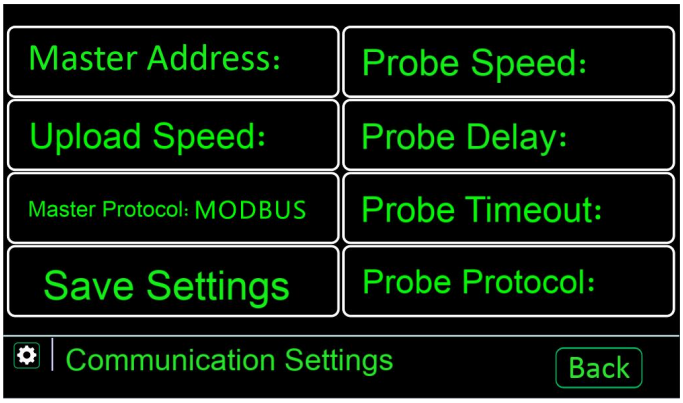
Modbus-RTU (Controller) Communication Protocol V3.02

1. View Host Settings



As shown, navigate to the [Communication Settings] menu and confirm that the host protocol is set to MODBUS. Adjust the baud rate as needed; the default value is 9600.

2. data structure

1. Communication Properties: baud rate 9600, start bit 1, no parity, stop bit 1
2. Communication Frame Structure

Higher-level machine command format:

station address	FC	Starting register address	Number of registers to read	CRC Check Bit Low	CRC Check High Bit
occupies 1 byte	occupies 1 byte	occupies 2 bytes	occupies 2 bytes	occupies 1 byte	occupies 1 byte
(0~255)	0x03/0x06	High Byte, Low Byte	High Byte, Low Byte	CRC lower byte	CRC high byte

3. FC

data type	FC		Meaning of Function Code	explanatory note
	decimal system	hexadecimal		
Byte	3	0x03	Read Holding Register	Read internal detector information (e.g., concentration)
	6	0x06	Write to a single register	Write detector information (e.g., modify low values)

4. Address Details

data type	FC		address		Registry Description	explanatory note
	decimal system	hexadecimal				
font (word)	3	0x03	Detector Address	0x00	Concentration	
				0x01	Gas Unit	
				0x02	state	
				0x03	Types of Gases	
				0x04	accuracy	

	6	0x06	Detector Address	0x01	Zero Point Translation	Calibrate the detector's zero point

state register	explanatory note
0	preheat
1	normal
2	Warning (Not Used)
3	Level 1 Alarm (Underreported)
4	Secondary Alarm (High Level)
5	hitch

Gas Unit		
order number	code name	state
1	0X01	%LEL
2	0X02	%VOL
3	0X03	PPM
4	0x04	ug/m3
5	0x05	mg/m3
accuracy	explanatory note	
0	No decimal point (divided by 1)	
1	A decimal (divided by 10)	
2	Two decimal places (divided by 100)	
3	Three decimal places (divided by 1000)	

Example of reading a single detector (all parameters):

Read the parameters of Host 1 and Probe 1

The host computer sends: 01 03 01 00 00 05 84 35

Host Address | Command | Detector Address | Number of Registers | CRC Check

Upper-level received data: 01 03 0A 00 00 00 00 00 05 00 00 00 00 E8 B6

Host Address | Command |Byte Count| Density | Unit | Status | Type | Precision| CRC Check

Read multiple detector concentrations (read-only concentrations) example:

Read the concentration values from detectors 1 to 5 on Host 1.

The host computer sends: 01 03 00 01 00 05 D4 09

Host Address | Command | Detector Address | Number of Read Registers | CRC Check

Host machine receives: 01 03 0A 00 00 00 00 00 00

Host Address	Command	Byte Count	Concentration1	Concentration2	Concentration3
00 00	00 00	24 B6			

Concentration4	Concentration5	CRC Check

3. Modbus Address Description for Reading a Single Detector (All Parameters)

The address increases by 256 each time, and so on.

First detector parameter address

40257 Concentration

40258 Gas Unit

40259 state

40260 Types of Gases

40261 accuracy

Second probe parameter address

40513 Concentration

40514 Gas Unit

40515 state

40516 Types of Gases

40517 accuracy

4. Read multiple detector concentrations (read-only concentrations) – Modbus address description

The address increases by 1 each time, and so on.

Concentration of Probe 1 at register address 40002

Concentration register address 40003 for Probe 2

Concentration of Probe 3 at register address 40004

Concentration of Probe 4 at register address 40005