

GT-1000 SERIES MULTIFUNCTIONAL GAS AND DUST DETECTOR

USER MANUAL



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WARNING

**Read and understand this instruction manual before operating instrument.
Improper use of the gas monitor could result in bodily harm or death.**

Periodic calibration and maintenance of the gas monitor is essential for proper operation and correct readings. Please calibrate and maintain this instrument regularly! Frequency of calibration depends upon the type of use you have and the sensor types. Typical calibration frequencies for most applications are between 1 and 3 months, but can be required more than or less often based on your usage.

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Notice

① Button description

There are seven buttons beneath the display screen: Up,Down,Back,Ok,run/stop,⏻Power,Print

Three operation interfaces: Detector interface,menu,parameter setting.

The following form is description for the seven buttons. [The table below illustrates the function of seven buttons.](#)

	Detector interface	Menu	parameter setting
Up	Save instant data(press and hold for 5 seconds) (manually saving mode)	Up	Move up/ Value+
Down	Save instant data(press and hold for 5 seconds) (manually saving mode)	Down	Move down/ Value-
Back	Switch gas detection mode and dust detection mode(When dust detection is necessary)	Return to previous menu	Return to previous menu
Ok	Enter menu(press and hold for 5 seconds)	Confirm to enter menu	Enter/Select/Save
Run/stop	Pump switch/ Timing detection switch	Invalid	Invalid

Power	On/Off(press and hold for 5 seconds)	On/Off(press and hold for 5 secondseconds)	On/Off(press and hold for 5 seconds)
Print	Print instant gas concentration data	Invalid	Invalid

CAUTION:

1. All operations are operate by a short press of the button unless it is special noticed
2. GT-1000 series multifunctional gas and dust detector could be work normally only in condition of the pump was switched on

②Gas Detector Processing Operation under Out-range Status

Users should avoid to have sensor impacted by the gas with a pressure value greater than the maximum of the detector, which might affect the service life and precision of the detector, or even directly damage detector.

When a user accidentally makes out-range operation, he should evacuate the instrument out of the detecting site and place it in the clean air for more than half an hour. During the time, user should observe whether the density value of the instrument is keeping decreasing or not. If it can straightly go down to normal value, then he can continue to use it after the zero calibration of instrument.

While the instrument after the out-range operation and user has placed it in clean air for hours, the density value remains high, then it should be sent back to the manufacturer or agent for maintenance, be ready to replace the sensor.

Special Note: Detector damage resulted from out-range operation is not within the warranty.

③Detector Calibration and Warranty

We guarantee all detector were precise calibrated with certain density standard gas. It's not necessary for customer to re-calibrate the detector after purchase unless encounter special situation. Also the calibration need to be operate under the guidance of the professional.

All GT-1000 series products we provide 12-Mounths warranty for the detector and 3-Mounth warranty for the accessories. Beside , we have free calibration once a year during the entire products service life.

④Instruction of detector display dimmed

Power capacity protection program had been preset for all GT-1000 multifunctional gas detector, when no operation were made within 30 seconds the protection program will activate and the display of the detector will dim out,user can light up the display by press power button.

⑤GT-1000 series Hot Key Instruction

Mute: When detector is in the state of alarming user can mute the detector by pressing the “Up”or “Down”button.

Save manually:When storage mode was preset as manually, user can save the gas concentration value of each channel by long press the “Up” button in detection interface

Function menu: When detector is in the detection menu user can enter system menu by pressing “Ok” button for 5 seconds

When gas concentration reach the alarming value and triggered the alarm,user can mute the detector by pressing Up or Down button(Press to mute and press another time to restart the alarm)

⑥Parameter modification instruction

User can modify all parameters by “Back”, “Up”, “Down”, “Ok” buttons.

1.Product Brief Introduction

GT-1000 series multifunctional gas detector are portable gas and dust detector which can be configure flexibly up to 5 gas sensors or 3 gas sensors plus 1 dust sensor. With import gas sensor and most advance nanometer semiconductor technology GT-1000 series multifunctional gas detector can detect corresponding gas and dust concentration at the same time rapidly and precisely, we maintain a leading position in domestic level and our products are famous of high stability and repeatability .User can custom setting all parameters to ensure the operations are user-friendly, 4000mA built-in high capacity polymer rechargeable battery, technical indicators、 gas concentrations and history data can be display in the 3.5 inches IPS technical grade screen, User can save concentration data. output data, print and output data, detect temperature and humidity level.

2.Key Features

- ◆ With the most advance nanometer semiconductor technology ,ultra low power 32bit microprocessor,24bit ADC data acquisition chip,outstanding accuracy.
- ◆ 3.5 inches IPS technical grade display with a pixel up to 320*480,display technical indicators and gas concentration value perfectly.
- ◆ Three concentration units are available PPM,%VOL,mg/m3.
- ◆ User can combine different sensor,1-5 kinds of gas can be detect at the same time,PM 2.5 dust sensor, temperature and humidity sensor and other kind of sensors are available.
- ◆ Up to 100,000 group data can be storage,user can view history data on the display and data output is available.
- ◆ GT-1000 allow user to connect to portable printer to print data
- ◆ With temperature and humidity detection,user can detect temperature and humidity value on the scene or the temperature and humidity value inside the pipe.
- ◆ Five operation modes are optional:Detection mode,Storage mode,Printing mode,Display mode,Pumping mode.
- ◆ With high-power pump allow device working under tiny negative pressure condition,the reasonable gas chamber design ensures that the sensor is not affected by the pressure.
- ◆ With over-voltage protection,overcharge protection,electrostatic prevention,magnetic-field interference prevention
- ◆ All software automatic calibration, sensor up to 6 levels target calibration,ensure the accuracy and linearity of the entire measurement,also with data recovery function.
- ◆ Chinese and English operation model are available,user-friendly.
- ◆ With temperature and humidity compensating function.With dust filter and dust-proof design allow device applies in all sort of harsh conditions.

3. Technical Parameters

Product type:	Multifunctional gas detector(Customize according to user need)		
Detection Range:	Please refer to sensor list at end of this manual		
Display:	Please refer to sensor list at end of this manual		
Scalable gas sensor:	User can customize 1-5 gas sensors in any combination,please refer to the sensor parameters		
Dust sensor:	Laser dust sensor (0.3um、0.5um、1.0um、2.5um、10um) is optional		
Temperature and humidity:	Temperature detection range:-40 ~ 120℃ Humidity detection range:0-100%RH		
Detection pattern:	Pumping,with built-in high-power pump allow device working under tiny negative pressure condition,the flow rate is adjustable.		
Detection accuracy:	≤±3%F.S	Linearity error:	≤±1%F.S
Reaction Time:	≤20 S (T90)	Zero drift:	≤±1% (F.S/Year)
Recovery Time:	≤20 S	Repeatability:	≤±1%F.S
Detection pattern:	Real-time detection mode and timing detection mode can be switch freely		
Storage pattern:	Automatically saving and manually saving is available,Up to 100,000 group data ,user can view history data on the display.		
Printing pattern:	Micro printer is optional,user can set		

Explosion proof sign:	ExdII CT4 (IA)	Shell material:	ABS+PC ABS+PC
IP rating:	IP66	Working temperature:	-30 ~ 60℃
Power:	4000mA high capacity polymer rechargeable battery	Humidity:	≤95%RH, Non-condensing
Dimensions:	220*88*55 mm (L×W×H) 0.5 Kg (net weight)	Working pressure:	-30Kpa ~ 100Kpa
Accessories:	Dust filter、 Case、 User manual、 Certification、 USB charger+Data cable、 Calibration cover		

4.Product Structure



- ① — Power
- ② — Print
- ③ — Print and charge port
- ④ — Up
- ⑤ — Down
- ⑥ — Confirm and Menu
- ⑦ — Back
- ⑧ — Pump On/Off
- ⑨ — Temperature sensor
- ⑩ — Inlet
- ⑪ — IPS Display

5.Operation Instruction

5.1Button Description

There are seven buttons beneath the display screen: Up,Down,Back,Ok,Run/stop,Power,Print

Three operation interface: Detector interface、 Menu、 Parameter setting.


The following form is description of the seven buttons.

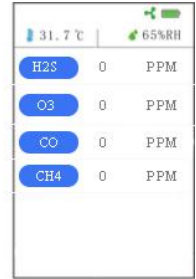
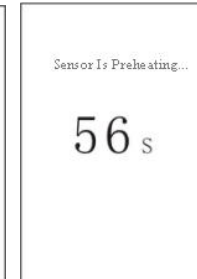
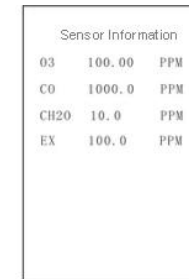
	Detector interface	Menu	parameter setting
Up	Save instant data(press and hold for 5 seconds) (manually saving mode)	Up	Move up/ Value+
Down	Save instant data(press and hold for 5 seconds) (manually saving mode)	Down	Move down/ Value-
Back	Switch gas detection mode and dust detection mode(When dust detection is necessary)	Return to previous menu	Return to previous menu
Ok	Enter menu(press and hold for 5 seconds)	Confirm to enter menu	Enter/Select/Save

Run/stop	Pump switch/ Timing detection switch	Invalid	Invalid
Power	On/Off(press and hold for 5 seconds)	On/Off(press and hold for 5 secondseconds)	On/Off(press and hold for 5 seconds)
Print	Print instant gas concentration data	Invalid	Invalid

CAUTION: GT-1000 series multifunctional gas detector will perform normally Only in condition of the pump was switched on

5.2Power On

Long press  power button for five seconds until you hear a beep the “DI” sound then the display and red signal light turn on,The screen appears:Korno’s logo (3 seconds),Sensor information(1 second) ,Sensor preheating and automatically start the pump(60 seconds count down)in sequence as it show in figure 1-3,detector will start after the count down and enter detection interface as figure 4.




When the GT-1000 completes its startup sequence,it is in Measuring Mode.

The fan symbol in the upper right corner will appear



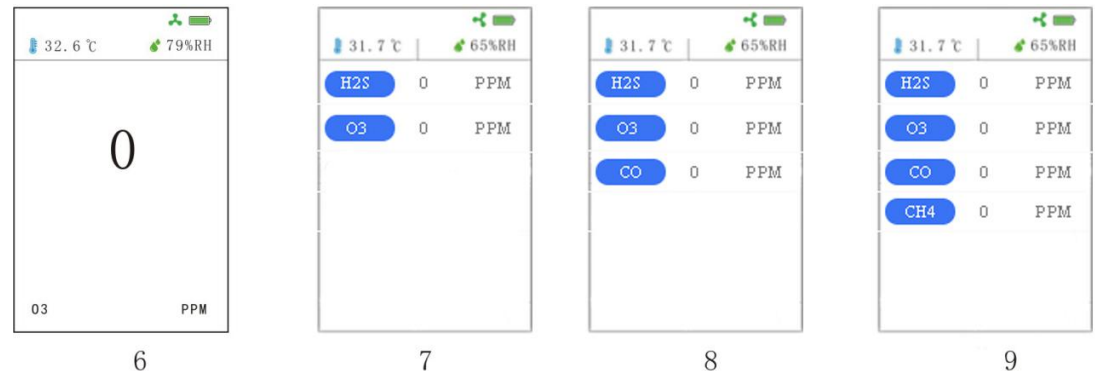
5.3 Power Off

In normal detection mode long press  power button for five seconds until the “DI” sound ,display shows shutting down as it show in figure 5,device will be shut off within 1 minute .

6.Operation Interface

6.1 Gas Detection Interface

Under normal-detection mode,according to the number and types of sensors in the device,there are different interfaces: single gas detection mode as shown in figure6(O3 for example),two kinds of gas detection mode as shown in figure 7 (O3、 H2S for example) ,three kinds of gas detection mode as shown in figure 8(O3、 H2S、 CO for example),four kinds of gas detection mode as shown in figure 9(O3、 CO、 H2S、 CH4for example).



Icons at the top of the display shows the “pump status”, “battery capacity”, “humidity”,take figure 9 for example,there are four channels, figure indicate corresponding gas concentration in each channel,”O₃” is the gas’s molecular formula,lower right”PPM” is the concentration unit;when one or several gas channel reach the alarm value,there will be a alarm sign under corresponding

concentration figure.

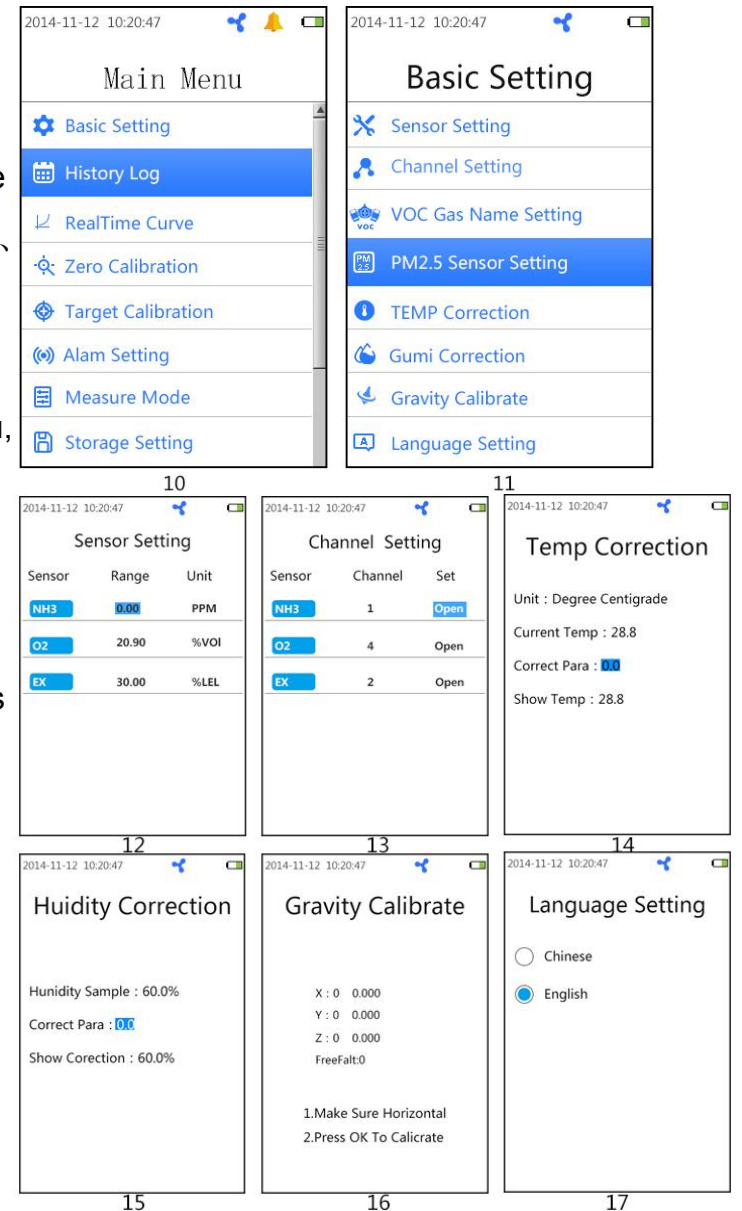
6.2 Function Menu Instruction

Long press "OK" button for 5 seconds to enter function menu as shown in figure 10. Nine sub-menus are including in function menu: Basic setting、History Log、RealTime Curve、Zero calibration、Target calibration、Alarm setting、Measure Mode、Storage setting、Print Setting、Time Setting、Factory Setting. In main menu move the cursor to different sub-menu by press "Up" and "Down" button, press "Ok" to enter corresponding sub-menu, press "Back" to return to normal detection interface or previous menu.

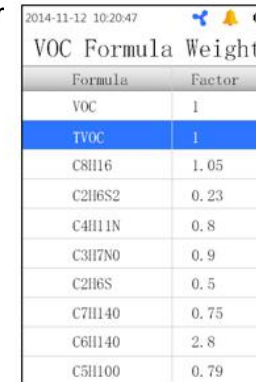
6.2.1 Basic Setting

In Basic setting menu user can see various setting as shown in figure 11, press "Up" and "Down" button to move the cursor, press "Ok" to enter sub-menu and modify parameters

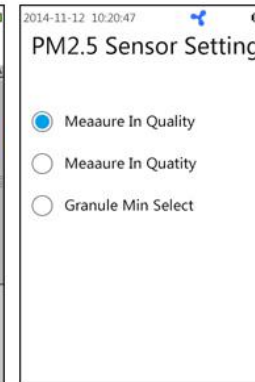
1. Sensor setting: (as shown in figure 12) User set detection range and units (ppm, mg/m³, mg/L, %VOL) of different gas
2. Channel setting: In this menu user can set to activate/shield one or various gas channels as shown in figure 13, and also allow user to check channel address.
3. Temp Correction: In this menu user were allow to modify the temperature parameter manually as shown in figure 14.



4. Humi Correction: In this menu user were allow to modify the humidity parameter manually as shown in figure 15.
5. Gravity Calibrate: In this The gravity sensor can be re-calibrated as shown in figure 16.
6. Language Setting: User can switch between Chinese and English menu as shown in figure 17.
7. 2 Special Sub-menu: VOC Gas Name Setting and PM2.5 Sensor Setting.



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These two sub-menu only will exist when the detector is equipped with VOC sensor and dust particle sensor. The user can choose the specific VOC gas name as shown in figure 18, and choose the detection unit or the min detect diameter of dust particle as shown in figure 19-20.

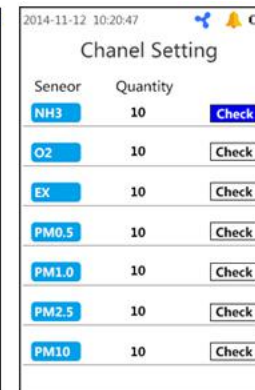
6.2.2 History Data Log

User can check history log, view history log curve, export history log and clear history log as shown in figure 21.

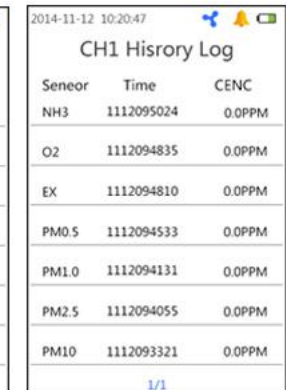
1. Check History Log: Press "OK" to enter this sub-menu, the sensor name, quantity of history data will be shown, press "OK" again to check all previous concentration datalogs as it shown in figures 22-23.



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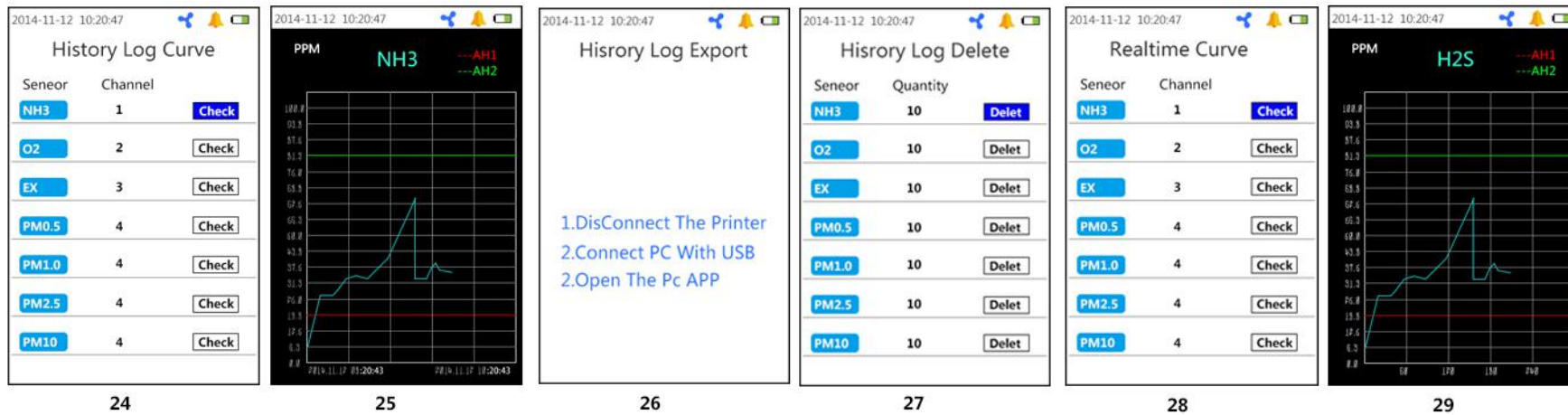


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2. History Log Curve: Press "OK" to check history log in curve format as it shown in figures 24-25.

3. History Log Export: Press “OK” and follow the procedure as it shown in figure 26 to export the history data.
4. Clear CH History Log: Press “OK” to enter this sub-menu, in this menu users can view all the sensors and corresponding data quantity, press “OK” again to history data of specific channel as it shown in figure 27.
5. Clear ALL History Log: Press “OK” to delete all history data.

See “Appendix 9: Concentration Datalog Output Instruction” on page.



6.2.3 Realtime Curve

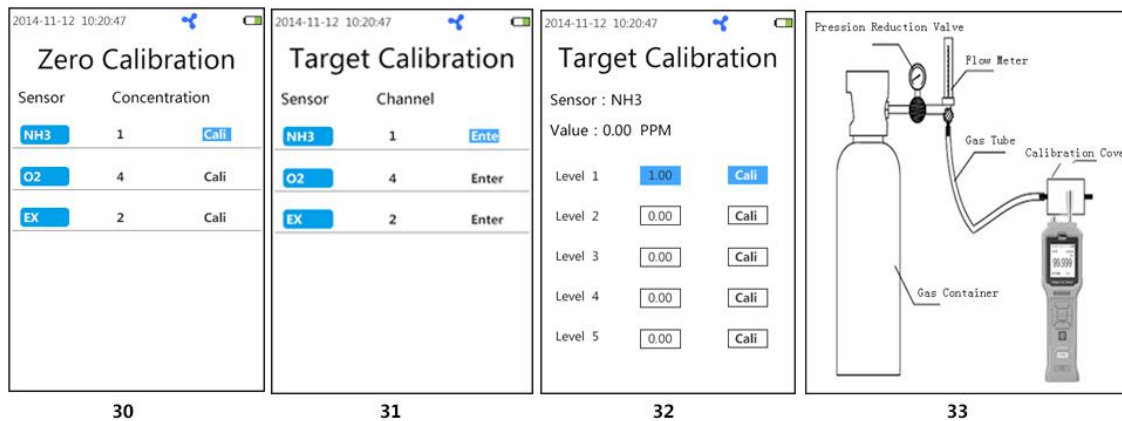
In this menu users can view all the sensors and corresponding channel. Press “Enter” to check each sensor’s real-time curve as shown in figure 28-29.

6.2.4 Zero Calibration

If zero drift of the sensor is over range, user can proceed zero calibration ,the gas concentration are defaulted set to zero after zero calibration as shown in figures 30.

Special Note: 1.Zero calibration must be proceed in fresh air or high-purity inert gas(for example 99.999%VOL N2 etc)

2.Do not operate zero calibration for those gases which already exist in the air,such as oxygen,carbodioxide,nitrogen.



6.2.5 Target Calibration(Do Not Calibrate Unless You Are Professional)

Find a fresh-air environment.This is an environment free of toxic or combustibile gases and a normal oxygen content(20.9%VOL)

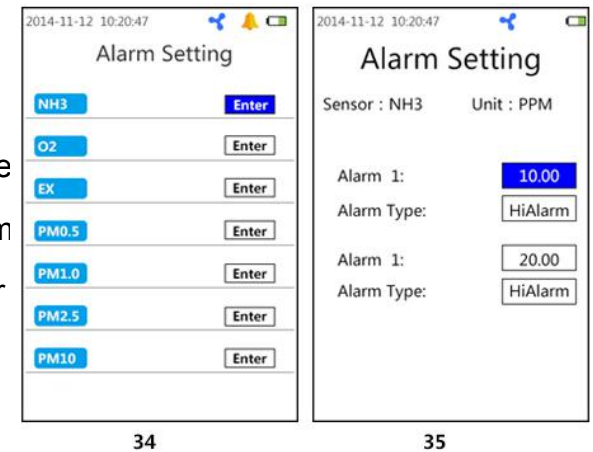
GT--1000 series gas detector provide 6 levels target gas concentration calibration,as shown in figure 31-32,this calibration should be

operate under conditions of certain standard concentration gas, Pressure reduction valve ,Flow meter, Calibration cover and make sure all instruments are well connected, otherwise this function is forbidden.

Procedures: Connect all instruments as shown in figure 33,enter target gas calibration interface,release standard gas slowly and control gas flow within 600ml/min,observe the real-time concentration value(concentration value should be increasing),wait until real-time concentration value rise to the peak reading and stay still, user can chose a un-calibrate option to operate(√ stand for this level has been calibrated and × stand for this level still need to be calibrate);first of all input a concentration value of standard gas then calibrate. Target gas concentration value will set up to be the standard gas concentration value after calibration.

6.2.6 Alarm Setting

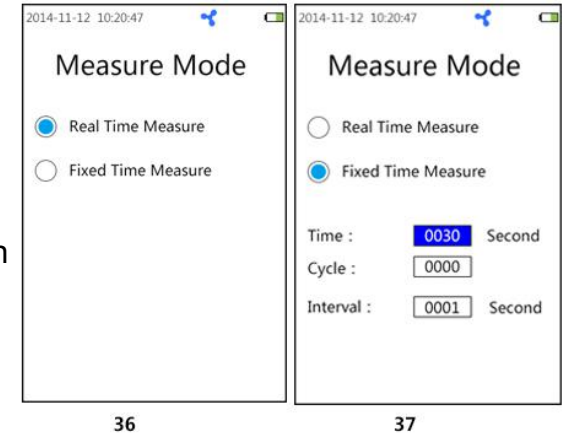
User can set the alarm limit and alarm mode in this menu, as shown in figures 34-35,there are two alarm value setting, which are high alarm and low alarm. When user set as the low alarm mode, it will trigger alarm when real-time concentration is lower than preset value , when user switch to high alarm mode, it will trigger alarm when real-time concentration is higher than preset value.



Procedures: Enter alarm settings sub-menu, Move the cursor to “Enter”,press “Ok” to select and press “Up” and “Down” to switch alarm mode, then press “Ok” to save your modification.

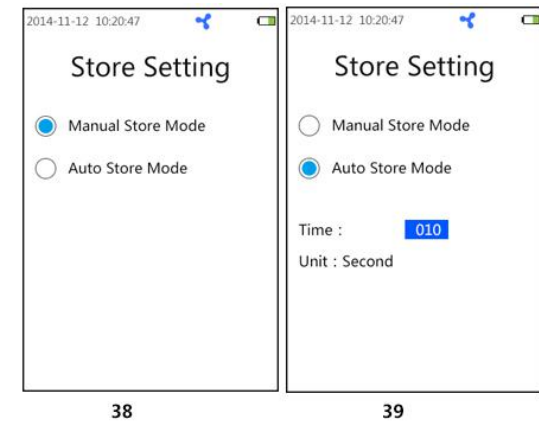
6.2.7 Measure Mode

User can choose two measure mode:real time measure and fixed time measure as shown in figure 36.When detector is preset as “real-time measure”mode, it provides continuous monitoring and will shows real-time concentration of each channel in the display.And you can select the duration of each fixed time detection, the detect cycle times and the interval between the two fixed time measure as shown in figure 37.



6.2.8 Store Setting

Manually save、 automatically save are optional in this menu,it also allows user to set storage cycle under automatically storage mode. Users can set the storage interval(interval of two storage data) when preset as “ Auto Store Mode” .The maximum setting is 999 second and the minimum setting is 1 second.(figure 38-39)



6.2.9 Print Setting

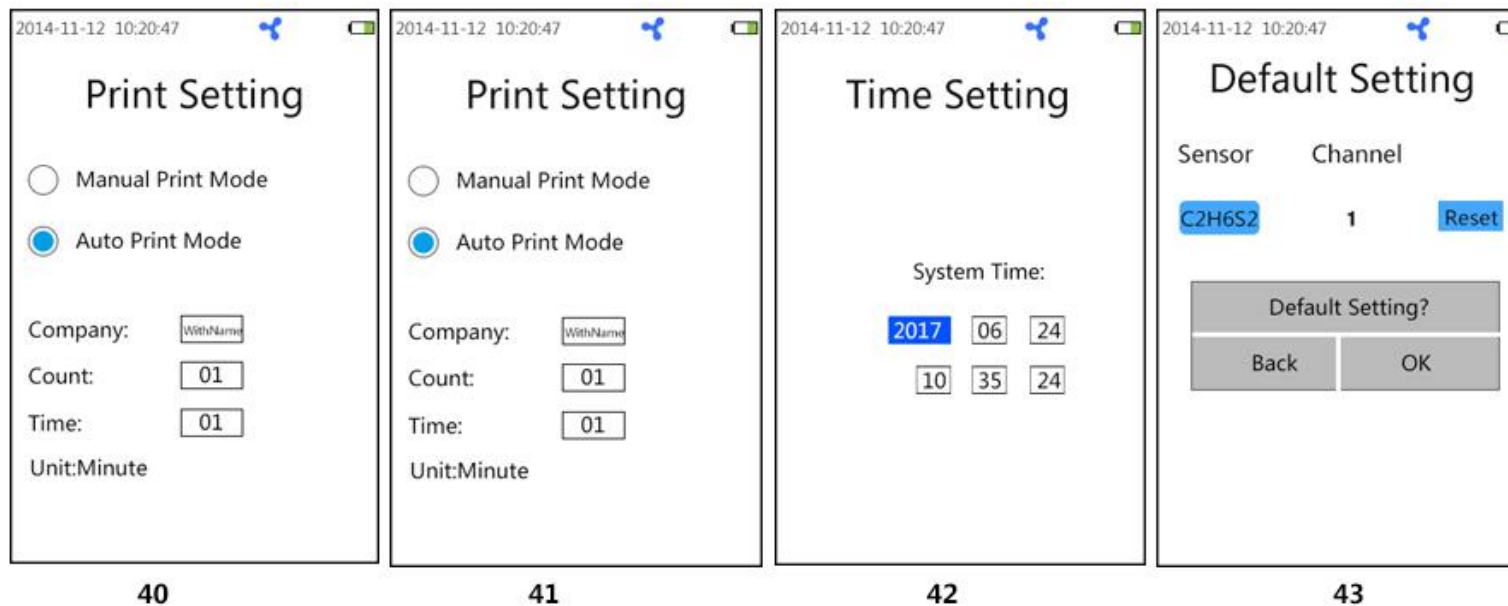
Manually print、 automatically print are optional in this menu. It can print data via a micro printer(the micro printer is optional accessory). The report will print with company name,count,time and unit of time as shown in figure 40-41.

6.2.10 Time Setting

Time setting menu allow user to set date and time,this time is related to the time of the concentration values are being recorded as it shown in figure 42.

6.2.11 Factory Setting

If user proceeded an wrong operation by accidentally or need to reset all parameters to factory setting,you can reset all parameter to factory setting as it shown in figure 43.



7. Common Faults and Exclusions

Problem: Concentration value is not stably when detector place in air, reading is unstable

Possible reasons: Electrochemical sensor might interfered with unrelated colorless and odorless gas

Solutions: Place detector at pure gas environment to see whether the concentration value decreasing or not, if it is that the environment is clear but the concentration value remains high, you need to proceed zero calibration

Problem: No response or weak response when detecting

Possible reasons:

- 1) Oxygen content value of gas is too low: <5%VOL.
- 2) Gas pressure is too high, the pump can't not afford it.
- 3) Expired sensor might cause the problem too .

Solutions: Make sure the oxygen content value of the gas is higher than 5%VOL when equip with Electrochemistry sensor, Catalytic combustion sensor or Semiconductor sensor. Detector working pressure is -30Kpa~100Kpa, User can proceed zero calibration if has standard gas. If oxygen content value, working pressure are eligible for detection but problems still remain, user should return detector to factory for maintenance.

Problem: Concentration value is unstable when start detecting.

Possible reasons: Normally due to gas oxygen content is too low or changing of gas concentration value.

Solutions: Increase gas oxygen content value and make sure the gas flow speed is stable.

Problem:Weak pumping,or device make a unusual sound while pumping.

Possible reasons:Gas inlet blocked due to too many dust and vapor inhaled.

Solutions: Return to manufacturer to replace the pump,install a dust and vapor filter at the gas inlet.

Problem:Unable to boot up instrument.

Possible reasons:Battery low or empty

Solutions: Try to start the instrument after fully charged the battery,if the problem still remain,user need to return the device to manufacturer.

Problem:Unable to charge the instrument

Possible reasons:Adapter failure or wrong adapter(5-5.5VDC,1-2A)

Solutions: Make sure output voltage of adapter is 5V,user need to change a adapter if the output voltage is not 5V,if the problem still remain after change a adapter,user need to return the instrument to manufacturer.

8.Concentration Datalog Output Instruction

GT -1000 series gas detector allow user output history datalog via the charge port,there are several steps to output datalog.

- 1) Install concentration datalog output software in host computer
- 2) Boot up the detector and wait for 30s to preheat the instrument and connect to the computer
- 3) Run the concentration datalog output software in the host computer,make sure the detector is connected to the host computer,meanwhile at the lower left interface of the software will show connection port standby(defaulted baud rate is 115200,do not change)
- 4) Enter the history data interface to output datalog,there will be menu prompts at the both software and detector interface.
- 5) User can preset detector's address in concentration datalog output software(this address need to corresponded to the parameter in "address setting"of the detector)、 Channel(Corresponded to the gas channel of the detector)、 start time and finish time(datalog storage period should be within the start and finish time)
- 6) Detector allows user to search concentration of certain channel of datalog storage period,datalog can be output as EXCEL format by "datalog output" function.

NOTICE:Connection cable is the USB cable connected to the adapter

Notice

- ◆ Please read User Manual carefully before use the detector.
- ◆ It is strictly forbidden user to disassemble the detector or replacement parts.
- ◆ Installation, adjustment, calibration and parameters setting must be progress by professionals.
- ◆ Regular inspection of calibration is necessary, expired or broken sensor should be replace immediately.
- ◆ It is strictly forbidden to impact sensor with gas which is over detection value.
- ◆ User should prevent drop or impact the detector.
- ◆ It is strictly forbidden to use detector in high temperature, high humidity or high pressure environment ,if workingenvironment is high humidity, detector need to equip with vapor filter.
- ◆ Man-made damage is not within warranty.
- ◆ To reduce the risk of ignition of hazardous atmospheres, recharge, remove or replace the batteryonly in an area known to be non-hazardous.Do not mix old and new batteries or batteries from different manufacturers.
- ◆ Electrostatic discharge should be proceed before the detection in hazardous area
- ◆ GT -1000 series products shall only be charged outside hazardous areas,it is strongly recommend use the original charger.

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