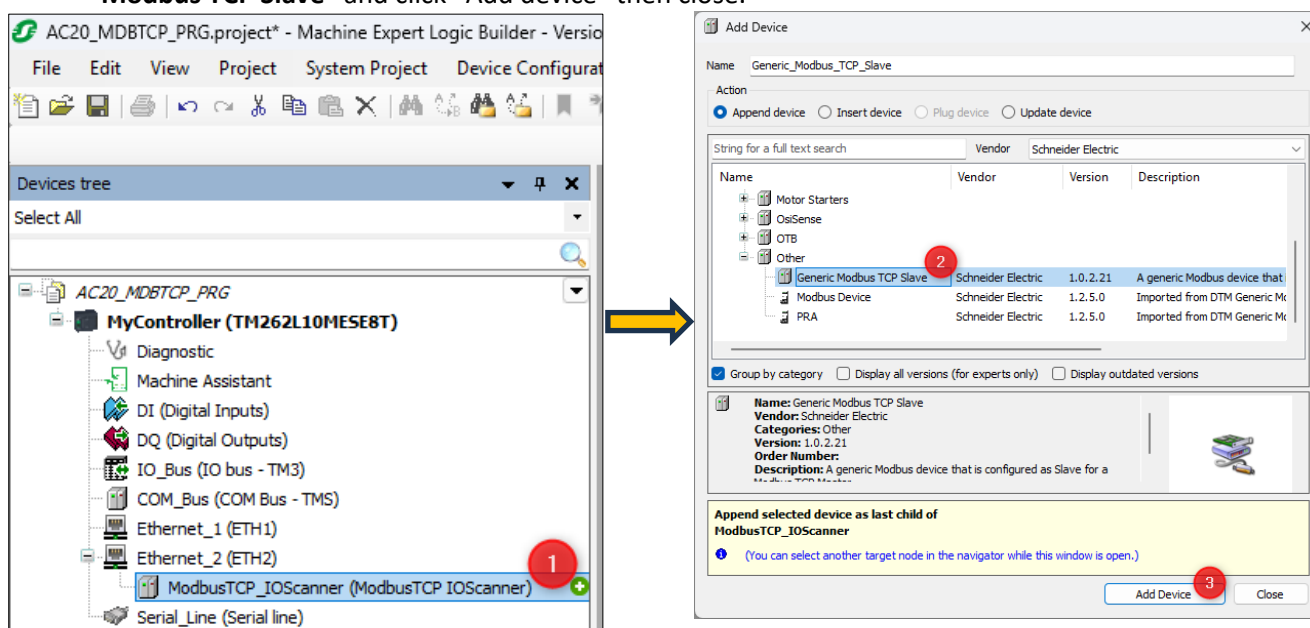
3 Communication set between PLC and AC20 drive.

3.1 Add AC20 slave into Machine Expert project.

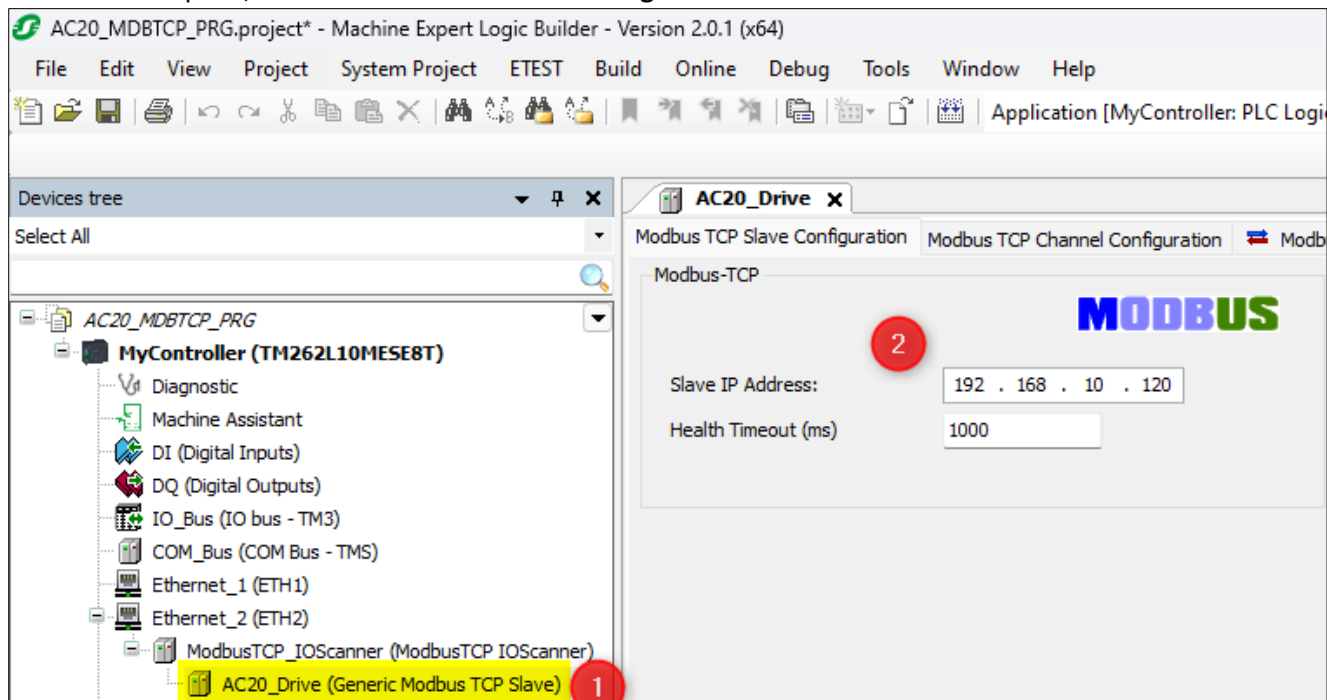
- a- **Add Modbus Manager to network:** Click the + in green circle or right click Ethernet_2 and select add device to open the “add device” Tab, select “ModbusTCP_IOScanner” then click Add Device and Close.



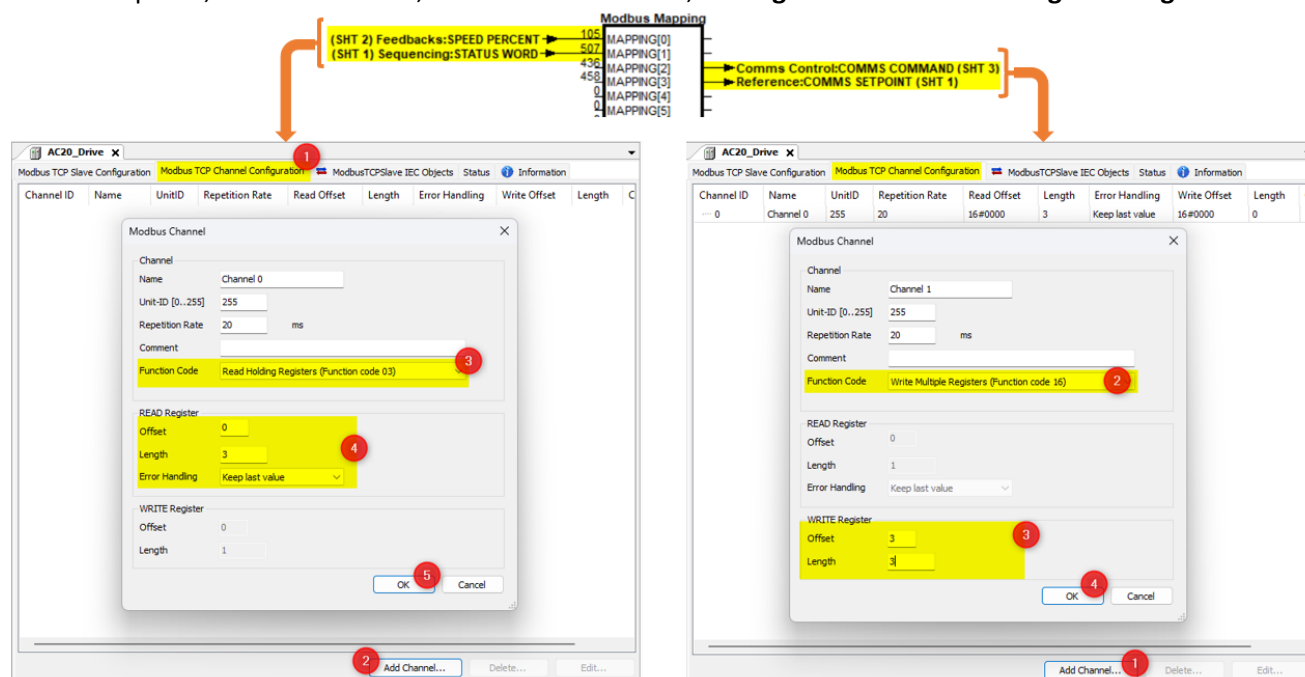
- b- **Add Modbus generic device as AC20 Drive:** Click the + in green circle or right click “ModbusTCP_IOScanner” from project network to open the “add device” Tab. Select “Generic Modbus TCP Slave” and click “Add device” then close.



- c- **Set device network interface:** Double click the just added “**Generic Modbus TCP Slave**” to open the device pane, select “**Modbus TCP Slave Configuration**” tab and set the network interface data.



- d- **Set Modbus Request:** Select drive “**Modbus TCP Channel Configuration**”, click on “**Add Channel**” requests, for each channel, set the **function code**, the **register offset** and the **register length**.



Note: Supported function code and register address

Function Code	Register Address
Read Holding Registers (#3)	00001 - 00256
Read Input Registers (#4)	00001 - 00256
Write Single Register (#6)	00001 - 00256
Write Multiple Registers (#16)	00001 - 00256

Read/Write multiple registers function code is not supported by AC20 Device.

- e- **Assign the variables name:** select drive “ModbusTCPSlave I/O Mapping” and assign a name to each variable.

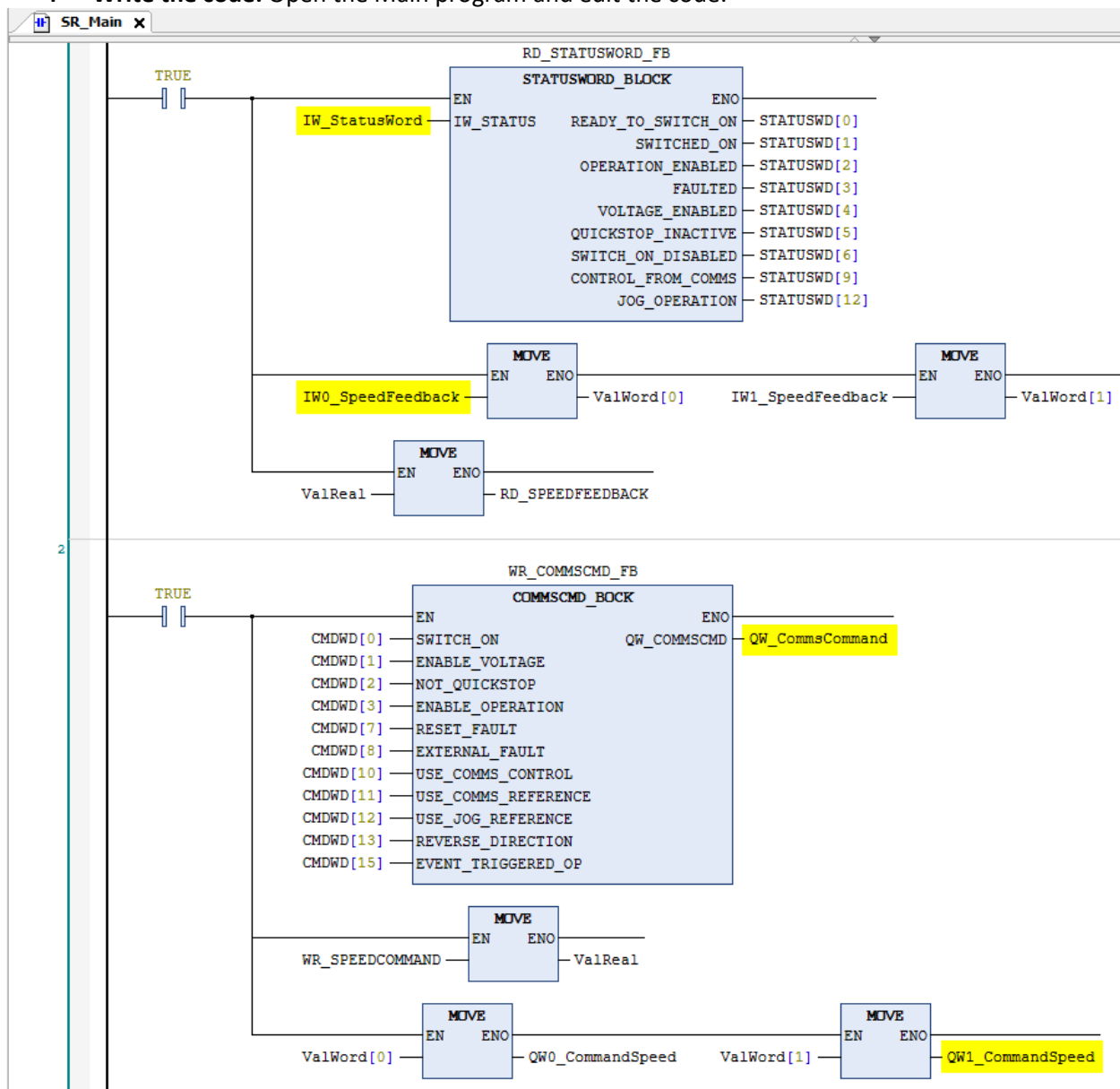
AC20_Drive x

Modbus TCP Slave Configuration Modbus TCP Channel Configuration **ModbusTCPSlave I/O Mapping** ModbusTCPSlave IEC Objects Status

Find Filter Show all + Add FB for IO Channel... Go to I...

Variable	Mapping	Channel	Address	Type	Default Value	Unit	Description
Inputs							
IW0_SpeedFeedback		Channel 0	%IW6	WORD			Input Channels
IW1_SpeedFeedback		Channel 0	%IW7	WORD			
IW_StatusWord		Channel 0	%IW8	WORD			
Outputs							
QW_CommsCommand		Channel 1	%QW1	WORD	0		Output Channels
QW0_CommandSpeed		Channel 1	%QW2	WORD	0		
QW1_CommandSpeed		Channel 1	%QW3	WORD	0		

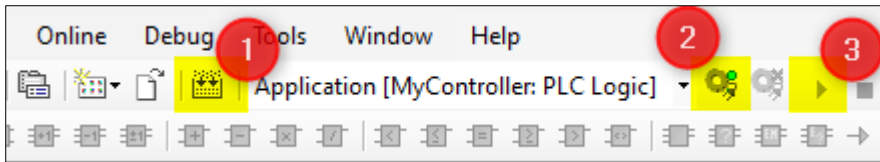
- f- **Write the code:** Open the Main program and edit the code.



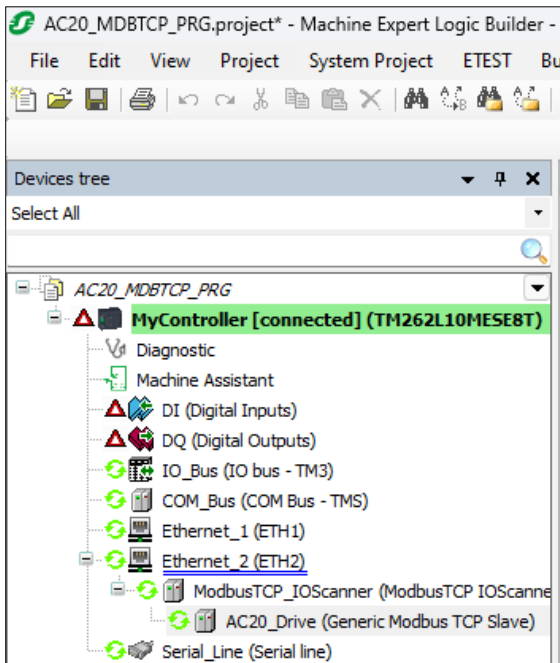
3.2 Establish the connection and run the program.

Make sure the PC, PLC and AC20 drive are physically connected.

Compile (1) and download project (2) into the PLC, go online with PLC (3).



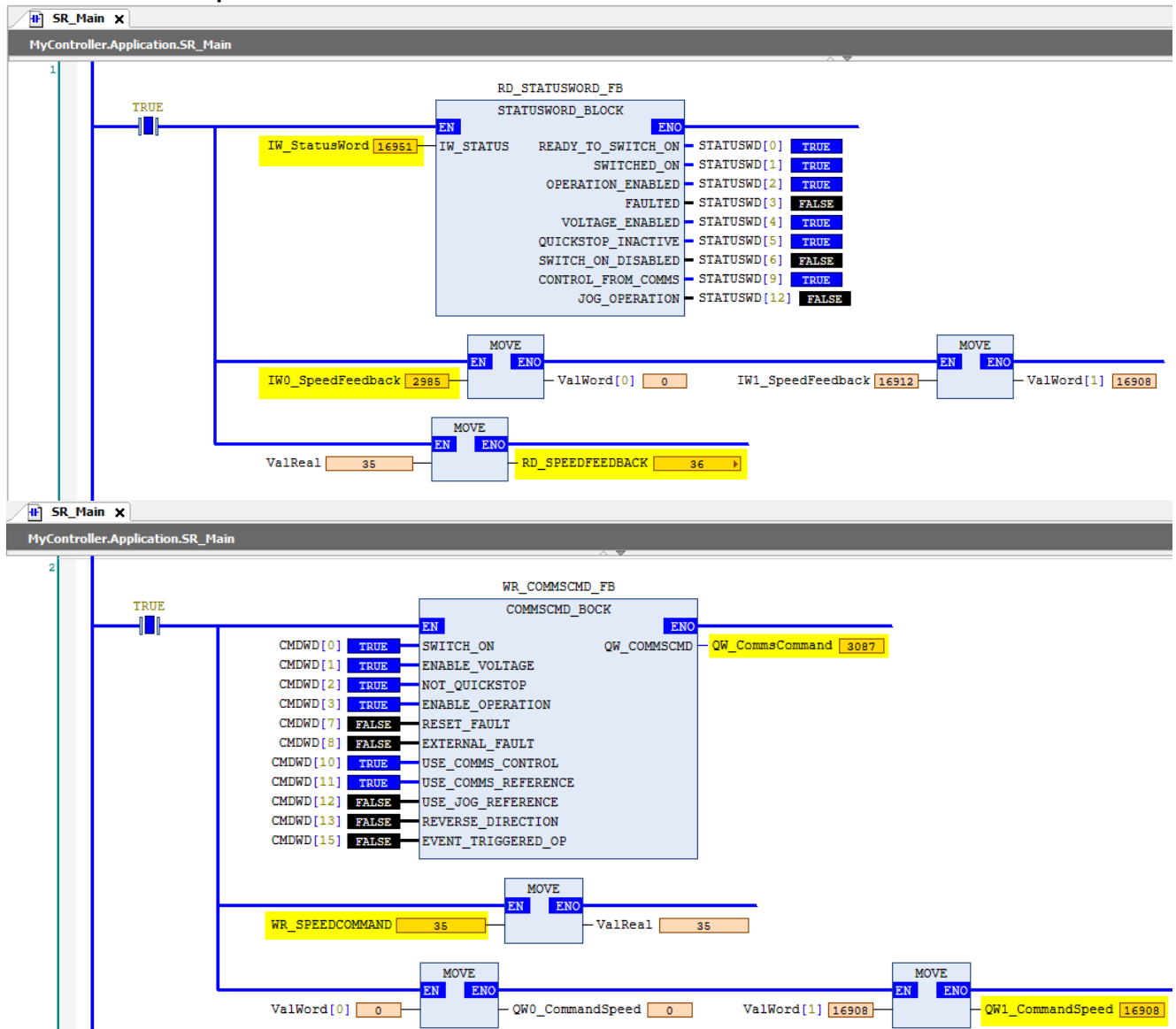
After completing the operation above, the communication should be established between PLC and AC20 slave, the view below shows the communication diagnostic.



✓ DSE Lite Online Monitor

DSE Monitor List	
Parameter	Value
Comms Control::COMMS COMMAND	0x0C0F
Feedbacks::SPEED PERCENT	34.59 %
Reference::COMMS SETPOINT	35 %
Sequencing::STATUS WORD	0x4237

✓ Machine expert Online Monitor



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