

Modbus-RTU (Detector) Communication Protocol V3.02

1. Detector Address, baud Rate

Enter password 1111, select menu FU-8, and modify the detector address.

Enter password 1212, then select menu FH-3 to modify the baud rate.

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

Detector Address	FC	Register Address	Registry Description	Register Content
0x01	0x03 Read Register	0x00 0x00	Concentration	gas concentration
		0x00 0x01	Gas Unit	0x00 Empty 0x01 %LEL 0x02 %VOL 0x03 PPM 0x04 ug/m ³ 0x05 mg/m ³
		0x00 0x02	state	0x00 Preheating 0x01 Normal 0x02 Warning (Not Used) 0x03 Underreported (Level 1 Alarm) 0x04 High Alert (Level 2)

				Alarm) 0x05 Fault
		0x00 0x03	Types of Gases	Refer to the gas name table below
		0x00 0x04	accuracy	0x00 No decimal point 0x01 A decimal point 0x02 Two-digit decimal point 0x03 three decimal places
		0x00 0x05	Underreported value	Level 1 Alarm Value
		0x00 0x06	High Report Value	Secondary Alarm Value
	0x06 Write register	0x00 0x01	Calibrate the detector's zero point	Fixed Content 0X55 0xAA
		0x00 0x02	Change low alarm value	Underreported value
		0x00 0x03	Change High Alarm Value	High Report Value

III. Example Explanation:

Read all parameters of Probe 1:

The host computer sends: 01 03 00 00 00 07 04 08
Address Command Register Address Number of Registers CRC Check
Host machine receives: 01 03 0E 00 0A 00 01 00 01 00 01 00 00 00 14
Address Command ByteCount Concentration Unit Status Name
00 32 2F 62
Precision Underreport Overreport CRC Check

Concentration: 10

Unit: 1 (%LEL)

Status: 1 (Normal)

Name: 1 (Flammable)

Precision: 0 (no decimal places)

Underreported: 20

High Report: 50

Gas Name Number:

number	Gas Name	number	Gas Name	number	Gas Name	number	Gas Name	number	Gas Name
1	combustible EX	21	alcohol	41	epoxyethane	61	Fluorine gas	81	ethyl chlorocarbonate
2	Ammonia gas (NH ₃)	22	isopropanol	42	Ozone O ₃	62	Butylenes (C ₄ H ₁₀)	82	xenon chloride

3	Hydrogen sulfide (H ₂ S)	23	formaldehyde	43	argon Ar	63	sulfur hexafluoride	83	Ethyl Silicate
4	carbon monoxide CO	24	phenol	44	Nitrogen dioxide (NO ₂)	64	perhydrol	84	formic acid
5	Oxygen O ₂	25	acetone	45	nitric oxide NO	65	helium	85	acetic acid
6	Hydrogen (H ₂)	26	hydrogen fluoride HF	46	chlorine hydride HCL	66	phosphine	86	acetonitrile
7	light petroleum	27	benzene	47	hydrogen cyanide HCN	67	boron trichloride	87	triethylamine
8	ethylene	28	methylbenzene	48	Carbon dioxide (CO ₂)	68	aluminium methide	88	caustic alcohol
9	Acetylene C ₂ H ₂	29	dimethylbenzene	49	Chlorine gas (CL ₂)	69	laughing gas	89	acrylonitrile
10	Propane C ₃ H ₈	30	nitrobenzene	50	Concentration	70	silane	90	Acetone
11	Freon	31	sulphuric acid	51	stive	71	arsenic hydride	91	dimethylhydrazine
12	Natural Gas CH ₄	32	chlorobenzene	52	temperature	72	chlorine dioxide	92	Tetraazotene
13	aniline	33	sulfur anhydride	53	humidity	73	ortho-phosphoric acid	93	nitrogen oxide
14	butadiene	34	Bromine (Br ₂)	54	carbon disulfide	74	hydrogen nitrate	94	Benzene compounds
15	VOCs	35	Sulfur dioxide (SO ₂)	55	Dichloromethane	75	caustic soda	95	alkanes
16	acroleic acid	36	Triethylamine	56	chlorethylene	76	epichlorohydrin	96	oil gas
17	gasoline	37	Formamide	57	N-hexane	77	carbon dioxide	97	silicon tetrafluoride
18	diesel oil	38	butylene oxide	58	Ethyl acetate	78	trichlorosilane	98	lube
19	coal gas	39	Ethyl acetate	59	dichloroethane	79	diethyl ether	99	TDI
20	Methanol	40	Nitrogen (N ₂)	60	Methane CH ₄	80	hydrofluosilicic acid	100	IO