

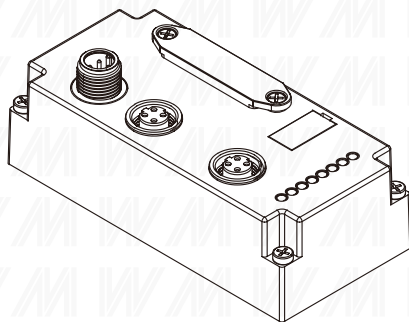
MVE2-MBR

100 / 156 / 188 / 220

Fieldbus System

User Manual E1.1.0

Modbus RTU



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Warranty

All products manufactured by Mindman are under warranty regarding defective materials for a period of one year, starting from the date of delivery to the original purchaser.

Warning

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If there has any question, please contact Mindman right away. Thanks.

1. Review

This manual is established by organization, so the chapters are interconnected.

1.1 Manual structure

1. Overview section
2. Basic safety information

1.2 Typography habits

List: Enumeration is displayed as a list with bullets.

- Vocabulary 1
- Vocabulary 2

Action: The action description is represented by a front triangle.

The result of the action is represented by an arrow.

- ▶ Military action description 1
- Action results
- ▶ Military action description 2

The step program can also be displayed numerically in parentheses.

- (1) Step 1
- (2) Step 2

Syntax: Digit

Decimal numbers are displayed without additional indicators (e.g., 123), Hexadecimal number display with additional indicator hex (Such as: 00hex) Or with prefix "0X" (Such as: 0×00)

Cross reference: Cross referencing indicates where additional information about this topic can be found.

1.3 Symbol

Explanatory note: This symbol indicates a general note.

Pay attention: This symbol indicates the most important safety notice.

1.4 Acronym

FNI : Network interface

I : Standard input

EMC : Electromagnetic compatibility

O : Standard output

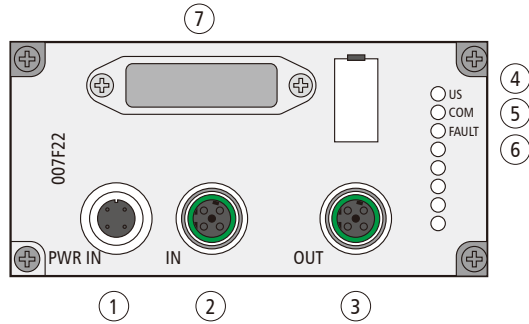
FE : Functional earthing

1.5 Viewing angle deviation

The product views and explanations in this manual may deviate from the actual product. They only explain the materials used left and right.

2. Guide

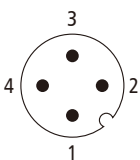
2.1 Module overview / LED status



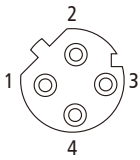
No.	Name	Code	Describe		
1	Power interface	POWER	communication interface and equipment power supply. M12, A-Coded (male), 4PIN		
2	Power interface	IN	M12, D-Coded (female), 4PIN		
3	Power interface	OUT	M12, D-Coded (female), 4PIN		
4	Power indicator light	US	Green	always on	Power supply is normal
				Not lit	Abnormal power supply
5	Communication indicator light	COM	Green	flashing (interval 1s)	When all dials (S1-S8) are 1, test the dialling mode and the dialling is normal
				flashing (interval 0.3s)	Communication is normal
				Not lit	In set coil quantity mode(S7 = 1)
				always on	Abnormal communication
6	Abnormal indicator light	FAULT	Red	flashing (interval 0.3s)	Coil open circuit or short circuit
				Not lit	No abnormalities
7	Dial switch	-	8-bit dialing, Baud setting, 485 communication load resistance selection, coil number setting		

2.2 Electrical connections

Power interface (POWER)

Pin assignment			
Interface	Pin	Function	Description
	1	UA	Power supply 24V
	2	GND	Grounding 0V
	3	US	Module power supply 24V
	4	GND	Grounding 0V

485 Communication Interface (IN / OUT)

Pin assignment			
Interface	Pin	Function	Description
	1	NC	NC
	2	RS485_A	RS485 Communication Interface
	3	NC	NC
	4	RS485_B	RS485 Communication Interface

3. Technical Data

3.1 Operating conditions

Project	Parameter
Operation temperature	-25~+60°C
Working humidity	35~85%RH (No condensation)
Working atmosphere	Non corrosive gas
Storage temperature	-25~+60°C
Waterproof grade	IP54

3.2 Electric data

Project	Parameter
Valve Island Power Consumption (Ius)	≤0.1A (21.6~26.4VDC)
Total power consumption of solenoid valve (Iua)	≤4A (22.8~26.4VDC)
Type of solenoid valve	NPN (+COM)
Single load	Single circuit less than 350mA with surge protection 24V solenoid valve
Number of output coils	Single coil (007F23) Coil 1~16 *
	Double coil (007F22) Coil 1~32
	Double coil (007F21) Coil 1~48 *

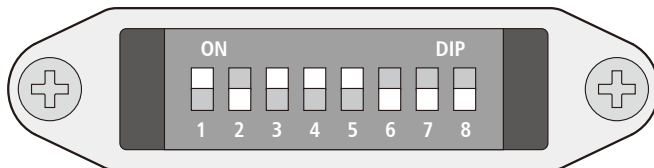
* Non-standard specification, please contact us.

3.3 Communication specifications

Project	Parameter
Agreement	Modbus RTU RS-485
Cable type	4-core shielded twisted pair
Baudrate / bps	9600 / 19200 / 38400 / 115200
Communicate format	8 bits data bits, no parity bit, 1 stop bit
Number of output coils	1~24 routes

4. Dialing Settings

The dial switch is shown in the following figure: Dial up ON is 1, down is 0



S7 is the function selection code, which cannot be toggled after power on. S1-S6 and S8 can be toggled for function settings after power on

When S7=1, other dialing functions are shown in the table below:

Funtion	Dialing
Setting the number of coils	S6 (MSB) - S1 (LSB) sets the number of coils in binary: 1 (000001) ~ 24 (011000) *
Terminator	S8=0 Not used, S8=1 use

* Non-standard specification, please contact us.

When S7=0, other dialing functions are shown in the table below:

Funtion	Dialing
Slave address setting	S4 (MSB) - S1 (LSB) sets the slave address in binary format; Address range 0 (0000) -15 (1111)
Baud rate setting	S5 S6=00 BPS=9600; S5 S6=10 BPS=19200; S5 S6=01 BPS=38400; S5 S6=11 BPS=115200
Terminator	S8=0 Not used S8=1 use

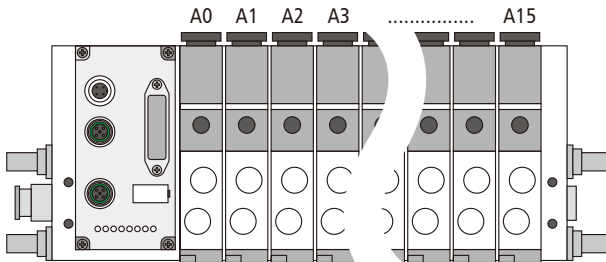
Dialing code setting steps

1. Set the number of coils (factory set, can be changed as needed), S7 Set the number of coils required for dialing 1 and S1-S6.
2. Power on, wait for 3 seconds, then power off.
3. Dial 0 in S7, set Baud in S5S6, and set slave address in S1-S4.
4. Power on to operate normally.

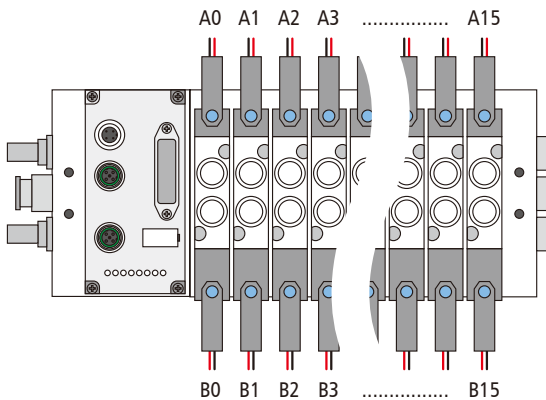
5. Communication Module Data

5.1 Coil definition

Single coil (007F23) : As shown in the figure, the coil above is defined from left to right A0~A15.



Double coil (007F21 / 007F22) : As shown in the figure below, define the upper coil as A0~A15 from left to right; the lower coil as B0~B15 from left to right.



5.2 Input diagnostic data

5.2.1. As shown in the table below, if the bit data corresponding to the coil is 1, there is an overcurrent fault in the coil. After the fault is resolved and the reset signal of the coil is set to 1, the alarm can be cleared and the coil can be operated.

Single coil 007F23 *:

Register address	bit								Notes
	7	6	5	4	3	2	1	0	
500CH	A7	A6	A5	A4	A3	A2	A1	A0	Short circuit, Overload, Overtemperature
500DH	A15	A14	A13	A12	A11	A10	A9	A8	

* Non-standard specification, please contact us.

Double coil 007F21 * / 007F22:

Register address	bit								Notes
	7	6	5	4	3	2	1	0	
500CH	B3	A3	B2	A2	B1	A1	B0	A0	Short circuit, Overload, Overtemperature
500DH	B7	A7	B6	A6	B5	A5	B4	A4	
500EH	B11	A11	B10	A10	B9	A9	B8	A8	
500FH	B15	A15	B14	A14	B13	A13	B12	A12	
5010H	B19	A19	B18	A18	B17	A17	B16	A16	
5011H	B23	A23	B22	A22	B21	A21	B20	A20	

* Non-standard specification, please contact us.

5.2.2. As shown in the table below, if the bit data corresponding to the coil is 1, there is an open circuit fault in the coil. After the fault is resolved, the reset signal of the coil can be set to 1 before the alarm can be released.

Single coil 007F23 *:

Register address	bit								Notes
	7	6	5	4	3	2	1	0	
5012H	A7	A6	A5	A4	A3	A2	A1	A0	Open circuit alarm information
5013H	A15	A14	A13	A12	A11	A10	A9	A8	

* Non-standard specification, please contact us.

Double coil 007F21 * / 007F22:

Register address	bit								Notes
	7	6	5	4	3	2	1	0	
5012H	B3	A3	B2	A2	B1	A1	B0	A0	Open circuit alarm information
5013H	B7	A7	B6	A6	B5	A5	B4	A4	
5014H	B11	A11	B10	A10	B9	A9	B8	A8	
5015H	B15	A15	B14	A14	B13	A13	B12	A12	
5016H	B19	A19	B18	A18	B17	A17	B16	A16	
5017H	B23	A23	B22	A22	B21	A21	B20	A20	

* Non-standard specification, please contact us.

5.3 Output data

5.3.1. As shown in the table below, after the bit corresponding to the coil is written to 1, the coil is closed. Write 0, coil disconnected

Single coil 007F23 *:

Register address	bit								Notes
	7	6	5	4	3	2	1	0	
5000H	A7	A6	A5	A4	A3	A2	A1	A0	Coil output
5001H	A15	A14	A13	A12	A11	A10	A9	A8	

* Non-standard specification, please contact us.

Double coil 007F21 * / 007F22:

Register address	bit								Notes
	7	6	5	4	3	2	1	0	
5000H	B3	A3	B2	A2	B1	A1	B0	A0	48 channels of control output
5001H	B7	A7	B6	A6	B5	A5	B4	A4	
5002H	B11	A11	B10	A10	B9	A9	B8	A8	
5003H	B15	A15	B14	A14	B13	A13	B12	A12	
5004H	B19	A19	B18	A18	B17	A17	B16	A16	
5005H	B23	A23	B22	A22	B21	A21	B20	A20	

* Non-standard specification, please contact us.

- 5.3.2. After an abnormality occurs, remove the abnormality and operate the coil as follows:
1. Write the address bit of the reset signal register corresponding to the coil to 1
 2. Control coil status
 3. Write 0 to the address bit of the reset signal register corresponding to the coil;

Single coil 007F23 *:

Register address	bit								Notes
	7	6	5	4	3	2	1	0	
5006H	A7	A6	A5	A4	A3	A2	A1	A0	Reset signal
5007H	A15	A14	A13	A12	A11	A10	A9	A8	

* Non-standard specification, please contact us.

Double coil 007F21 * / 007F22:

Register address	bit								Notes
	7	6	5	4	3	2	1	0	
5006H	B3	A3	B2	A2	B1	A1	B0	A0	48 channels of reset signal
5007H	B7	A7	B6	A6	B5	A5	B4	A4	
5008H	B11	A11	B10	A10	B9	A9	B8	A8	
5009H	B15	A15	B14	A14	B13	A13	B12	A12	
500AH	B19	A19	B18	A18	B17	A17	B16	A16	
500BH	B23	A23	B22	A22	B21	A21	B20	A20	

* Non-standard specification, please contact us.

5.4 Relay address and coil

5.4.1. As shown in the table below, the corresponding relay address of the coil is written to FF00, and the coil is closed; Write 0000, coil disconnected.

Single coil 007F23 *:

Relay address	Coil name	Relay address	Coil name
5101H	A0	5109H	A8
5102H	A1	510AH	A9
5103H	A2	510BH	A10
5104H	A3	510CH	A11
5105H	A4	510DH	A12
5106H	A5	510EH	A13
5107H	A6	510FH	A14
5108H	A7	5110H	A15

* Non-standard specification, please contact us.

Double coil 007F21 * / 007F22:

Relay address	Coil name	Relay address	Coil name	Relay address	Coil name
5101H	A0	5111H	A8	5121H	A16
5102H	B0	5112H	B8	5122H	B16
5103H	A1	5113H	A9	5123H	A17
5104H	B1	5114H	B9	5124H	B17
5105H	A2	5115H	A10	5125H	A18
5106H	B2	5116H	B10	5126H	B18
5107H	A3	5117H	A11	5127H	A19
5108H	B3	5118H	B11	5128H	B19
5109H	A4	5119H	A12	5129H	A20
510AH	B4	511AH	B12	512AH	B20
510BH	A5	511BH	A13	512BH	A21
510CH	B5	511CH	B13	512CH	B21
510DH	A6	511DH	A14	512DH	A22
510EH	B6	511EH	B14	512EH	B22
510FH	A7	511FH	A15	512FH	A23
5110H	B7	5120H	B15	5130H	B23

* Non-standard specification, please contact us.

5.4.2. In the following table, the corresponding relay address of the coil is written to FF00, and the coil reset signal is set to 1; write 0000, set the coil reset signal to 0.

After an abnormality occurs, remove the abnormality and operate the coil as follows:

1. Write the corresponding reset signal relay address bit of the coil to FF00;
2. Control coil status
3. Write the corresponding reset signal relay address bit of the coil to 0000;

Single coil 007F23 *:

Relay address	Coil name	Function code	Coil name
5101H	A0	5109H	A8
5102H	A1	510AH	A9
5103H	A2	510BH	A10
5104H	A3	510CH	A11
5105H	A4	510DH	A12
5106H	A5	510EH	A13
5107H	A6	510FH	A14
5108H	A7	5110H	A15

* Non-standard specification, please contact us.

Double coil 007F21 * / 007F22:

Relay address	Coil name	Relay address	Coil name	Relay address	Coil name
5131H	A0	5141H	A8	5151H	A16
5132H	B0	5142H	B8	5152H	B16
5133H	A1	5143H	A9	5153H	A17
5134H	B1	5144H	B9	5154H	B17
5135H	A2	5145H	A10	5155H	A18
5136H	B2	5146H	B10	5156H	B18
5137H	A3	5147H	A11	5157H	A19
5138H	B3	5148H	B11	5158H	B19
5139H	A4	5149H	A12	5159H	A20
513AH	B4	514AH	B12	515AH	B20
513BH	A5	514BH	A13	515BH	A21
513CH	B5	514CH	B13	515CH	B21
513DH	A6	514DH	A14	515DH	A22
513EH	B6	514EH	B14	515EH	B22
513FH	A7	514FH	A15	515FH	A23
5140H	B7	5150H	B15	5160H	B23

* Non-standard specification, please contact us.

5.5 Modbus RTU funtion code

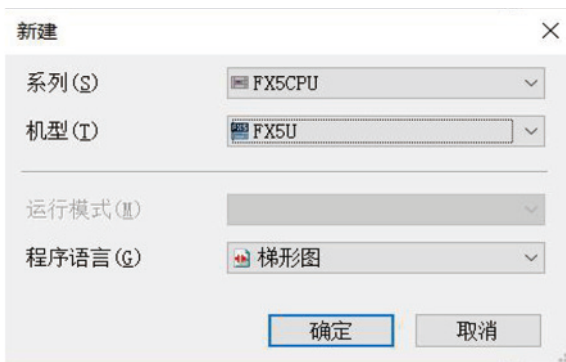
Funtion code	Operation address	Description
01H	5000H~5002H	Read one or multiple switch output
	5006H~5008H	
02H	500CH~500EH	Read one or multiple switch inputs
	5012H~5014H	
03H	5000H~5002H	Read multiple register output
	5006H~5008H	
04H	500CH~500EH	Read multiple register inputs
	5012H~5014H	
05H	5101H~5118H	Set individual relay switch status
	5131H~5148H	
06H	5000H~5002H	Setting a single holding register
	5006H~5008H	
0FH	5000H~5002H	Set multiple relay states
	5006H~5008H	
10H	5000H~5002H	Setting multiple holding registers
	5006H~5008H	

6. Integration

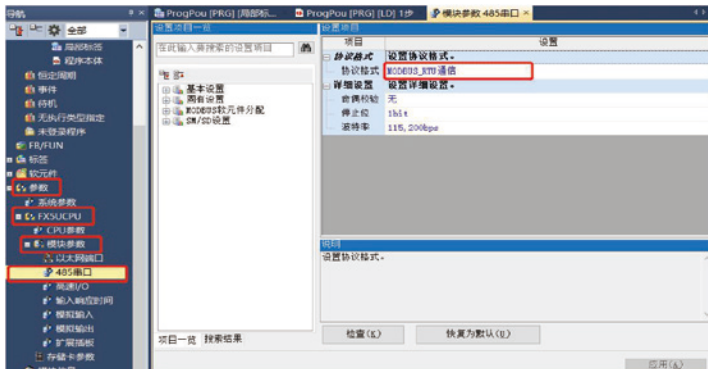
6.1 At Mitsubishi GX Works3

Here, you will see an example of how to integrate this module into GX Works3 using FX5U. PLC as an example:

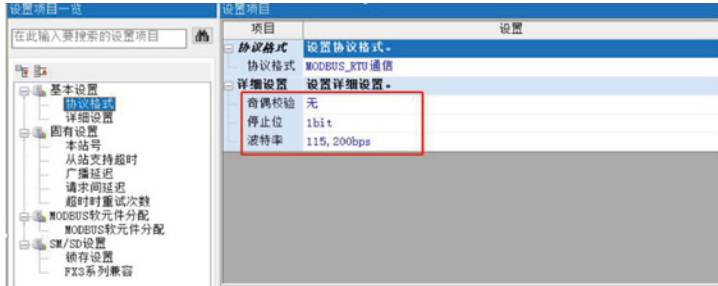
Engineering > New > Select Series Model (FX5U) > Confirm



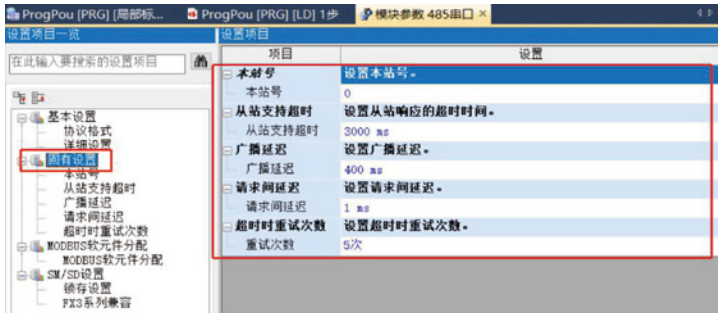
Parameter > FX5UCPU > Module parameter > 485 serial port > Select protocol format Modbus_RTU communication



Set Baud by dialing



Inherent settings can be set according to project requirements



Programming reference "MELSEC iQ-F FX5 User Manual (Modbus Communication Chapter)"

