

# HOW USING AN ABB CP600 HMI PANEL TO CONTROL AN ACS355 DRIVE VIA MODBUS RTU



This short and basic tutorial shows how to connect a CP 600 series operator panel to an ACS355 type ABB drive, using the ModBus RTU protocol.

This example uses the mode in which the CP600 panel is a slave and the drive is always the master, so the CP 600 sends the data request to the drive and it responds.

**All the following instructions have as a prerequisite that the user has sufficient knowledge of the indicated ABB products, that he has sufficient knowledge of the electrical risks and that he adopts all the safety measures provided in the use of these devices**

Basic documentation :

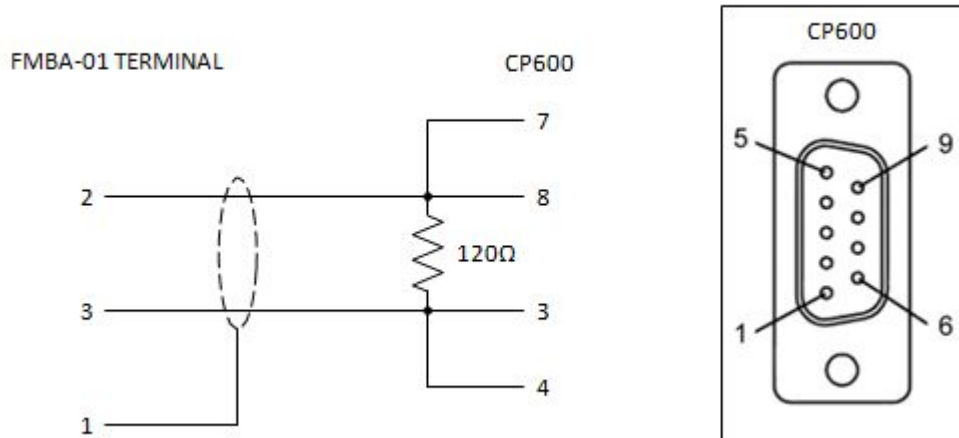
- 3ADR059001M0210\_PB610\_V2.6\_EN - PB610 Panel Builder 600 Manual SW
- 3AUA0000066143 Rev D (EN) – ACS355 User's Manual
- 3AFE68586704 – FMBA-01 ModBus Adapter module User's Manual

What you need to do it:

- ABB CP600 or CP600 eCo series HMI panel
- ABB Automation Builder or Panel Builder SW
- ABB ACS355 drive
- FMBA-01 ModBus RTU interface
- Ethernet cable for programming the CP 600 HMI
- CP600 serial compatible cable – see the following image for pin out cable

#### Hardware setup:

- Connect grounding, motor cable and input power for ACS355 as the ACS355 manual indicate
- Connect the CP600 to +24V supply as shown in the CP600 instruction manual
- Connect the Ethernet cable between CP 600 and PC with Panel Builder / Automation Builder SW
- Connect the CP600 panel and the ACS355 drive + FMBA-01 with the serial cable – see below



#### Configure the CP600 panel:

- Apply the power supply to the CP 600 and wait for the boot
- Depending on your panel type, set the IP address for the communication with Panel Builder
- Make sure that the first three octets of the IP address in your PC, reading from the left, must match the first three octets of CP600 IP address setting after. The right most octet must be different from the CP600 IP address. For example, if the IP address of the panel is 192.168.001.010 the IP address of the PC Ethernet adapter must be 192.168.001.[a value between 1 and 255 other than 010]
- Subnet Mask and Default Gateway are both 255.255.255.0.
- If everything is connected and configured correctly you should be able to ping the CP600 from your PC.

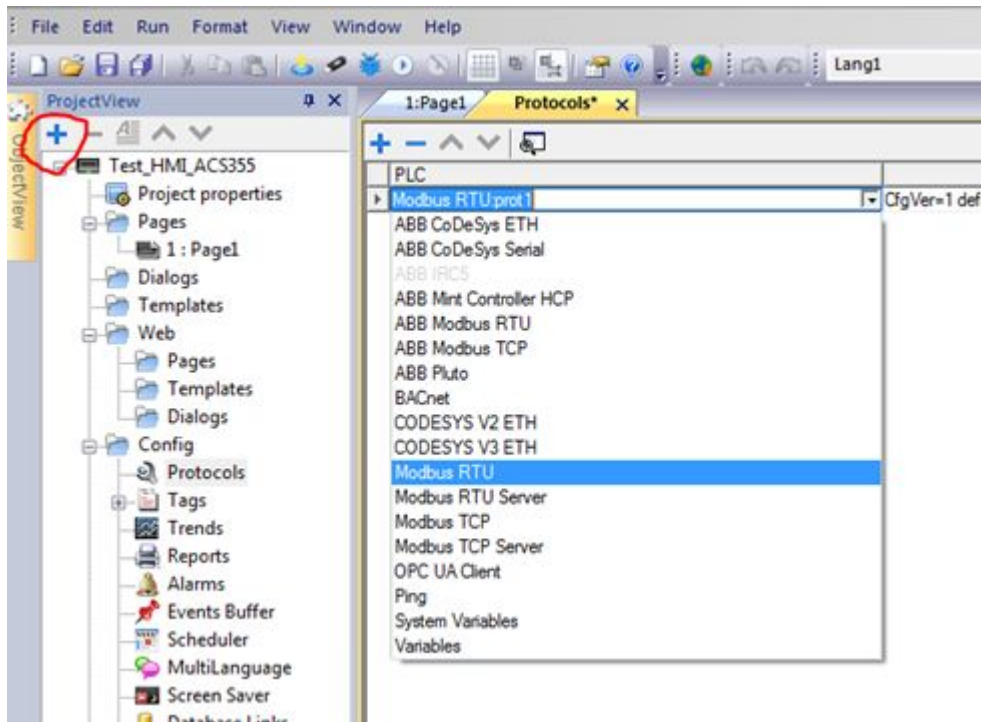
#### Configure the ACS355 drive:

- Parameter group 99 – depending on the type / power of the motor - follow the manual about this
- Parameter 98.02 – select MODBUS STD
- Parameter 10.01 – select COMM
- Parameter 11.02 – select COMM
- Parameter 11.04 – select 0 Hz
- Parameter 11.05 – select 50 Hz
- Parameter 20.07 – select 0 Hz
- Parameter 20.08 – select 50 Hz
- Parameter 53.02 – select 3, this is the node that you assign for the communication
- Parameter 53.03 – select 96, this is the speed of the communication – baud rate
- Parameter 53.04 – select 8N1 – this is the parity set of the communication
- Parameter 53.05 – select ABB DRIVE LIM – in my application this is functioning

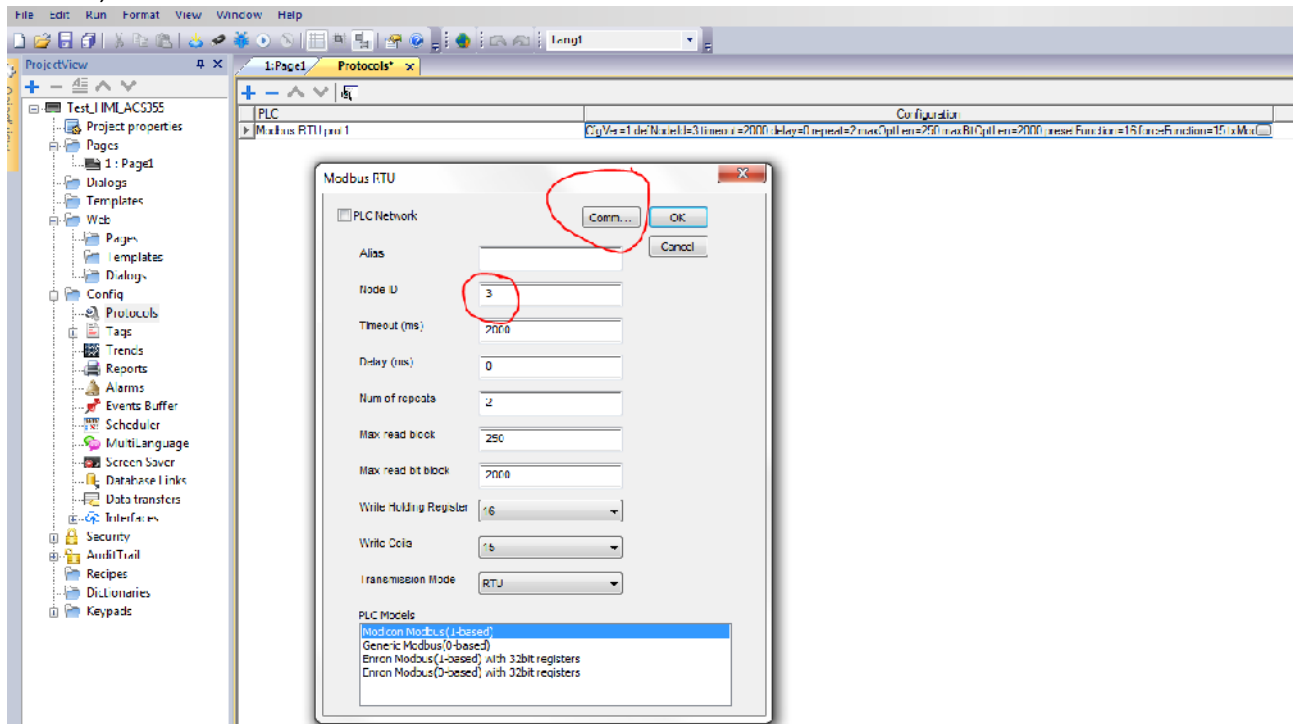
- Parameter 53.10 – select 103 - this means that drive send the Output frequency to the panel
- Parameter 53.11 – select 104 – this means that the drive send the Output current to the panel

Create the Panel Builder Project:

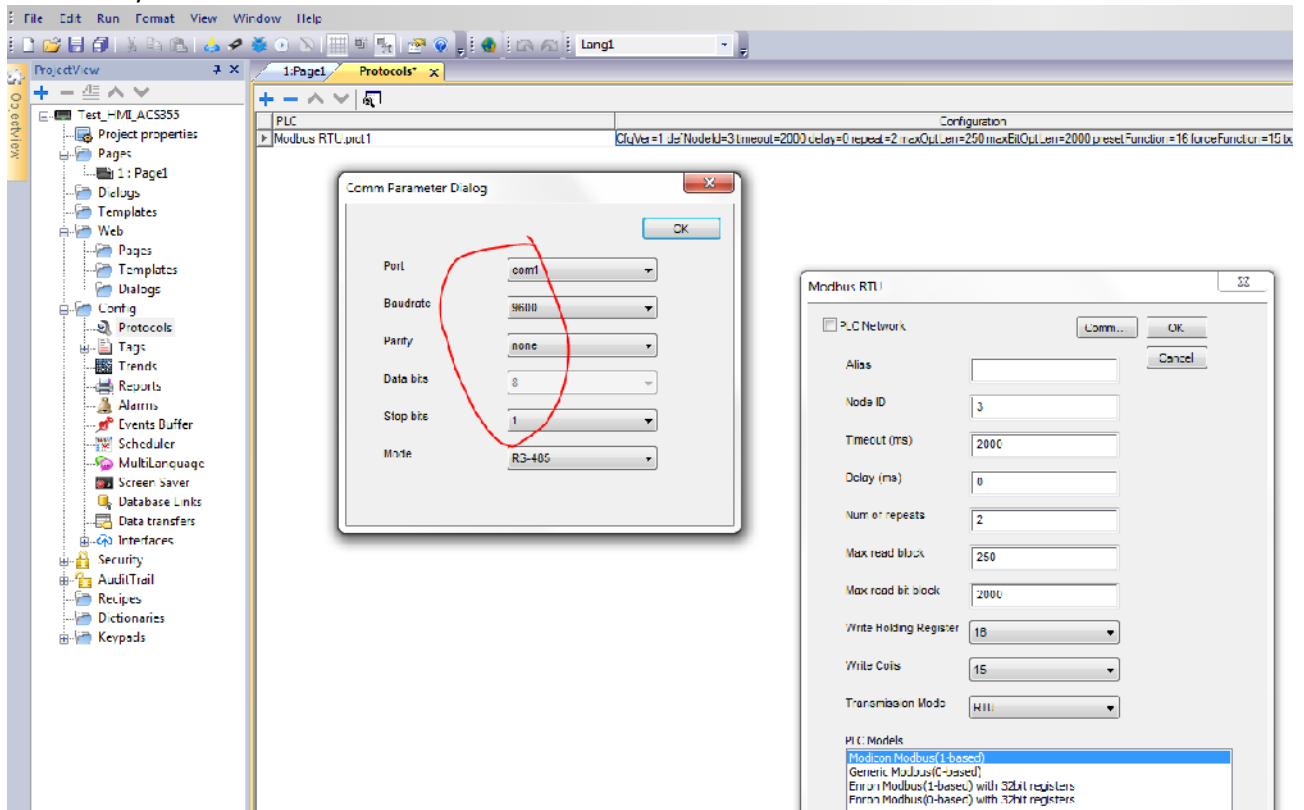
- Open Panel Builder SW
- Create a new project
- Double click “Protocols” in the project tree to open the Protocol tab, click on “+” button and select ModBus RTU – see below



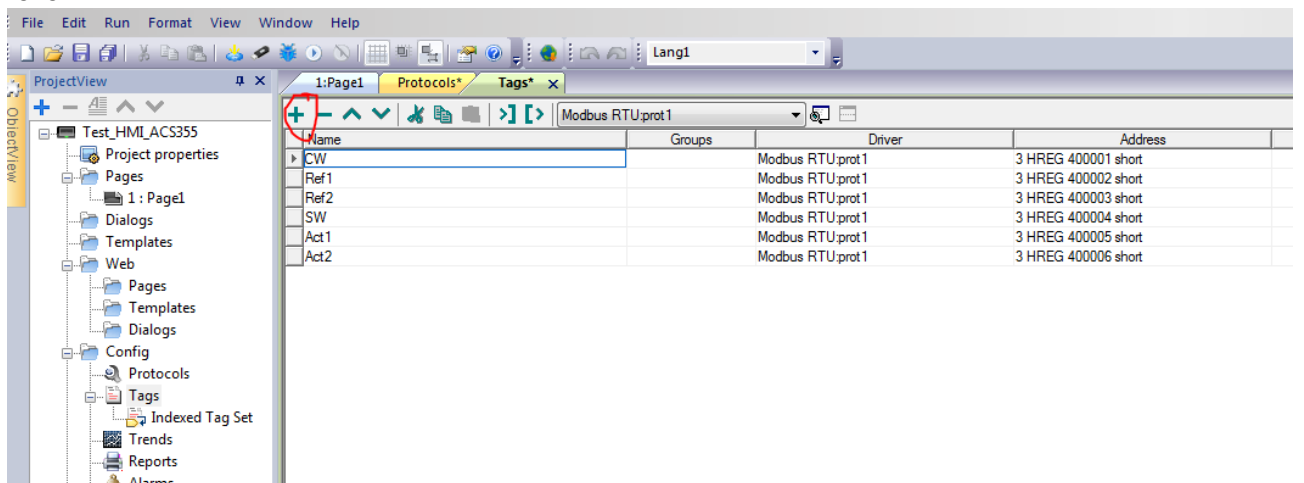
- After the selection of the Protocols, select the correct number of the node – in our case “3” and confirm, then click on the button – Comm



- Now you must define the Comm parameters, please note that node and Comm parameters are the same that you have wrote before in the ACS355



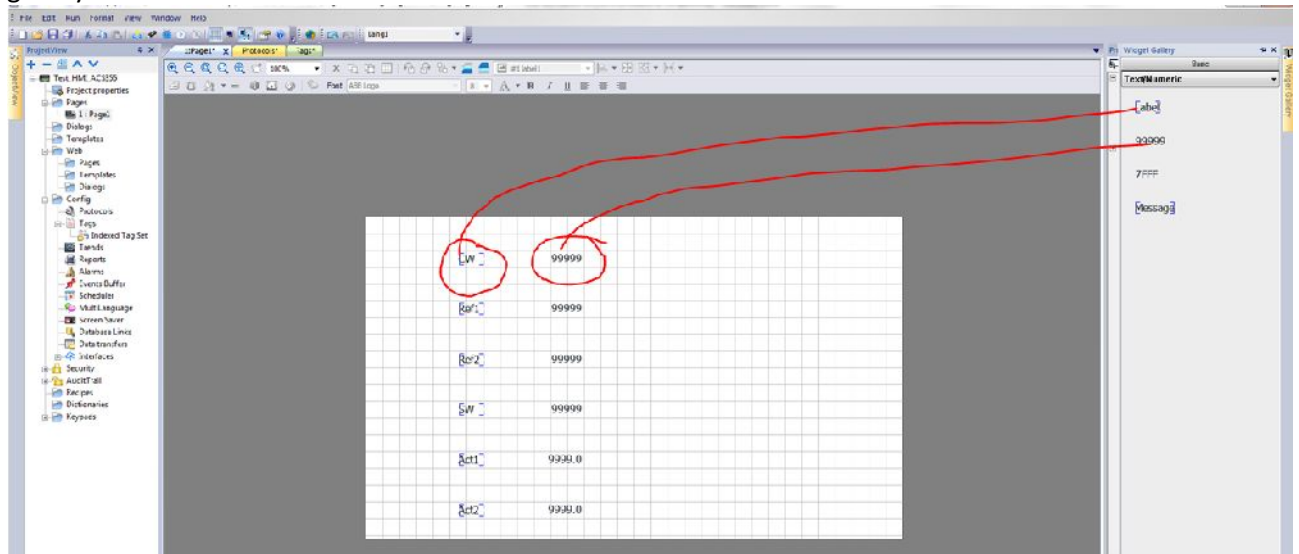
- Confirm and close the dialog box
- Create the tags for the project, click on tags button in project tree and add with "+" six new tags as follow



- Now you have defined the follow tags:

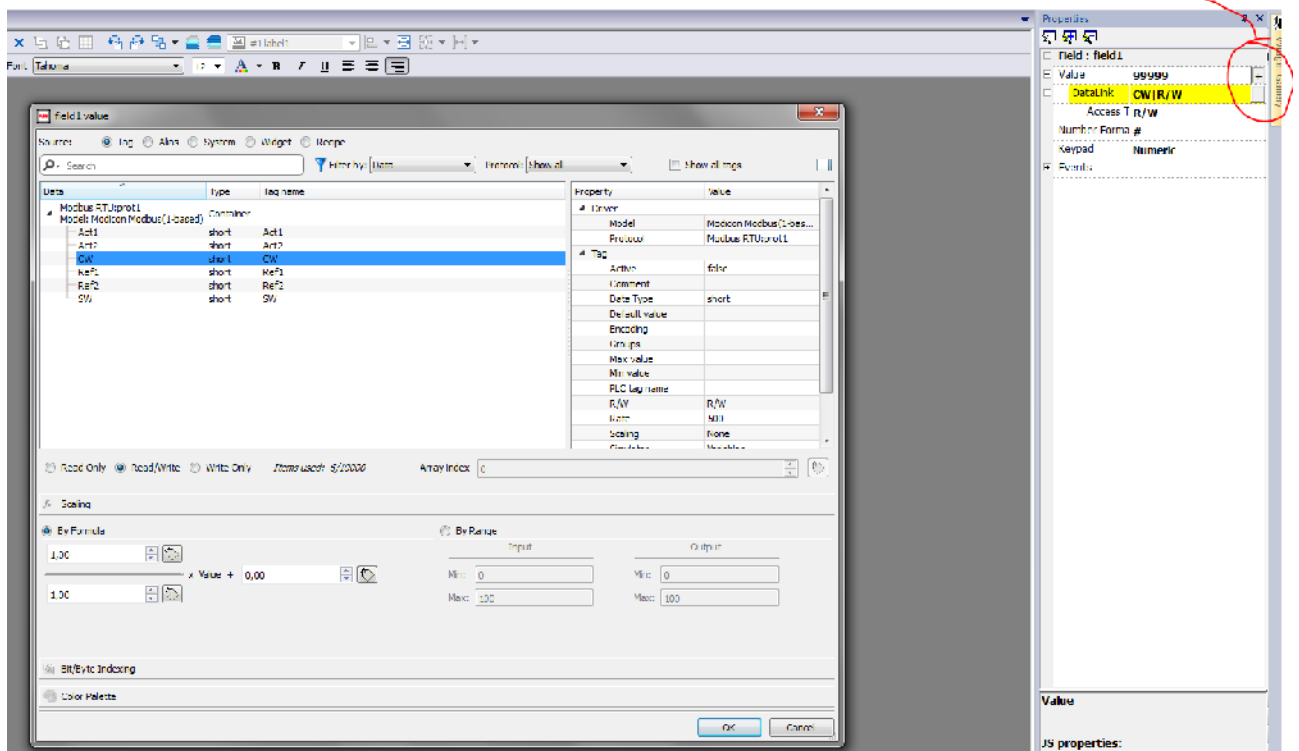
Name	Driver	Address		
		Memory Type	Offset	Data Type
CW	Modbus RTU:prot1	Holding registers	400001	short
Ref1	Modbus RTU:prot1	Holding registers	400002	short
Ref2	Modbus RTU:prot1	Holding registers	400003	short
SW	Modbus RTU:prot1	Holding registers	400004	short
ACT1	Modbus RTU:prot1	Holding registers	400005	short
ACT2	Modbus RTU:prot1	Holding registers	400006	short

- Now click on pages tab and open Page 1, insert six labels and six numeric control from Widget gallery and show below:



- Double click each of the labels and rename the labels and assign to the numeric control the defined tags (e.g. CW,SW, Ref1 ecc.)

Edit every field number and assign the correct address by clicking the “+” button, Select the tag labeled “CW”. Be sure to select the “Read/write” radio button so the value can be edited at run-time. Click [OK].



- Attach tags to the rest of the numeric values. Do not select the “Read/write” radio button for the feedback values – SW, Act1 or Act2
- Save the project. Then, download the project to the panel by selecting “Download to target” from the “Run” menu. You can manually enter the IP address of the panel or use the [V] button to select the IP address from a drop-down list. Click [Download] to load the project into the panel. The process should take 1-2 minutes then the panel should reboot to the screen created in the previous steps.

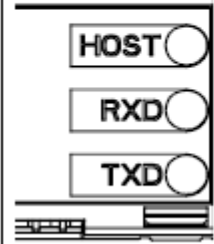


- After the download, the screen of the HMI panel visualize the layout – page 1- with the variable

Testing the project:

- Verify that the communication between the panel and the drive is OK, you must have the HOST green led always ON – fixed light – and the both RXD and TXD blinking.

The FMBA-01 Modbus Adapter module is equipped with three green diagnostic LEDs. The LEDs are described below.

	Name	Colour	Function
	HOST	Green	The module is powered up.
	RXD	Blinking	The module receives data from the bus. The LED blinks whether the received data is address to the unit or not.
	TXD	Blinking	The module sends data to the bus.

- At the HMI set CW to 1150m by click on numeric value on the right of CW
- Set CW to 1151. The drive should switch to run mode
- By default the reference is scaled so that a value of 20000 corresponds to rated motor speed. Change the REF1 value to 10000, the motor should accelerate to ½ rated speed
- Set CW to 1150. The drive should drop out of run mode and the motor should coast to stop