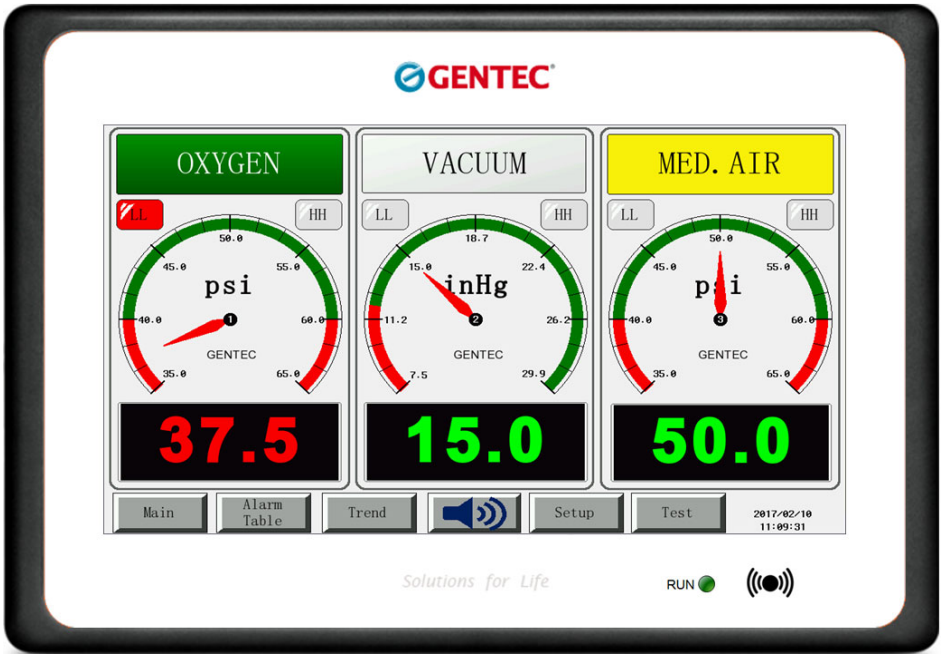
GENTEC®

Gentec Systems Corporation

GM100M

USER'S MANUAL
FIELD INSTALLATION GUIDE
TECHNICAL INFORMATION



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GENERAL INFORMATION

WARRANTY

- Gentec warrants that the product manufactured by the company and delivered hereunder will be free of defects in material and workmanship for a period of twelve months from the date of receiving the product by the purchaser.
- The purchaser shall promptly report in writing any failure to conform to this warranty to the company within said period. The company will, at its options, repair the defective item or provide a replacement free of charge upon receiving the returned item, provided that it has not been mishandled in its storage, installation, maintenance, and operation after being received by the purchaser. The purchaser shall ship the defective product back to the company only after receiving a written authorization of the company.
- The equipment should not be repaired or altered without prior written or verbal approval of the company or its authorized distributors. Failure to comply will void all warranty on the product.
- The effects of corrosion, erosion and normal wear and tear are specifically excluded from this warranty.
- THE COMPANY MAKES NO OTHER, EXPRESSED OR IMPLIED, WARRANTY OR REPRESENTATION OF ANY KIND WHATSOEVER. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSEARE HEREBY DISCLAIMED.

SAFETY

General safety precautions:

1. Only trained personnel certified by Gentec shall be permitted to adjust or repair the equipment.
2. Read all instructions carefully before operating the equipment.
3. Do not connect the equipment to an electrical supply of incorrect voltage and/or frequency.
4. Switch off the main power supply before opening the case front panel to do wiring inside the equipment unless otherwise instructed.
5. Do not short any signal wires at both ends of the transmitting cable.
6. Do not use the equipment outside the specified ambient temperature and humidity ranges. Do not operate the equipment when it is considered defective. Otherwise, it may not reliably deliver its expected functions.
7. The equipment is not intended to be and must not be used in potentially explosive atmospheres. Do not install the equipment at or close to locations where there is any actual or foreseeable risk of hazardous levels of flammable gases or vapors.

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Features:

GM-100 Area Alarm actively displays your medical gas information on a highly visible 10" TFT LCD screen. It is capable of handling up to **8 gases**, 14 relay inputs, 7 relay outputs and 2 analog outputs in one alarm covering all needs of hospital alarm and monitoring needs.

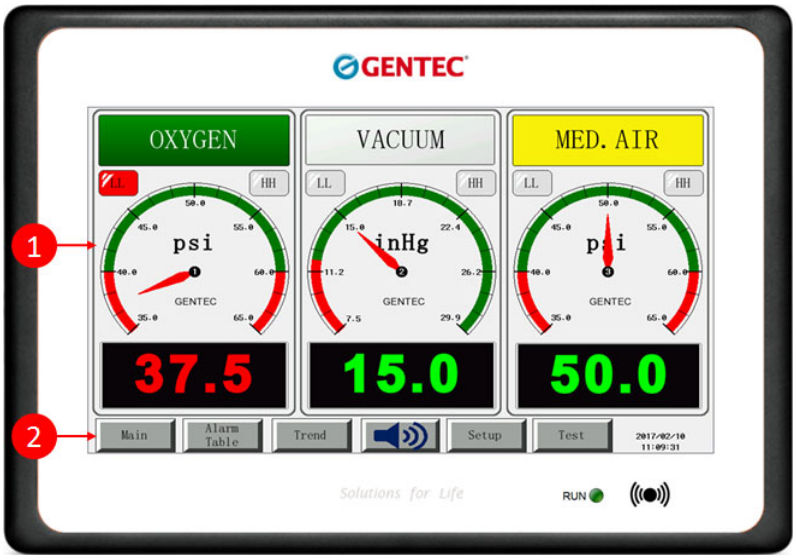
- On-site customization without the use of a laptop, tablet, or mobile device. Settings such as brightness, pressure, hysteresis, silence time, communication parameters, and high and low alarm conditions can be adjusted.
- 10” Touch Screen Display with Password protected interface
- Can be used as an area alarm, master or combination alarm.
- Full networking capabilities out of the box including Modbus RTU/TCP, UDP protocols.
- Can be integrated with SCADA system or BMS systems
- Transducers can be mounted locally or remotely utilizing shielded twisted pair wiring up to 100 ft (30.5 m)
- Gas specific DISS fitting to ensure that the transducer is connected to its corresponding gas.
- Circuitry protection and detection, if the transducer is not connected at all or not to the appropriate gas display, an error message (No Sensors) will be displayed.
- The alarm system allows users to have optional relay outputs according to single or multiple alarm conditions.
- Event Log to view history of time stamped alarm events

1.1 Electrical and Physical Specifications

MECHANICAL	
Front Panel	ABS
Case Body	Metal Alloy
Nominal Physical Dimensions	Overall Size： 193mm x 280mm x 103mm (Height x Width x Depth) Beneath the Wall：181mm x 262mm x 98 mm (Height x Width x Depth)
Wall Mounting Opening	181mm x 262mm (Height x Width)
ENVIRONMENT	
Ambient Temperature	0℃ ~ 50℃
Ambient Humidity	10% ~85% RH, non-condensing
Cooling	Natural Air Cooling
ELECTRICAL	
Power Requirements	Input：100~240 VAC, 50~60Hz, 115V, 1.5A/230V, 1A
Processor	32-bit RISC Microcontroller
Monitor	LCD Size：10.1” TFT, LED Backlit Resolution：1024x600 Pixels Color Depth：16 bit, 65536Colors Brightness: 200 cd/m2 Touch Screen：4-wire resistive (Hardness 4H) Durability： 50000 hours
Buttons	Resistive touch buttons
Buzzer	Adjustable Volume (95dB Max.)
COMMUNICATION	
RS-485Modbus RTU	9600/19200 baud rate, (8,N,1)
UDP	Modbus RTU over UDP
Modbus TCP	10/100M Automatic Selection
INPUT AND OUTPUT	
Analog Input	Number of Channels：8 Input：4-to-20 mA Double-wire Transmitter Input ADC Resolution：14 bit or Range of Sensor within ±1%
Digital Input	Number of Channels：14 Input：Dry Contact or TTL
Relay Output	Number of Channels：7 Maximum load：1A at 30VDC/0.5A at 120VAC
Analog Output	Number of Channels：2 Maximum load：0-20mA(maximum), in relation to 1~5V current for4~20 mA Double-wire Transmitter

2.FUNCTION AND APPEARANCE

2.1 FRONT PANEL



1. Main Screen
2. Touch Buttons

2.2 FUNCTION OF FRONT PANEL

Main screen is divided into two sections: upper section is for display and lower section is for touch buttons.

(1) Homepage: Shows pressure value, gauge indicator, gas type and high or low alarm conditions.

(2) Event log: keeps a time stamped record and cause of all alarm activity.

(3) Trend chart: Shows the trend line of pressure value.

(4) Parameter Setting: Upon entering password, user can set up analog and digital alarm condition, analog and relay output condition as well as other setups.

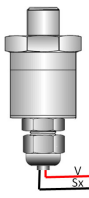
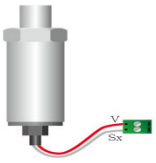
(5) Test: press the button to test if buzzer works. If it does, the siren will sound twice.

(6) Silence: Shows condition of buzzer (Mute/Unmute). Press the button to silence the buzzer when siren arises.

3.FUNCTION DESPCRIPTIOON

3.1 INPUT AND OUTPUT WIRING

Pressure Monitoring: when GM100M is used as area alarm, it can monitor up to eight gases which occupy different input channel as follows:

Analog Input Channel	Gas Type	Wiring
S1	OXYGEN	 80A & 83A serial  P51 & P52 serial
S5	CARBON DIOXIDE	
S2	VACUUM	
S6	NITROUS OXIDE	
S3	MEDICAL AIR	
S7	WAGD/AGSS	
S4	NITROGEN	
S8	INSTRUMENTAIR	

Relay Output: Seven sets of relay output are assigned as follows:

Users can set custom outputs based on alarm condition(s), including analog input too low, analog input too high, digital input alarm and buzzer alarm output.

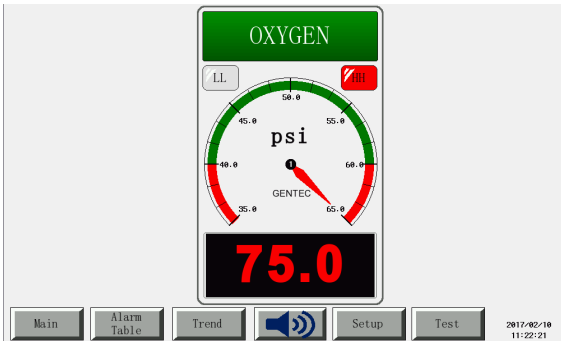
Default setup is as follows:

RELAY NO.	FUNCTION
1	OXYGEN ALARM
2	VACUUM ALARM
3	MED. AIR ALARM
4	NITROGEN ALARM
5	CARBON DIOXIDE ALARM
6	NITROUS ALARM
7	Buzzer Triggered

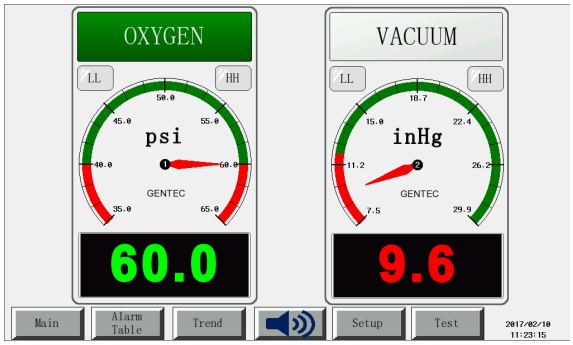
Digital Input: Provides up to 14-digital inputs for dry contact or TTL for master alarm.
Analog Output: Provides up to 2 output channels for 4~20mA. Users can select and duplicate any output channel

3.1.1 MAIN SCREEN

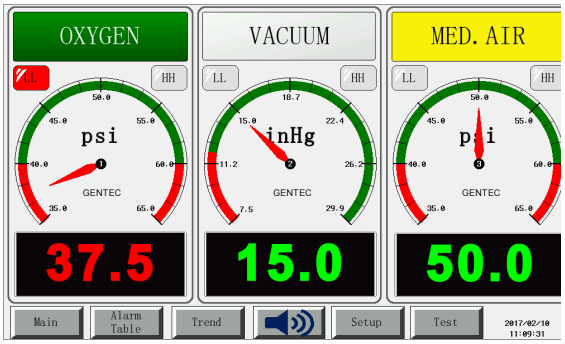
Display of homepage depends on the purpose and the number of gas monitored. GM100M provides area, master or combination alarm signals as required by the latest edition of NFPA99. Display pages for common gas monitored are as follows:



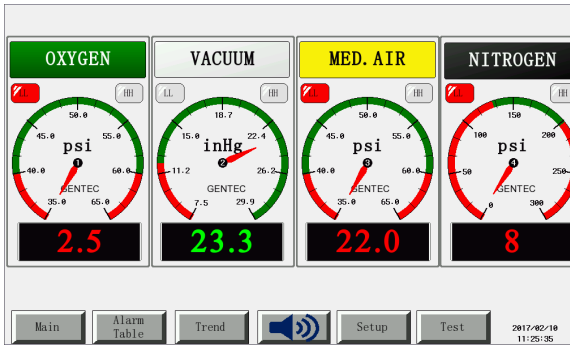
Display for one gas



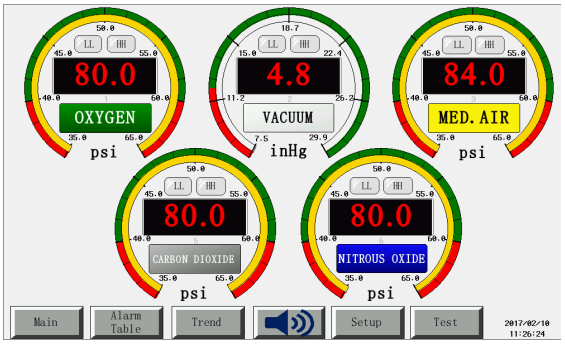
Display for two gases



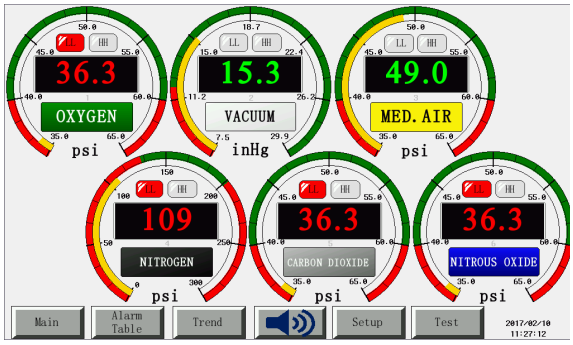
Display for three gases



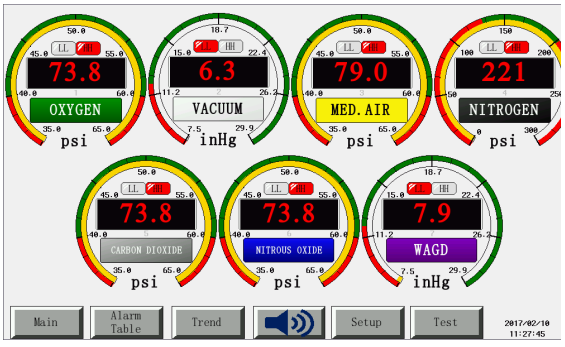
Display for 4 gases



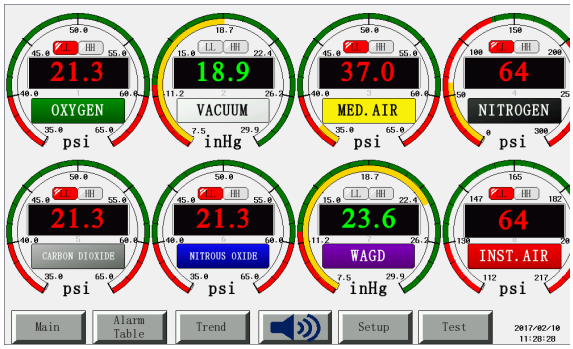
Display for 5 gases



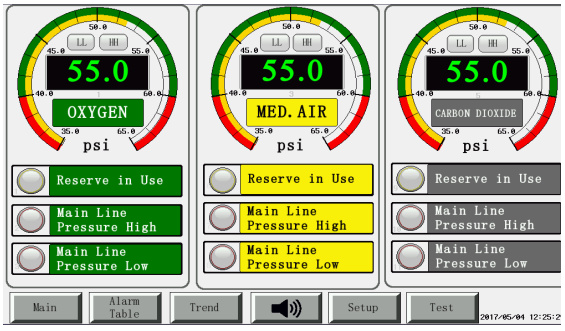
Display for 6 gases



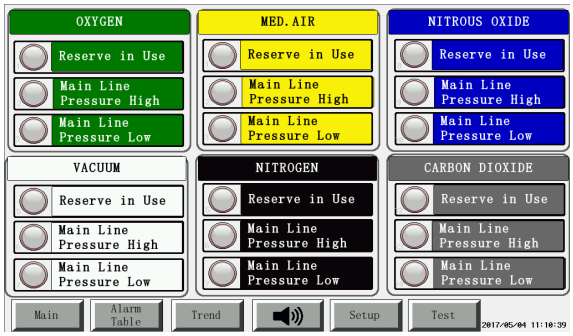
Display for 7 gases



Display for 8 gases



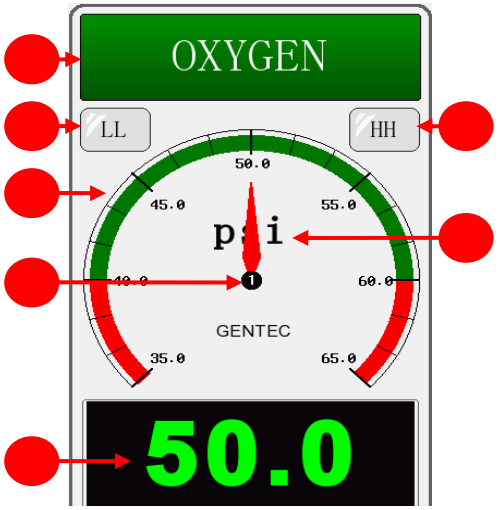
Combo alarm



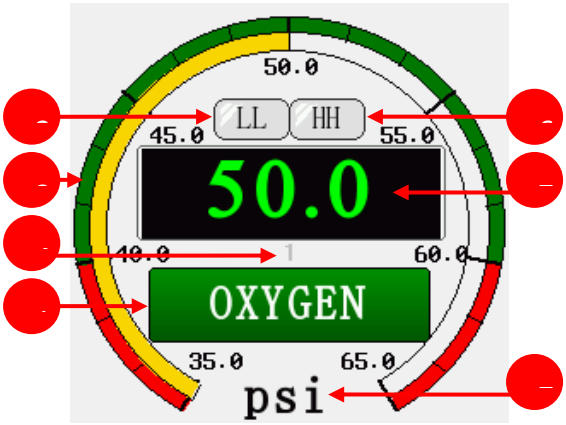
Master alarm

All monitoring display is divided into two categories, namely, analog input display and digital input display components. The display is as follows:

Elements of analog input module are explained as below:



Default display of gauge indicator when number of monitored gas is under four.



Default display of gauge indicator when number of monitored gas is above five.

(1) **Channel Identification Label**: Displays the type of gas or label of measuring condition by text and color coding. Press the label to set up after entering password.

(2) Low Alarm Indicator
- **Gray:** Data is within the normal range
- **Blink red**: Data has reached the low alarm limit.

(3) **Digital Gauge Scale:** Provides easy visual identification of alarm condition and trend based on where the needle is pointing on the color coded scale. (Green area: condition is normal, Red Area: alarm condition triggered)

(4) **Channel Identification**

(5) **Numerical Data Display**:

a. Data is in high or low limit range: When the value has reached the set high or low limit, the numerical value becomes a red font and blinks as a visual alarm indicator.
b. Data is within normal range: When data is within the normal range, the numerical value is displayed as a green font.
c. Silenced Alarm Condition: When a user silences the audio alarm, the display will show a red background with numerical value shown in a black font.
d. Data is close to high or low limits: Numerical value will be displayed in a yellow

font.

(6) High Alarm Indicator
- **Gray**: Data is within the normal range
- **Blink Red**: Data has reached the high alarm limit.

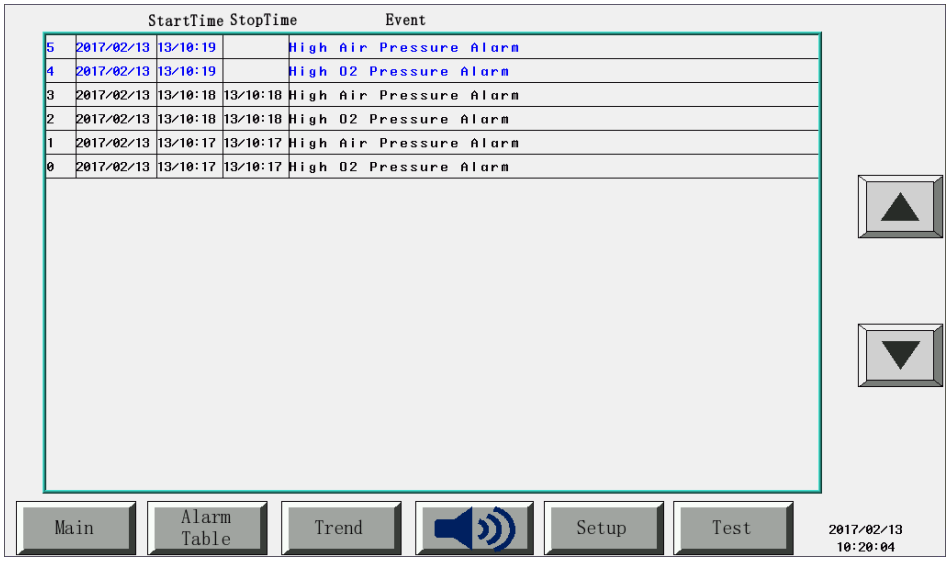
(7) **Unit of Measure**: for display of Unit of Measurement

Elements of digital input module are explained as blow

(1) Digital Input Light
Gray: No alarm.
Red: Alarm triggered.
Yellow: Caution, alarm limit almost reached but alarm not triggered

(2) **Channel Identification Label**: Displays the type of gas or label of measuring condition by letters and color. Press the label to set up after entering password.

3.1.2 EVENT LOGS



Press “Event Log” button to enter event history. The page maintains a rolling list of the 200 most recent alarm events. The date, duration, and time of the event will be logged as well as the alarm trigger condition. Press up and down buttons to flip pages to check other events.

3.1.3 Pressure Trends

Press the “Pressure Trends” button to enter page showing trends of pressure value from analog input. The page maintains 24 hours of the most recent pressure trends. Roll the bar on the bottom to check other trending of pressure values.

4. FUNCTION OF BUTTONS

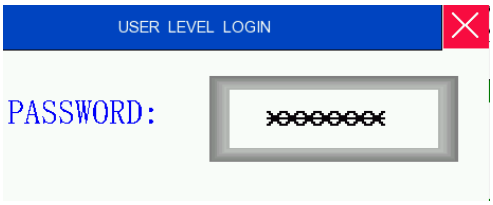
Functions of buttons are described below:

Main	**Homepage** Press the button to go back to the main page.
Alarm Table	**Event Log** Press the button to switch to the event log page.
Trend	**Pressure Trends** Press the button to switch to the pressure trends page.
Setup	**Setup** A password prompt will display after pushing the "setup" button. Enter the correct password to access the system settings. Press the "setting" button again to go back to setting page.
Test	**Test** Press the button to test if buzzer works. The siren shall beep twice.
	Silence When buzzer is activated, the color of image will turn red and siren will arise. Press the button to silence buzzer (the default setting is to silence the alarm for 60 seconds).

In the following sections, we will describe the contents and operation of each setting page.

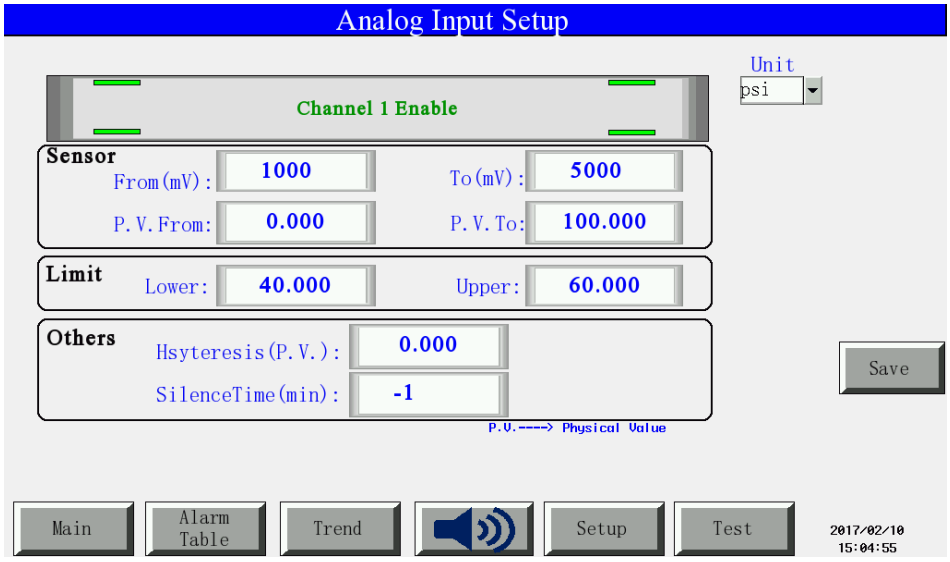
5. SETUP

Pressing the Channel Identification Label or "Setup" button brings up a password prompt. Enter the correct password to access the system settings.



Enter the password to enter the settings menu (the default password is 111111). After entering the correct password, the window will disappear and jump to the setup page.

5.1.PARAMETER SETTING FOR ANALOG INPUT CHANNEL



Pressing an item brings up a password prompt. Enter the correct password to access the analog input parameter settings. Press on the fields to modify and an onscreen keyboard will allow access to modify values. Press "SAVE" to save changes made. The modifiable parameters are as follows:

(1). Input Signal Range.
"From (mV)" Sands for the minimum output voltage from the transmitter (in mV).
" To (mV)"：Stands for the maximum output voltage from the transmitter (in mV). (The analog input load resistance of this system is 250Ω, so 4 to 20mA input is equivalent to 1000 to 5000 mV).

(2). "P.V. From" (Physical Value From): The physical value of the transducer's read-in data for output voltage at its lowest value.
"P.V. To" (Physical Value To): The physical value of the transducer's read-in date for output voltage at its highest value.
For example, the read-in data of voltage should be 0 psig when it is a two-wire transducer outputting 4mA; and the read-in data of voltage should be 100 psig when it is two-wire transducer outputting 20mA for a pressure transducer range of 0-100 psig 4-20 mA.

(3). Lower (Lower Limit). Upper (Upper Limit). (E.g.：40 psig and 60 psig).
"Limit" these values will define the lower and upper limits for alarm conditions.

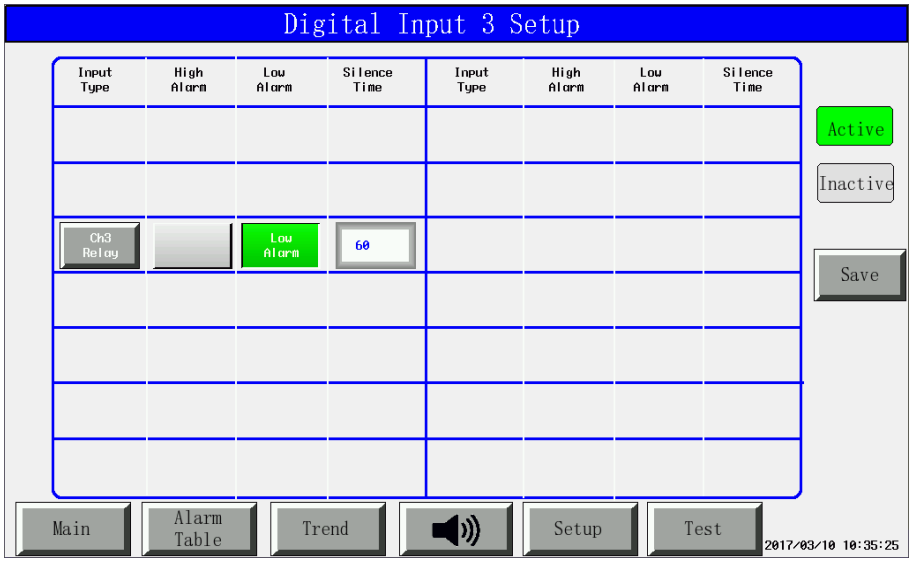
Lower: alarm value to lower limit.
Upper: alarm value for upper limit
(For example: 40 psig lower limit and 60 psig higher limit, alarm will trigger when pressure reaches 40 psi on the lower limit and also trigger when pressure reaches the 60 psi upper limit.

(4). Silence time: The unit of measure is by minute(s). User can silence the buzzer for a few minutes by pressing “Silence” icon button when alarm is triggered. The silence time duration can be altered here by entering a value above “0”. To disable the mute function (buzzer cannot be turned off) change the value to “0”. To infinitely mute the buzzer, change the value to “-1”.

(5). Hysteresis: Is a buffer function to ensure monitored values have returned to the functional state after an alarm condition arises and the problem is solved before alarm conditions return to normal state. For example, if the alarm upper limit is set to 60 and the hysteresis value is 5, an alarm will be generated when the data reaches 60, and will not shut off until the value returns to 5 less than the alarm condition of 60. In this example, the alarm condition will remain until the monitored value returns to 55. Similarly, if the lower alarm limit is set to 35 and the alarm hysteresis is set to 5, the device will alarm when the sampled value is less than or equal to 35 and the alarm state will not deactivate immediately after the sampling value is greater than 35. The device will exit the alarm state when the value is greater than or equal to 40.

(6). Pressure unit selection (psi, mmHg, inHg, kPa, MPa and bar): the change of unit of measure actives immediately.

5.2.PARAMETER SETTING FOR DIGITAL INPUT CHANNEL



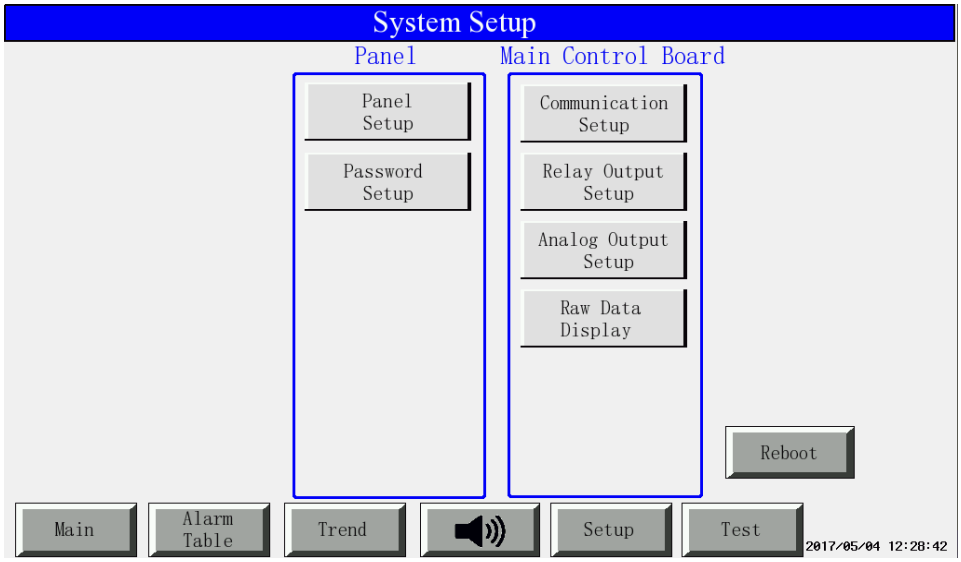
Pressing an icon brings up a password prompt. Enter the correct password to access the digital input parameter settings. Press on the fields to modify and an onscreen keyboard will allow access to modify values. Enter values desired and click SAVE to save changes. The setup parameters are:

(1). Dry contact or TTL digital inputs.
(2). The buzzer will be enabled when the read-in data is High (Open).
(3). The buzzer will be enabled when the read-in data is Low (Closed).
(4). The unit of measure for silence time is by the minute.

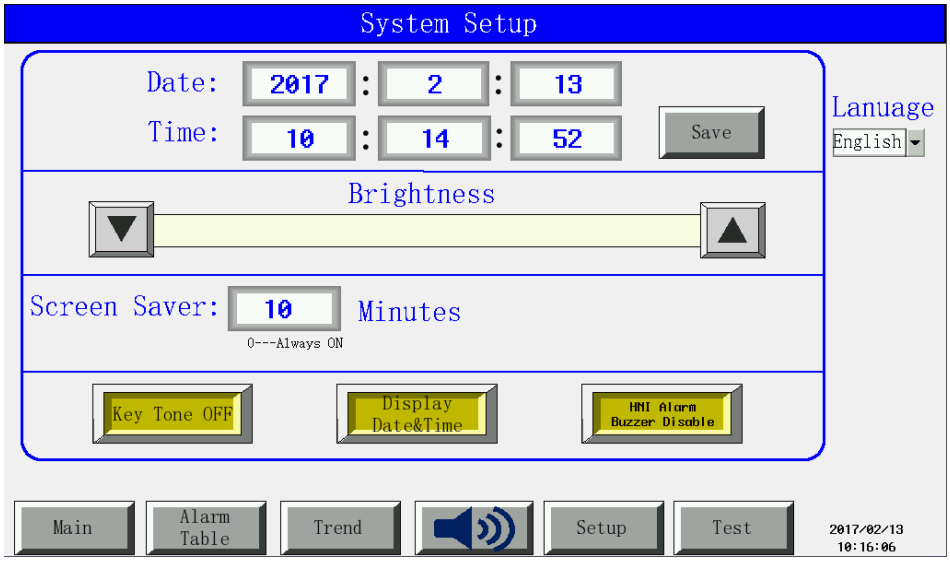
To avoid false alarms, user should disable the channels not in use.

5.3. SYSTEM PARAMETER SETUP

Pressing an icon brings up a password prompt. Enter the correct password to access the system parameter settings. Press on the fields to modify and an onscreen keyboard will allow access to modify values. Enter values desired and click SAVE to save changes.



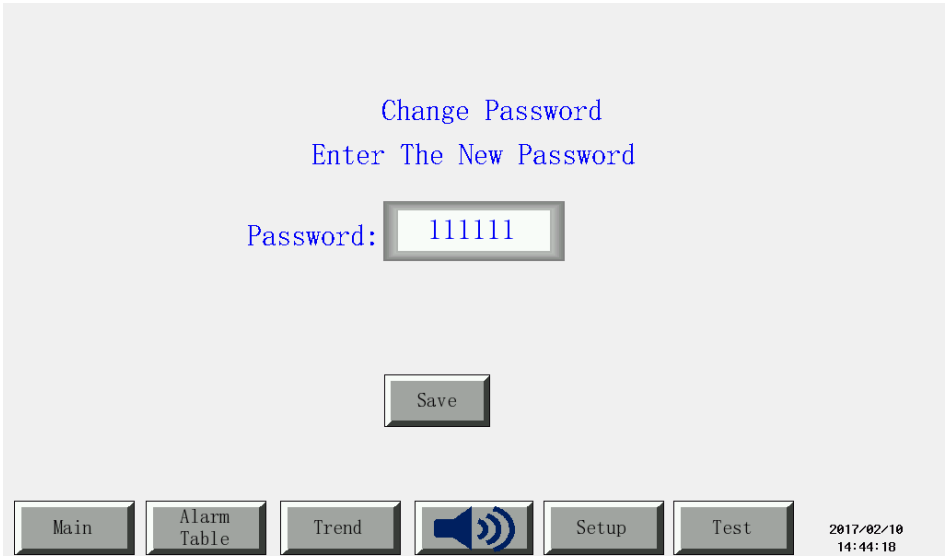
5.3.1. PANEL SETUP



Press on a field for the onscreen keyboard, enter numbers and click “SAVE” to save changes. The setup parameters are as follows:

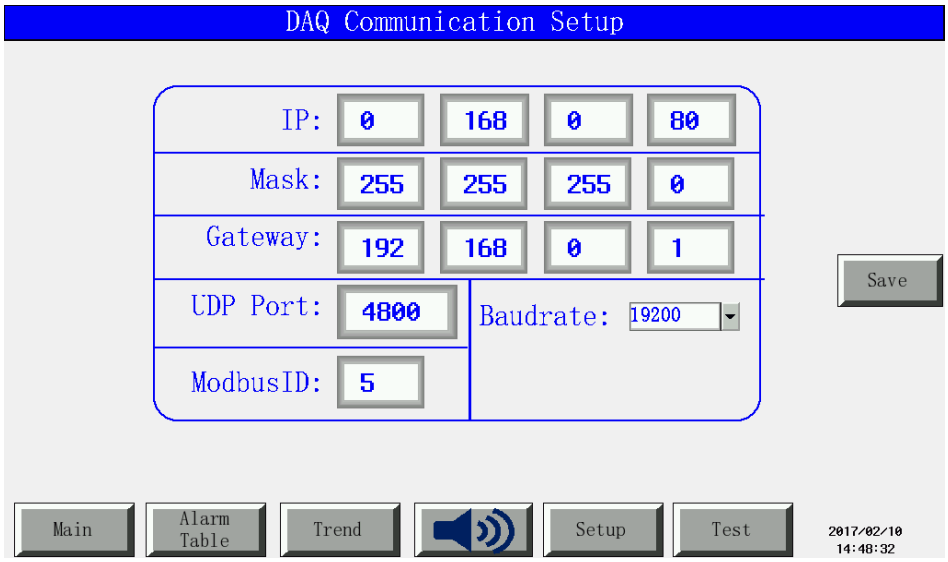
(1) Date and time.
(2) Brightness: press up and down buttons to adjust brightness.
(3) Screen Saver: Screen Saver will be activated based on set value. Deactivate the screen saver function by entering the value “0”
(4) Keyboard Click Sounds: Press the icon to activate or deactivate click sounds.

5.3.2. PASSWORD SETTING



Press the box for the onscreen keyboard to enter a new 6 digit password and click SAVE.

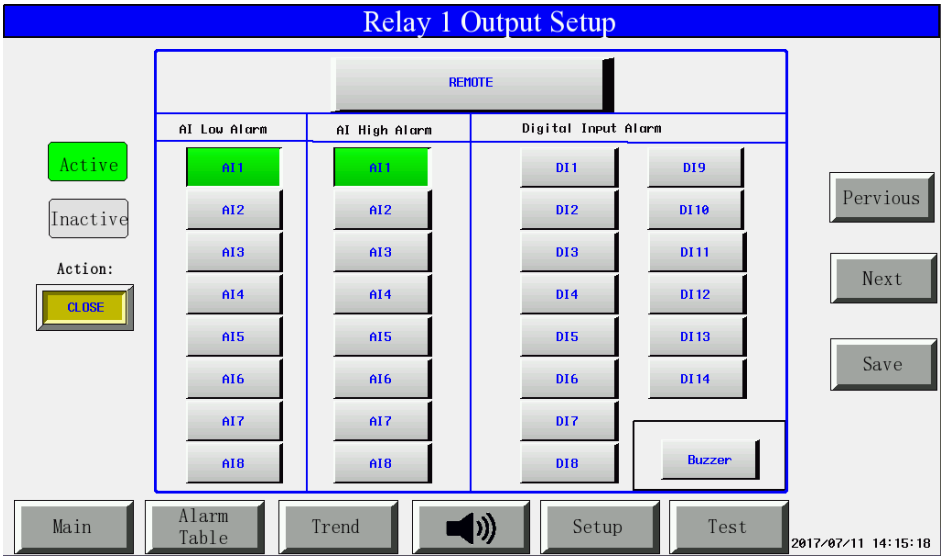
5.3.3. PARAMATER SETTING FOR COMMUNICATION



Press an item for onscreen keyboard to enter numbers and click SAVE to save changes. The setup parameters are:

(1). IP Address: the default setup is 192.168.0.18.
(2). Mask: the default setup is 192.168.0.18. Mask decides traffic of network. Do not change setup unless it is necessary.
(3). Gateway: the default setup is 192.168.0.1.
(4). UDP Port: the default setup is 48000.
(5). Modbus RTU ID (range from 1~247): Either adopting Modbus-TCP, UDP or RS232/485, Modbus ID has to be set up correctly to communicate with modules. Modbus RTU Baudrate (9600 or 19200)。

5.3.4. PARAMATER SETTING FOR RELAY OUTPUT

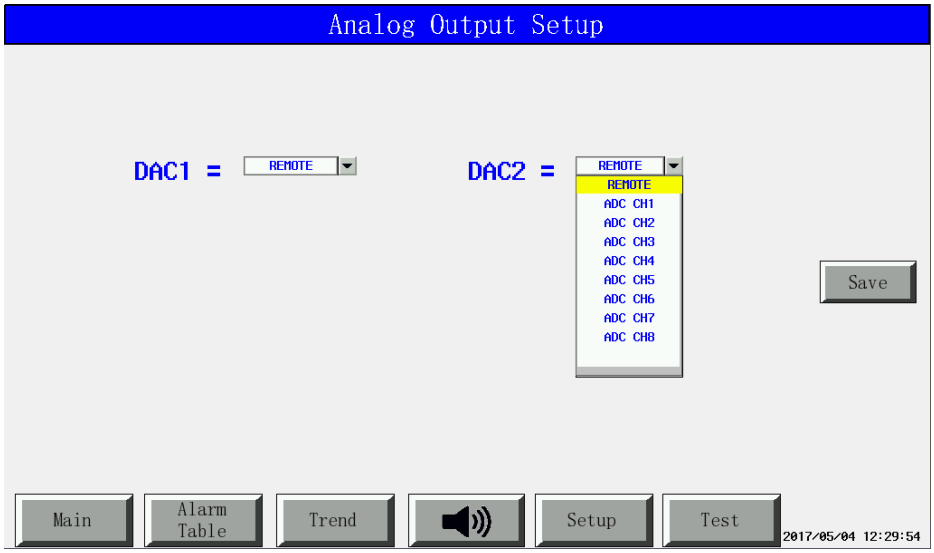


Press Previous and Next to select a relay output and press the selected item to set up. Click "SAVE" to save changes.

Parameters to set up are as follows:
(1). Select remote or screen to control the relay output.
(2). When read-in data of channels 1-8 for analog or read-in data of channels 1-14 for digital input causes an alert, channels 1-7 relays can be selected to short-circuit or open-circuit output. The relay short-circuit or open-circuit is selected by the Action button.

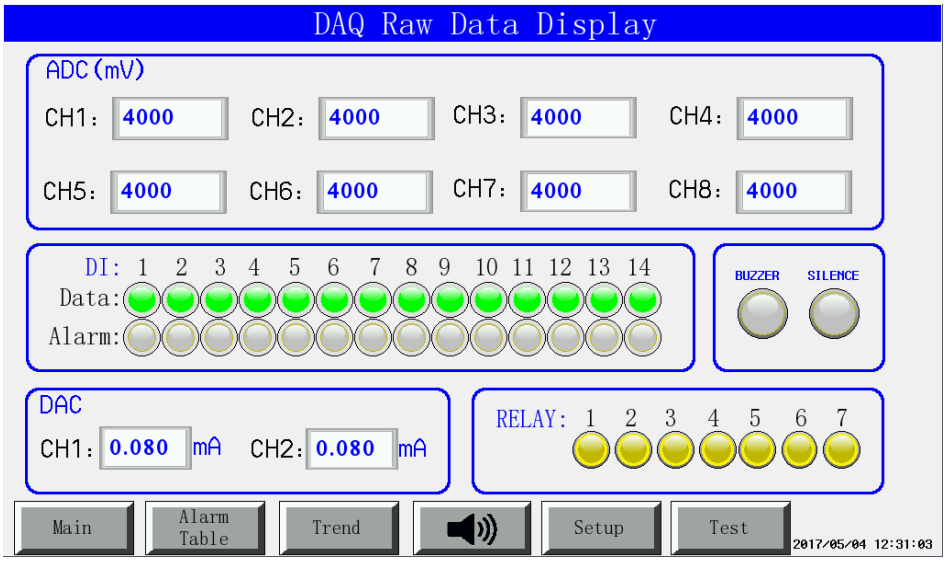
NOTE: If buzzer is selected as actuating action for relay output, other selection(s) should be disabled to prevent false alarm.

5.3.5. PARAMETER SETTING FOR ANALOGOUTPUT



Select the analog output: 1) remotely (or from the screen) or 2) copy the channel number of the analog input as output.

5.3.6. DAQ RAW DATA DISPALY



The page displays read-in voltage data from ADC, raw data of digital input and relay output.

6. FIELD INSTALLATION

NOTICE: Normally, the display module will be dispatched along with the other components
CAUTION: Field installation is not allowed without certified technician supervised.

The module assembly consists of three sections:

(1) Front Panel:
The data-access PCB and display panel are mounted onto the front panel.
(2) Metal Case
Power supply, fuse and power switch are mounted inside the metal case.

(3) Transducer:
Sensors with brass, DISS connectors for different gases. The actual brass, DISS connector, the number of sensors, the number of components vary according to the different systems.
Parts of transducer vary from gas type. The actual coupling tube, DISS connector and quantity of transducer vary from system to system.

STEP 1: Case Mounting
Prepare a wall opening of the dimensions (see Appendix 2). Make sure locations of wall-mounting screw holes match the ones of case body so it will fit in the wall opening. For the front panel to secure on to case body, make sure the shape of case body is not distorted out of being embedded in the wall opening.

STEP 2: Install Coupling Tube with DISS
Each DISS comes with a label of gas type (see Appendix 4). If transducer is installed inside the case, DISS on coupling tube should be welded onto corresponding gas pipe (see Appendix 3). Do not damage DISS while installation is undergoing.

STEP 3: Pressure Test
Medical Gas Pipeline system should be pressurized according to NFPA 99 standard to check all welding connections.

STEP 4: Transducer Installation

Transducer Inside the Case (Local)

Each DISS on coupling tube comes with a gas label, so does connector and transducer.

1. Make sure the DISS is connected to the corresponding transducer.
2. Secure the DISS onto transducer and make sure there is no gas leakage.
3. Check the pressure range of the transducers installed meet the specification of the intended gas:

   Low pressure transducers: 0~100psi (oxygen, medical air, nitrous oxide and carbon dioxide).
   High pressure: 0~300psi (nitrogen, instrument air, hyperbaric oxygen).
   Negative pressure: 0~30inHg/760mmHg (vacuum, WAGD)

Transducer Outside the Case (Remote)

1. Secure a T-shape ¼ ’’ NPT female onto transducer (see Appendix 5).
2. Take down check valve on DISS and secure T-shape gas distribution connector onto it.
3. Secure check valve onto transducer and make sure there is no gas leakage.
   Connect lead and wire of transducer to communication cable inside case. Specification of the communication cable should be 22AWG insulated and its length should not be longer than 30 meters.

STEP 5: Display Module Assembly Installation (see Appendix 3)
1. Secure hinges of display module assembly onto screw holes on the bottom of metal case
2. Secure retaining strings of display module assembly onto screw holes of on the sides of metal case.

NOTICE: Make sure no static electricity cause damage to the circuit board on display module during or prior to assembly.

STEP 6: Power Supply Installation (see Appendix 3 and 6)

NOTICE: Switch DC power supply to "OFF" position before installing display module assembly, wiring or replacing transducer.

1. Make sure the switch of power supply is at "OFF" position.
2. Connect the DC power of metal case to the DC power of display on module assembly.
3. Connect the AC power to the AC power supply Terminals on power supply board. AC power wires must run thru the conduit to the metal case of prepunch hole.
4. Connect the earth ground lead to the earth ground terminal. AC Supply 'GND' terminal is connected to the Building Earth directly. Make sure the earth ground terminal is connected to metal case with washer nut. After the 'GND' terminal is connected to the Building Earth, this terminal must be connected to the 'ground' of the power supply with a bonding conductor.

STEP 7: Screw Terminal Wiring (See Appendix 7)

Transducer Inside the Metal Case (take oxygen transducer for example):

1. Connect the red lead of transducer to DIP switch V of screw terminal on display module assembly and the black lead of transducer to DIP switch ai1 of screw terminal on display module assembly. DIP switch can be taken down while users conduct wiring.
2. Repeat the step above to connect other leads of transducer to screw terminal.

Assignments of DIP Switch

V & ai1	**V & ai5**	**V & ai2**	**V & ai6**	**V & ai3**	**V & ai7**	**V & ai4**	**V & ai8**
OXYGEN	CARBON DIOXDE	VACUUM	NITRIOUS OXIDE	MED. AIR	WAGD	NITROGEN	INSTRUMENT AIR

Transducer Outside the Metal Case (take oxygen transducer for example):

1. Make sure the communication cable is 22AWG insulated and its length should not be longer than 30 meters.
2. Connect the positive lead of communication cable to DIP switch V of screw terminal on display module assembly and the negative one of communication cable to DIP switch ai1. The screw terminal on display module assembly can be taken down while users conduct wiring.
3. Repeat Step 1 above to connect other leads of transducer to DIP switches.

Analog Output Installation (4~20mA output channel 1)

1. Make sure the communication cable is 22AWG insulated and its length should not be longer than 30 meters.
2. Connect the positive lead of communication cable to DIP switch o1 of screw terminal on display module assembly.
3. Connect the negative lead of communication cable to DIP switch G of display module assembly. The screw terminal on display module assembly can be taken down while users conduct wiring.

Digital Input Installation (Input Channel 1)

1. Make sure the communication cable is 22AWG insulated.
2. Connect the positive lead of communication cable to DIP switch i1 of screw terminal on display module assembly.
3. Connect the negative lead of communication cable to DIP switch G of screw terminal on display module assembly. The screw terminal on display module assembly can be taken down while users conduct wiring.

Relay Output Installation (Relay Output Channel 1)

1. Make sure the communication cable is 22AWG insulated.
2. Connect the positive lead of communication cable to DIP switch +1 of screw terminal on display module assembly.
3. Connect the negative lead of communication cable to DIP switch -1 of display module assembly. The screw terminal on display module assembly can be taken down while users conduct wiring.

RS-485 cable Installation

1. Make sure the cable specification is 22AWG twisted pair and insulated.
2. Connect the positive lead of RS-485 cable to the positive pin of screw terminal.
3. The screw terminal on display module assembly can be taken down while users conduct wiring.
4. Connect the insulated lead of RS-485 cable to DIP switch S on screw terminal. The screw terminal on display module assembly can be taken down while users conduct wiring.
5. If the alarm is the last device on the RS-485 network, the dip switch of the last module of the alarm must be turned off.

STEP 8: Swing the Display Module Assembly Upward (see Appendix 3)

1. Switch power supply to “ON” position and make sure the system works normally.
2. Swing the display module assembly upward and check the retaining string is inside the metal case.
3. Secure the display module assembly onto the metal case using the screw holes at the top edges of the metal case and the module assembly.

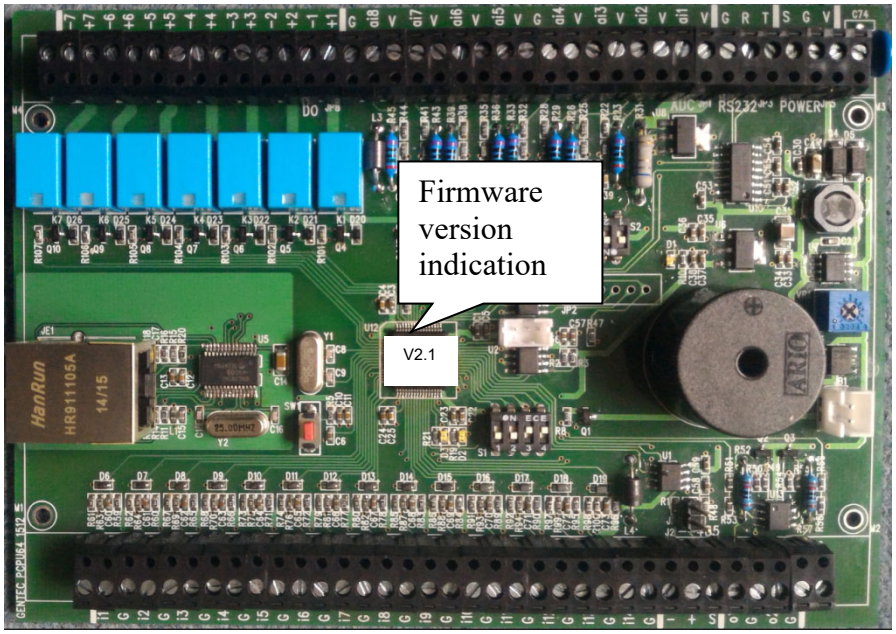
STEP 9: Parameters Setting

Please refer to Chapter 4.1 for parameters setting if any modification is needed.

7. Firmware of Device

Since GM100 uses microcontroller to control all signals, any change of firmware is not allowed by user. The version of firmware is attached on backboard.

VERSION	DESCRIPTION
V 2.1	Support LCD display of alarm indications Support LCD display of trends Support LCD display of history events Support audio alarm control Support analog input, analog output, digital input, and digital output parameters setup Support Modbus RTU/TCP/UDP communication



8. MAINTEINANCE AND TROUBLESHOOTING

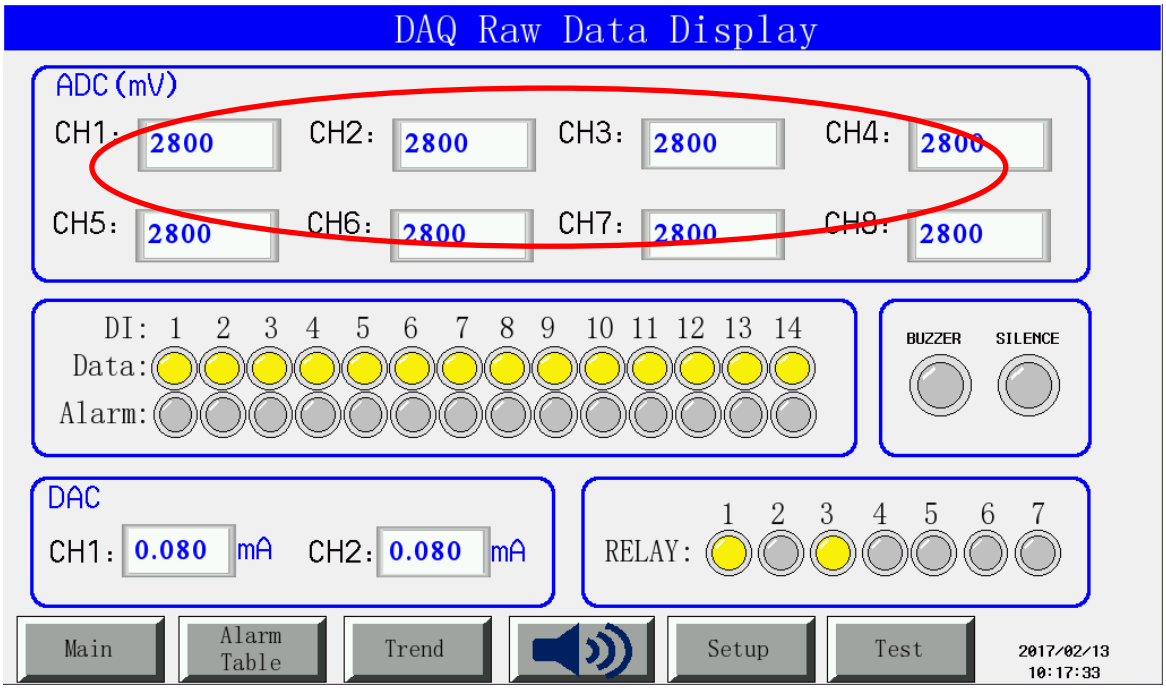
Environmental uncertainty may degrade efficiency of the alarm system; therefore, a routine maintenance check (about every six to twelve months) of your PLC and control system is good practice, and should include the following items:

NO.	ITEM	CHECK	CONDITION	SOLUTION
1	Power Supply	If AC voltage is exceeding nominal value	The specification for AC power supply should be between 100~240 VAC.	Use AC volt meter check if AC power supply is within the range
2	Voltage Input / Output	If input or output voltage is exceeding nominal value.	The specification for input or output voltage should be within nominal value.	Use AC volt meter check if AC power supply is within the range.
3	Environment	Temperature	0 to 55°C	Use thermometer to measure temperature.
		Humidity	10%~90~ RH, non-condensing	Use hygrometer to measure humidity and adjust humidity to be within specifications if possible.
		Direct Sunlight Exposure	Direct sunlight exposure is not allowed	Keep alarm away from sunlight exposure.
		If there are any particles, salts or metallic shavings accumulations in exterior.	Any particles, salts or metallic shavings accumulation is not allowed.	Clean up exterior case if needed.
		If there are any splash of liquid, oil, stain or chemical.	Splash of liquid, oil , stain or chemical is not allowed.	Clean up exterior case if needed
		Check for telecomm interference.	Telecom interference is not allowed	Keep alarm away from telecom interference.
		If there is any shaking movement?	Avoid shaking movement to alarm.	Use foam as shock absorber if necessary.
4	Wiring	If wiring is correct and tightened.	Insufficient tightening is not allowed.	Reconnect the loose wire and make sure it is tightened.
		Inspect mechanics and screws for wiring.	Insufficient tightening is not allowed.	Make sure the loose screw is tightened.
		Inspect wiring condition.	No cable damage is allowed.	Replace damaged cables for new ones.
5	Buzzer Testing	Press the button to test alarm.	If Buzzer does not sound	Send alarm back for maintenance.
6	Touch Screen Testing	Press buttons on screen	Alarm system will switch to its pages respectively when buttons are pressed.	Send alarm back for maintenance.

9. Q&A

1. How to make sure wiring for transducer is correct?

To get to DAQ Raw Data Display, press correct password then press item DAQ Raw Data Display. It will display read-in data of voltage and digital input. Users can tell if wiring of transmitter is correct from read-in voltage. For example, the system has to serve a load of 250mA, the read-in data of voltage should be 1000mV when it is two-wire transmitter outputting 4mA; and the read-in data of voltage should be 5000mV when it is two wire transmitter outputting 20mA. If read-in data of voltage is incorrect, please check if the wiring of transmitter is solid.



Contact your retailer

If you fail to operate the system, please contact your retailer or Gentec Systems Corporation.

GENTEC®

Gentec Systems Corporation

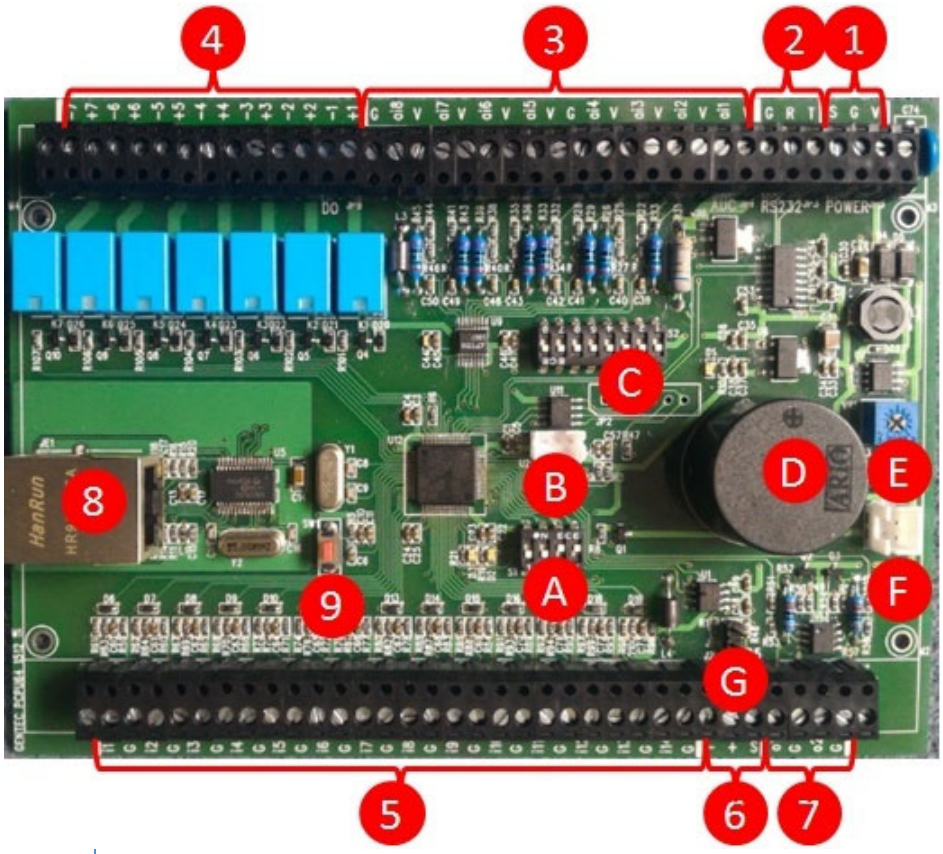
5F., No.51-3, Fusing Rd., Sindan City, Taipei County 23150 Taiwan

Tel: 886-2-8667-3290

Fax: 886-2-8667-3289

E-mail: gentec.tec@msa.hinet.net

APP. 1. PORT, CONNECTOR AND SWITCH LOCATIONS FOR BACK BOARD



(1). DC Power Supply
(2). RS-232 at TTL Level
(3). Connector for Analog Input and Transducer
(4). Dry Contact Output Interface
(5). Connector for Digital Input
(6). Connector for RS-485 Screw Terminal
(7). Connector for 4~20mA Analog Output
(8). Connector for 10/100M, auto selection
(9). Reset Button
(A). Dip Switch for Function Selection
(B). Connector for Firmware Download
(C). Dip Switch for Signal Input Type Selection
(D). Buzzer
(E). Buzzer Volume Adjustment Knot
(F). External Output for Buzzer
(G). Dip Switch for RS-485 Terminating Resistor

Functions of connectors described as below:

(1). DC Power Supply

PIN NUMBER	V	G	S
ASSIGNMENT	DC +12~24VV	GND	Chassis Ground

(2). Connector for RS-232 at TTL Level: the connector is compatible with TFT LCD display connector

PIN NUMBER	1	2	3
ASSIGNMENT	TXD	RXD	GND

(3). Connector for Analog Input and Transducer

INPUT AND OUTPUT CONNECTIONS	
SCREW TERMINAL	**ASSIGNMENT**
V	2-to-20 mA Double-wire Transmitter DC Power Supply
S1	Channel 1 for Analog Input
V	2-to-20 mA Double-wire Transmitter DC Power Supply
S5	Channel 5 for Analog Input
V	2-to-20 mA Double-wire Transmitter DC Power Supply
S2	Channel 2 for Analog Input
V	2-to-20 mA Double-wire Transmitter DC Power Supply
S6	Channel 6 for Analog Input
G	Analog Input Common (Ground)
V	2-to-20 mA Double-wire Transmitter DC Power Supply
S3	Channel 3 for Analog Input
V	2-to-20 mA Double-wire Transmitter DC Power Supply
S7	Channel 7 for Analog Input
V	2-to-20 mA Double-wire Transmitter DC Power Supply
S4	Channel 4 for Analog Input
V	2-to-20 mA Double-wire Transmitter DC Power Supply
S8	Channel 8 for Analog Input
G	Analog Input Common (Ground)

(4). Dry Contact Input Interface

INPUT AND OUTPUT CONNECTIONS			
Relay No.	**Terminals**	**CONNECTION**	**FUNCTION DESCRIPTION**
1	1+	Relay 1 Common	Action Close : Alert ---------- 1+,1- shortage No Alert ----- 1+,1- open Action Open: Alert ---------- 1+,1- open No Alert ----- 1+,1- shortage
	1-	Relay 1 Normally Open	
2	2+	Relay 2 Common	Action Close : Alert ---------- 2+,2- shortage No Alert ----- 2+,2- open Action Open: Alert ---------- 2+,2- open No Alert ----- 2+ ,2- shortage
	2-	Relay 2 Normally Open	
3	3+	Relay 3 Common	Action Close : Alert ----------3+,3- shortage No Alert ----- 3+,3- open Action Open: Alert ---------- 3+,3- open No Alert ----- 3+,3- shortage
	3-	Relay 3 Normally Open	
4	4-	Relay 4 Common	Action Close : Alert ---------- 4+,4- shortage No Alert ----- 4+,4- open Action Open: Alert ---------- 4+,4- open No Alert ----- 4+,4- shortage
	4+	Relay 4 Normally Open	
5	5+	Relay 5 Common	Action Close : Alert ---------- 5+,5- shortage No Alert ----- 5+,5- open Action Open: Alert ---------- 5+,5- open No Alert ----- 5+,5- shortage
	5-	Relay 5 Normally Open	
6	6+	Relay 6 Common	Action Close :

	6-	Relay 6 Normally Open	Alert ---------- 6+,6- shortage No Alert ----- 6+,6- open Action Open: Alert ---------- 6+,6- open No Alert ----- 6+ ,6- shortage
7	7+	Relay 7 Common	Action Close : Alert ---------- 7+,7- shortage No Alert ----- 7+,7- open Action Open: Alert ---------- 7+,7- open No Alert ----- 7+,7- shortage
	7-	Relay 7 Normally Open	

(5). 14 Channels of Digital Input Connector

INPUT AND OUTPUT CONNECTIONS	
SCREW TERMINAL	**ASSIGNMENT**
I1+	Channel 1 - Non-inverting Input
I1-	Channel 1 - Ground
I2+	Channel 2 - Non-inverting Input
I2-	Channel 2 - Ground
I3+	Channel 3 - Non-inverting Input
I3-	Channel 3 - Ground
I4+	Channel 4 - Non-inverting Input
I4-	Channel 4 - Ground
I5+	Channel 5 - Non-inverting Input
I5-	Channel 5 - Ground
I6+	Channel 6 - Non-inverting Input
I6-	Channel 6 - Ground
I7+	Channel 7 - Non-inverting Input
I7-	Channel 7 - Ground
I8+	Channel 8 - Non-inverting Input
I8-	Channel 8 - Ground
I9+	Channel 9 - Non-inverting Input
I9-	Channel 9 - Ground
I10+	Channel 10 - Non-inverting Input
I10-	Channel 10 - Ground
I11+	Channel 11 - Non-inverting Input
I11-	Channel 11- Ground
I12+	Channel 12 - Non-inverting Input
I12-	Channel 12 - Ground
I13+	Channel 13 - Non-inverting Input
I13-	Channel 13 - Ground
I14+	Channel 14 - Non-inverting Input
I14-	Channel 14 - Ground

The channels can be configured to receive input signal as TTL or dry contact input.

(6). Connector for RS-485 Screw Terminal

RS-485 CONNECTOR			
PIN NUMBER	**-**	**+**	**S**
ASSIGNMENT	Inverting Input / Output	Non-inverting Input / Output	GND

Connector for RS-485 Screw Terminal supports MODBUS RTU to connect to other devices for users to read and download data to their personal computers or integrate them to other SCADA software.

(7). Connector for 4~20mA Analog Output

INPUT AND OUTPUT CONNECTIONS

SCREW TERMINAL	ASSIGNMENT
I1+	4~20mA Output
I1-	Ground
I2+	4~20mA Output
I2-	Ground

Any analog output interface can be configured as a link or replica of any analog input or remote data or screen control output.

(8). Connector for 10/100M, auto selection

The GM-100 includes full networking capabilities out of the box. The system supports MODBUS TCP and UDP protocols to communicate with other devices. Through MODBUS TCP or UDP protocol, users can access read-in data, which can be integrated with Supervisory Control And Data Acquisition (SCADA) system. A built-in web server enables users to read condition of I/O through web browsers such as IE, Chrome and Safari. The default IP address is 192.168.0.18. The Port number of MODBUS TCP is 502, UDP port number is 4800.

(9). Reset Button

Press the button to rest DAQ PCB.

(A). Operation Mode DIP Switch S1

S1 SWITCH SETTING				OPERATION MODE SELECTION
4	3	2	1	
ON	ON	ON	ON	Calibration (in factory only)
ON	ON	ON	OFF	Calibration (in factory only)
ON	ON	OFF	OFF	Demo Mode
OFF	OFF	OFF	ON	Run Mode
OFF	OFF	OFF	OFF	Run Mode

(B). Connector for Firmware Download

The connector is configured to update for firmware. It is the connector for engineers.

(C). Dip Switch for Signal Input Type Selection

FUNCTION	VIRTUAL DRY CONTACT INPUT	4~20mA (DEFAULT)
SWITCH 1	ON	OFF
SWITCH 2	ON	OFF
SWITCH 3	ON	OFF
SWITCH 4	ON	OFF
SWITCH 5	ON	OFF
SWITCH 6	ON	OFF
SWITCH 7	ON	OFF
SWITCH 8	ON	OFF

(D). Buzzer

(E). Buzzer Volume Adjustment Knob

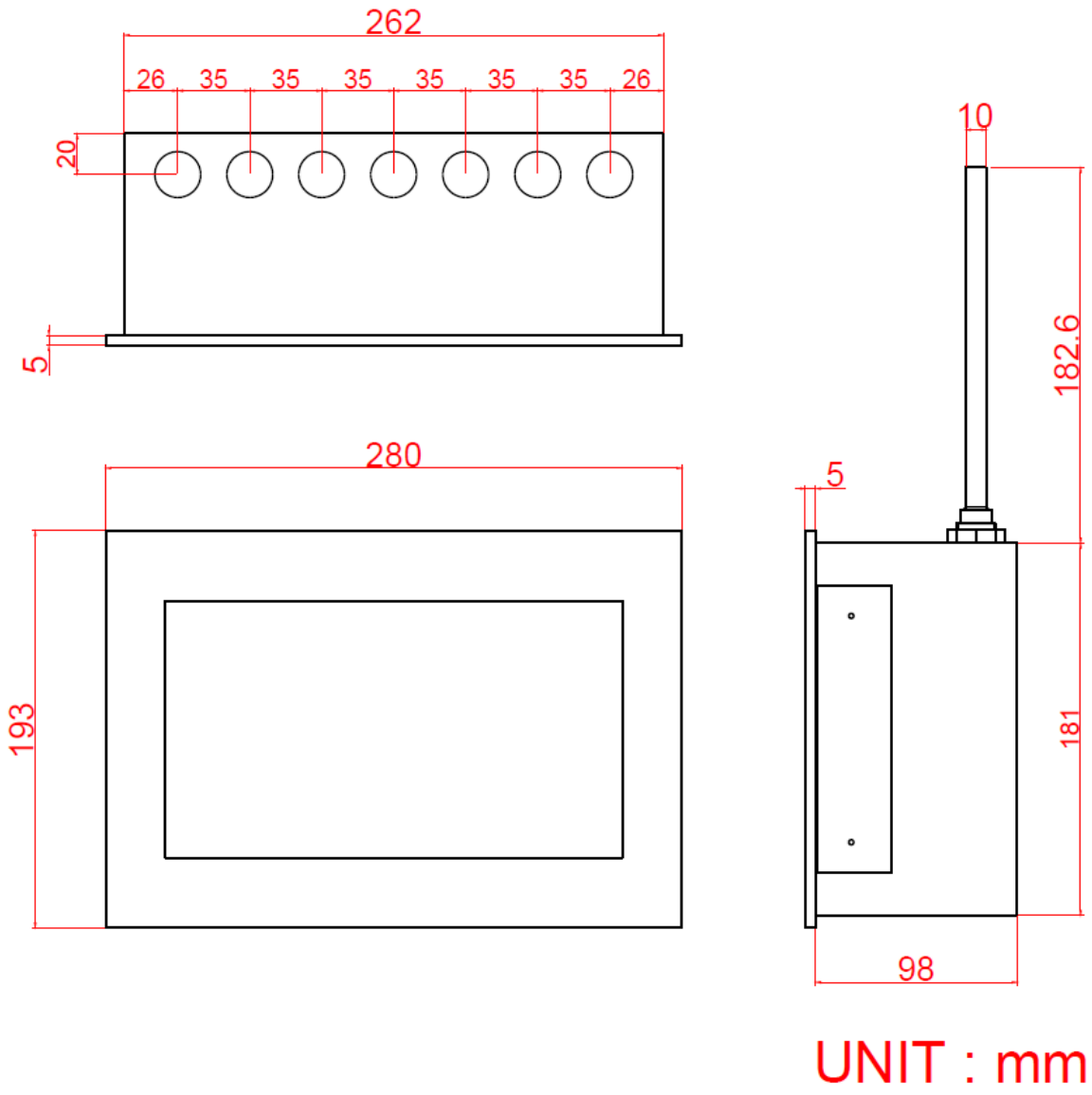
(F). External Output for Buzzer

Interface for external buzzer output

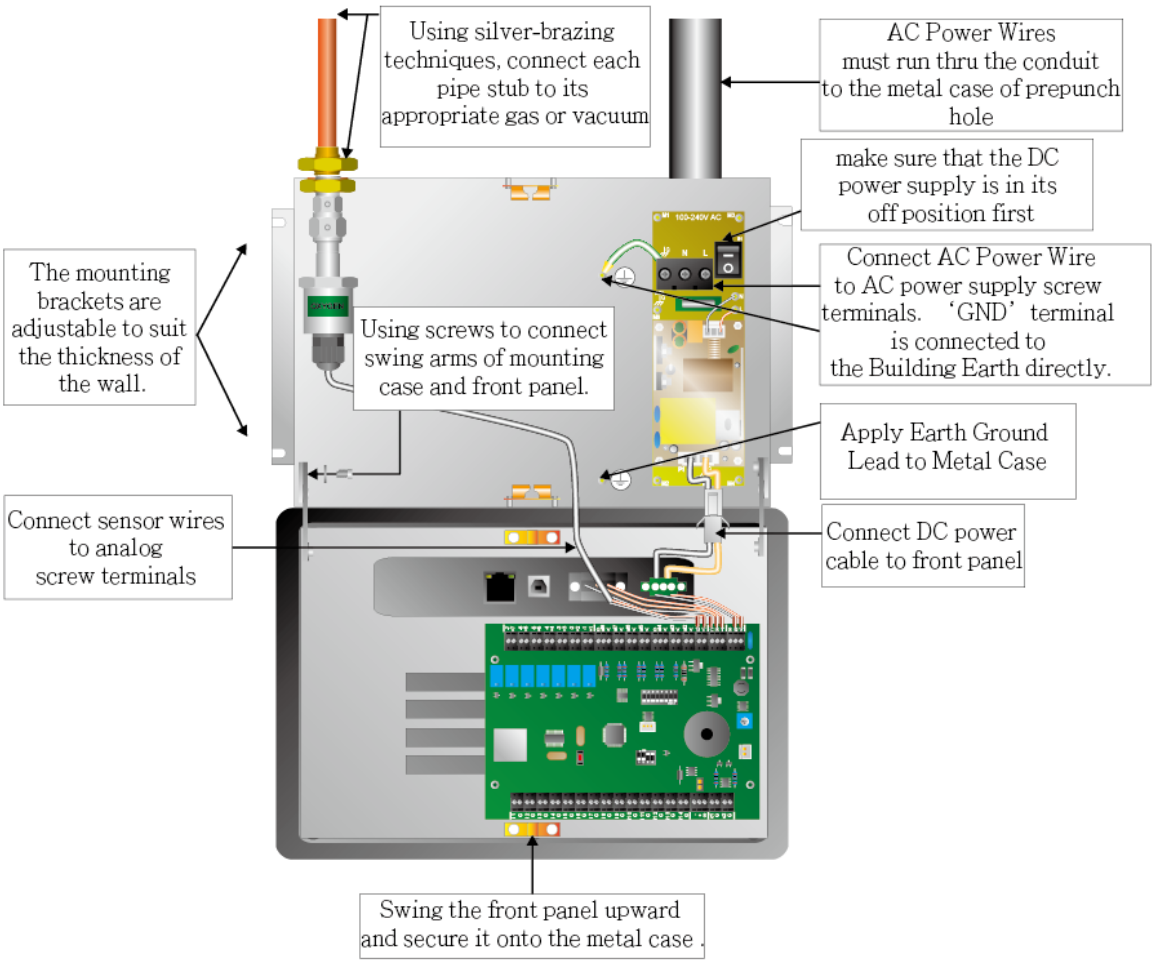
(G). Dip Switch for RS-485 Terminating Resistor

If the alarm is the last device on the RS-485 network, the dip switch of the last module of the alarm must be turned on.

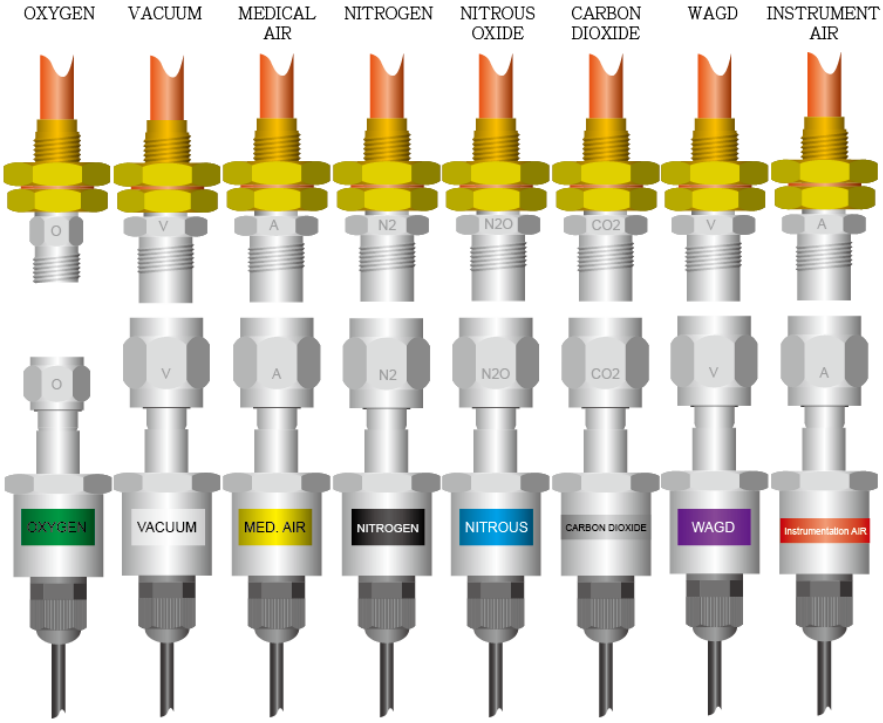
APP. 2. DIMENSIONS AND WALL OPENING



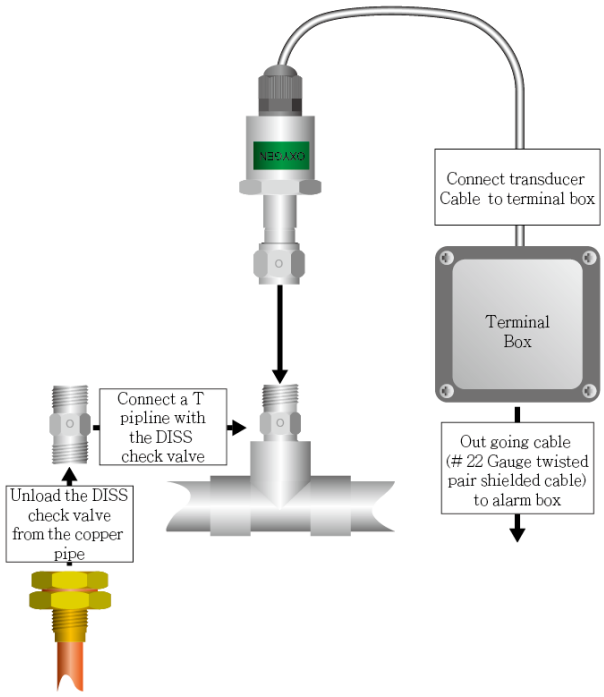
APP. 3. INSTALLATION FOR METAL CASE AND FRONT PANEL



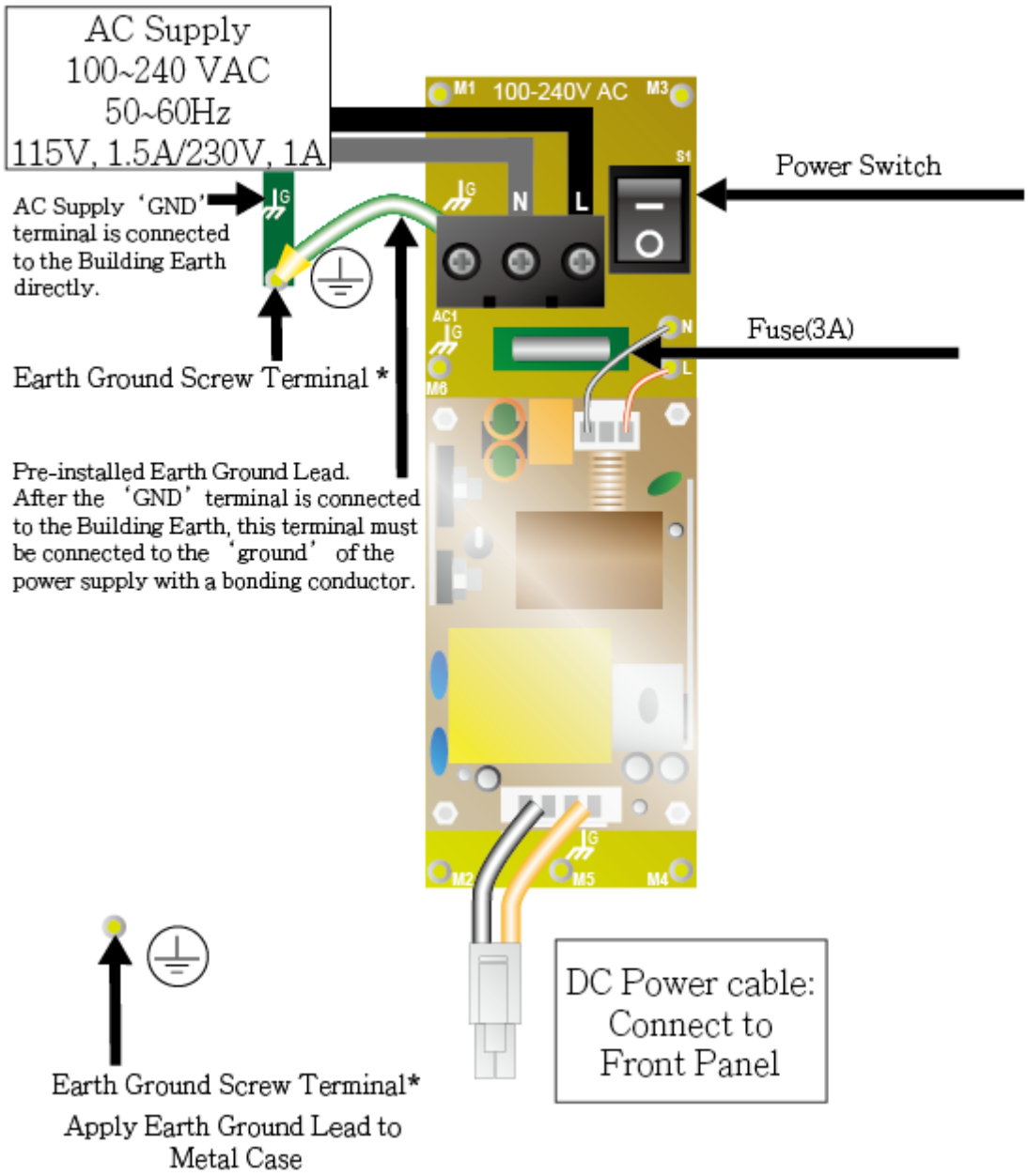
APP 4. CONNECTOR AND COUPLING TUBE WITH DISS



APP. 5. INSTALLATION FOR REMOTE TRANSDUCER

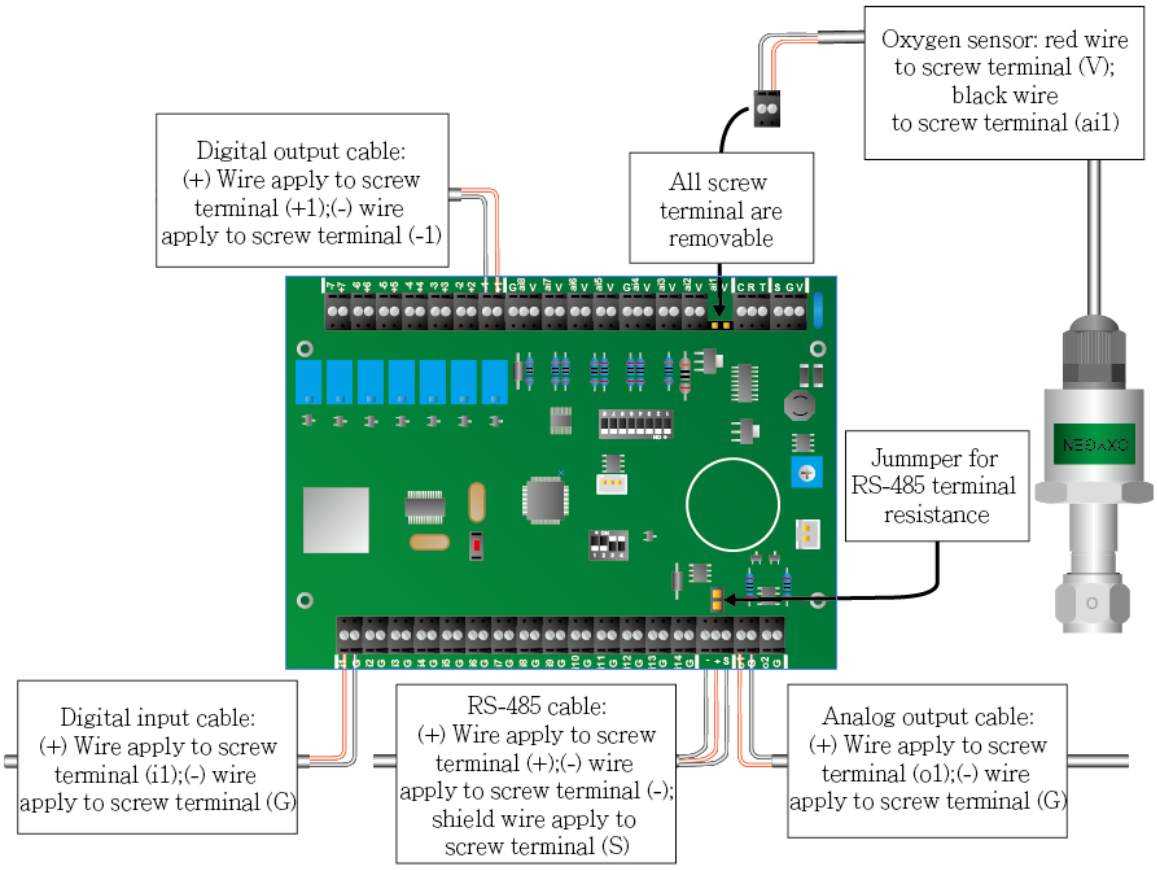


APP. 6. INSTALLATION FOR POWER SUPPLY AND GROUNDING



*Make sure the earth ground terminal is connected to case with washer nut.

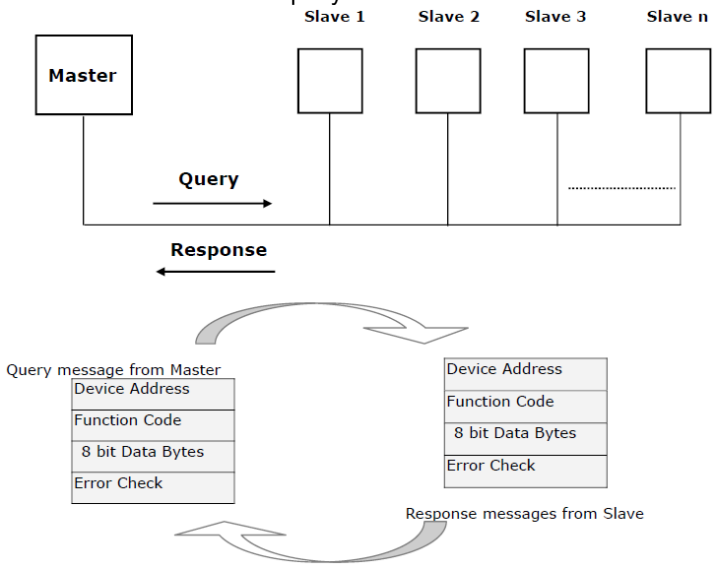
APP. 7. WIRING OF TRANSDUCER TO SCREW TERMINAL



APP. 8. Modbus

APP. 8.1 The Query-Response Cycle

The master sends a query for a slave with a specific ID. All slaves check this query and send a response to the master only when slave has the same ID of query.



APP. 8.2 Modbus Function Code and Format

The function code of a Modbus message defines the action to be taken by the slave.

Code	Modbus name	Description
03	Read Holding Registers	Read the content of read/write location (4X reference)
04	Read Input Registers	Read the contents of read only location (3X reference)
16	Pre-set Multiple Registers	Set the contents of read/write location (4X reference)

In RTU mode, messages start with a silent interval of at least 3.5 character times, and end with a similar interval of at least 3.5 character times. This is most easily implemented as a multiple of character times at the baud rate that is being used on the network.
All other fields are composed of 8-bit data.

Query :

Slave Address	Function Code 0x03, 0x04	Start Address (Hi)	Start Address (Lo)	Number of Points (Hi)	Number of Points (Lo)	Error Check (Lo)	Error Check (Hi)

Response :

Slave Address	Function Code 0x03, 0x04	Byte Count	Data (Hi)	Data (Lo)	Error Check (Lo)	Error Check (Hi)

Query :

Slave Address	Function Code 0x10	Start Address (Hi)	Start Address (Lo)	Number of Points (Hi)	Number of Points (Lo)	Byte Count	Data (Hi)	Data (Lo)	Error Check (Lo)	Error Check (Hi)

Response :

Slave Address	Function Code 0x10	Start Address (Hi)	Start Address (Lo)	Number of Points (Hi)	Number of Points (Lo)	Error Check (Lo)	Error Check (Hi)

APP. 8.3 Communication Examples

Please refer to APP. 9. Registers Map for more details.

Example 1: 03 Read Holding Registers

Query:

	Code (Hex)
Slave Address	02
Function	03
Starting Address Hi	00
Starting Address Lo	20
No. of Points Hi	00
No. of Points Lo	01
Error Check (CRC Lo)	85
Error Check (CRC Hi)	F3

Response:

	Code (Hex)
Slave Address	02
Function	03
Number of Bytes	02
Data 1 Hi	00
Data 1 Lo	03
Error Check (CRC Lo)	BC
Error Check (CRC Hi)	45

Error Response:

	Code (Hex)
Slave Address	02
80+Function code	83
Error Code	03
Error Check (CRC Lo)	xx
Error Check (CRC Hi)	xx

Example 2: 04 (0x04) Read Input Registers

Query:

	Code (Hex)
Slave Address	02
Function	04
Starting Address Hi	10
Starting Address Lo	00
No. of Points Hi	00
No. of Points Lo	01
Error Check (CRC Lo)	35
Error Check (CRC Hi)	39

Response:

	Code (Hex)
Slave Address	02
Function	04
Number of Bytes	02
Data 1 Hi	00
Data 1 Lo	03
Error Check (CRC Lo)	BD
Error Check (CRC Hi)	31

Error Response:

	Code (Hex)
Slave Address	02
80+Function code	84
Error Code	02
Error Check (CRC Lo)	xx
Error Check (CRC Hi)	xx

Example 3: 16 (0x10) Write Multiple registers
Query:

	Code (Hex)
Slave Address	02
Function	10
Starting Address Hi	00
Starting Address Lo	02
No. of Points Hi	00
No. of Points Lo	01
Number of Bytes	02
Data 1 Hi	00
Data 1 Lo	03
Error Check (CRC Lo)	F5
Error Check (CRC Hi)	C1

Response:

	Code (Hex)
Slave Address	02
Function	10
Starting Address Hi	00
Starting Address Lo	02
No. of Points Hi	00
No. of Points Lo	01
Error Check (CRC Lo)	00
Error Check (CRC Hi)	03

Error Response:

	Code (Hex)
Slave Address	02
80+Function code	84
Error Code	xx
Error Check (CRC Lo)	xx
Error Check (CRC Hi)	xx

APP. 9. Registers Map

Input Register Number	Data Type	Name of Parameter	Function description
1	UINT16	AI_CH1_Channel InUse	Channel in use of analog input channel 1 (0: Disable 1: Enable)
2	INT32	AI_CH1_PhysicalValue	Physical value of analog input channel 1: This value is multiplied by 1000. For example, the physical value is 12.345 when received data is 12345.
4	INT32	AI_CH1_LLimit	Alarm of low limit value of analog input channel 1: This value is multiplied by 1000. For example, the low limit value is 12.345 when received data is 12345.
6	INT32	AI_CH1_ULimit	Alarm of high limit value of analog input channel 1: This value is multiplied by 1000. For example, the high limit value is 12.345 when received data is 12345.
8	INT16	AI_CH1_SuspendCountDownMin	Remaining times of alarm suspend of analog input channel 1: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
9	UINT16	AI_CH1_Status	Status of analog input channel 1 bit 2------ Sensor Error 0:Normal, 1:Error 3------ Silence 0:Disable, 1:Enable 6------ Low Alarm 0:No alarm, 1:Alarm 7------ High Alarm 0:No alarm, 1:Alarm
10	UINT16	AI_CH2_Channel InUse	Channel in use of analog input channel 2 (0: Disable 1: Enable)
11	INT32	AI_CH2_PhysicalValue	Physical value of analog input channel 2: This value is multiplied by 1000. For example, the physical value is 12.345 when received data is 12345.
13	INT32	AI_CH2_LLimit	Alarm of low limit value of analog input channel 2: This value is multiplied by 1000. For example, the low limit value is 12.345 when received data is 12345.
15	INT32	AI_CH2_ULimit	Alarm of high limit value of analog input channel 2: This value is multiplied by 1000. For example, the high limit value is 12.345 when received data is 12345.
17	INT16	AI_CH2_SuspendCountDownMin	Remaining times of alarm suspend of analog input channel 2: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
18	UINT16	AI_CH2_Status	Status of analog input channel 2 bit 2------ Sensor Error 0:Normal, 1:Error 3------ Silence 0:Disable, 1:Enable 6------ Low Alarm 0:No alarm, 1:Alarm 7------ High Alarm 0:No alarm, 1:Alarm
19	UINT16	AI_CH3_Channel InUse	Channel in use of analog input channel 3 (0: Disable 1: Enable)
20	INT32	AI_CH3_PhysicalValue	Physical value of analog input channel 3: This value is multiplied by 1000. For example, the physical value is 12.345 when received data is 12345.
22	INT32	AI_CH3_LLimit	Alarm of low limit value of analog input channel 3: This value is multiplied by 1000. For example, the low limit value is 12.345 when received data is 12345.
24	INT32	AI_CH3_ULimit	Alarm of high limit value of analog input channel 3: This value is multiplied by 1000. For example, the high limit value is 12.345 when received data is 12345.
26	INT16	AI_CH3_SuspendCountDownMin	Remaining times of alarm suspend of analog input channel 1: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
27	UINT16	AI_CH3_Status	Status of analog input channel 3 bit

			2------ Sensor Error 0:Normal, 1:Error 3------ Silence 0:Disable, 1:Enable 6------ Low Alarm 0:No alarm, 1:Alarm 7------ High Alarm 0:No alarm, 1:Alarm
28	UINT16	AI_CH4_Channel InUse	Channel in use of analog input channel 4 (0: Disable 1: Enable)
29	INT32	AI_CH4_PhysicalValue	Physical value of analog input channel 4: This value is multiplied by 1000. For example, the physical value is 12.345 when received data is 12345.
31	INT32	AI_CH4_LLimit	Alarm of low limit value of analog input channel 4: This value is multiplied by 1000. For example, the low limit value is 12.345 when received data is 12345.
33	INT32	AI_CH4_ULimit	Alarm of high limit value of analog input channel 4: This value is multiplied by 1000. For example, the high limit value is 12.345 when received data is 12345.
35	INT16	AI_CH4_SuspendCountDownMin	Remaining times of alarm suspend of analog input channel 4: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
36	UINT16	AI_CH4_Status	Status of analog input channel 4 bit 2------ Sensor Error 0:Normal, 1:Error 3------ Silence 0:Disable, 1:Enable 6------ Low Alarm 0:No alarm, 1:Alarm 7------ High Alarm 0:No alarm, 1:Alarm
37	UINT16	AI_CH5_Channel InUse	Channel in use of analog input channel 5 (0: Disable 1: Enable)
38	INT32	AI_CH5_PhysicalValue	Physical value of analog input channel 5: This value is multiplied by 1000. For example, the physical value is 12.345 when received data is 12345.
40	INT32	AI_CH5_LLimit	Alarm of low limit value of analog input channel 5: This value is multiplied by 1000. For example, the low limit value is 12.345 when received data is 12345.
42	INT32	AI_CH5_ULimit	Alarm of high limit value of analog input channel 5: This value is multiplied by 1000. For example, the high limit value is 12.345 when received data is 12345.
44	INT16	AI_CH5_SuspendCountDownMin	Remaining times of alarm suspend of analog input channel 5: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
45	UINT16	AI_CH5_Status	Status of analog input channel 5 bit 2------ Sensor Error 0:Normal, 1:Error 3------ Silence 0:Disable, 1:Enable 6------ Low Alarm 0:No alarm, 1:Alarm 7------ High Alarm 0:No alarm, 1:Alarm
46	UINT16	AI_CH6_Channel InUse	Channel in use of analog input channel 6 (0: Disable 1: Enable)
47	INT32	AI_CH6_PhysicalValue	Physical value of analog input channel 6: This value is multiplied by 1000. For example, the physical value is 12.345 when received data is 12345.
49	INT32	AI_CH6_LLimit	Alarm of low limit value of analog input channel 6: This value is multiplied by 1000. For example, the low limit value is 12.345 when received data is 12345.
51	INT32	AI_CH6_ULimit	Alarm of high limit value of analog input channel 6: This value is multiplied by 1000. For example, the high limit value is 12.345 when received data is 12345.
53	INT16	AI_CH6_SuspendCountDownMin	Remaining times of alarm suspend of analog input channel 6: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
54	UINT16	AI_CH6_Status	Status of analog input channel 6 bit 2------ Sensor Error 0:Normal, 1:Error 3------ Silence 0:Disable, 1:Enable 6------ Low Alarm 0:No alarm, 1:Alarm 7------ High Alarm 0:No alarm, 1:Alarm
55	UINT16	AI_CH7_Channel InUse	Channel in use of analog input channel 7 (0: Disable 1: Enable)
56	INT32	AI_CH7_PhysicalValue	Physical value of analog input channel 7: This value is multiplied by 1000. For example, the physical value is 12.345 when received data is 12345.
58	INT32	AI_CH7_LLimit	Alarm of low limit value of analog input channel 7: This value is multiplied by 1000. For example, the low limit

			value is 12.345 when received data is 12345.
60	INT32	AI_CH7_ULimit	Alarm of high limit value of analog input channel 7: This value is multiplied by 1000. For example, the high limit value is 12.345 when received data is 12345.
62	INT16	AI_CH7_SuspendCountDownMin	Remaining times of alarm suspend of analog input channel 7: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
63	UINT16	AI_CH7_Status	Status of analog input channel 7 bit 2------ Sensor Error 0:Normal, 1:Error 3------ Silence 0:Disable, 1:Enable 6------ Low Alarm 0:No alarm, 1:Alarm 7------ High Alarm 0:No alarm, 1:Alarm
64	UINT16	AI_CH8_Channel InUse	Channel in use of analog input channel 8 (0: Disable 1: Enable)
65	INT32	AI_CH8_PhysicalValue	Physical value of analog input channel 8: This value is multiplied by 1000. For example, the physical value is 12.345 when received data is 12345.
67	INT32	AI_CH8_LLimit	Alarm of low limit value of analog input channel 8: This value is multiplied by 1000. For example, the low limit value is 12.345 when received data is 12345.
69	INT32	AI_CH8_ULimit	Alarm of high limit value of analog input channel 8: This value is multiplied by 1000. For example, the high limit value is 12.345 when received data is 12345.
71	INT16	AI_CH8_SuspendCountDownMin	Remaining times of alarm suspend of analog input channel 8: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
72	UINT16	AI_CH8_Status	Status of analog input channel 8 bit 2------ Sensor Error 0:Normal, 1:Error 3------ Silence 0:Disable, 1:Enable 6------ Low Alarm 0:No alarm, 1:Alarm 7------ High Alarm 0:No alarm, 1:Alarm
73	UINT16	DI_Data	Status (0 or 1) of digital input: Bit 0: Digital input channel 1 6: Digital input channel 7 1: Digital input channel 2 7: Digital input channel 8 2: Digital input channel 3 8: Digital input channel 9 3: Digital input channel 4 9: Digital input channel 10 4: Digital input channel 5 10: Digital input channel 11 5: Digital input channel 6 11: Digital input channel 12
74	UINT16	DI_Alarm	Alarm status of digital input: Bit 0 0: DI CH1 no alarm, 1: DI CH1 alarm 1 0: DI CH2 no alarm, 1: DI CH2 alarm ……
75	INT16	DI_CH1_SuspendCountDownMin	Remaining times of alarm suspend of digital input channel 1: In alarm state, alarm suspend is disable when remaining times is 0. The unit of this parameter is minute.
76	INT16	DI_CH2_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
77	INT16	DI_CH3_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
78	INT16	DI_CH4_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
79	INT16	DI_CH5_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
80	INT16	DI_CH6_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
81	INT16	DI_CH7_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
82	INT16	DI_CH8_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
83	INT16	DI_CH9_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
84	INT16	DI_CH10_SuspendCountDownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
85	INT16	DI_CH11_SuspendCount	(Please refer to the function description of

		DownMin	DI_CH1_SuspendCountDownMin)
86	INT16	DI_CH12_SuspendCount DownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
87	INT16	DI_CH13_SuspendCount DownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
88	INT16	DI_CH14_SuspendCount DownMin	(Please refer to the function description of DI_CH1_SuspendCountDownMin)
89	UINT16	DO_Status	Status of digital output。 Bit 0---Relay1 0:open 1:short 1---Relay2 0:open 1:short 2---Relay3 0:open 1:short 3---Relay4 0:open 1:short 4---Relay5 0:open 1:short 5---Relay6 0:open 1:short 6---Relay7 0:open 1:short
90	UINT16	DA_CH1_uA	Analog output channel 1: The unit of parameter is μA
92	UINT16	DA_CH2_uA	Analog output channel 2: The unit of parameter is μA
94	INT32	AI_CH1_Hysteresis	Hysteresis of analog input channel 1: This value is multiplied by 1000. For example, the hysteresis value is 5 when received data is 5000.
96	INT16	AI_CH1_SilenceTime	Silence time of analog input channel 1: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
97	INT32	AI_CH1_mV	Voltage of analog input channel 1: The unit of this parameter is mV.
99	INT32	AI_CH2_Hysteresis	Hysteresis of analog input channel 2: This value is multiplied by 1000. For example, the hysteresis value is 5 when received data is 5000.
101	INT16	AI_CH2_SilenceTime	Silence time of analog input channel 2: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
102	INT32	AI_CH2_mV	Voltage of analog input channel 2: The unit of this parameter is mV.
104	INT32	AI_CH3_Hysteresis	Hysteresis of analog input channel 3: This value is multiplied by 1000. For example, the hysteresis value is 5 when received data is 5000.
106	INT16	AI_CH3_SilenceTime	Silence time of analog input channel 3: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
107	INT32	AI_CH3_mV	Voltage of analog input channel 3: The unit of this parameter is mV.
109	INT32	AI_CH4_Hysteresis	Hysteresis of analog input channel 4: This value is multiplied by 1000. For example, the hysteresis value is 5 when received data is 5000.
111	INT16	AI_CH4_SilenceTime	Silence time of analog input channel 4: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
112	INT32	AI_CH4_mV	Voltage of analog input channel 4: The unit of this parameter is mV.
114	INT32	AI_CH5_Hysteresis	Hysteresis of analog input channel 5: This value is multiplied by 1000. For example, the hysteresis value is 5 when received data is 5000.
116	INT16	AI_CH5_SilenceTime	Silence time of analog input channel 5: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
117	INT32	AI_CH5_mV	Voltage of analog input channel 5: The unit of this parameter is mV.
119	INT32	AI_CH6_Hysteresis	Hysteresis of analog input channel 6: This value is multiplied by 1000. For example, the hysteresis value is 5 when received data is 5000.
121	INT16	AI_CH6_SilenceTime	Silence time of analog input channel 6: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
122	INT32	AI_CH6_mV	Voltage of analog input channel 6: The unit of this parameter is mV.
124	INT32	AI_CH7_Hysteresis	Hysteresis of analog input channel 7: This value is multiplied by 1000. For example, the hysteresis value is 5 when received data is 5000.
126	INT16	AI_CH7_SilenceTime	Silence time of analog input channel 7: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
127	INT32	AI_CH7_mV	Voltage of analog input channel 7: The unit of this

			parameter is mV.
129	INT32	AI_CH8_Hysteresis	Hysteresis of analog input channel 8: This value is multiplied by 1000. For example, the hysteresis value is 5 when received data is 5000.
131	INT16	AI_CH8_SilenceTime	Silence time of analog input channel 8: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
132	INT32	AI_CH8_mV	Voltage of analog input channel 8: The unit of this parameter is mV.
134	INT16	DI_CH1_SilenceTime	Silence time of digital input channel 1: The unit of this parameter is minute. Buzzer is not active when value is set to -1.
135	INT16	DI_CH2_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
136	INT16	DI_CH3_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
137	INT16	DI_CH4_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
138	INT16	DI_CH5_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
139	INT16	DI_CH6_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
140	INT16	DI_CH7_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
141	INT16	DI_CH8_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
142	INT16	DI_CH9_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
143	INT16	DI_CH10_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
144	INT16	DI_CH11_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
145	INT16	DI_CH12_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
146	INT16	DI_CH13_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)
147	INT16	DI_CH14_SilenceTime	(Please refer to the function description of DI_CH1_SilenceTime)