19. Configure HMI as a MODBUS Server

This chapter explains how to configure HMI as a MODBUS Server.

19.1.   Overview

Once the HMI is configured as a MODBUS device, the data of HMI can be read or written via MODBUS protocol.

As shown in the following figure, the HMI is configured as a MODBUS device (also called MODBUS Server). The HMI, PC or other devices can use MODBUS protocol to read or write HMI data via Ethernet or RS-232 / RS-485 interface.
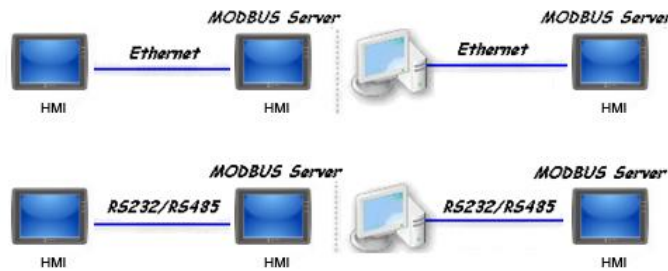
19.2.   Steps to Create a MODBUS Server

1.   To configure the HMI as a MODBUS device, add a new device to the device list in [System Parameters] first. Click [PLC type] drop-down box and select "MODBUS Server" driver. [PLC I/F] includes: RS-232 / RS-485 2W / RS-485 4W / Ethernet / USB / CAN BUS. Choose the PLC interface appropriate for your PLC model.
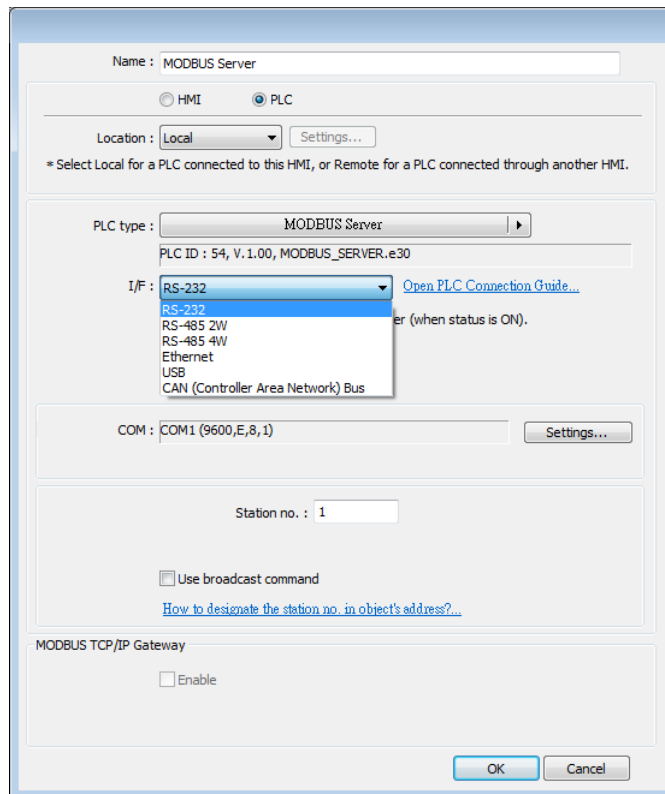
2. If [PLC I/F] is set to [RS-232] or [RS-485], please select [COM] (COM 1 ~ COM 3) and set correct communication parameters as shown in the following figure. MODBUS Server [Station no.] is set to 1. Click [Settings], the maximum LW address range read / written by Modbus Client can be set. When the object in the project uses a LW register, the Modbus Client will not be able to read or write an address that is not within the specified range.

If [PLC I/F] is set to [Ethernet], please set [Port no.].

The [Port no.] of MODBUS Server and HMI must be the same. To change the port number, please set in the [System Parameters] » [Model] tab.
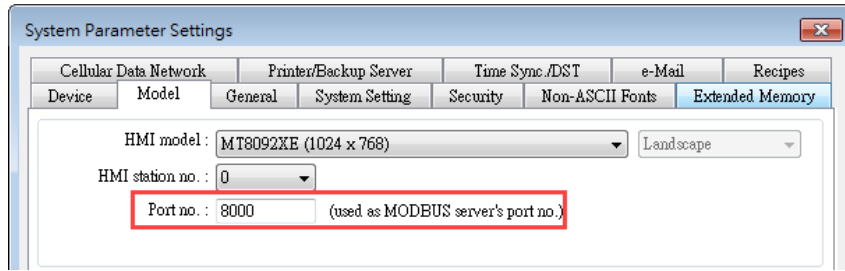
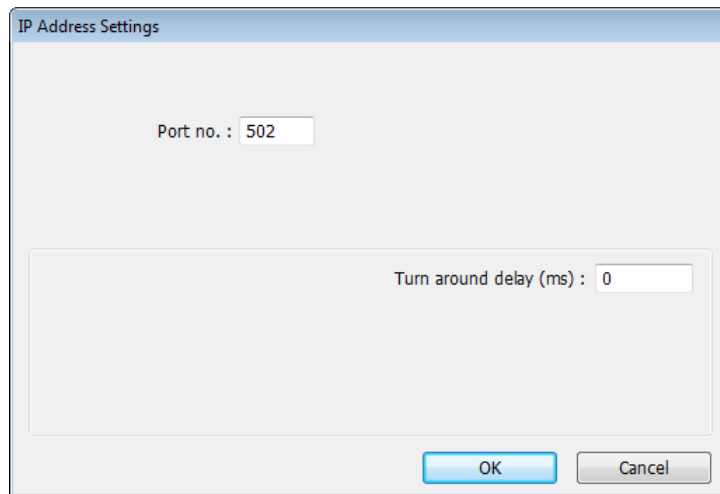3. When finished, MODBUS Server is listed in [Device] tab. The configuration of MODBUS device is completed. Compile the .emtp file and download the compiled .exob file to the HMI, then HMI data can be read or written by using MODBUS protocol.
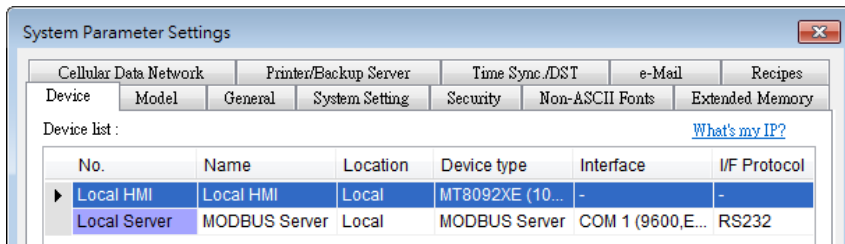
Note

■ For cMT / cMT X Series models, if [Ethernet] PLC interface is chosen, port number can be specifed.


19.3.   Steps to Access a MODBUS Server

Two HMIs can be configured as one MODBUS client and one MODBUS server to communicate and exchange data.

1. Add a new device in client's device list. If the client chooses [Ethernet] PLC interface, set [PLC type] to "MODBUS TCP/IP" and fill in the correct [IP address] (the IP of MODBUS Server), [Port no.], and [Station no.].

If the client chooses [RS-232] or [RS-485] PLC interface, the [PLC type] must be set to "MODBUS RTU", and its communication parameters also must be configured correctly.
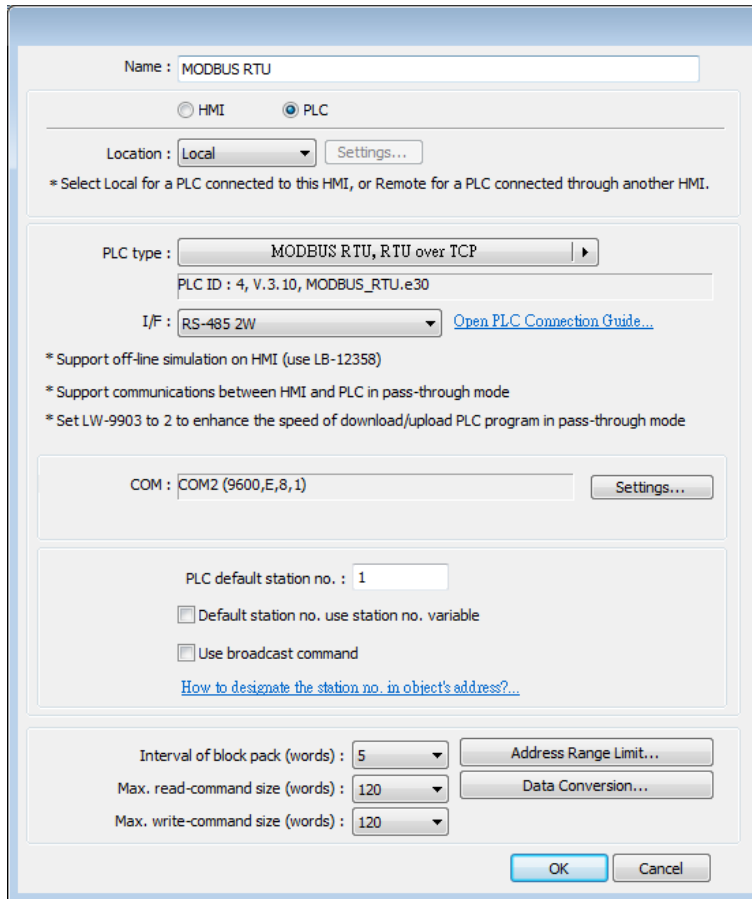
2. When finished, click [OK], then a new device "MODBUS RTU" is listed in the [Device] tab.
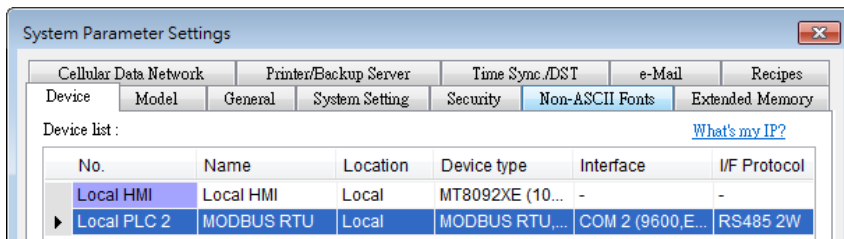
3. In the setting page of each object, select "MODBUS RTU" in [PLC name], and set the address of MODBUS RTU.
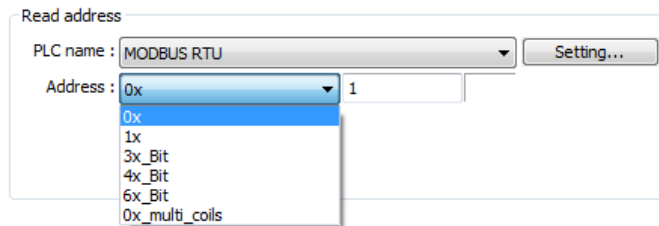
Since the server is an HMI, the corresponding read and write addresses are listed below：

0x/1x (1 ~ 12800)	LB (0 ~ 12799)
3x/4x/5x (1 ~ 9999)	LW (0 ~ 9998)
3x/4x/5x (10000 ~ 65535)	RW (0 ~ 55535)

19.4.   Changing MODBUS Server Station Number Online

EasyBuilder Pro provides the following system registers to change MODBUS Server station number online.

LW-9541	MODBUS/ASCII server station no. (COM 1)
LW-9542	MODBUS/ASCII server station no. (COM 2)
LW-9543	MODBUS/ASCII server station no. (COM 3)
LW-9544	MODBUS/ASCII server station no. (Ethernet)

19.5.   MODBUS Address Type

In the EasyBuilder Pro, the address types of MODBUS protocol are 0x, 1x, 3x, 4x, 5x, 6x, 3x_bit and 4x_bit. MODBUS RTU function codes are listed below:

0x: Coils	A read and write device type. When reading a bit with this device type, the function code is 01H. When writing a bit, the function code is 05H. When writing multiple bits, the function code is 0fH.
1x: Discrete Inputs	A read only device type. When reading a bit the function code is 02H.
3x: Input Registers	A read only device type. When reading data, the function code is 04H.
4x: Holding Register	A read and write device type. When reading data, the function code is 03H. When writing data, the function code is 10H.
5x	The function code is the same as 4x. The difference is that 5x makes double word swap when the format is 32-bit unsigned. If the data read by 4x is 0x1234, the data read by 5x is 0x3412.
6x	A read and write device type. When reading data, the function code is 03H. The difference from 4x is that when writing data, the function code is 06H, meaning to write a single register.
3x_bit	The function code is the same as 3x. The difference is that 3x_bit reads a single bit in the data.
4x_bit	The function code is the same as 4x. The difference is that 4x_bit reads a single bit in the data.
6x_bit	The function code is the same as 6x. The difference is that 6x_bit reads a single bit in the data.

☞ For more information, see "37 MODBUS TCP/IP Gateway".

⬇ Click the icon to download the demo project. Please confirm your internet connection before downloading the demo project.