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Air-Met Scientific
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Control Panel

Operator's Manual

AGS1000

Dear customer:

Glad to have your trust and support on AIYI Technologies, we will provide you best product and service in return.

As an ISO certified manufacturer. AIYI Technologies has been focus on safety and environment many years, we provide you gas & dust detector and systems. The design and manufacture of product is strictly follow the international standard and company regulations, and each product get a normative QC control to ensure the best quality for you.

Please read and understand this operator's manual before operating instrument. Improper use of the gas monitor could result in bodily harm or death. Please don't hesitate to contact us if you have any questions or suggestions. Thanks!

We are honored to have the opportunity to serve you.

Yours sincerely,

Dongxu Zhang
Vice-General Manager
Nanjing AIYI Technologies Co., Ltd.

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Statement

This manual describes the hardware features, installation methods, and maintenance of the AGS1000 Series control panel.

This manual is suitable for the following personnel: instrument maintenance engineers, field users.

In addition to this manual, for the latest product information, please visit <http://www.aeindustry.com> or call 0086-25-87756351.



Attention: please read the manual carefully before connecting and operating your device.

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CONTENT

Chapter 1 Product Introduction

1.1 Brief Introduction	01
1.2 Description	02
1.3 Specifications	04

Chapter 2 Installation

2.1 Packing list	05
2.2 Cautions	05
2.3 Installation	05
2.4 Wiring	05
2.5 Power-on test	07

Chapter 3 Operations and Maintenance

3.1 Menu	08
3.2 mute and clear	08
3.3 Enter menu	08
3.4 Alarm records	08
3.5 User set	09
3.6 Reset	09
3.7 Self-test	09
3.8 Time set	09
3.9 Zero/span calibration	10
3.10 Factory set	10
3.11 Parameter set	10
3.12 Block set	10
3.13 Password set	11
3.14 Serial port set	11
3.15 Local address	11
3.16 Baud rate	11
3.17 RS485	12
3.18 Maintenance	12

Chapter 4 Annex 1	13
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Chapter 1 Product Introduction

1.1 Brief introduction

AGS1000 series control panel (hereinafter referred to as panel) is a new generation product independently developed by Nanjing AIYI Technologies Co., Ltd., which is specially used for matching gas detectors such as AG200, AG210, ANR, ANR-S, ANR-N and AG310.

The product adopts advanced microprocessor technology, with high measurement accuracy, stable and reliable operation and strong versatility. The color LCD displays the status of each channel in real-time. Each channel can set alarm value and measure range. It has various alarm modes such as light alarm, display alarm and audible alarm. The panel also has functions such as calibration, time set, and password protection functions.

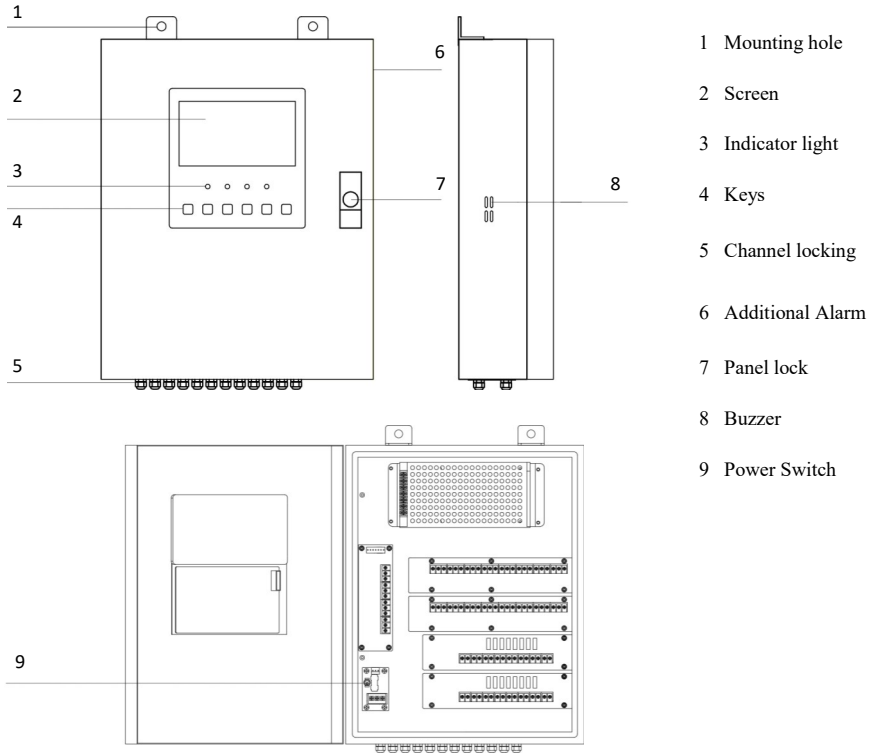
Main features of the product:

- Optional 4-20mA or RS485 signal input (choose one).
- Supports up to 32 channels (4-20mA) / 64 channels (RS485) input.
- The color LCD screen displays the gas concentration in real-time and sound and light alarm automatically when exceeds the standard.
- Power, alarm, fault, self-test indicator, real-time prompt work status.
- Channel block, over-range alarm, fault alarm.
- History query such as alarm records and fault records.
- 3 relays to achieve multi-level chain control.
- Spray molded carbon steel case, sturdy and durable.
- An explosion-proof sound and light alarm can be additionally connected.

The design, manufacture, testing follow the below standards:

- GB 50493-2009 *Code for the design of combustible gas and toxic gas detection and alarm for petrochemical industry*
- GB 12358-2006 *Gas Monitors and Alarms for Workplace Atmosphere General Technical Requirements*
- GBZ 2.1-2007 *Occupational exposure limits for hazardous agents in workplace Part1: Chemical hazardous agents*
- JJG 915-2008 *Carbon monoxide detection alarm*
- JJG 695-2003 *Hydrogen Sulfide Gas Detector*
- JJG 551-2003 *Sulphur dioxide gas detector*
- JJG365-2008 *Electrochemical Oxygen Analyzer*

1. 2. Descriptions



Screen

CHANNEL			CONCENTRATION	STATUS	RECORDS		
NO.	STATUS	CHANNEL					
1			PPM	FAULT	1	ALARM	2
2	60		PPM	ALARM			
3	0		PPM	NORMAL			
4	0		PPM	NORMAL			
5	0		PPM	NORMAL			
6	0		PPM	NORMAL			
7	0		PPM	NORMAL			
ALARMS		1	FAULTS		1		
							19-06-21 20:22

Channel status bar: Alarm information bar:
 Recent 7 alarms
 all current channel alarms and faults records
 Show current time

Indicator light



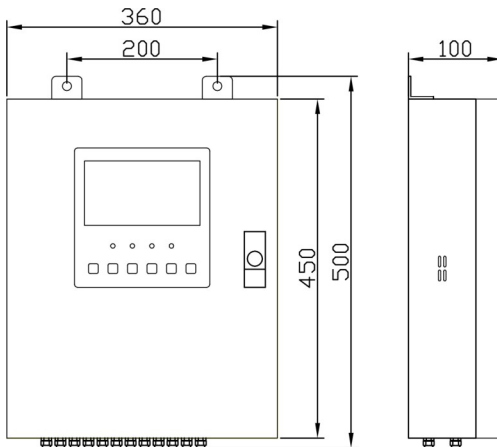
Power	Always on when power on, off when power off
Alarm	Normally off, the red light is always on when the alarm is on.
Fault	Normally off, the yellow light is always on when the fault occurs.
Self test	Normally off, the green light is always on during self-test

Keys



Clear	Eliminate the alarm in main interface
Mute	Mute during alarm or fault
Menu	Enter menu, confirm
back	Back to previous
Up	Up, and Lock or unlock the current screen on main interface
Down	Down or Screwing down

Dimension





Performance

Model	AGS1000
-------	---------

1.3. Specification
 Channel No. 4-20mA: up to 32 channels, 8/16/24/32 is optional;

RS485: up to 64 channels

Electric

Power supply	AC220V/50Hz
--------------	-------------

Power consumption	≤5W
-------------------	-----

Signal input	RS485/4-20mA
--------------	--------------

Signal output	RS485
---------------	-------

Wiring	4-20mA: three wires
	RS485: four wires

Suitable cable	4-20mA: RVVP3*1.5mm ²
	RS485: RVVP4*1.0mm ²

Relays output	3 Passive relay (250VAC/5A 30VDC/5A) (High, low, fault alarm)
---------------	---

Display & operation

Display	7.0 inch 800*480 LED color screen
---------	-----------------------------------

Indicator light	Power, alarm, fault, self-test
-----------------	--------------------------------

Operation method	operation (clear、mute、menu、back、up、down)
------------------	---

Environment

Operating temperature	0℃~40℃
-----------------------	--------

Operating humidity	≤95%RH Non-condensing
--------------------	-----------------------

Operating pressure	80-120kPa
--------------------	-----------

Structure

Body material	Carbon steel with electrostatic spraying
---------------	--

weight	About 7.5kg
--------	-------------

Dimensions	360*500*100mm(H*W*D)
------------	----------------------

Certificate

SIL	SIL2
-----	------

Note: The AGS1000 only supports RS485 input or 4-20mA input separately. The maximum number of loads may vary depending on the power consumption when connect the combustible gas detector. Please consult the manufacturer for details.

Chapter 2 Installation

2.1 Packing list



Device*1



Operators manual*1



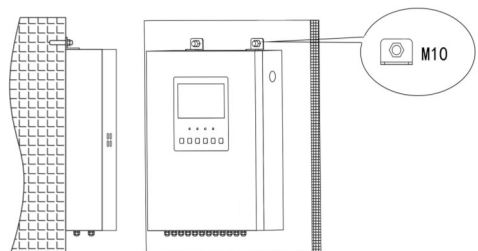
Accessory*1

2.2. Cautions

- ❑ The controller is non-explosion-proof and is only used in safe area such as duty rooms and operating rooms. Do not use it in hazardous areas.
- ❑ Please select the corresponding wiring method according to the input signal.
- ❑ The panel should not use the same power supply with any other large power consumption equipment.
- ❑ Wall-mounted panels require a flat, solid wall.
- ❑ The installation process must comply with international standards.
- ❑ The installation position should ensure that the display is visible, and the reserved space is convenient for the operation of the door opening and wiring debugging.
- ❑ Note that the transmission distance between the panel and the detector is recommended to be within 800m.
- ❑ For the RS485 wiring, when there are more than 32 units to be connected to the panel, a signal amplifier or two-loop access is required.
- ❑ The installation location should avoid exceeding the operating temperature, humidity, and protection level of the panel, such as a large amount of dust, high temperature, water splashing, corrosive gases, vibrations, etc.

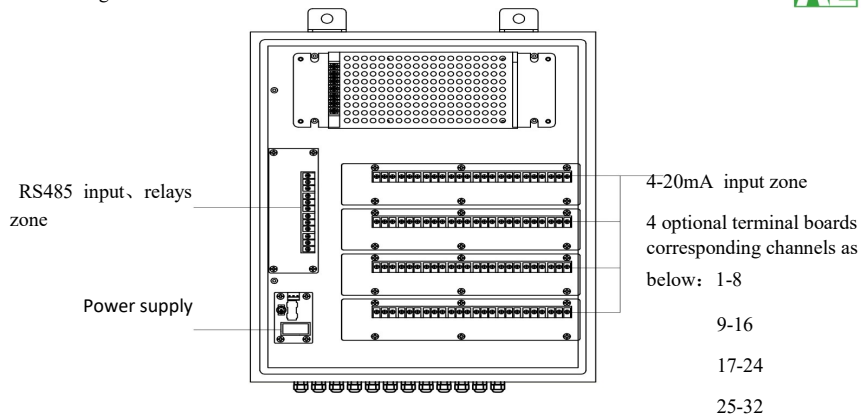
2.3 Installation

- ❑ Determine the installation location.
- ❑ Secure the panel to the wall with the M10 expansion screw through the mounting holes on the panel upper part.

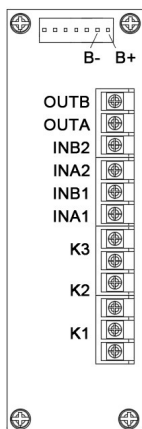


2.4 Wiring

- ❑ Be sure to turn off the power before wiring.
- ❑ Open the panel
- ❑ Unscrew the bottom locking port of the panel and introduce the cable into the controller.
- ❑ According to the terminal port identification, make sure the wiring between the detectors and panel in one-to-one correspondence.
- ❑ The panel reserves a mounting hole for additional sound and light alarms. The power cables of sound and light alarm are connected to the B- and B+ terminals of the circuit board.

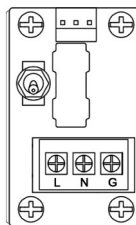


RS485 input, relays zone



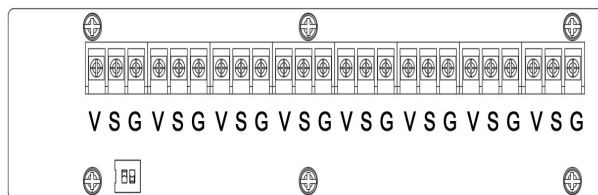
- B- External alarm 24V-
- B+ External alarm 24V+
- OUTB RS485 output B
- OUTA RS485 output A
- INB2 RS485 Spare
- INA2 RS485 Spare
- INB1 RS485 input B
- INA1 RS485 input A
- K3 Fault alarm relay
- K2 High alarm relay
- K1 Low alarm relay

Power zone



- L Fire line
- N Zero line
- G Ground line

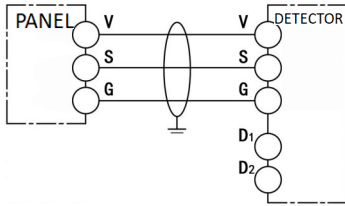
4-20mA input zone



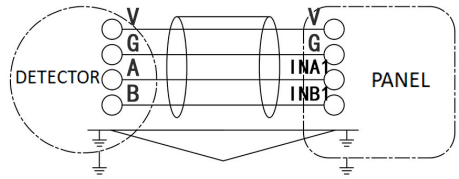
- V 24V+
- S 4-20mA
- G 24V-

The dial switch is set for the board address. Do not operate it without training.

Wiring

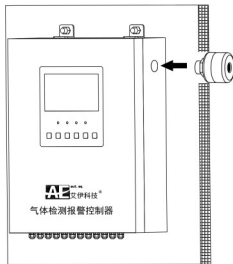


4-20mA



RS485

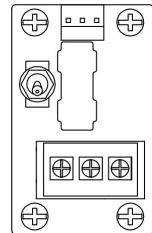
Additional sound light alarm



2.5 Power-on test

- Please confirm that the wires and terminals are safe before power-on.
- The wall-mounted multi-channel panel requires a key to open and switch the power to the "on" .
- It starts work and POWER light of the panel is always on when supplied by 220VAC power.

Power





3.1 Menu

After power-on, the panel comes to the self-test page and enters the main interface after the self-test is completed. The left side of the main interface is the channel status bar, showing the concentration and status of each channel.



CHANNEL	CONCENTRATION	STATUS	NO.	RECORD	CHANNEL
1	PPM	FAULT	1	ALARM	2
2	60 PPM	ALARM			
3	0 PPM	NORMAL			
4	0 PPM	NORMAL			
5	0 PPM	NORMAL			
6	0 PPM	NORMAL			
7	0 PPM	NORMAL			
ALARMS	1	FAULTS	1		

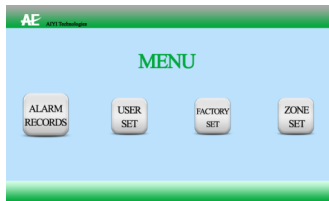
19-06-21 20:22

On the right is the alarm information bar, which displays the last 7 historical alarms. The bottom displays faults, alarms, time and so on.

3.2 Mute and clear

When the panel alarms, press the “mute” button to mute. If a fault or alarm occurs again after muffling, the panel will alarm again. When you need to clear the contents of the alarm information bar, press the “Cancel” button to clear the alarm information field.

3.3 Enter menu



Press the “MENU” button to enter the main menu interface, and it displays “ALARM RECORDS”, “USER SET” and “FACTORY SET” respectively. Press the “UP” or “DOWN” button to select, press the “MENU” button to confirm, press the “BACK” button to return to the main interface.

3.4 Alarm records



CHANNEL	CONCENTRATION	TYPE	TIME
1	50 PPM	ALARM	19-06-21 20:22

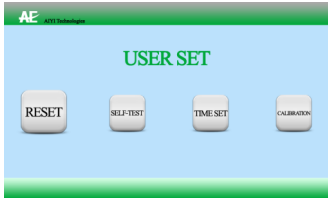
PAGE: 1 PAGES: 1

The alarm records are divided into two types: “ALARMS” and “FAULTS”. You can view the history information by entering the corresponding query type.

The record can be turned through the "UP" and "DOWN" keys. To clear the record, press and hold the “CLEAR” button for 5 seconds on the main interface. After the deletion is successful, the screen will automatically return to the main interface. (This step cannot be recovered, please be cautious).



Note: The following user set menu and factory set menu are professional settings. Non-professionals should not operate. If you need to operate, please contact the manufacturer.



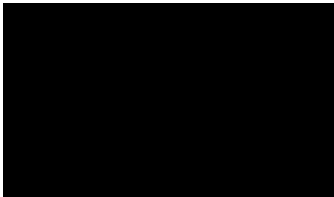
3. 5. User set

Press the “MENU” button, enter the password (6 times “MENU” buttons) to enter the USER SET interface, and display “RESET”, “SELF-TEST”, “TIME SET” and “ZERO CALIBRATION” respectively. Press the “UP” or “DOWN” button to select, press “MENU” to confirm, press “BACK” to return to the main interface.



3. 6. Reset

The reset function is used to clear the existing detection status of the system. Press the “MENU” button in the reset option. At this time, the screen will restart and enter the main interface. The panel will re-detect the current detection status. After the reset, the original alarm and fault information are all cleared, and the current status is redisplayed.



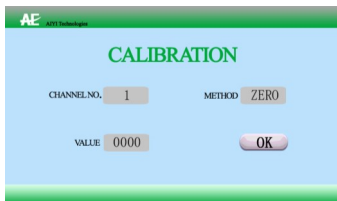
3. 7. Self-test

After the self-test is selected, the panel enters the self-test state. At this time, the system detects the screen, buzzer, and indicator light in turn, and automatically returns to the user set after the self-test ends.



3. 8. Time set

Press the “MENU” button to select the TIME SET option, press the “UP” button or the “DOWN” button to adjust the value. After the setting is finished, press the “MENU” button to save and exit. Press the "BACK" button to exit.

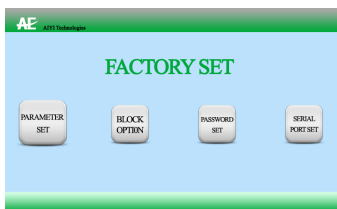


3.9. Zero/Span calibration

This menu is used to do zero and span calibration for panel.

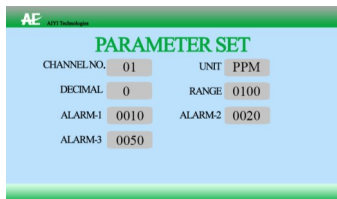
Press the “MENU” button to select the corresponding option, press the “UP” button or the “DOWN” button to adjust the value. After the setting is finished, the option moves to the confirmation and press the “MENU” button to save and exit. Press the "BACK" button in the settings to exit without saving.

To change other channel parameters, repeat the above steps.



3.10. Factory set

Press the “MENU” button, enter the password (6 times “MENU” buttons) to enter the factory set interface, and display “PARAMETER SET”, “BLOCK SET”, “PASSWORD SET”, “SERIAL PORT SET” respectively. Press the “UP” or “DOWN” button to select, press “MENU” to confirm, press “BACK” to return to the main interface.

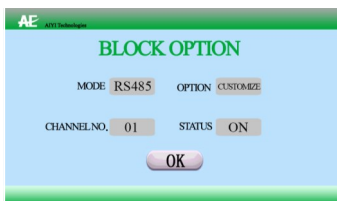


3.11. Parameter set

This menu is used to set the parameters of each channel's unit, decimal point, range, alarm value and so on.

Press the “UP” or “DOWN” button to select the corresponding option, and press the “MENU” button to adjust value. After the setting is over, the option moves to Confirm and press the “MENU” button to save and exit. Press the "BACK" button in the settings to exit without saving.

To change other channel parameters, repeat the above steps.



3.12. Block set

This menu is used to set the opening and closing of each channel and input signals.

Press the “UP” or “DOWN” button to select the corresponding option, and press the “MENU” button to adjust value. After the adjustment is completed, move to the confirmation option and press the “MENU” button to save. If no need to save, press the “BACK” button to return to the user set menu. To change other channel parameters, repeat the above steps.

The mode setting should be kept consistent with the actual input signal of the panel. If it is inconsistent, a channel failure alarm will occur.



3.13. Password Set

The system initial password is 6 "MENU" keys. Press the "UP" or "DOWN" button to adjust the password level. After pressing the "MENU" button, the system automatically enters the "ENTER NEW PASSWORD" and "CONFIRM NEW PASSWORD" status. After re-entering the six-digit password, cursor move to the confirmation button, press the "MENU" button to confirm the save, and press the "BACK" button to cancel.

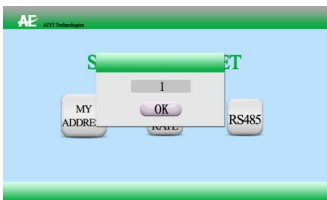
After the setting is successful, it will automatically return to the third level menu. If the password input is inconsistent twice, the pop-up window will not return to the third-level menu without saving.

To prevent password forgetting, the controller has built-in super password ("Unlock", "Mute", "Up", "Down", "Function", "Return"), which can be used to enter the setup menu to reset the password when the password is forgotten.



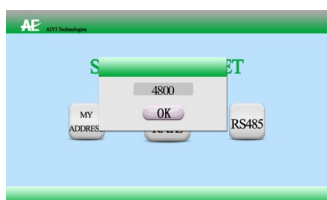
3.14. Serial Port Set

Press the "MENU" button to enter the serial port set user set interface, which displays "LOCAL ADDRESS", "BAUD RATE" and "RS485" respectively. Press the "UP" or "DOWN" button to select, press "MENU" to confirm, press "BACK" to return to the main interface.



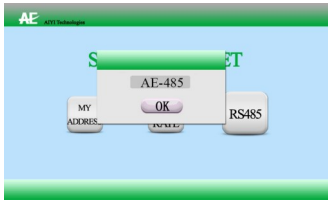
3.15. Local address

Press "MENU" to pop up the address setting window, press "UP" or "DOWN" to set the address. After setting, press "MENU" to move cursor to the confirmation button, press "MENU" to save and return to the serial port set interface.



3.16. Baud rate

Press "MENU" to pop up the baud rate set window, press "UP" or "DOWN" to select the baud rate. The baud rate is optional for 2400, 4800, 9600, 38400, 14400, 57600, 115200. Then press the "MENU" to move cursor to the confirmation button, press the "MENU" button to save and return to the serial port set interface.



3. 17. RS485

Press “MENU” to pop up the baud rate set window, press “Up” or “Down” to select the baud rate. The baud rate is 2400, 4800, 9600, 38400, 14400, 57600, 115200. Then press the “MENU” move cursor to the confirmation button, press the “MENU” button to save and return to the serial port set interface.

3.18. Maintenance

- ▮ The panel should avoid water splashing, dust etc. and keep it clean.
- ▮ The panel key should be kept by a special person, and it is forbidden to open and operate it at will.
- ▮ The panel should operate the test periodically to ensure normal function.
- ▮ Pay close attention to controller faults, alarms and handle it in time.
- ▮ Repair of the instrument and replacement of the components must be carried out with original spare parts and by specially trained personnel.
- ▮ If the panel fails to solve the problem, please contact the manufacturer to solve it.
- ▮ Common troubleshooting methods are as follows:

Faults	Reasons	Solutions
Screen without display	Power disconnection	Reconnect the power cord
	Circuit failure	Return to factory maintenance
Panel cannot communicate	Communication and Baud rate get wrong set	Check serial port
Power-on alarm	Circuit failure between panel and detector	Check circuit and connection
	Detector faults	Check if detector is working properly

**Chapter 4 Annex 1**

4.1. AE RS485 communication

Baud rate: 2400 Data bits: 8 bits Stop bits: 1 bit Checksum: NONE

Master:	0X55	0X03	0X01	0X01	0x00 0X00 0X00 0X00	CRCL CRCH
	Start code	Host ID	Address code	Function code	Four-byte data bit	check bit

Slave:	0X55	0X01	0X01	0X01	0x00 0X00 0X00 0X00	CRCL CRCH
	Start code	Slave ID	Address code	Function code	Four-byte data bit	check bit

For example:

If there is a gas detector with Address code 1 , the details will be as below :

0X55 0X03 0X01 0X01 0X00 0X00 0X00 0X00 0X8A 0X19

Address code The default is four " 0 " standard CRC check

Response from slave: 0X55 0X01 0X01 0X01 0X00 0X00 0X42 0X70 0X98 0X9D the result is 60

Float data conversion:

```

typedef union
{
float sub_float;
struct
{
uchar b1,b0,b3,b2;
}sep_float;
}u_float;
float Uchar_to_Float()
{
float_styp.sep_float.b2 = float_sbuff[0];
float_styp.sep_float.b3 = float_sbuff[1];
float_styp.sep_float.b0 = float_sbuff[2];
float_styp.sep_float.b1 = float_sbuff[3];
return(float_styp.sub_float);
}

```



4.2. MODBUS RTU communication

Baud rate: 2400 Data bits: 8 bits Stop bits: 1 bit Checksum: NONE

Master:

0X01	0X03	0X00 0X01	0X00 0X01	CRCL CRCH
Address	Function code	Start code	End code	Check bit

Slave:

0X01	0X03	0X00	0X00 0X00	CRCL CRCH
Address	Function code	Concentration byte number	Concentration (complete)	Check bit

For example:

If there is a gas detector with address code1, the details will be as below :

0X01 0X03 0X00 0X01 0X00 0X01 D5 CA

Response from slave (the result is 60):

0X01 0X03 0X00 0X01 0X00 0X3C 14 1B



**SCIENTIFIC INNOVATION
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