

MODEL: MultiSens

(Portable Multi Gas Detector)

User Manual



Sensotran

More than 50 years of
experience in gas detection

Product Overview

MULTISENS is a portable multi gas detector to warn the dangerous environment related to the gases. The detector indicates the concentration of 4 gases (oxygen, carbon monoxide, hydrogen sulfide, combustible gas) simultaneously on the LCD monitor. It is easy and simple to operate. The device alerts the workers of the danger by alarm, LED, vibration when the concentration exceeds the safety gas levels. The device shows the gas concentration in real time and identify the maximum and minimum concentration. The settings values can be modified through SENSOTRAN IR-LINK (option).



Warning

- Please do not replace or change the parts. In this case, we do not guarantee the warranty and safety even though it is under warranty.
- Please remove any debris on the surfaces of the sensor, LED or buzzer hole before use.
- Test the performance of the gas sensor through the gas beyond the alarm level regularly.
- Test the device on a regular basis whether its LED, alarm and vibration function properly.
- Use the device under the conditions instructed, including the temperature, humidity and pressure range. The use environment outside the instruction may cause malfunction or failure.
- The sensors inside the device may indicate the gas concentration differently according to the environment such as temperature, pressure and humidity. Please make sure to calibrate the detector under the same or similar environment to the specification.
- Extreme changes in temperature may cause drastic changes of the gas concentration. (e.g. using the detector where there is a huge gap between the inside and outside temperature) Please use the device when the concentration becomes stable.
- Severe pressure or impact may cause drastic changes of the gas concentration. Therefore, please use the device when the concentration is stable. Severe pressure or impact may cause also malfunction in the sensor or the device.
- The alarms are set according to the international standard and must be changed by an authorized expert.
- Charging or replacing the battery should be done in a safe area where there is no risk of explosion or fire. Changing the sensor or battery with improper replacements, which are not authorized by the manufacturer, may invalidate the warranty.
- IR communication should be done in a safe area where there is no risk of explosion or fire.



Caution

- Please use after reading the manual carefully.
- The device is not a measurement device, but a gas detector.
- Please stop using and consult the manufacturer if the calibration fails continuously.
- Please test the device every 30 days under the atmospheric environment of clean air without gases.
- Clean the exterior of the device with soft cloth and do not clean it with chemical detergent.

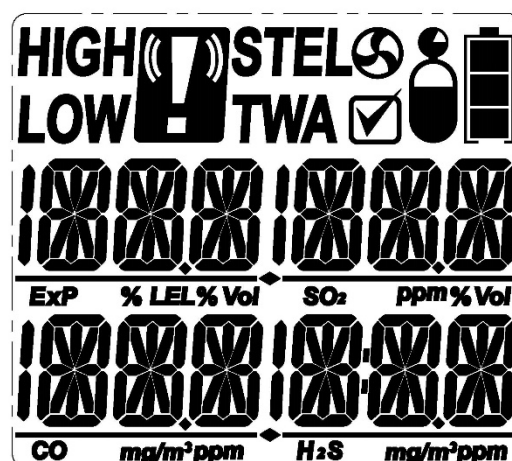
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1. Product Overview



1. Gas sensor (O₂)
2. Gas sensor (LEL)
3. Gas sensor (Dual : CO & H₂S)
4. Key
5. IR Port
6. Alarm LED
7. LCD display
8. Buzzer




LCD display symbols

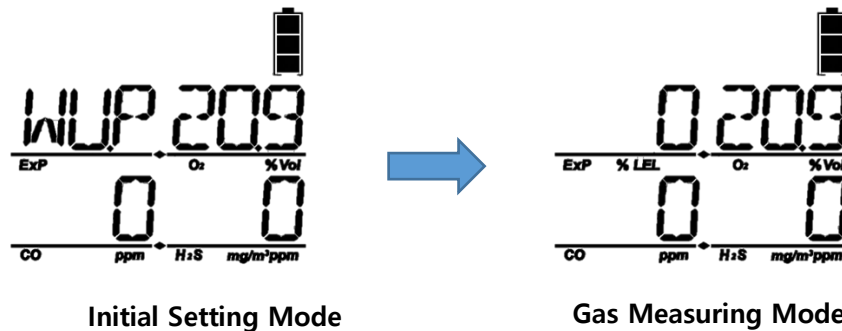
HIGH	High Alarm		Fresh Air Calibration
LOW	Low Alarm		Device Stabilization & Calibration Succeeded
	Alarm Condition		Standard Gas Calibration
STEL	STEL Alarm		Remaining Battery
TWA	TWA Alarm		

2 Activation

2.1. Turn On

Press and hold down the KEY button() and the device will be switched on along with the three seconds countdown.


(The device will be switched on only when you keep pressing the button for longer than three seconds.)



Once activated, the device will enter the warm up stage to stabilize sensors. The warm up process is completed, the device is ready to detect gases.

<Caution> A proper calibration is always required before using the device at the work site. The user shall check whether the device is properly sensing the levels of dangers of gases and make sure whether the detecting section of the device is not blocked with materials impairing the detection.

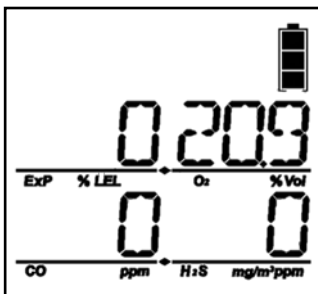
2.2. Turn Off

Keep pressing the KEY button() and the 3, 2 and 1 in the mentioned order will appear on the monitor and finally the device will be switched off.

(The device will not be switched off only unless you keep pressing the button for longer than three seconds.)

3. Mode

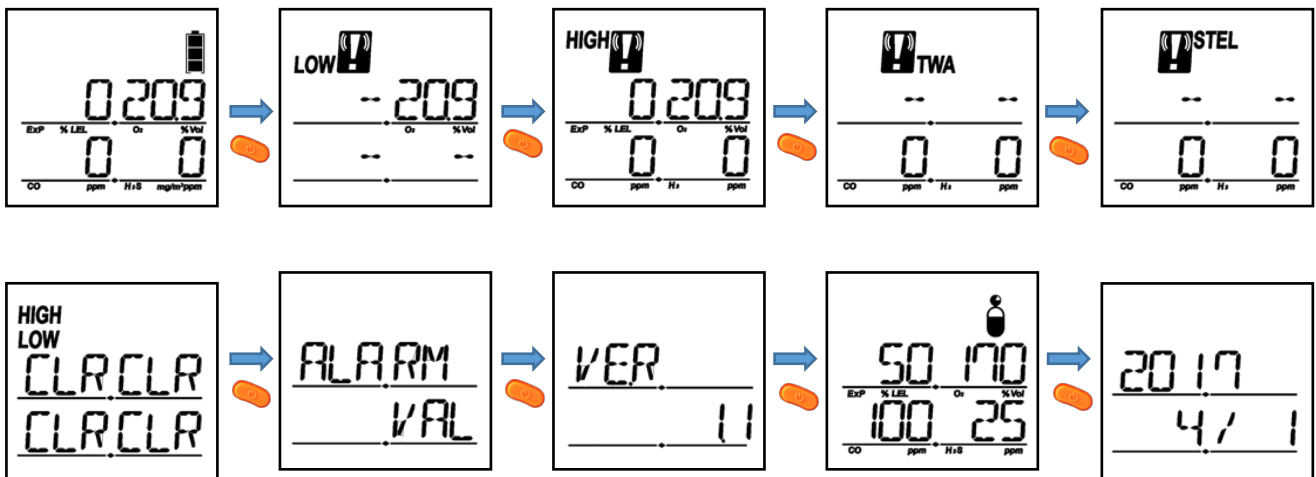
3.1. Measuring Mode



If the device goes into the normal measuring mode after stabilization, the gas concentration and the battery power level are displayed on the LCD monitor. Oxygen is displayed in %vol, combustible gases in %LEL and H₂S, CO in ppm unit. When the concentration levels change, the value is displayed in real time, and when the levels exceed the threshold for either LOW alarm or HIGH alarm (or TWA/STEL), the display icons of **LOW**, **HIGH**, **TWA** or **STEL** blinks regularly and the alarm, LED and vibration activates.


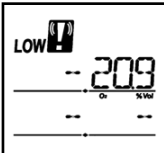

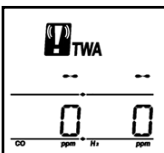
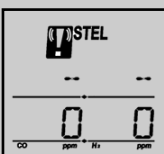
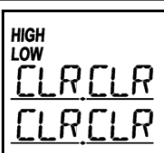

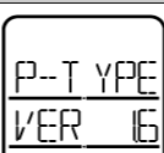
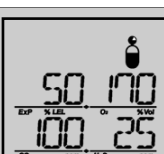
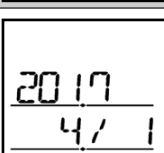
When the device goes to a safe area, the concentrations detected by the device declines and the alarm stops. Even after going to a safe area after the alarms set off, the icon of the alarm does not go away, and you must push the KEY button () to make it go away.

3.2. Display Mode


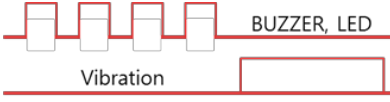

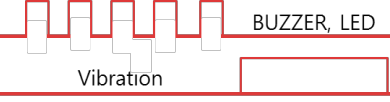

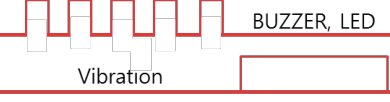

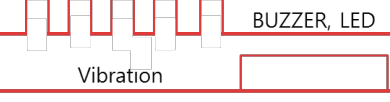




The displays in ten different modes as above are shown in the measuring mode every time when you press the KEY button().

3.2.1 Display Mode in Detail

LCD Display Images	Description in Detail
	<ul style="list-style-type: none"> ➤ Measuring Mode (Basic Display) ➤ Display the current gas levels of the atmosphere and the battery power level
	<ul style="list-style-type: none"> ➤ Minimum gas concentration detected by the device. *In an ambient air, the Oxygen level normally indicates 20.9%vol.
	<ul style="list-style-type: none"> ➤ Maximum gas concentration detected by the device. *In an ambient air, the Oxygen level normally indicates 20.9%vol.
	<ul style="list-style-type: none"> ➤ Average exposure levels of the toxic gases for the last eight hours (Time Weight Average)
	<ul style="list-style-type: none"> ➤ Average exposure levels of the toxic gases for the last 15 minutes (Short Term Exposure Limit)
	<ul style="list-style-type: none"> ➤ Clear Low, High (Peak), TWA, STEL values.
	<ul style="list-style-type: none"> ➤ Check the current setting values manually. (Low alarm, High alarm, TWA, STEL)
	<ul style="list-style-type: none"> ➤ Firmware version and type (N type or P type)
	<ul style="list-style-type: none"> ➤ Display SPAN calibration levels ➤ Mode for ZERO calibration and SPAN calibration
	<ul style="list-style-type: none"> ➤ Current Date and Time

3.3. Alarm Display

Type	Set-Off Condition	LCD Display	Alarm Sound & Vibration Display
LOW Alarm	Exceed LOW alarm value	 icon & gas concentration levels displayed	
HIGH Alarm	Exceed HIGH alarm value	 icon & gas concentration levels displayed	
TWA Alarm	When exceeding TWA alarm value	 icon & gas concentration levels displayed	
STEL Alarm	When exceeding STEL alarm value	 icon & gas concentration levels displayed	
Bump Test	Request Date for Bump Test		Stops after Bump Test
Execute Calibration	Request Date for Calibration		Stops after Calibration

LOW Alarm Sets Off : When the user presses Key after noticing that the LOW alarm sets off, the sound stops, but the vibration and LED alarm remain.

HIGH Alarm Sets Off : The user must leave the area immediately, and the sound alarm/vibration/LED alarm stops when the device goes to a safe area where the concentrations are normal.

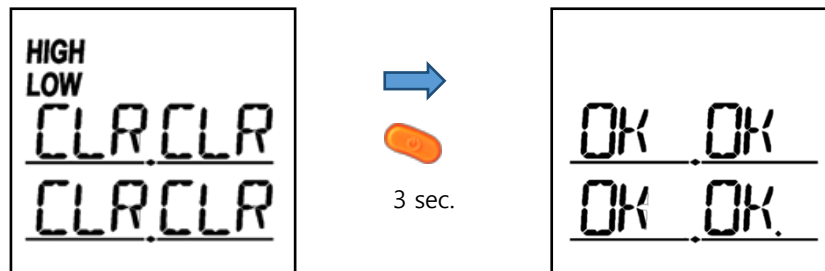
TWA Alarm Sets Off : The alarm sets off when the hourly average levels of the gas concentration for the last eight hours exceed the TWA concentration, and the sound alarm/vibration/LED alarm stop when the gas concentration levels reach the alarm set-off value as the user goes to a safe area.


STEL Alarm Sets Off : The alarm sets off when the hourly average levels of the gas concentration for the last 15 minutes exceed the STEL concentration, and the sound alarm/vibration/LED alarm stop when the gas concentration levels reach the alarm set-off value as the user goes to a safe area.

Bump Test Interval (SENSOTRAN IR-LINK Options): Notices the user on a regular basis to check the device.

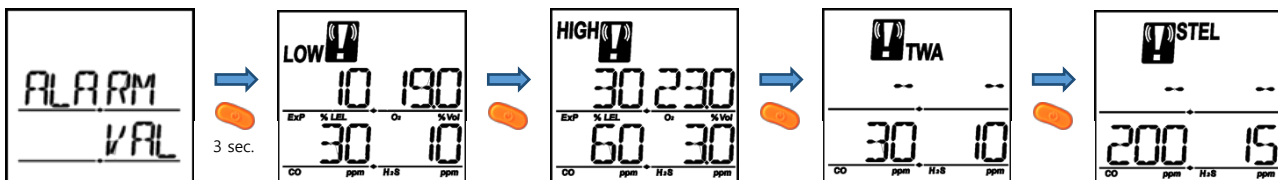
Calibration Interval (SENSOTRAN IR-LINK Options): Notices the user on a regular basis to calibrate the sensor.


3.4. Clear Peaks



You can see the minimum and maximum values for the concentration levels detected by the device as well as the high TWA and STEL value on the display, and the values can be initialized. Press KEY button () for three seconds on the CLR(Clear) mode on the LCD monitor, and the OK will appear on the LCD monitor to notify the completion of the initialization.

3.5. Check on Alarm Value



Press the KEY button () for three seconds under the **ALARM VAL** mode and the value for the LOW alarm is displayed. Press the KEY button one time each to set the alarm set-off value for HIGH alarm, LOW alarm, TWA and STEL alarm in the mentioned order.

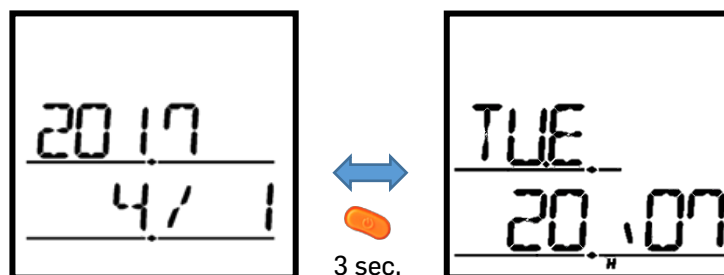
3.5.1 Initial Setting Concentration Levels



	Inflammables (Ex)	Oxygen (O ₂)	Carbon Monoxide (CO)	Hydrogen Sulfide (H ₂ S)
LOW	10 %LEL	19.5%	20 ppm	5 ppm
HIGH	20 %LEL	23.5%	200 ppm	10 ppm
TWA			20 ppm	5 ppm
STEL			100 ppm	10 ppm

* The set values can be modified on PC through SENSOTRAN IR-LINK (option).

<Caution> The values of different gases in the device are set based on the international standards. As such, the alarm set-off values for each gas can be modified upon the approval and monitoring of the supervisor. The modification may be done through SENSOTRAN IR-LINK (option).

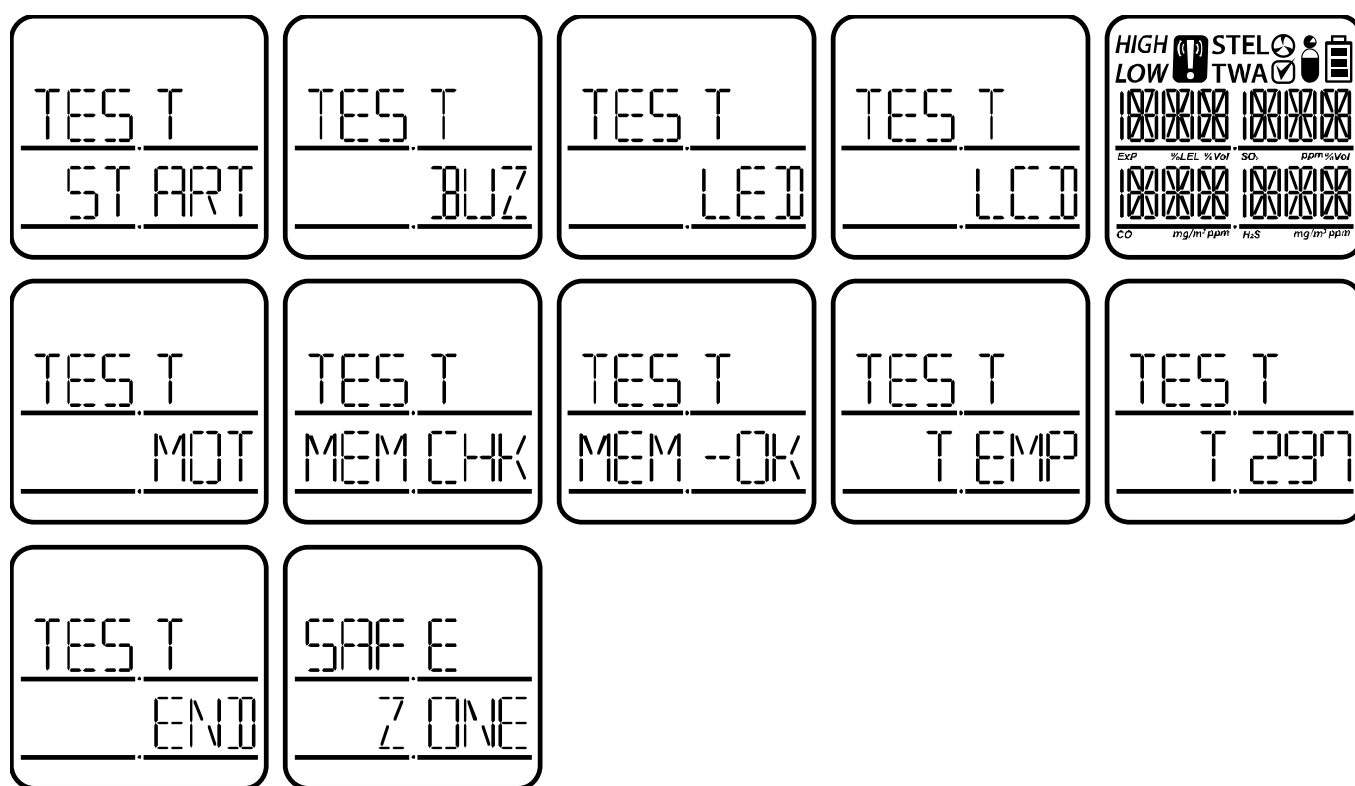
3.6. Date and Time



Press the button () under the (YY/MM/DD) mode for 3 seconds and the day/time mode will appear. Press the button () again for 3 seconds under the (D/T) mode and it will go back to previous mode.

* The current time shall be automatically synched with that of the PC when linked with SENSOTRAN IR-LINK.

3.7. Self-Test



Press and hold the button for 3 seconds. The device will start the self-test checking buzzer, LED, LCD, Motor, Memory, and Temperature.

4. Event Log

Up to 30 events may be saved, the oldest data will be automatically substituted with the newest one. The saved data can be downloaded to PC through SENSOTRAN IR-LINK.

Data log records the operation status every second for more than 2 months.

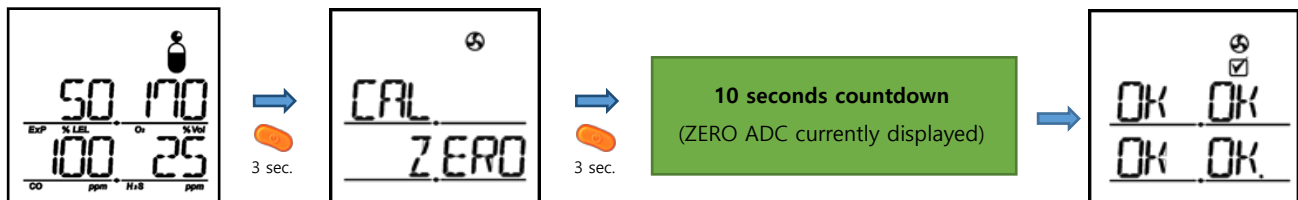
Log Categories	Log Details
EVENT(High, Low, TWA, STEL) Alarm	Time, Duration, Alarm Type, Gas Concentration, Serial Number
BUMP TEST Log	Test date, Pass/non-pass, Span Gas Concentration, Measured Concentration
Calibration Log	Calibration Date, Type, Span Gas Concentration, Measured Concentration
Data Log	Time, Date, Concentration, Alarm Type, Options



5. Calibration

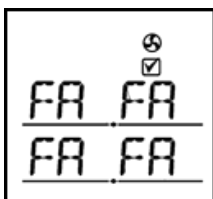
<Caution> The initial calibration is executed at SENSOTRAN S.L. before device shipment. The calibration values are saved in the device which means inaccurate calibration may impair the accuracy of the device performance. User should perform calibration every six months.

<Caution> Because it is calibrated on the assumption that oxygen concentration is 20.9%vol, the combustible gas is 0%LEL, and the toxic is 0ppm in the normal fresh atmosphere, fresh air calibration must be conducted in the absolutely clear air without any impact of other gases. Fresh air calibration in the airtight spaces therefore is not recommended. Make sure to avoid calibration under the work environment where gases may be present.

5.1. Fresh Air Calibration

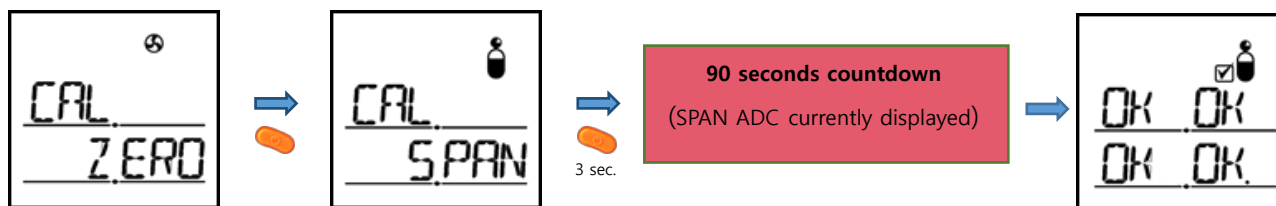




Press KEY button () for 3 seconds under the gas calibration value mode and the icon () for fresh air calibration will appear on the display with the message "CAL ZERO." Press for another 3 seconds to do fresh air calibration and it will take 10 seconds to calibrate. Press the button during the calibration process to abort the calibration. If you press the button upon the completion, it will return to the fresh air calibration mode, and if you don't press the button, it automatically enters the measure mode.

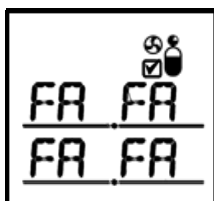


If the calibration fails, message FA(Fail), appears on the display. Press the button to enter the initial fresh air calibration mode and it changes into the measure mode if you do not press the button for 3 seconds. If FA continues, please consult SENSOTRAN or your local distributor as it may require the replacement of the sensor or maintenance tasks.

5.2. Standard Gas Calibration

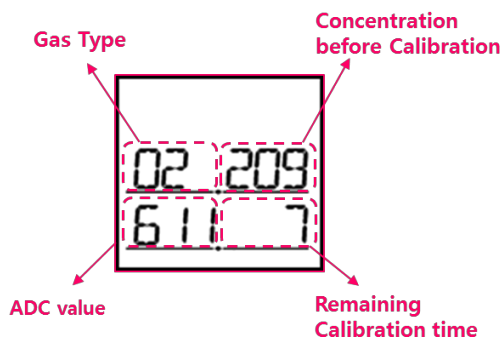


Press KEY button () at fresh air calibration mode and the icon () of standard gas calibration will appear on the display with the "CAL SPAN" message. Press for 3 seconds to do the standard gas calibration and it will be completed automatically in 90 seconds. Press the button during the calibration to abort it. If you press the button upon the completion, it will return to the initial standard gas calibration mode, and if you don't press the button, it automatically enters the measure mode.



If the calibration fails, message FA(Fail), appears on the display. Press the button to enter the initial fresh air calibration mode and if you do not press the button, it changes into the measuring mode. If FA continues, please consult SENSOTRAN or your local distributor as it may require the replacement of the sensor or maintenance tasks.

Display for Calibration Count



Initial Standard gases concentration for calibration

	Combustible	Oxygen	Carbon Monoxide	Hydrogen Sulfide
Concentration	50%LEL(CH ₄)	18 %Vol	100 ppm	10 ppm


* The Span concentration can be modified throw SENSOTRAN IR-LINK (option).

DOCKING STATION

Standard gas calibration can be easily done through Docking Station (option), which holds gas inside.

* Docking Station is used to determine whether the device functions properly by the bump test before using MULTISENS in the work site.

6. Specification

Model	MULTISENS			
Measure Gas	Combustible	O ₂	CO	H ₂ S
Detecting Method	Diffusion / Sampling (with Sampling Pump(option))			
Measure Mechanism	Catalytic (MULTISENS-P) NDIR (MULTISENS-N)	Electrochemical	Electrochemical	Electrochemical
Range	0-100 %LEL	0-30 %vol	0-500 ppm	0-100 ppm
Sensor life	> 5 years	3 years	> 2 years	> 2 years
Response Time t_{90}	< 15sec/	< 15sec	< 30sec	< 30sec
Accuracy	\pm 3%/ Full Scale			
Resolution	1%LEL	0.1 %vol	1 ppm	0.1 ppm
Operation	Front Key 			
Display	Digital LCD display, LCD Backlight, Indicator LED			
Alarm	Visual : LCD alarm display, LCD Backlight, Indicator LED Audible / buzzer (90dB at 10cm)			
Data Saving	Event Log : 30 EA, Calibration Log : 30 EA Bump Log : 30EA, Data log Two Months or longer			
How to Fix	Belt Clip			
Temperature	-20°C - +50°C			
Humidity	10 to 95% RH(Non-condensing)			
Battery Type	Manufacturer: SAMSUNG SDI, Product Name: ICP103450S, Type: Lithium-Ion Charger Nominal Voltage : 3.7V , Nominal Capacity: 2000mAh , Max Charging Voltage: 6.3V			
Battery Duration	(MULTISENS-P : 24 Hours, MULTISENS-N : 2 Months)			
Case	Rubber-based PC Case			
Size	(W x D x H) 60 x 40 x 118mm			
Weight	240 g			
Options	Manual Sampling Pump, SENSOTRAN IR-LINK, Docking-Station			
Certification	MULTISENS-P : II 1G Ex da ia IIC T4 Ga, IP 67 MULTISENS-N : II 1G Ex ia IIC T4 Ga, IP 67			

Limited Warranty

SENSOTRAN warrants this product to be free of defects in workmanship and materials-under normal use and service-for two years from the date of purchase from the manufacturer or from the product's authorized reseller.

The manufacturer is not liable (under this warranty) if its testing and examination disclose that the alleged defect in the product does not exist or was caused by the purchaser's (or any third party's) misuse, neglect, or improper installation, testing, or calibrations. Any unauthorized attempt to repair or modify the product, or any other cause of damage beyond the range of the intended use, including damage by fire, lightening, water damage or other hazard, voids liability of the manufacturer.

In the event that a product should fail to perform up to manufacturer specifications during the applicable warranty period, please contact the product's authorized reseller or SENSOTRAN service center at +34 934 785 842 for repair / return information.

Sensotran

More than 50 years of
experience in gas detection

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