

iGasis

iGasis1 Gas Detector



USER MANUAL

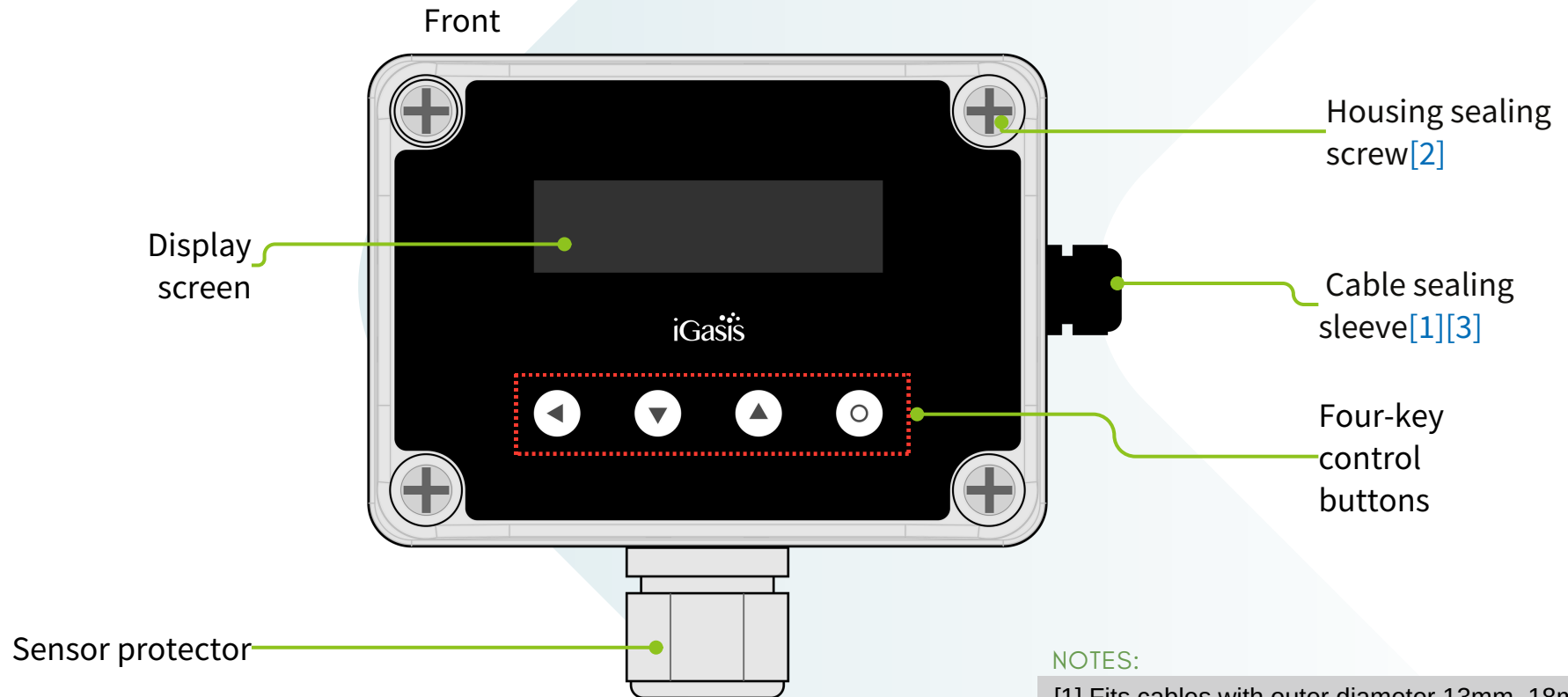
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PACKAGE CONTENTS

- iGasis1 main unit
- Warranty card

PRODUCT DESIGN / FEATURES



NOTES:

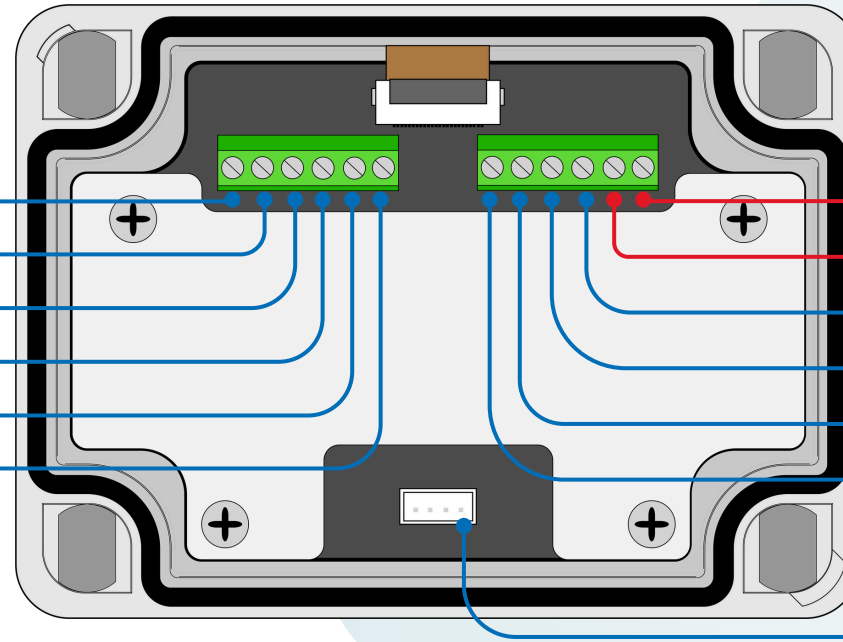
- [1] Fits cables with outer diameter 13mm–18mm
- [2] Tighten sealing screw for waterproofing
- [3] Tighten cable gland for waterproofing

PRODUCT DESIGN / FEATURES

Inside of the cover

External port pin definitions

- FLT Dry Contact (COM)[1]
- FLT Dry Contact (NO)[1]
- A2 Dry Contact (COM)[1]
- A2 Dry Contact (NO)[1]
- A1 Dry Contact (COM)[1]
- A1 Dry Contact (NO)[1]



External port pin definitions

- 24VDC positive[1][2]
- 24VDC negative[1][2]
- RS485 A [1]
- RS485 B [1]
- 4-20mA(+) [1]
- 4-20mA(-) [1]
- Sensor connector[3]

NOTES:

[1] Recommended communication cable for ports:

RS485: AWG22 twisted pair control wire

24VDC: AWG24~AWG19 multi-core power wire

4-20mA: AWG24~AWG19 multi-core power wire

Dry contact: AWG24~AWG19 multi-core power wire

[2] When installing 24VDC, ensure correct polarity; do not reverse.

[3] Ensure the sensor wire is correctly installed on the sensor connector.

COMMUNICATION INTERFACE:

4-20mA Communication function

- iGasis1 uses a 3-wire 4-20mA output, with the 4-20mA(-) terminal being common with the 24VDC negative terminal.

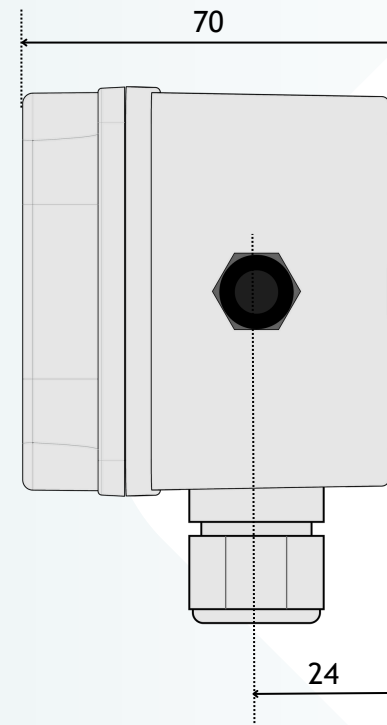
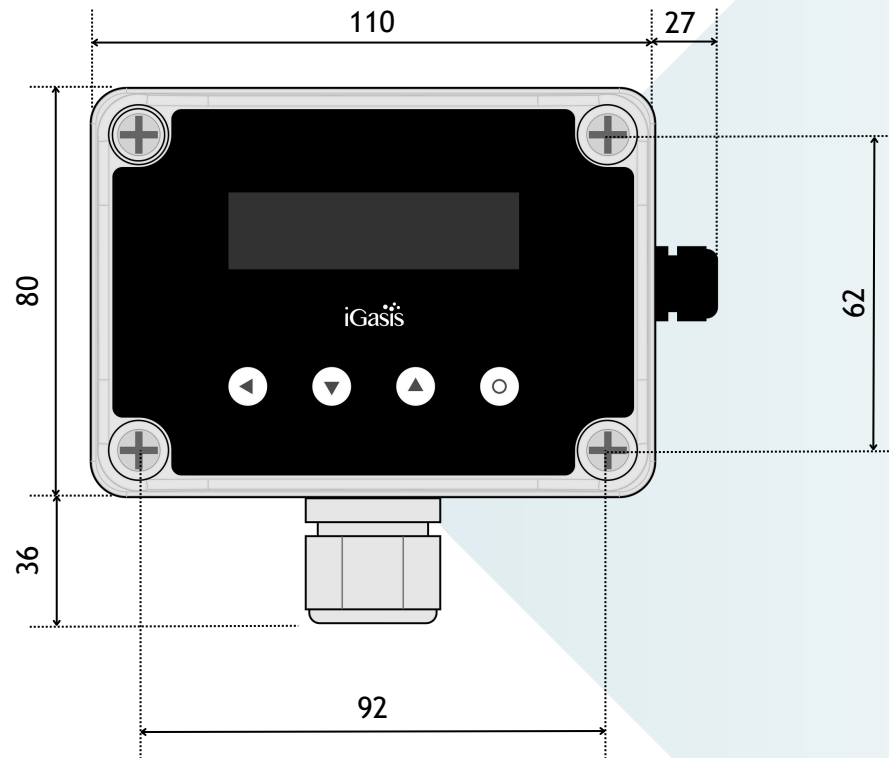
RS485 Communication function

- RS-485 is directional; check A(+) and B(-) positions when wiring.

Dry contact function (optional)

- This product can be set with three dry contacts: A1, A2, FLT, to trigger actions based on alarm or device malfunction. Use appropriate wiring to connect.[1]

PRODUCT DIMENSIONS

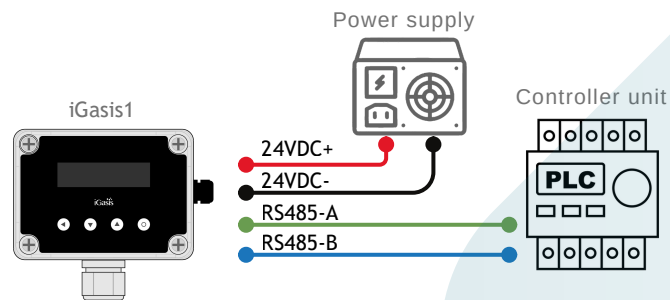


Unit: mm

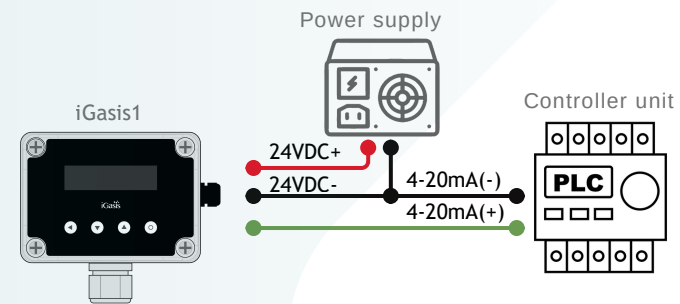
WIRING INSTALLATION

THE FOLLOWING FOUR ARE COMMON WIRING METHODS:

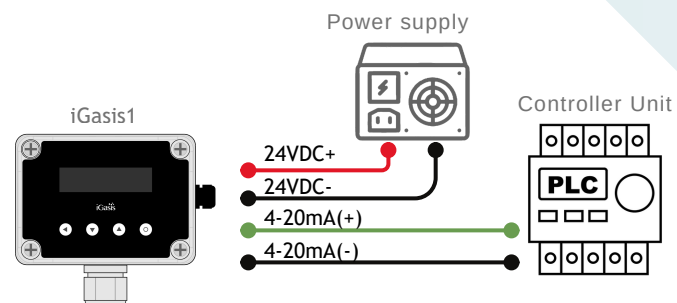
1. RS485 Interface



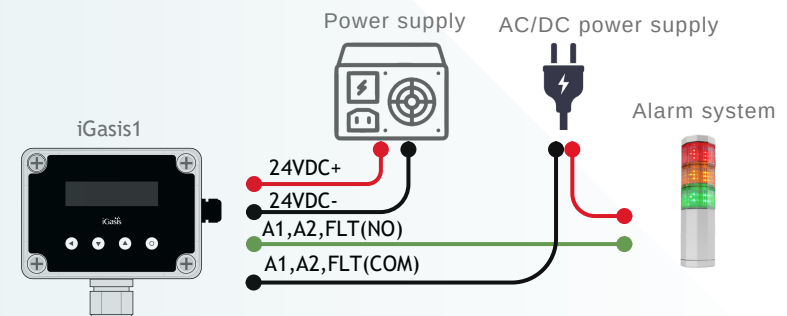
2. 3-wire 4-20mA



3. 4-wire 4-20mA

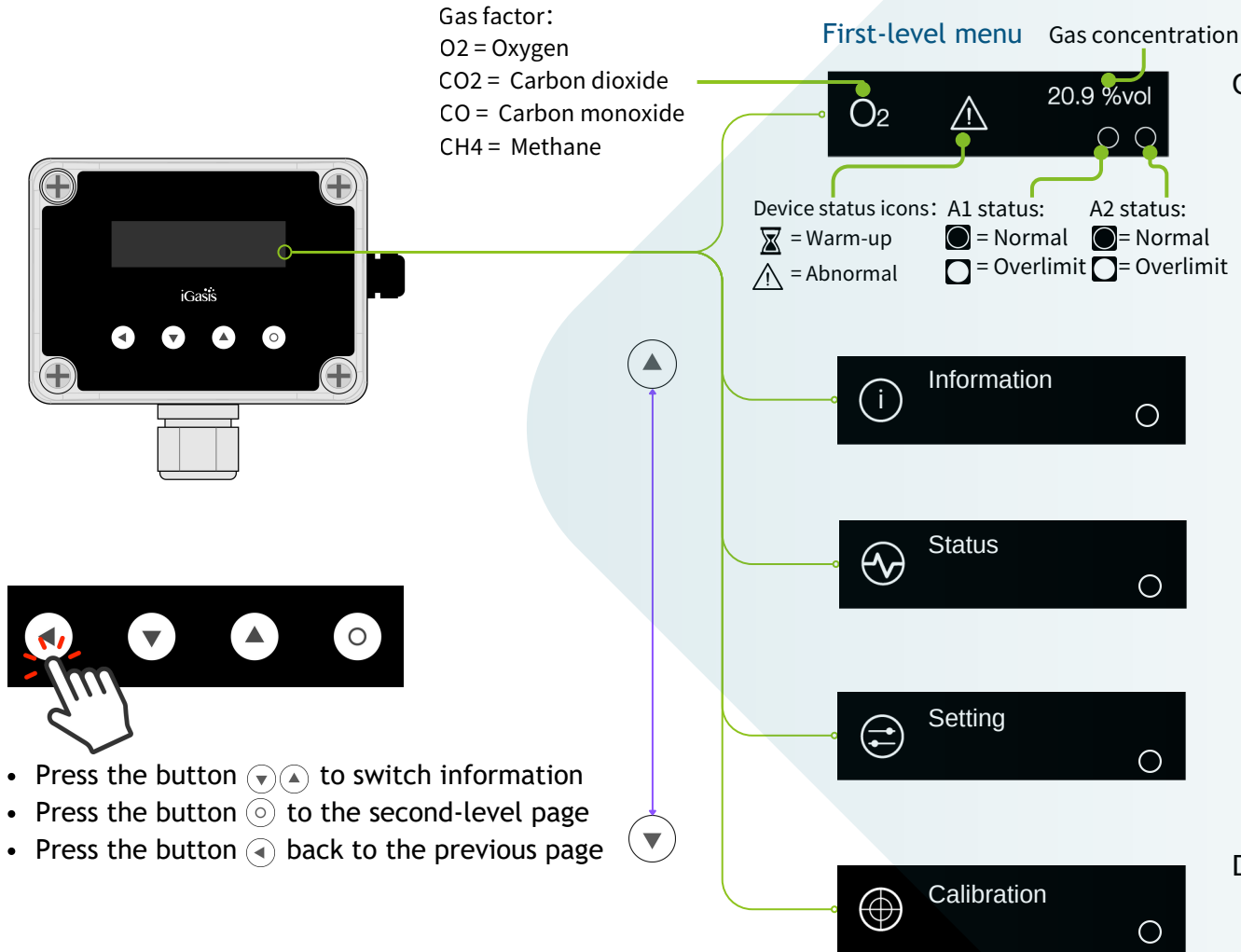


4. Dry contact control



USER INTERFACE

THE USER CAN VIEW GAS CONCENTRATION AND IGASIS1 INFORMATION THROUGH THE FRONT SCREEN.



Gas monitoring screen

- This is the default standby screen after startup.
- A warm-up symbol appears during device warm-up.
- An error symbol appears for device issues, and error codes can be checked on the info page.
- If A1 or A2 exceeds the limit, a white solid circle indicates an over-limit condition.

Product information screen

- Displays product info, like serial number and software version.
- For more information, press the button on this page

Device status screen

- Displays device status, such as Baud rate, Modbus ID, etc.
- For more information, press the button  on this page

Device settings

- Users can modify device settings.
- To change device settings, press the button  on this page.

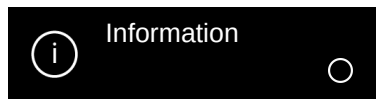
Device calibration

- Users can calibrate sensor parameters or 4-20mA output.
- To perform calibration, press the button  on this page.

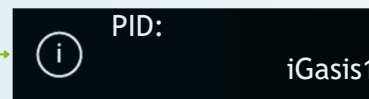
PRODUCT INFORMATION MENU

- In the first-level menu, press the button   to scroll up/down to the [Product Information Screen].
- Press the button  to enter the second-level menu.
- In the second-level menu, press the button  to return to the first-level menu.

The first-level menu

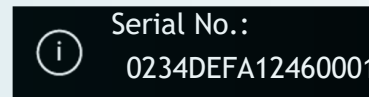


The second-level menu



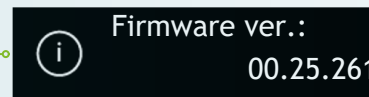
Device model

- Displays device model.



Device serial number

- Displays device serial number.



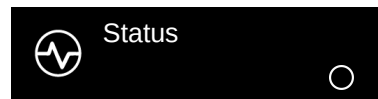
Device firmware version

- Displays device firmware version.

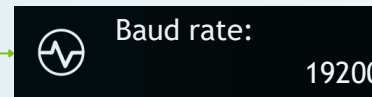
DEVICE STATUS MENU

- In the first-level menu, press the button (▼) (▲) to scroll up/down to the [status screen].
- Press the button (○) to enter the second-level menu.
- In the second-level menu, press the button (◀) to return to the first-level menu.

The first-level menu

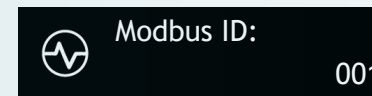


The second-level menu



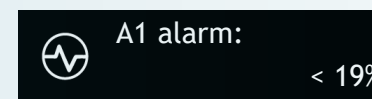
Baud rate

- Displays Baud rate[1]



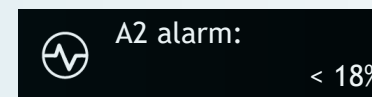
Modbus ID

- Displays Modbus ID[1]



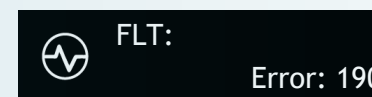
A1 alarm

- Displays A1 overlimit warning setting[1].



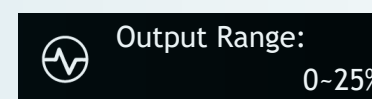
A2 alarm

- Displays A2 overlimit warning setting[1].



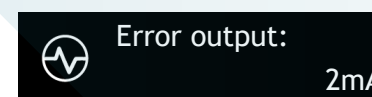
FLT

- Displays device error code[1].



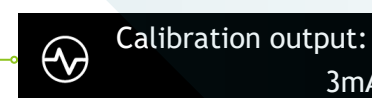
Output range

- Displays sensor measurement and output range[1].



Error output

- Displays 4-20mA output current during device abnormality[1].



Calibration output

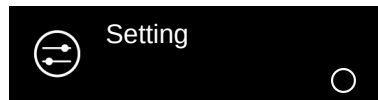
- Displays 4-20mA output current during calibration[1].

NOTES

[1] For details, see the [Settings Menu] section.

SETTINGS MENU

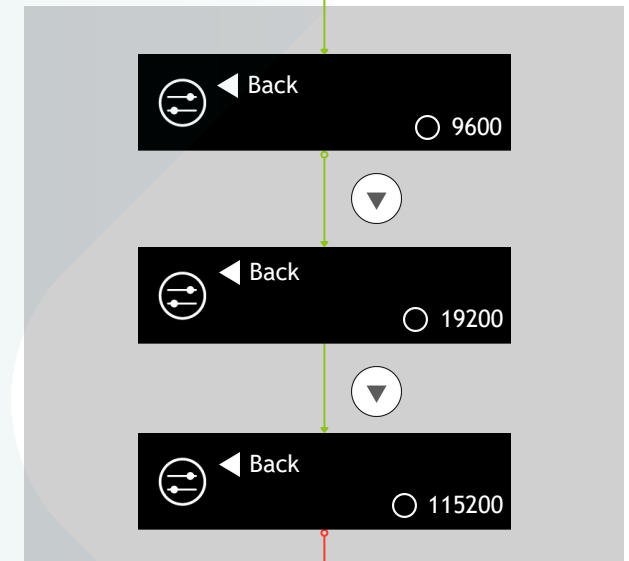
The first-level menu



The second-level menu



Baud rate change operation example



Save:
Confirm Baud Rate = 115200



Return:
Do not save, discard changes.

SETTINGS MENU DESCRIPTION

The settings menu content is described as follows:

- **Baud Rate** : Changes RS485 baud rate
The device's factory default is 19200bps, and the supported baud rates are as follows:
600bps、1200bps、2400bps、4800bps、9600bps、19200bps、115200bps、230400bps
- **Modbus ID** : Changes the device address in Modbus.
Default ID is 1, supports addresses 1 to 247.
- **Output range** : Changes the sensor measurement and output range display.
Some factors allow users to modify the output range.
- **A1 Trigger** : Changes the A1 over-limit warning trigger logic [2]
The trigger logic can be: High-level trigger (>Level), Low-level trigger (<Level), or Disable trigger (X).
- **A1 Level** : Changes the A1 over-limit warning trigger level [1][2]
The device comes with a default trigger logic and level. Users can change the settings according to their preferred trigger logic.
- **A2 Trigger** : Changes the A2 over-limit warning trigger logic [2]
The trigger logic can be: High-level trigger (>Level), Low-level trigger (<Level), or Disable trigger (X).
- **A2 Level** : Changes the A2 over-limit warning trigger level [1][2]
The device comes with a default trigger logic and level. Users can change the settings based on their preferred trigger logic.
- **FLT Output** : Changes the 4-20mA output current when the device is in an abnormal state.
The device is set to 2mA by default at the time of manufacture.
- **Calibration Output**: Changes the 4-20mA output current during the calibration process.
The device is set to 3mA by default at the time of manufacture
- **Force Output** : Users can set the 4-20mA output current manually.
This allows users to set a specific current to test the 4-20mA loop.
- **Reboot** : Restart the device to apply changes

NOTES

[1] Before setting A1(A2) Level, first configure A1(A2) Trigger to ensure correct settings.

[2] Refer to the A1, A2 Overlimit Alarm Setting section.

4-20mA Output range Settings

- In the first-level menu, press the button   , once to switch the menu [Output range] to display
- Press the button  to enter the 4-20mA output range adjustment procedure.
- During the adjustment procedure, press the button  to return to the first-level menu.
- The first step is to adjust the 4mA output lower limit. After completion, adjust the 20mA output upper limit.

1. 4mA Output Lower Limit Adjustment

1. Switch the menu to display [Output range], then press the button  to enter the adjustment procedure.
2. The menu shows [4mA output] on the first line and the value on the second line.
3. If adjustment is needed, press the button   to set the 4mA output lower limit [1][2][3]
4. Press the button  to finish adjusting and save the 4mA output lower limit.
5. Or press the button  to cancel the 4mA output lower limit adjustment.

2. 20mA Output Upper Limit Adjustment

1. After 4mA adjustment, the device enters 20mA adjustment.
2. Menu shows [20mA output] on line 1 and value on line 2.
3. If adjustment is needed, press the button   to set the 20mA output upper limit [1][2][3]
4. Press the button  to finish and save the 20mA output upper limit adjustment.
5. Or press the button  to cancel the 20mA upper limit adjustment.

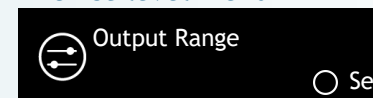
NOTES:

[1] The minimum adjustment unit is one resolution.

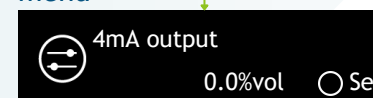
[2] If the value is below the device's lower limit, pressing the button  returns to the upper limit.

[3] If the value exceeds the upper limit, pressing the button  returns to the lower limit.

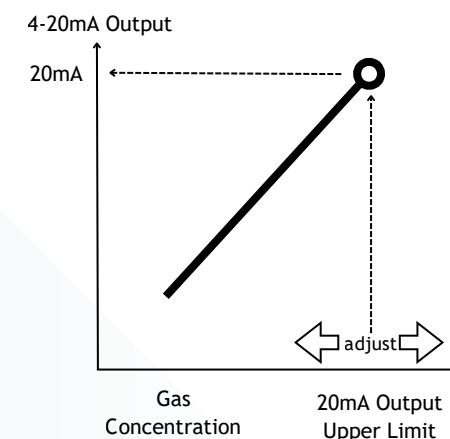
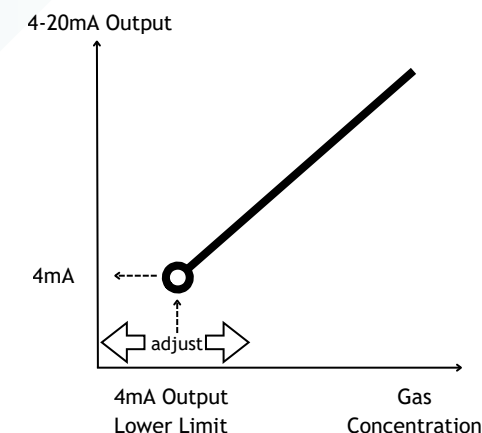
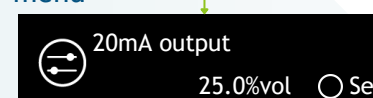
The 1st-level menu



The 2nd-level menu



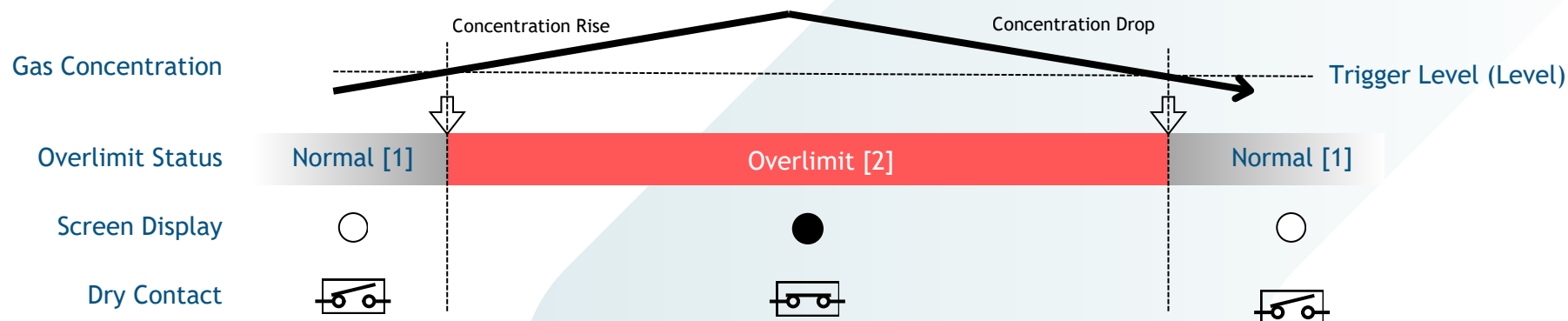
The 2nd-level menu



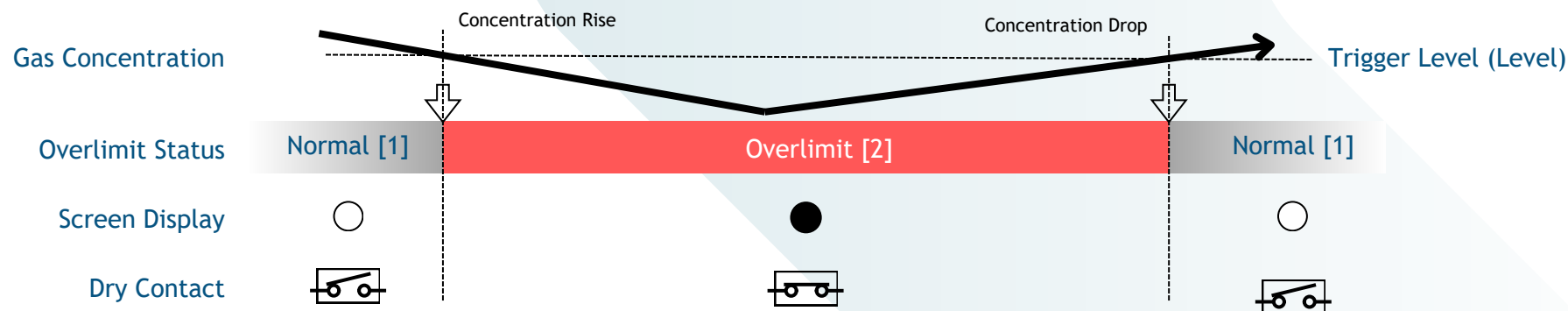
A1 and A2 Overlimit Alarm Settings

A1 and A2 overlimit alarms have two trigger methods, as described below:

1. High-level trigger ($>\text{Level}$)



2. Low-level trigger ($<\text{Level}$)



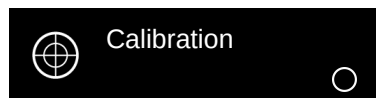
NOTES:

- [1] A1,A2 in normal status: screen display ○, and the dry contact NO and COM are open
- [2] A1,A2 in overlimit status: screen display ●, and the dry contact NO and COM are closed
- [3] Different factors have default trigger logic and levels, but users can also modify these settings.

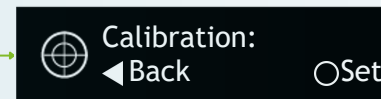
DEVICE CALIBRATION MENU

- In the first-level menu, press the button (▼) (▲) to switch to the [Device Calibration] display.
- Press the button (○) to enter the second-level menu.
- In the second-level menu, press the button (◀) to return to the first-level menu.

The first-Level menu

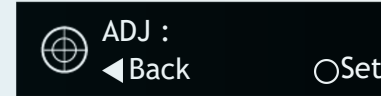


The second-level menu



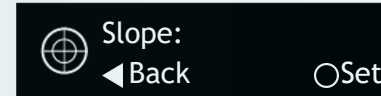
Gas Sensor Calibration

- Execute Gas Sensor Calibration Procedure[1]



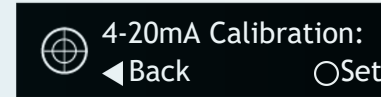
Adjust the sensor output offset

- Adjust with the output slope together



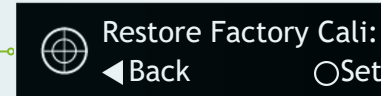
Adjust the sensor output slope

- Please adjust the output offset along with the output slope [2]



4-20mA Output Calibration

- To execute the 4-20mA output calibration procedure



Restore the factory calibration parameters

- Restore the sensor parameters and 4-20mA output parameters

NOTES

[1] Calibration restores the sensor offset and slope to factory settings.

[2] Sensor offset (ADJ) and slope (Slope) are defined as:

$$\text{Data}_{\text{out}} = (\text{Data}_{\text{raw}} + \text{ADJ}) \times \text{Slope}$$

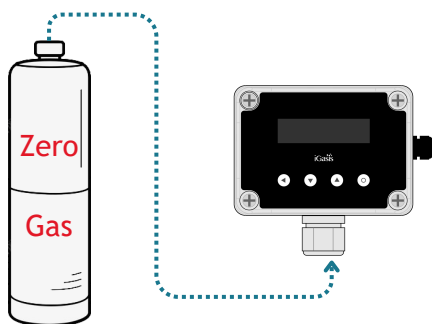
Output value

Original value

Offset

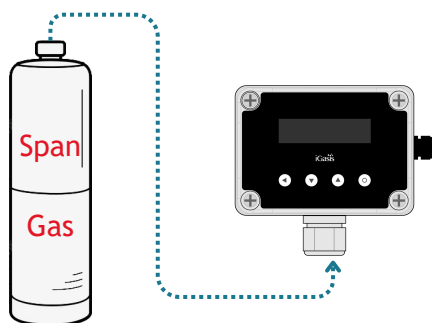
Slope

GAS CALIBRATION PROCESS



1. Zero point calibration (Zero)

1. Apply the zero-point calibration gas [1] into the sensor [5].
2. Press the button  and wait for the countdown, allowing the gas to stabilize in the sensor.
3. After the countdown, press the button  to finish the zero calibration and save the zero parameters [6].
4. You can also press the button  to skip the zero calibration, and the device will use the previous zero parameters.



2. Span calibration (Span)

1. Apply the span calibration gas [2] into the sensor [5].
2. Press the button  and wait for the countdown, allowing the calibration gas to fill the sensor and stabilize the concentration value.
3. Once the value stabilizes, press the button  to proceed to the next adjustment stage [4].
4. The screen shows the gas concentration. Press the button   to adjust the value until the correct concentration is displayed.
5. Press the button  to finish the span calibration and save the concentration parameters.
6. You can also press the button  to cancel the span calibration, and the device will not save the concentration parameters [6].

NOTES:

- [1] Use high-purity nitrogen (N2) or zero air cylinders for zero-point calibration gas, or use uncontaminated air (with an absorbent medium to remove pollutants)
- [2] For span calibration gas, use a full-range or known concentration standard gas cylinder.
- [3] Ensure the sensor has sufficient warm-up time (30 minutes) before calibration.
- [4] The span calibration process will also count down for 5 minutes and automatically proceed to the next stage.
- [5] Use appropriate gas flow; too high or too low flow may affect calibration. Recommended flow: 0.5-1.0 L/min.
- [6] Verify the accuracy of zero and span calibration values. If the deviation exceeds $\pm 5\%$, contact the manufacturer for maintenance.

4-20mA Calibration process

1. 4mA Calibration

1. Connect the ammeter to the 4-20mA output terminals.
2. Switch to [4-20mA Calibration] and press the button  to start.
3. The device will output 4mA. Observe the ammeter reading.
4. If there's an error, press the button   to adjust the output until the ammeter shows 4mA.
5. Press the button  to finish the 4mA calibration and save the parameters.
6. You can also press the button  to cancel the calibration.

2. 20mA Calibration

1. After 4mA calibration, the device will automatically start 20mA calibration.
2. The device will output 20mA. Observe the ammeter reading.
3. Press the button   to adjust until the ammeter shows 20mA.
4. Press the button  to finish the 20mA calibration and save the parameters.
5. You can also press the button  to cancel the calibration.

RS485 communication protocol

RS485 uses the Modbus RTU communication protocol. Below is the main Input register [04h] list:

Address	Data	Access	Size (Word)	Description
30001	PID	Read	8	Product ID Return device product code. (ASCII Code format.) e.g. iGasis1-TR-RAD
30009	FW-Ver	Read	4	Firmware version Return device firmware version. (ASCII Code format.) e.g. 000.6
30017	S/N	Read	8	Serial Number Return device serial Number. (ASCII Code format.)
30025	Mod-Ver	Read	1	Modbus Table version
30026	Meas_Count	Read	1	Total number of measurement sensors

NOTES:

This table lists common parameters. For details, contact our sales department.

RS485 communication protocol

The following [Meas_SW] register indicates which gas factors are enabled:

Address	Data	Access	Size (Word)	Description
30027	Meas_SW	Read	2	Return the measuring switch: Bit.15 : Air Pressure switch. (1=ON , 0=OFF) Bit.14 : Noise switch. (1=ON , 0=OFF) Bit.13 : Lux switch. (1=ON , 0=OFF) Bit.12 : Wind Direction switch. (1=ON , 0=OFF) Bit.11 : Wind Speed switch. (1=ON , 0=OFF) Bit.10 : SO2 switch. (1=ON , 0=OFF) Bit.9 : NO2 switch. (1=ON , 0=OFF) Bit.8 : Ozone switch. (1=ON , 0=OFF) Bit.7 : TVOC switch. (1=ON , 0=OFF) Bit.6 : PM2.5 switch. (1=ON , 0=OFF) Bit.5 : PM10 switch. (1=ON , 0=OFF) Bit.4 : Carbon monoxide switch. (1=ON , 0=OFF) Bit.3 : Relative humidity switch. (1=ON , 0=OFF) Bit.2 : Temperature switch. (1=ON , 0=OFF) Bit.1 : Carbon dioxide switch. (1=ON , 0=OFF) Bit.0 : Formaldehyde switch. (1=ON , 0=OFF)

NOTES:

This table lists common parameters. For details, contact our sales department.

RS485 Communication protocol

The following list uses flexible length, and each register adjusts automatically based on [Meas_Count]:

Address	Data	Access	Size (Word)	Description
30101	Gas Name	Read	Meas_Count	Refer to Gas Name Table for details
30165	Scale Factor and Unit	Read	Meas_Count	Refer to Scale Factor and Unit Table for details
30229	Error Code	Read	Meas_Count	Sensor x status : 0: Normal operation phase 1: Warm-Up phase 2: Error case
30401	Concentration	Read	Meas_Count	To obtain the real floating point value in its specific sensor units, divide these register values by the Scale factor.

NOTES:

This table lists common parameters. For details, contact our sales department.

Precautions

- This product provides general gas concentration information and is not for health impact assessment or fire alarm use.
- Avoid using it in vibrating environments or direct sunlight, and keep it away from heat sources.
- Do not cover the sensor, ensure good airflow, and leave space around the unit.
- For accuracy, install one unit per 200 square meters (60 ping) at a height of 1.5 to 2.5 meters.
- Do not install on the ceiling.
- Only qualified personnel should disassemble or repair the product.
- Use correct connectors and wiring; improper handling may void the warranty.

【 Note 】 Power Supply Instructions

- This product requires a 12-24V DC power supply (24V DC is recommended). AC power must be converted to DC.
- Ensure proper grounding to protect from surge or lightning.
- Do not share the power source with high-power or noisy equipment. Use a power filter (Line Filter) if needed.

Power Supply Specifications

This product uses a 12-24V DC power supply (24V DC is recommended). Convert AC power to 12-24V DC and connect it to the device's input port. Ensure correct polarity; do not reverse the connections.

【 Note 】

- The control logic for both RS485 and dry contact output is fixed and designed for ventilation equipment only. Do not use it for other purposes.
- This is a precision sensor; avoid electromagnetic interference. Devices like walkie-talkies or mobile phones may affect the sensor readings.

Dry Contact Specifications

The dry contact is a mechanical, passive, normally open (NO) switch.
Rated AC voltage: 125V, current: 0.3A.
Rated DC voltage: 30V, current: 1A.

Use the correct connectors and ports

- Do not force connectors. Check for blockages. If the connector doesn't fit, ensure it matches the port.
- Improper use, like connecting to the wrong port, will void the warranty.

No live wiring

Always disconnect the power before changing the power supply or port terminals. Reconnect the power after completing the wiring and setup.