

RS485 COMMUNICATIONS MODBUS PROTOCOL

FUNCTION CODES:

- 0x03 Read hold register
- 0x06 Write hold Register
- 0x83, 0x86 Error Code

FUNCTION CODE SYNTAX EXAMPLES

READ HOLD REGISTER

Send

Address (1 Byte)	Function code (1 Byte)	Starting (2 Bytes)	Quantity (2 Bytes)	CRC (2 Bytes)
0FAH	03H	000BH (Note 1)	0003H	XXXX

Receive

Address (1 Byte)	Function code (1 Byte)	Byte count (1 Byte)	Register value (N Bytes)	CRC (2 Bytes)
0FAH	03H	06H (Note 2)	6 * 8 bit (Note 3)	XXXX

UART default

- BPS: 19200
- Data Bit: 8
- Parity bit: None
- Stop bit: 1

Read Hold Register

Master Transmit:

Function code	1Byte	0x03
Starting Address	2Bytes	0x0000 to 0xFFFF
Quantity of Registers	2Bytes	1 to 125 (0x7D)

<Address> <Function code> <Starting address byte₀ + Starting address byte₁>
 <data_byte₀ + data_byte₁> <CRC byte₀ + CRC_byte₁>
 <FA> <03> <00> <14> <00> <01> <D1> <85>

Slave Reply:

Function code	1Byte	0x03
Byte count	1Byte	2 x N*
Register value	N* x 2 Bytes	

*N = Quantity of Registers

<Address> <Function code> < Byte count byte0> <data byte, data byte> <CRC byte0
+ CRC byte1>

<FA> <03> <02> <03> <18> <5D> <6A>

0318h=792ppm

Error:

Error code	1Byte	0x83
Exception code	1Byte	01 or 02 or 03 or 04

Note 1: Start = Start address for getting data. i.e. CO₂ value = 0x0B

Note 2: The length of Data

Note 3: Data length for Receiving = Length for Sending x 2

Registers Map:

	Name	REG/EEP	Function	Description
00H (0x00)	Slave Address	EEP、 R/W	Base address for Modbus.	Address setting default 0x068 1~249 for slave UART/Modbus 250 (0xFA) is reserved for broadcasting, not selectable.
01H	BPS	EEP、 R/W	Baud rate	UART Parity setting, requires power cycle 0x00 : 38400 0x01 : 19200(default) 0x02 : 9600 0x03 : 4800
02H	SET	EEP、 R/W	UART Parity	UART Parity setting, requires power cycle 0x00: n82 0x01: n81 None (default) 0x02: e81 Even 0x03: o81 Odd
12H	O2 Value	R	O2: xx.xx%	Read only
13H	NH3	R	NH3:xxxxppm	Read only
14H	CO2 Value	R	CO2: xxxppm	Read only
15H	CO Value	R	CO: xxxppm	Read only
16H	VOC	R	VOC: xxxppb	Read only
17H	Pm2.5	R	xxxug/m ³	Read only
18H	PM10	R	Xxxxug/m ³	Read only
19H	AMB	R	Amb:xx.xx℃	Read only
1AH	Alti	R	Barometer:xxx.xmmHg	Read only
1BH	RH	R	RH:xx.xx%	Read only
1CH	DP	R	DP:xx.xx%	Read only
1DH	V-Battery	R	Volatge:x.xxxmV	Read only
1EH	Year	R	RTC:Year	Read only
1FH	M-D	R	RTC: Month-Day	Read only
20H	H-M	R	RTC:Hour-Minute	Read only

21H	Sec	R	RTC:sec	Read only
78H	Year	R/W	RTC:Year	Read/Write
79H	M-D	R/W	RTC: Month-Day	Read/Write
7AH	H-M	R/W	RTC:Hour-Minute	Read/Write
7Bh	Sec	R/W	RTC:sec	Read/write

Example:

Broadcasting Address: FAH reading CO2&COvalue

Master Transmit:

<FA><03><00><14><00><02> <91><84>

Start address: The starting address of CO2 is 20 (0x14H), so the starting address is set to <00><14>

The amount of data read: CO2& CO a total of 2 data volumes, so set to <00 ><02>

Slave Reply:

<FA><03><04><03><0D><00><00><21><7B>

The amount of data read back: There are 2 BYTE data for each data address, so the amount of data read back is double the amount of data read.

CO2=0x030D=781 ppm

CO =0x0000=0ppm