37. MODBUS Gateway

This chapter explains how to use MODBUS Gateway and configure address mapping tables.

37.1. Overview

To access the data of the PLC connected to HMI with SCADA software (Supervisory Control and Data Acquisition), the former way was to transfer PLC data to the HMI's local address first, and then use MODBUS TCP/IP or MODBUS RTU protocol on PC to read HMI local address to get PLC data. Now by using MODBUS Gateway provided by EasyBuilder Pro, the mapping of MODBUS address to PLC address can be defined first, and then one can directly use MODBUS TCP/IP or MODBUS RTU protocol to access PLC data.


37.2. Steps to Create an Address Mapping Table

To create an Address Mapping Table, please follow the steps:

1. In [System Parameter Settings] » [Device] tab, add the PLC device. (In the example FATEK FB Series is used).
2. Add MODBUS Server, select Ethernet or COM port interface according to the MODBUS Client and enable [MODBUS TCP/IP Gateway] / [MODBUS RTU Gateway] as shown below.
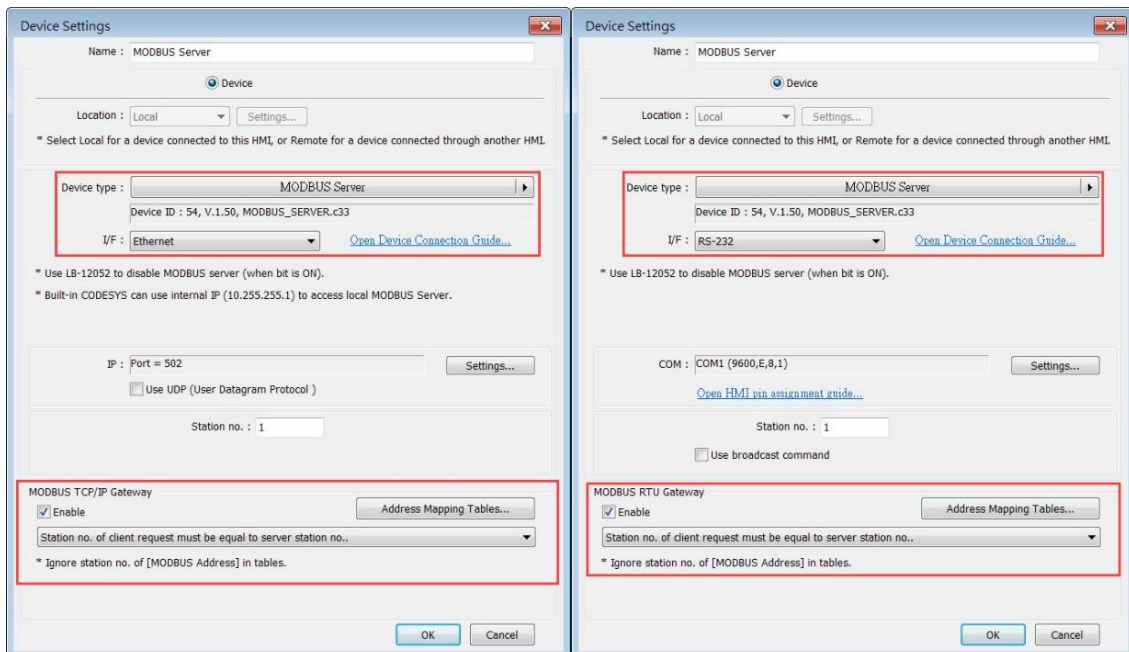
3. Click [Address Mapping Tables] button and the following default tables will be displayed. Modify the tables if needed or add new tables.
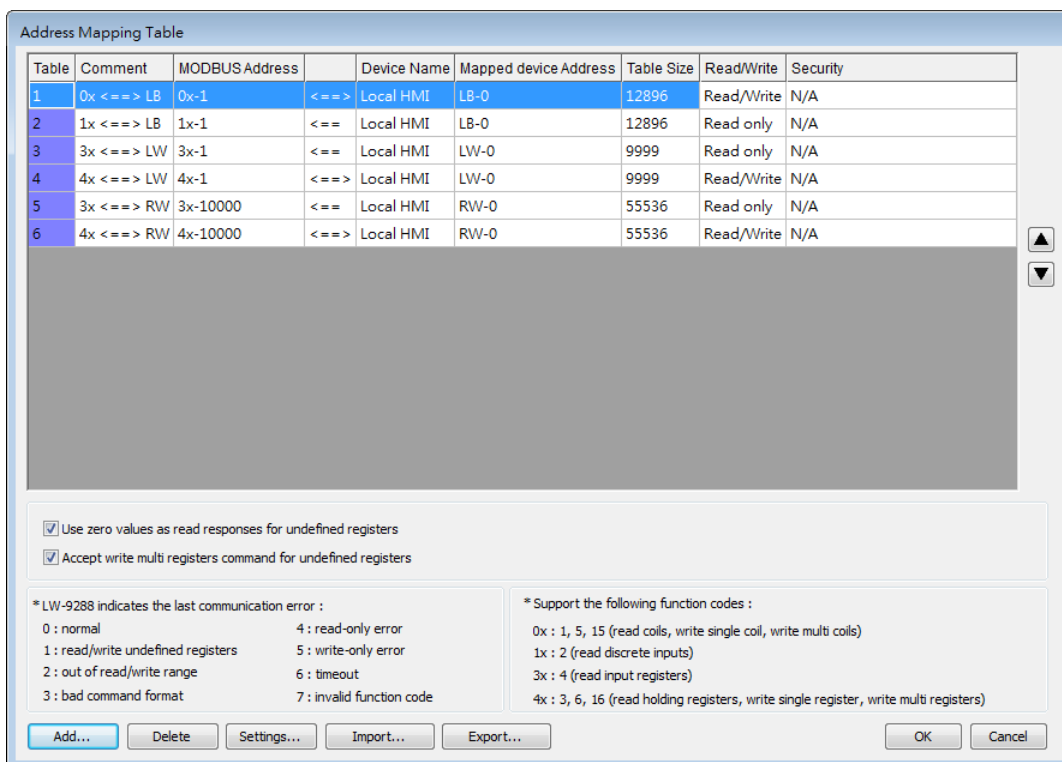
4. In the example below, to access the data in the 50 consecutive registers of FATEK FB Series PLC starting from register D-0, configure the settings as shown in the following figure.
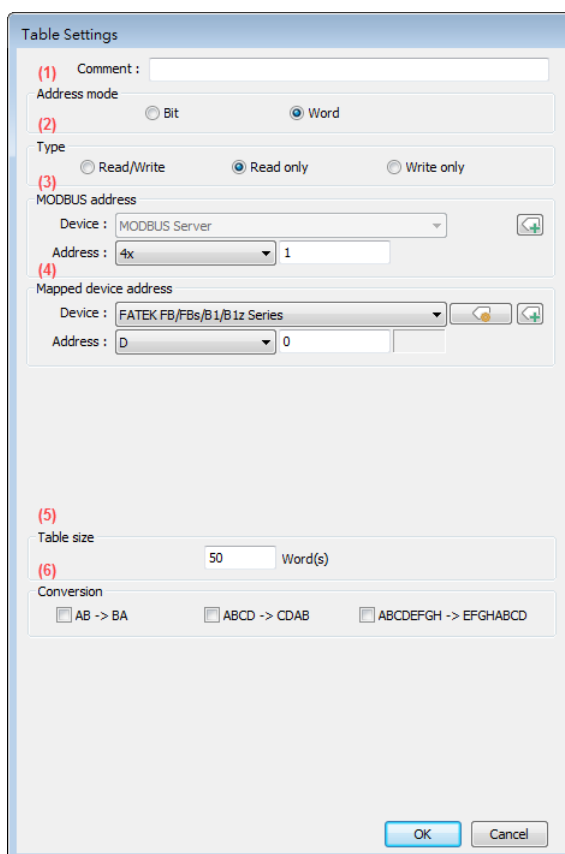
(1) Select the address mode, in this example select [Word].

(2) Select the access type, in this example select [Read/Write].

(3) Set the start address of MODBUS, in this example set to "4x-1".

(4) Set the start address of the mapped PLC, in this example set to "D-0".

(5) Set the size of address mapping table, in this example set to "50".

(6) Select high/low byte swap or high/low word swap if necessary.

Table	Description	MODBUS Address		PLC Name	Mapped PLC Address	Table Size	Read/Write
1	Access D0 ~ D49	4x-1	< = = >	FATEK FB Series	D-0	50 Word(s)	Read/Write

The above figure shows that MODBUS Server 4x-1 ~ 4x-50 registers are mapped to FATEK FB Series PLC D-0 ~ D-49 registers.

5. When finished, the data of FATEK FB Series PLC D-0 ~ D-49 registers are now accessible by using MODBUS protocol to send read / write command to 4x-1 ~ 4x-50 registers.

37.3.   Notes about Configuring Address Mapping

■   UDP is not supported when MODBUS TCP/IP Gateway feature is used.

■   MODBUS RTU Gateway feature is only supported on cMT / cMT X Series models.

■   The station number of MODBUS client request can be handled differently in the following
modes, please select a mode suitable for your application:

The station no. of client request must be equal to server station no.

Use the station number of MODBUS Server.

MODBUS RTU Gateway
☑ Enable   Address Mapping Tables...
Station no. of client request must be equal to server station no..   ▼
* Ingore station no. of [MODBUS Address] in tables.

Use station no. given by client request.

Use the station number of MODBUS Client. Only one MODBUS Client can be connected to
MODBUS Server at a time, and the clients should use different station numbers.

MODBUS RTU Gateway
☑ Enable   Address Mapping Tables...
Use station no. given by client request.   ▼
* Ingore station no. of [MODBUS Address] in tables.
* Ingore station no. of [Mapped Device Address] in tables.
* Target station no. is assigned by client request.

Station no. of client request must meet MODBUS address setting in tables.

Use the station number of the MODBUS address in the address mapping table.
Example: Two MODBUS Clients, 4x-1#100 and 4x-2#100, are connecting to MODBUS
Server using station no. 1 and station no. 2. Under this mode, multiple clients can
simultaneously connect to the server.
If no station number is assigned for the MODBUS address, the default station number of
the device will be used.

MODBUS RTU Gateway
☑ Enable   Address Mapping Tables...
Station no. of client request must meet MODBUS address setting in tables.   ▼

* Ingore station no. of [Mapped Device Address] in tables.

* Target station no. is assigned by client request.

■   Update time (sec) can be set to enable caching for MODBUS Server when multiple clients

are frequently reading data. By default, the setting is 0 and the caching feature is not enabled. Settings greater than 0 can enable caching. At the first time the server receives a command from the client, it gets data from PLC. If the update time is set to 1 second, and the client requests for data in the same register again, within a second, the server will use the PLC data previously obtained as response.
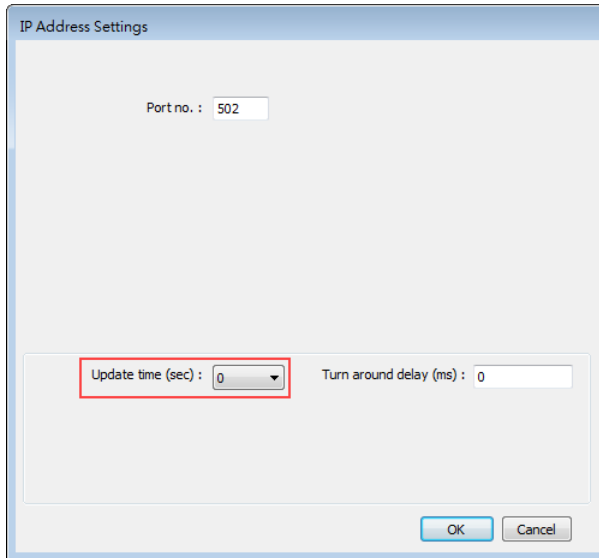
■ When the registers of the client device are not consecutive, and the user would like to read / write all data at a time, the following two options are provided for users to decide how to handle the undefined registers in the mapping table. These options are only available on cMT / cMT X models.
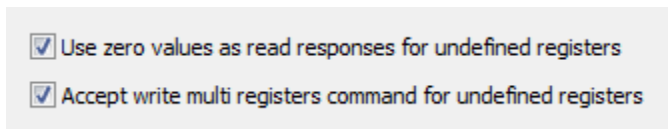
■ The clients are not allowed to read / write 16-bit data (high / low word) of a 32-bit register.

■ System register LW-9288 is used to indicate if data transfer has been correctly executed. The following error codes represent:

Value	Definition
0	Normal
1	Read or write the register that is not defined in the Address Mapping Table.
2	Read or write a range of registers that is not within the range defined in a single Address Mapping Table. (Or, read / write a register that is defined in other Address Mapping Table.)
3	The command format does not follow MODBUS TCP/IP protocol.

4	Modify a read-only register.
5	Read a write-only register.
6	Cannot get the correct reply from PLC within the specified time range.
7	Use a function code that is not supported by MODBUS Server.

■   If [MODBUS Gateway] is enabled, EasyBuilder Pro will cancel the original mapping between MODBUS Server and HMI register. That includes:

(1)   0x, 1x mapped to LB

(2)   3x, 4x mapped to LW, RW

Therefore, to access data in LB or LW register via 0x, 1x, 3x, 4x, configure the Address Mapping Table again. The following figure is an example.

Table	Description	MODBUS Address		PLC Name	Mapped PLC Address	Table Size	Read/Write
1	0x <==> LB	0x-1	<==>	Local HMI	LB-0	12400 Bit(s)	Read/Write
2	1x <==> LB	1x-1	<==	Local HMI	LB-0	12400 Bit(s)	Read only
3	3x <==> LW	3x-1	<==	Local HMI	LW-0	9999 Word(s)	Read only
4	4x <==> LW	4x-1	<==>	Local HMI	LW-0	9999 Word(s)	Read/Write
5	3x <==> RW	3x-10000	<==	Local HMI	RW-0	55536 Word(s)	Read only
6	4x <==> RW	4x-10000	<==>	Local HMI	RW-0	55536 Word(s)	Read/Write