FDC-300Series Communication protocol

- physical connection: RS-485；
- Standard Modbus-RTU protocol;
- Factory default communication format: baud rate: 9600Bps; parity: none; data bit: 8Bit; stop bit: 1Bit;
- Factory default device address: 1;
- All floating point numbers in this protocol are single-precision floating point numbers that comply with the IEEE 754 encoding standard.
- Register address description:

Table 1 Description of flow read and write registers

Register name	Register address	Register number	access type	Data element	Annotation
Communication test	0x01	1	Read only	U16	If data 0x0101 is returned, the communication test is successful.
Read flow rate(actual flow rate)	0x10	2	Read only	Float	The unit defaults to SCCM, and floating point numbers are encoded according to IEEE 754, with the low byte first and the high byte last.
Read flow rate (percentage method)	0x16	1	Read only	U16	0-10000=0-100.00% * full scale.
Set flow rate(actual flow rate)	0x20	2	Read and write	Float	The flow unit defaults to SCCM, and floating point numbers are encoded by IEEE 754, with the low digit first and the high digit last. (You can only choose one of the two traffic setting methods)
Set flow rate(percentage method)	0x26	1	Read and write	U16	0-10000=0-100.00% * full scale (You can only choose one of the two traffic setting methods)

Table 2 Communication register description

Register name	Register address	Register number	access type	Data element	Annotation
Communication address	0x30	1	Read and write	U16	Address range 1-99.
Communication baud rate	0x31	1	Read and write	U16	Baud rate = sent value * 100; such as 96, corresponding baud rate is 9600 Bps.
Communication check bit	0x32	1	Read and write	U16	0: No parity; 1: Odd parity; 2: Even parity.

Table 3 Other register descriptions

Register name	Register address	Register number	access type	Data element	Annotation
Valve control	0x2A	1	Read and write	U16	0: Normal control; 2: Cleaning (open at full power) If the cleaning function is not required, there is no need to perform this operation, and the default is the normal control state.
Communication method	0x2D	1	Read and write	U16	1: Rs485 communication; 2: Analog communication.
Equipment zeroing	0x41	1	Write-only	U16	Send 0xf0 to perform an auto-zero (make sure no gas is passing through to do this).
Accumulated flow rate	0x51	2	Read only	U32	The unit defaults to smL, with low bits in front and high bits in the back.
Accumulation cleared	0x53	1	Write-only	U16	Send data: 0x01, then perform clearing.
Warning code	0x61	1	Read only	U16	See Appendix 1 for the warning code table for details.
calibration gas	0x80	5	Read only	Char	Corresponds to the ASCII code table.
calibrated range	0x87	2	Read only	Float	The unit defaults to SCCM, and floating point numbers are encoded according to IEEE 754, with the low bit first and the high bit last.

- **Core register example (example data type: hexadecimal):**

Example 1: Read actual traffic (default unit SCCM)

The host sends data:

Device address	Function code	Starting address high	Starting address low	High register count	Low register count	CRC high	CRC low
01	03	00	10	00	02	C5	CE

Data returned by the device: (For example, the return traffic is: 1000 SCCM)

Device address	Function code	Number of bytes	data 1 high	data 1 low	Data 2 high	Data 2 low	CRC high	CRC low
01	03	04	00	00	44	7A	48	D0

Example 2: Read traffic percentage (0~10000=0~100.00%)

The host sends data:

Device address	Function code	Starting address high	Starting address low	High register count	Low register count	CRC high	CRC low
01	03	00	16	00	01	65	CE

Device return data: (if the return flow is 100% of full scale)

Device address	Function code	Number of bytes	High data	Low data	CRC high	CRC low
01	03	02	27	10	A2	78

Example 3: Set the actual flow rate (the default unit is SCCM, only one can be selected compared to Example 4)

The host delivers data: (Set the traffic to 1000 SCCM)

Device address	Function code	Register address high	Register address low	High register count	Low register count
01	10	00	20	00	02
#01	#02	#03	#04	#05	#06

Number of bytes	Data 1 high	Data 1 low	Data 2 high	Data 2 low	CRC high	CRC low
04	00	00	44	7A	43	54
#07	#08	#09	#10	#11	#12	#13

Device returns data:

Device address	Function code	Register address high	Register address low	High register count	Low register count	CRC high	CRC low
01	10	00	20	00	02	40	02

Example 4: Set the traffic percentage (0~10000=0~100.00%, only one can be selected from Example 3)

The host sends data: (Set the flow rate to 100% full scale)

Device address	Function code	Register address high	Register address low	High register count	Low register count
01	10	00	26	00	01
#01	#02	#03	#04	#05	#06

Number of bytes	High data	Low data	CRC high	CRC low
02	27	10	BB	6A
#07	#08	#09	#10	#11

Device returns data:

Device address	Function code	Register address high	Register address low	High register count	Low register count	CRC high	CRC low
01	10	00	26	00	01	E0	02

Example 5: Correspondence address settings

The host sends data: (Set the communication address to: 2)

Device address	Function code	Register address high	Register address low	High register count	Low register count
01	10	00	30	00	01
#01	#02	#03	#04	#05	#06

Number of bytes	High data	Low data	CRC high	CRC low
02	00	02	22	61
#07	#08	#09	#10	#11

Device returns data:

Device address	Function code	Register address high	Register address low	High register count	Low register count	CRC high	CRC low
01	10	00	30	00	01	01	C6

Example 6: Communication baud rate setting (Bps = sent data *100)

The host sends data: (Set the baud rate: 9600, and send the data to 96)

Device address	Function code	Register address high	Register address low	High register count	Low register count
01	10	00	31	00	01
#01	#02	#03	#04	#05	#06

Number of bytes	High data	Low data	CRC high	CRC low
02	00	60	A2	59
#07	#08	#09	#10	#11

Device returns data:

Device address	Function code	Register address high	Register address low	High register count	Low register count	CRC high	CRC low
01	10	00	31	00	01	50	06

Example 7: Communication check bit setting (0: no check; 1: odd check; 2: even check)

The host sends data: (Set the checksum to: even checksum)

Device address	Function code	Register address high	Register address low	High register count	Low register count
01	10	00	32	00	01
#01	#02	#03	#04	#05	#06

Number of bytes	High data	Low data	CRC high	CRC low
02	00	02	23	83
#07	#08	#09	#10	#11

Device returns data:

Device address	Function code	Register address high	Register address low	High register count	Low register count	CRC high	CRC low
01	10	00	32	00	01	A0	06

Appendix 1 Fault warning code table

Error code	**Failure analysis**	**Troubleshooting**
01	Sensor abnormality/valve leakage	In the non-ventilated state, zero adjustment is completed after preheating.
02	Abnormal air source	Check air source
03	Abnormal power supply voltage	Check supply voltage
04	Set signal over the limit	Check the set signal value
If the problem still cannot be solved according to the above process, you need to contact the manufacturer's technical personnel to investigate and solve the problem.		