
MODBUS communication protocol of FPDC controller

1. Communication format

- 1) Mode: MODBUS communication protocol with RTU mode;
- 2) Baud Rate: 9600bps baud rate is supposed.
- 3) Parity: none parity bit is supposed.
- 4) Stop Bit Setting: one stop bit is supposed;
- 5) Data Bits Setting: eight data bits.

2. Data format

MODBUS function codes of 0x03, 0x04 and 0x10 will be used in this FPDC controller.

In addition, each register is stored with 2 byte of data.

- 1) Function code 0x03 (read the holding register)

a) Received data format

Address of PCB board	Function code	Initial address	Register quantity	CRC
1byte	1byte	2byte	2byte	2byte

For example, the order 1103 006B 0003 7687 (all hexadecimal coding, the same as following situations) means that reading the content of 3 holding registers starting from 0X006B of RAM of the PCB board which address is 0x11.

Attention: Please change the parameter 14 of the backstage (local address) to set the DC fan coil address, similar as following situations.

b) Returned-data format (normal data)

Address	Function code	Data length (number of bytes)	Data	CRC
1byte	1byte	1byte	Nbyte	2byte

For example, the order 1103 06 022B 0000 0064 C8BA means the returned-data after receiving the data of last example.

Attention: 06 (number of bytes) = 03 (number of words) x2, similar as following situations.

c) Wrong data format

If the wrong data is received, the returned-data format will be as follow:

Address	Function code (top digit set as 1)	Wrong code	CRC
1byte	1byte	1byte	2byte

According to MODBUS standard communication protocol, the “wrong code” is as follow:

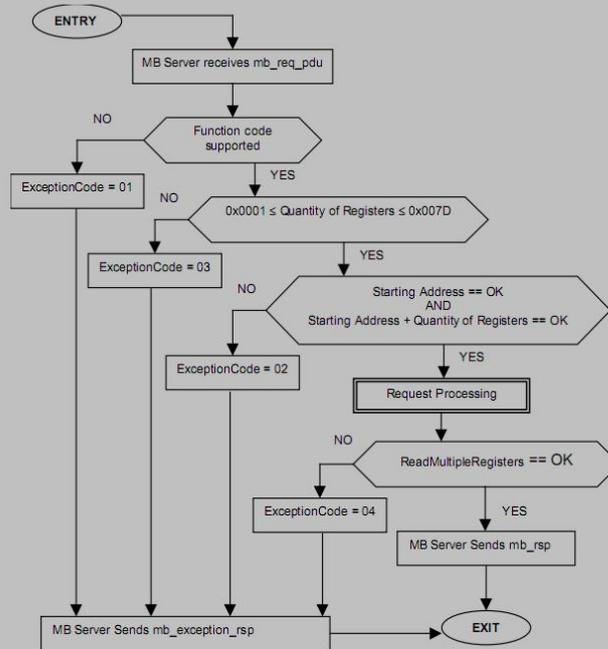


Figure 13: Read Holding Registers state diagram

2) Function code 0x04 (read the input register)

a) Received data format

Address of PCB board	Function code	Initial address	Register quantity	CRC
1byte	1byte	2byte	2byte	2byte

For example, the order 1104 0008 0001 B298 means that reading the content of one input register starting from 0x0008 of RAM of PCB board which address is 0x11.

b) Returned-data format (normal data)

Address	Function code	Data length (number of bytes)	Data	CRC
1byte	1byte	1byte	Nbyte	2byte

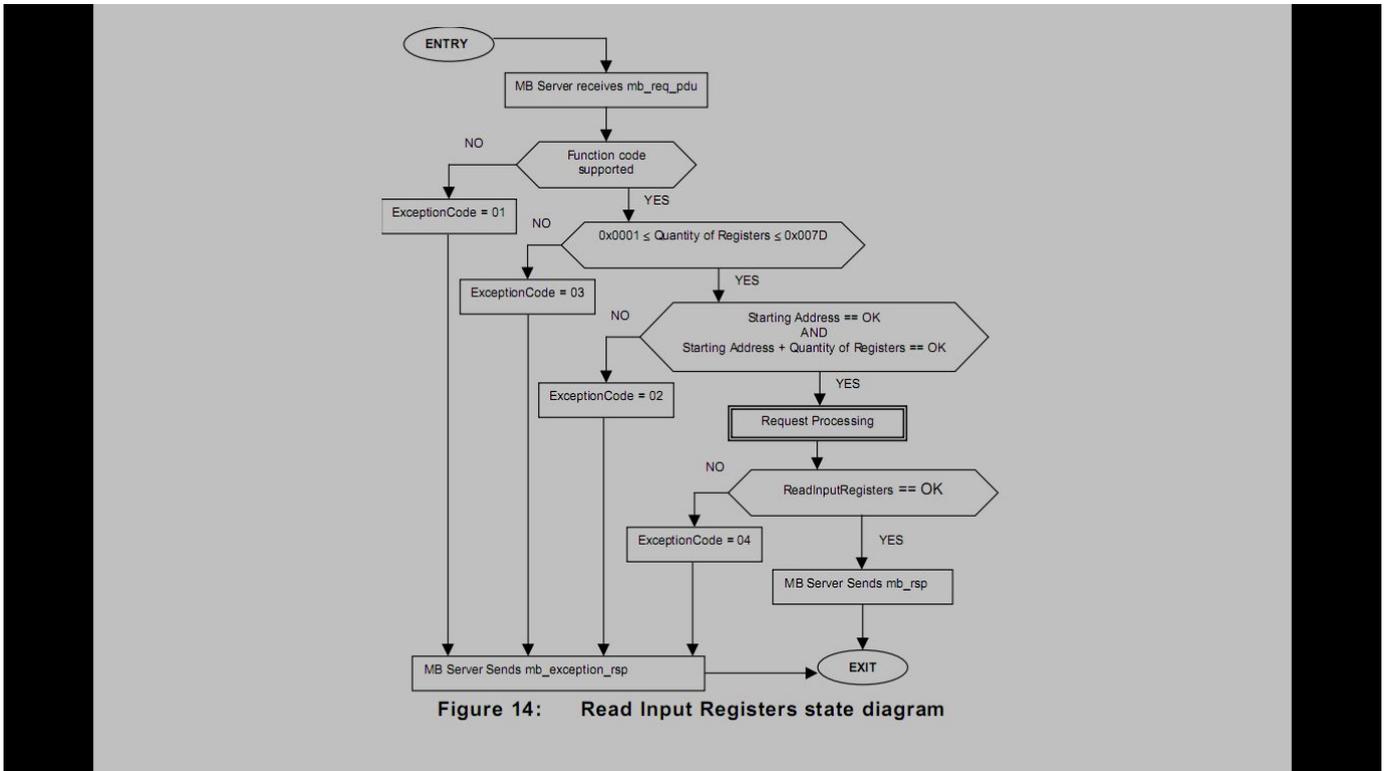
For example, the order 1104 02 000A F8F4 means the returned-data after receiving the data of last example.

c) Wrong data format

If the wrong data is received, the returned-data format will be as follow:

Address	Function code (top digit set as 1)	Wrong code	CRC
1byte	1byte	1byte	2byte

According to the MODBUS standard communication protocol, the “wrong code” is as follow:



3) Function code 0x10 (write several registers)

a) Received data format

Address of PCB board	Function code	Initial address	Register quantity	Data length	Data	Check code
1byte	1byte	2byte	2byte	1byte (ATTEN: Not 2byte)	nbyte	2byte

For example, the order 1110 0001 0002 04 000A 0102 C6F0 means changing the content of register 0001 to “000A”, and changing the content of register 0002 to “0102” in the PCB board (address: 0x11).

b) Returned-data format (normal data)

Address of PCB board	Function code	Initial address	Register quantity	Check code
1byte	1byte	2byte	2byte	1byte

For example, the order 1110 0001 0002 1298 means the returned-data after receiving the correct data for last example.

c) Wrong data return

If the wrong data is received, the returned-data format is as follow:

Address	Function code (top digit set as 1)	Wrong code	CRC
1byte	1byte	1byte	2byte

According to the MODBUS standard communication protocol, the “wrong code” is as follow:

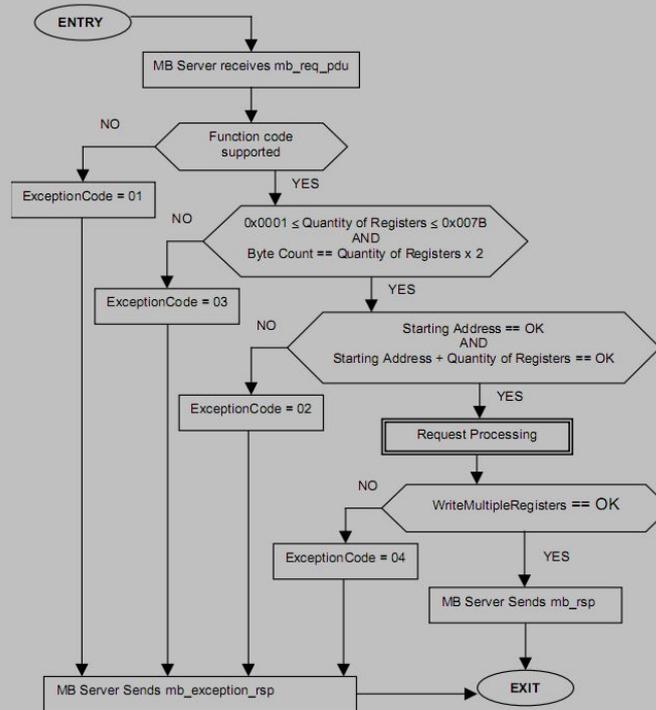


Figure 22: Write Multiple Registers state diagram

3. Format list of register

1) Format list of input register

Parameter	Meaning	Format	Address of register
T1	Indoor ambient temp.	Indoor ambient temp. (actual temp. should be enlarged by 10 times) (Bit15: sign bit, 0: positive number, 1: negative number; Bit14~0: data value; The following temp. is similar.)	46801
T2	Coil temp.	Coil temp. (actual temp. should be enlarged by 10 times)	46802
O1	Speed of motor running	0: shut down; 1: ultra-low wind speed; 2: low wind speed; 3: medium wind speed; 4: high wind speed; 5: top speed; 6: auto.	46803
O2	Speed of motor	0~2000 (rpm)	46804

O3	Condition of water value	0: off; 1: on.	46805
O4	Online conversion power on/off	0: off, the main unit needs to be turned off; 1: on, the main unit needs to be turned on.	46806
O5	Online conversion mode	0: the main unit needs to be switched to non-heating mode; 1: the main unit needs to be switched to heating mode.	46807
E1	Feedback error of motor	(1: Yes; 0: No.)	46808
E2	Error of indoor ambient temp. sensor	(1: Yes; 0: No.)	46809
E3	Error of coil sensor	(1: Yes; 0: No.)	46810

2) Format list of holding register

Parameter	Meaning	Format	Address of register
P01	Power on/off	1: on; 0: off.	28301
P02	Mode	0: auto; 1: cooling; 2: dehumidification; 3: ventilation; 4: heating.	28302
P03	Setting of wind speed	2: low speed; 3: medium speed; 4: high speed; 6: auto.	28303
P04	Lock of keyboard	1: lock; 0: unlock.	28304
P05	Sleep function	0: off; 1: on.	28305
P06	Timing power off	0: without timing power off; 1~11: hour number of timing power off.	28306
P07	Timing power on	0: without timing power on; 1~11: hour number of timing power on.	28307
P08	Upper limit of target temp. (including cooling, heating and auto)	(-9~96)°C	28308
P09	Lower limit of target temp. (including cooling, heating and auto)	(-9~96)°C	28309
P10	Target temp. in cooling mode	P09~P08	28310
P11	Target temp. in heating mode	P09~P08	28311
P12	Cooling target temp. in auto mode	P09~P08	28312

P13	Heating target temp. in auto mode	P09~P08	28313
P14	Temp. to start motor for anti-cold wind	(5~40)°C	28314
P15	Adopt anti-hot wind function or not	(1: Yes; 0: No.)	28315
P16	Adopt ultra low wind speed or not	(1: Yes; 0: No.)	28316
P17	With valve or not	(1: Yes; 0: No.)	28317
P18	Adopt floor heating or not	(1: Yes; 0: No.)	28318
P19	Adopt Fahrenheit or not	(1: Fahrenheit; 0: Celcius)	28319
P20	Is it the main controller	(1: Yes; 0: No.)	28320
P21	Local address	(1~32)	28321
P22	With keyboard lock or not	(1: Yes; 0: No.)	28322
P23	When the keyboard is locked, remote controller works or not	(1: Yes; 0: No.)	28323
P24	A password is needed or not for unlocking the keyboard	(1: Yes; 0: No.)	28324
P25	Password 1 for unlocking the keyboard	(0~99)	28325
P26	Password 2 for unlocking the keyboard	(0~99)	28326
P27	Running mode of motor when constant temp. turning off	0: stop; 1: run for 1min by stopping for every 15min; 2: continue running.	28327

Remark:

1. The precision of all the target temp. is 1°C.
2. P04/P05/P22/P23/P24/P25/P26 are invalid parameters.