PROSENSE Hand Terminal
User Manual

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WARNING!
READ THIS INSTRUCTION FIRST!

This manual must be carefully read by all persons who have or will have the responsibility for installing, using or servicing this product.

Like any equipment, this product will perform as designed only if installed, used and serviced in accordance with the manufacturer's instructions. Otherwise, it could fail to perform as designed and persons who rely on this product for their safety could suffer severe personal injury or death.

The warranties made by Prosense with respect to this product are voided if the product is not installed, used and serviced in accordance with the instructions in this user guide. Please protect yourself and other by following them.

Please contact info@prosense.com.tr for any inquiry or complaints.

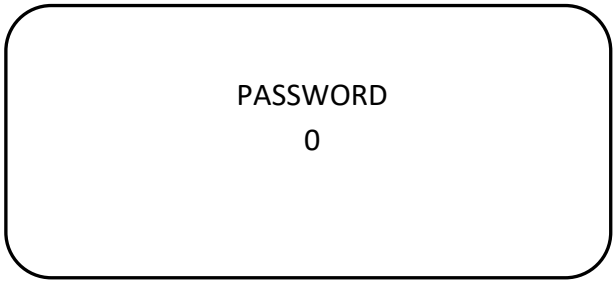
Contents

Introduction

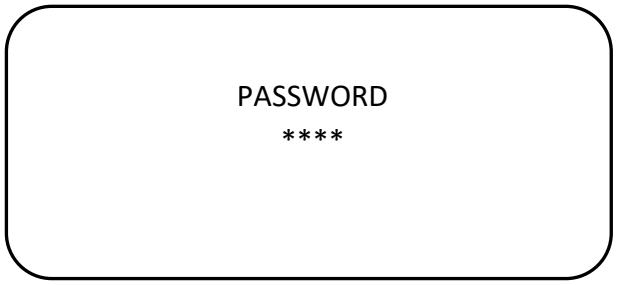
The Prosense hand terminal is designed to help maintenance and calibration operations on Prosense **PQ, PX, P, PC3** series detectors. The hand terminal uses MODBUS communication to connect the detectors. Prosense PQ, PX, P, PC3 series detectors have onboard MODBUS communication circuits. User should connect hand terminal MODBUS A and B ports to detector MODBUS and B ports. Communication ports must match to each other for communcation. Hand terminal operates with battery power and should be off to manage battery life.

Hand Terminal Menu

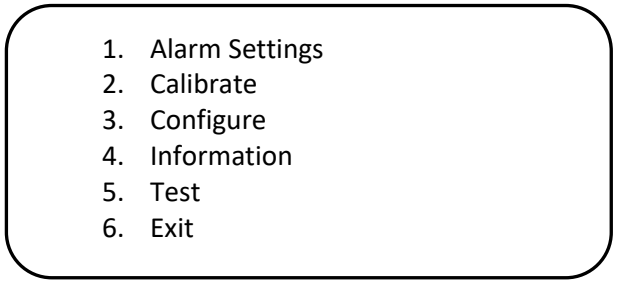
Hand terminal has 3 buttons on display that will be used to perform operation which are Enter, up (Increase) and down (decrease). To reach configuration menu press Enter. The screen will request password information:



The password is 1234. User need to change the password as defined in “Change password” step. You need to set values via using up and down keys. Once the value is set press Enter again to confirm and move to the next digit. Confirmed digits will be made invisible by detector program:



The screen will display menu options when correct password entered at last digit:



Menu structure

PQ Series Detector menu includes all necessary steps to setup detector and display information. Menu is available for only PQD and PQD-S models as they have display module.

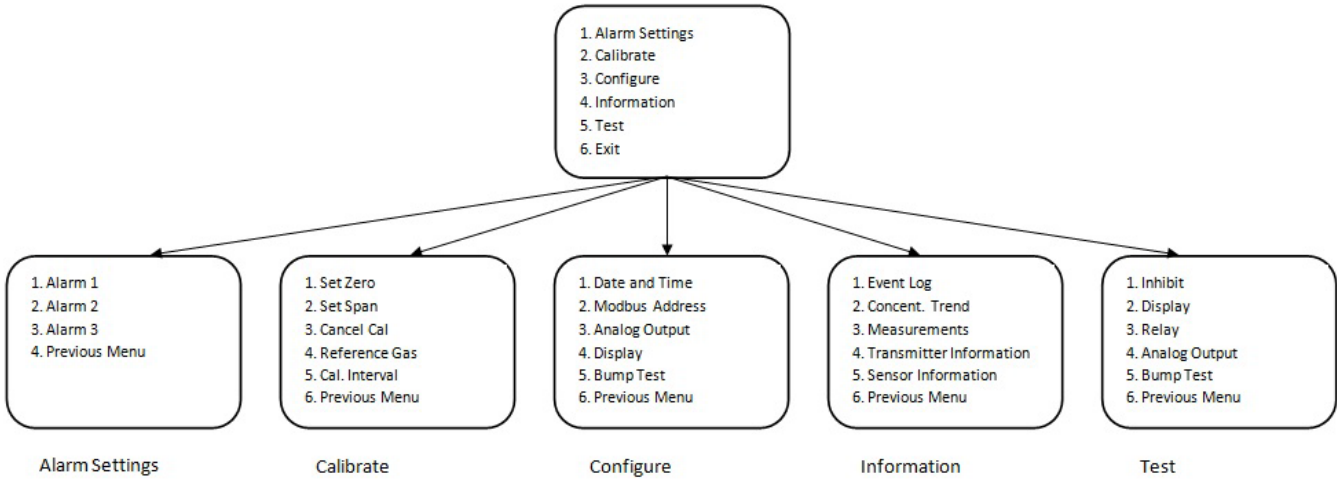


Diagram 16: Main menu structure

Alarm Settings

Alarm levels can be adjusted via using alarm menu steps. Alarm menu general structure is given in diagram-12:

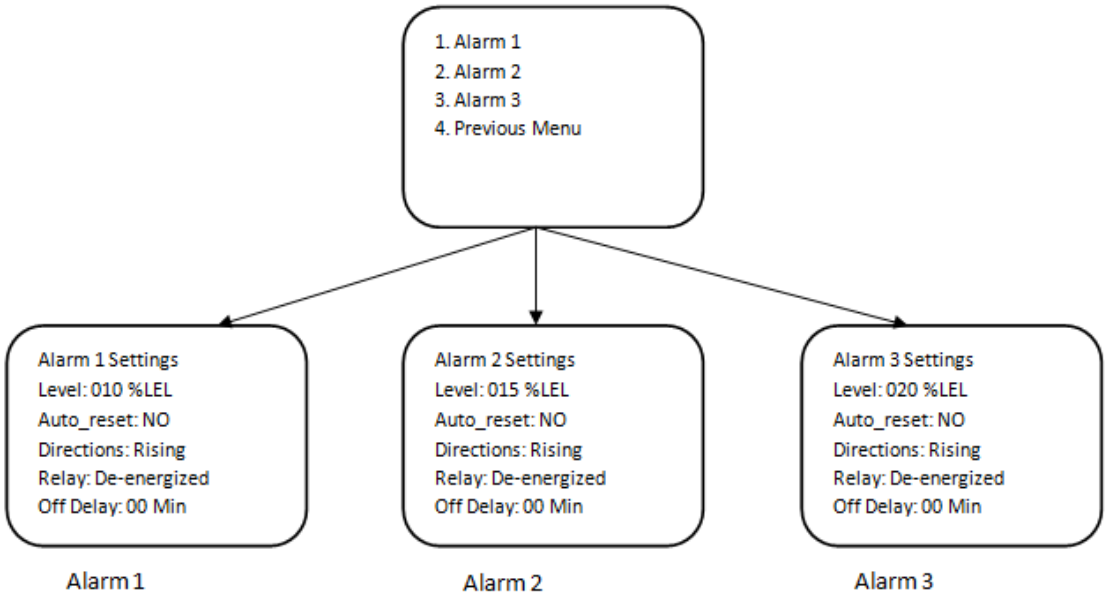
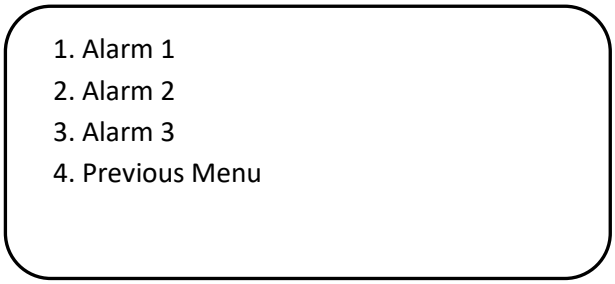


Diagram17: Alarm menu structure

Once you reach the main menu the first option is alarm settings. Press Enter to move the alarm settings menu. A new menu listing alarm levels will be shown:



Please select the alarm level you would like to adjust and press Enter key to see details. All alarm details will be listed in new screen and parameters will be blinking one by one while you set the values.

Alarm 1 Settings
Level: 10%
Auto-reset: NO
Directions: Rising
Relay: De-energized
Off Delay:00 Min

The first digit of the first alarm will start blinking to let you increase or decrease the digit via using up and down keys. When you set the value, press again Enter key to move next digit. The next digit will start blinking to allow you set desired value. When you complete, press Enter key long enough. The display will show “Successful” message and return back to higher level menu.

All alarm levels have same parameter that user can adjust if needed. Otherwise they will work with their default settings. The meaning of parameters is as follows:

Level: The measurement level to raise the alarm

Auto-reset: Define how the alarm relays will work. If ‘YES’ selected the relay will be released once the measurement level returned to normal. If ‘NO’ selected the relay will lock in their position. According to IEC EN 60079-29-1 highes level alarm ”Alarm-2” is set to latch mode without auto-reset.

Directions: Parameter to define in which way alarm will be activated whether increasing or decreasing. For most toxic and flammable gases it will be raising, for oxygen it can be both raising and falling.

Relay: It defines the alarm relay working conditions. Relays can be programmed as Energised (NC) or Non-energized (NO) contact according to use cases and scenarios. When Energized is selected, the relay will have energy during normal operation. When Non-energized is selected, the relay is only energized when performing the switching function.

Off Delay: User can define delay to deactivate the alarms. Equipment keeps alarms and relay contacts active fter measured gas level goes below the defined alarm level. This function must be adjusted according to operating conditions and safety rules. For example, in some plants ventilation fans kept activated after the measurement level falls below the alarm level. In such cases the off delay feature can be used. The off-delay can only be defined in minutes.

Configure

User can change the parameters of detector depending of the usage such as date, time, password and detector address via configure menu. Select ‘Configure’ step on main menu to perform changes. A new menu options will display with options:

1. Date and Time
2. Modbus Address
3. Analog Output
4. Display
5. Bump Test
6. Previous Menu

The Configure menu structure is given in below diagram:

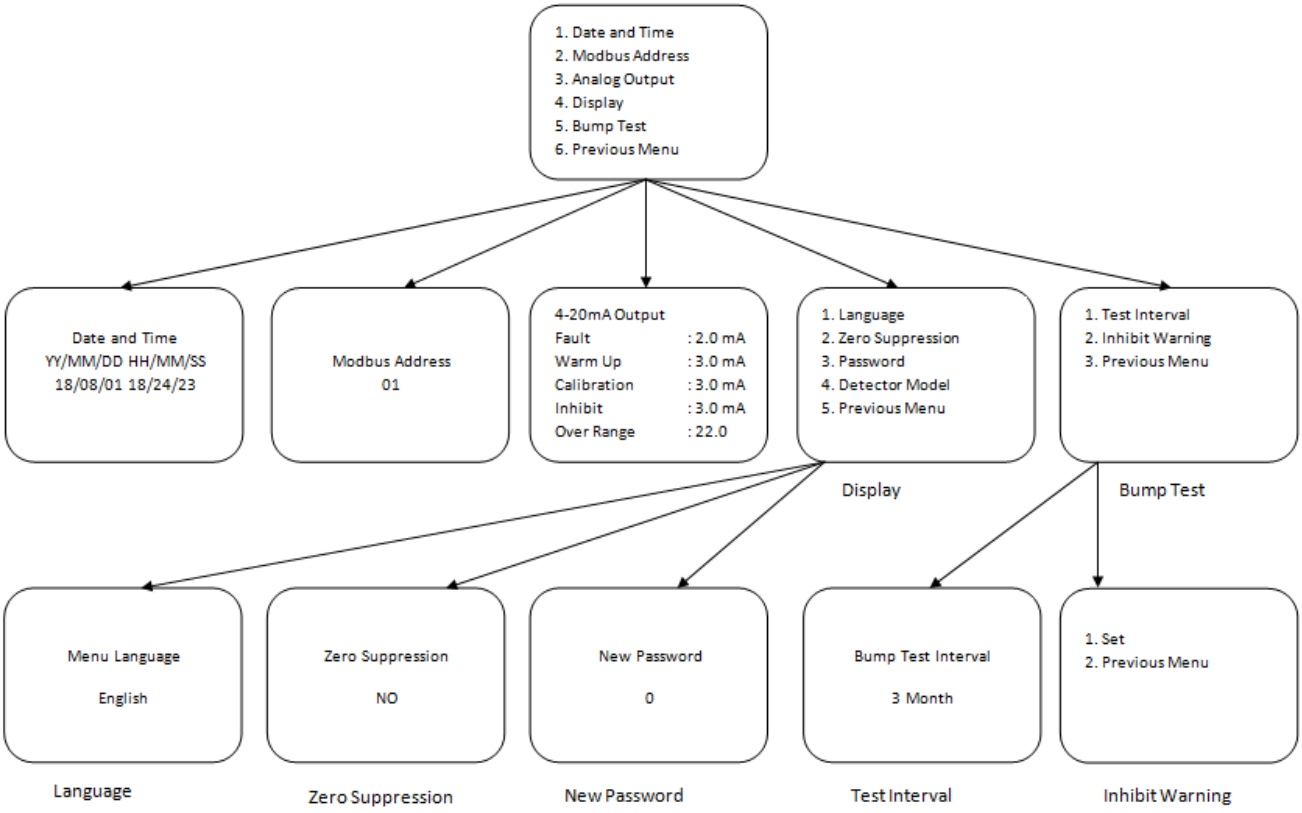


Diagram18: Configure menu structure

Change date and time

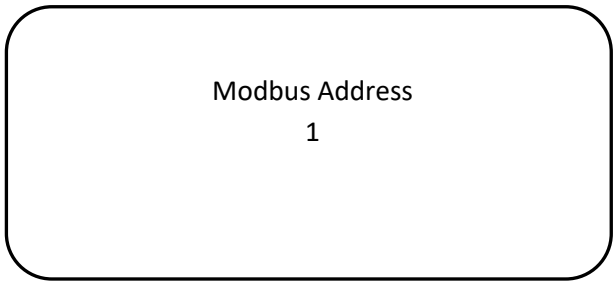
Date and Ttime fearue is only available on PQ Series. Other series would not use this option.
To change date and time select first menu item. Display will show date and time details:

Date and Time
YY/MM/DD HH/MM/SS
18/03/27 15/38/27

The first digit on screen will start blinking once entered the menu step. You can increase or decrease the value via using up and down keys. Once desired value has been set press Enter key to confirm and move to the next digit to set. Once all set press Enter key. The display will show “Successful” message and return back to higher level menu.

Change Modbus address

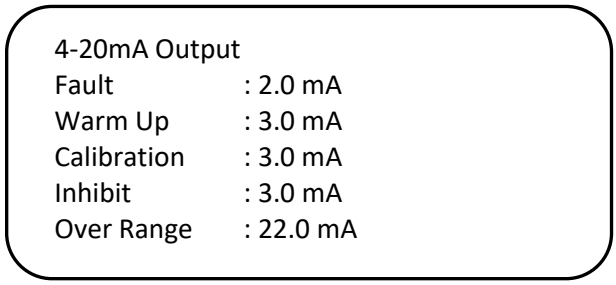
To change detector address, select “Modbus Address” menu option. In RS485 communication detectors are slave devices and control panel is the master device. Each detector must have unique address to work together in same RS485 communication loop. Select “Modbus Address” menu item via using up and down keys and press Enter key. Display will show default detector address which is 1:



Address can be changed with up and down keys from 1 to 256. Once set to desired address press Enter key long enough. The display will show “Successful” message and return back to higher level menu.

Change Analogue Output

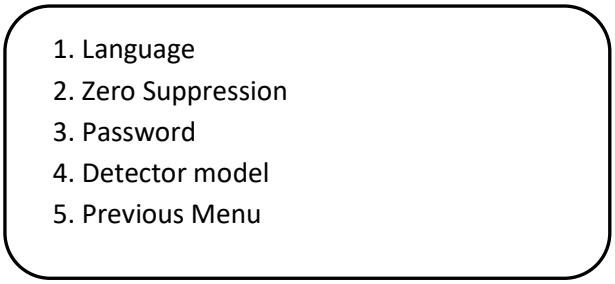
User can adjust analogue output levels depending of the status and function. To do this please select “Analogue Output” menu item on configuration menu via using up and down keys and select Enter key. Screen will display default values used for analogue output:



User can adjust these values to desired values depending of the application requirements between 1 to 3.5 mA for Fault, Warm-up, Calibration, Inhibit and 20-22mA for Overrange.

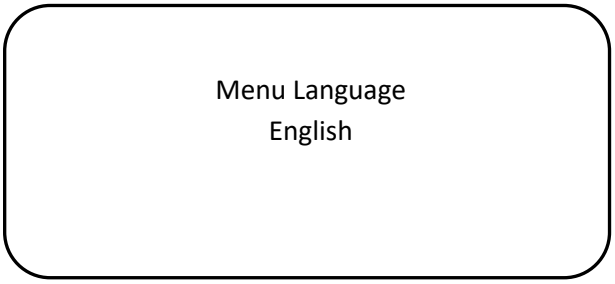
Display Parameters

Detector display can be adjusted as per requirements. The display options are given in Display menu item



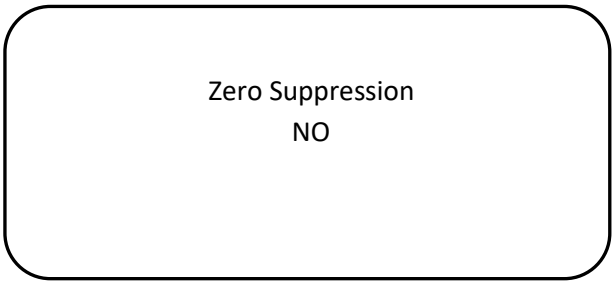
Change Language

The detector display language can be changed to English or Turkish. To change Language first select Configure option on main menu then select Display option and Language option. Once you reach to Language screen you will able to switch display language:



Change Zero Suppression

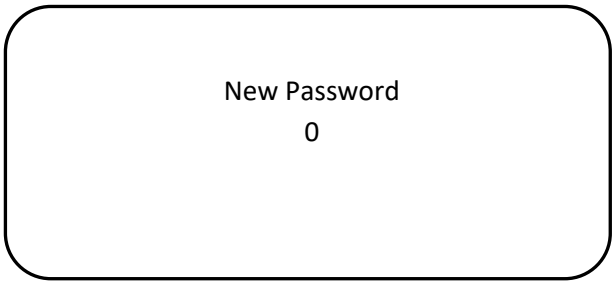
User can adjust the way showing measurement level around zero level. If zero suppression mode set to NO, detector will display measurement as detected. If zero suppression mode set to YES, detector will show measurement levels as 0 (zero) up to 3% LEL. At 3% LEL it will display measurements as detected.



To change zero suppression mode select Zero Suppression option on Display menu and pres Enter key. Current zero suppression mode will be displayed. If needed change the value via using up and down keys. Once adjusted press Enter key to record value.

Change password

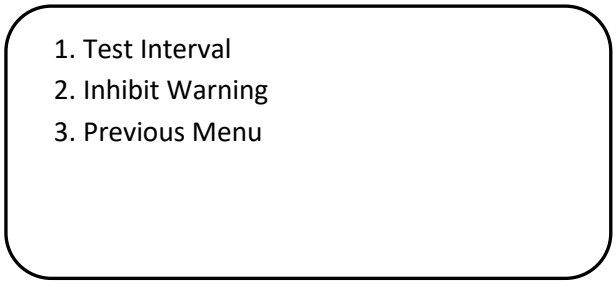
User must change the defaut password for security reasons. The default password is 1234. To change password select Password menu item via using up and down keys and press Enter key. Display will ask new password:



Password must be 4 digits and should be set digit by digit via using up and down keys. When completed, press Enter key long enough to confirm. The display will show “Successful” message and return back to higher level menu. User should remember the password to perform changes later on. If user forgets the password, detector should be returned back to Prosense to reset password. No Field operation is available to reset password at customer site.

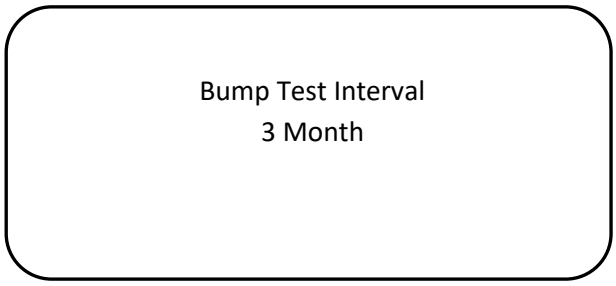
Bump Test

Detectors should be tested to make sure they can perform their operations as defined. To do this bump test should be performed in defined periods. Bump test parameters can be adjusted via using Bump Test options in Configure menu. To start adjustments select Bump Test step on Display menu. A new screen will display with available options:



Change Test Interval

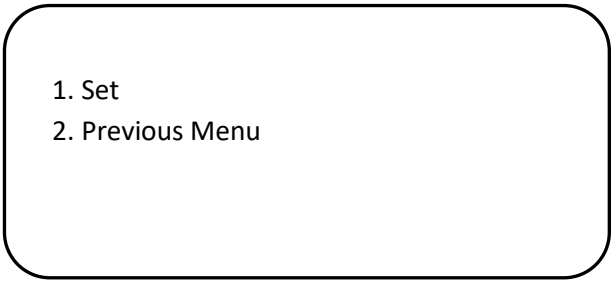
To change bump test interval select Test Interval option on Bump Test Menu.



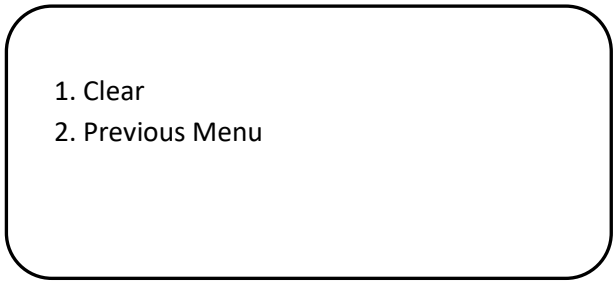
Once the bump test interval menu shown the time value will start blinking. User can change the value via using up and down keys. Select Enter key to save the value when adjustment done. The display will show “Successful” message and return back to previous menu.

Adjust Inhibit warning

User can set or clear inhibit warning via using Inhibit warning option on Bump Test Menu. To adjust warning please select Inhibit warning menu option. A new menu shown including possible adjustment option:



If inhibit warning already set, the screen will display clear option:



Once decided select the option and press Enter key. The display will show “Successful” message and return back to previous menu.

Information Menu options

Information menu provides more detailed information about measurements, events and device itself. The Information menu structure is given in below diagram:

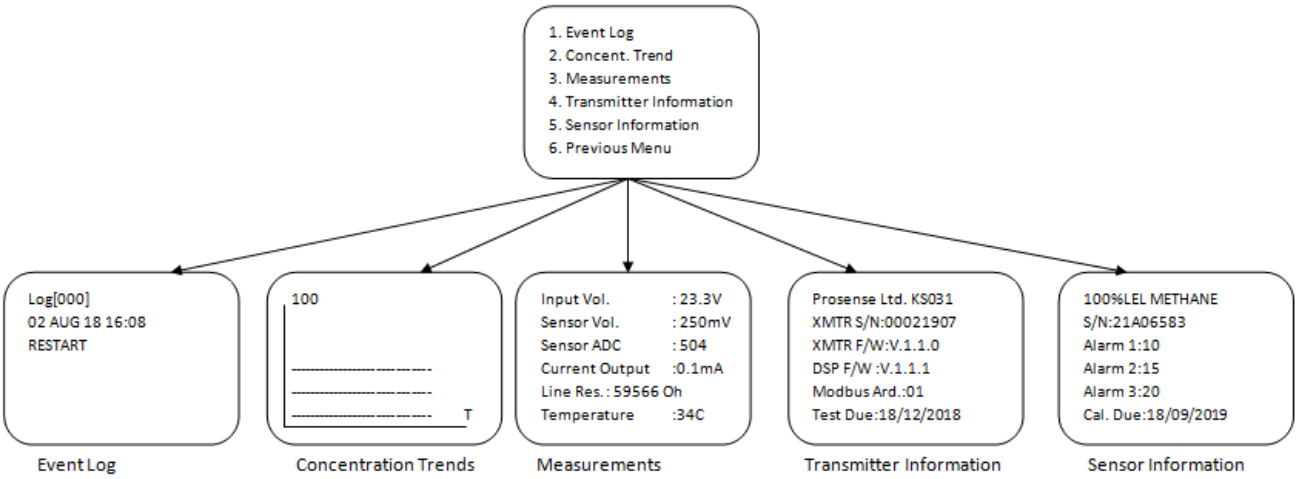
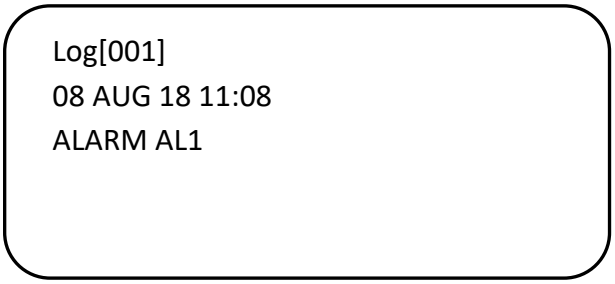


Diagram19: Information menu structure

Display Event Logs

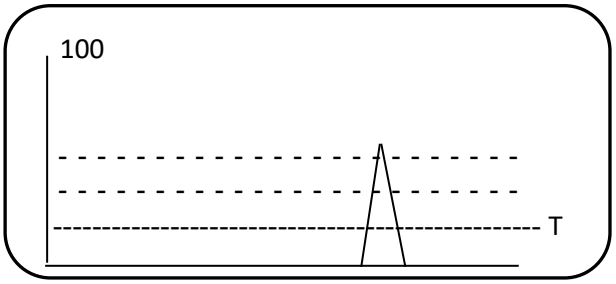
Detector records all events starting from its power-on. To display recorded events, select Event log option in Information menu. Detector will list the events:



The screen can display only one event. To see all events use up and down keys. All events starting from first power-on has been saved in detector memory. It can store up to 250 events. Event log feature is only available on PQ series.

Display Concentration Trends

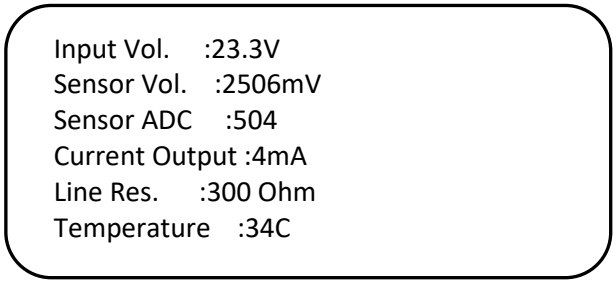
PQ detector can show gas concentration trends in screen as it is recording all the measurement data in last 8 hours. Once this option selected a graphic screen will shown to display gas measurements:



To return back to previous menu please press Enter key till the screen changes. This log feature is only available on PQ series.

Display Measurements

To get more details about the measurements please select measurements option in Information menu. Detector will display the voltage, current and temperature levels as in below example:



Display Transmitter information

To get details about transmitter and firmware level use transmitter information step in Information menu. A screen will display details.

Prosense Ltd. KS031
XMTR S/N:00021907
XMTR F/W:V.1.1.0
DSP F/W :V.1.1.1
Modbus Adr.:01
Test Due:18/12/2018

To return back to previous menu please press Enter key till the screen changes.

Display Transmitter information

To get details about transmitter and firmware level use transmitter information step in Information menu. A screen will display details.

100%LEL METHANE
S/N:21A06583
Alarm 1:10
Alarm 2:15
Alarm 3:20
Cal. Due:18/09/2019

To return back to previous menu please press Enter key till the screen changes.

Test Menu Options

User can execute tests to check detectors functions. Test menu structure is given in below:

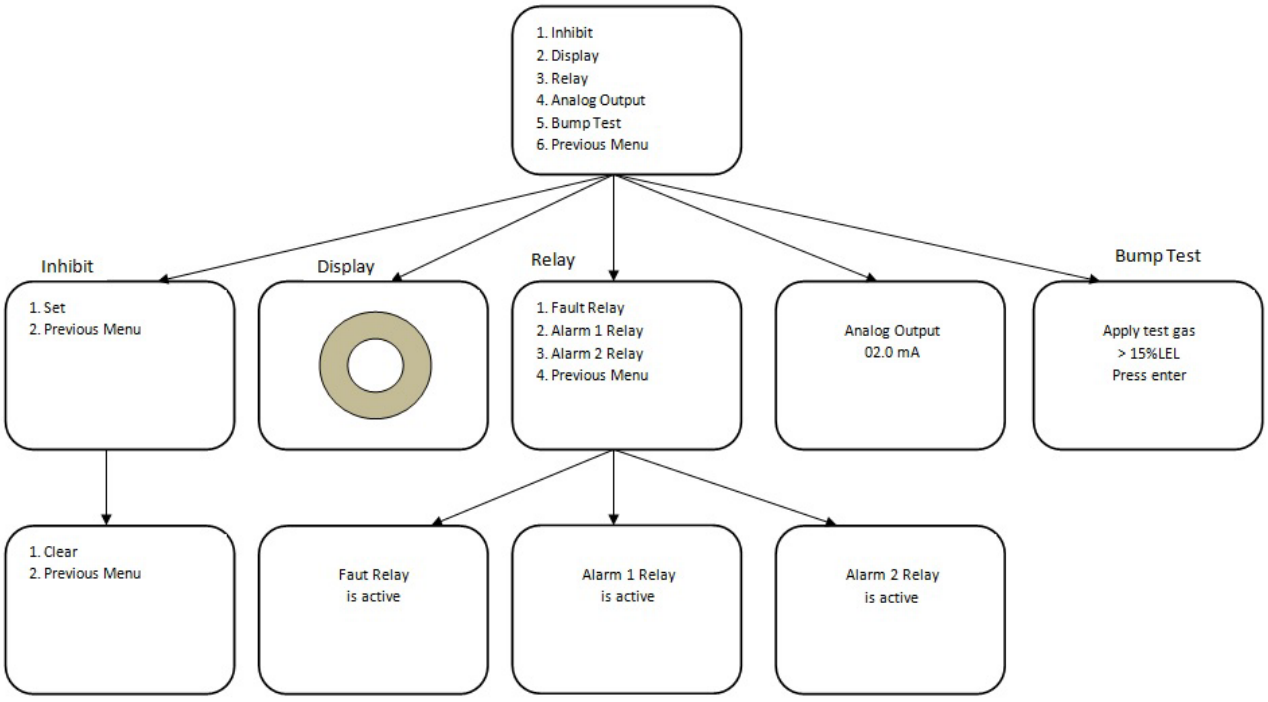
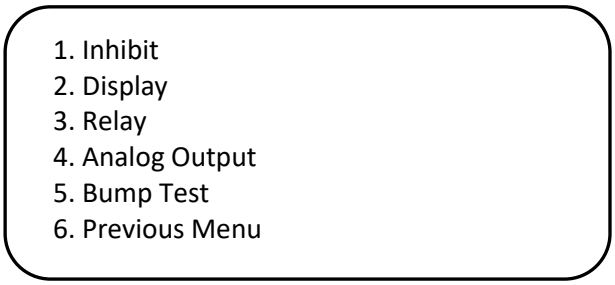


Diagram20: Test menu structure

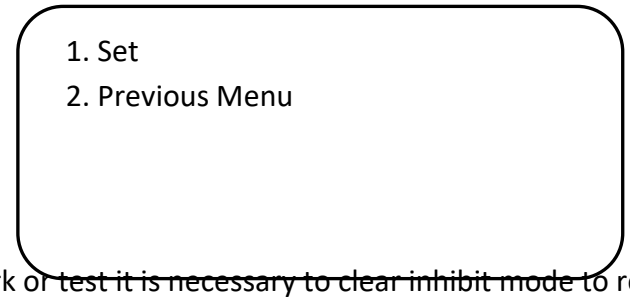
To perform tests select Test menu item via up and down keys then press Enter key. The screen will display test options:



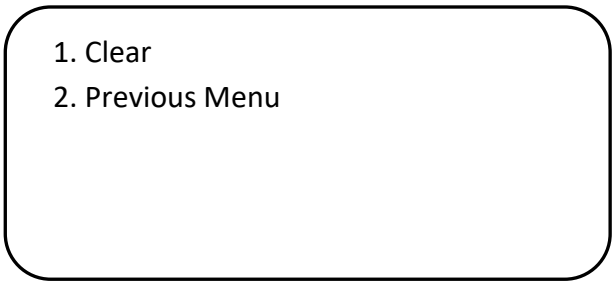
To execute tests select desired test option and press Enter key. To return back to previous menu please select Previous Menu option and press Enter key.

Run Inhibit test

User can initiate detector to work in inhibited mode. In this mode detector will provide the signal level defined in configuration details for inhibited mode (default is 3mA) and the alarms will be deactivated. When Inhibit option selected in Test menu below screen will display to set inhibit detector:



If user finish the work or test it is necessary to clear inhibit mode to return detector to normal operation. To do this user should re-enter to Inhibit menu in Test menu. The clear option will be displayed at this time:



Run Display test

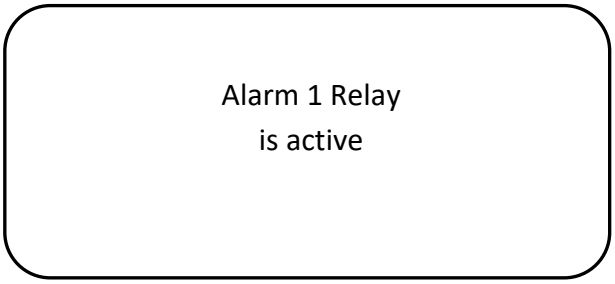
To execute display tests select Display option on Test menu and press Enter key. The detector program will start display test via drawing different patterns. It might take one minute to complete test. The display will return back to Test menu when test completed.

Run Relay test

It is possible to check relay functions via using menu options. Relays are only available if optional relay module installed on to detector main board. To run relay test please select test menu and select Relay option. Screen will display three options to test as there are three relays on relay module. Select the menu option related to desired relay test and press Enter key.

If fault relay test selected, detector will activate the relay and screen will display information:

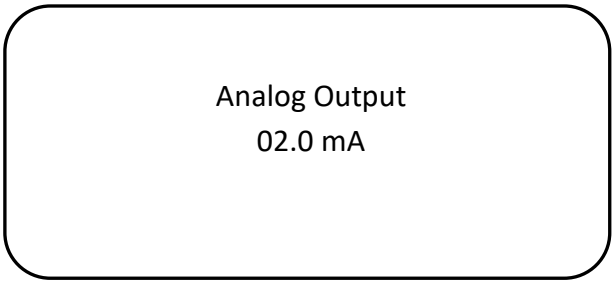
If alarm relay selected, detector will activate related alarm relay and screen will display information:



To return back to previous screen please press Enter key till the screen updated with previous menu items.

Run Analogue Output test

To test analogue output level user can initiate the analogue output test in Test menu. Once Analogue Output option selected press Enter Key. Screen will display the analogue output level. User can increase or decrease the output signal level via using up and down keys.

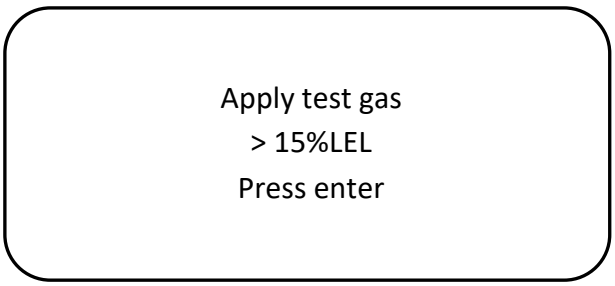


To return back from Analogue Output test please press Enter key till the screen updated with previous menu items.

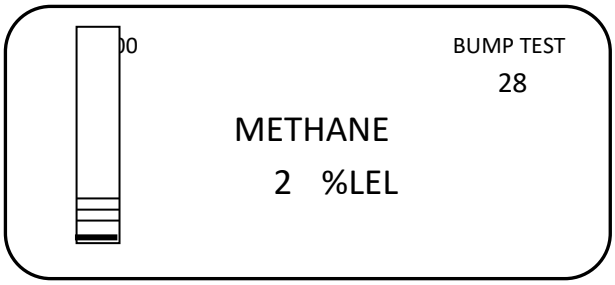
Run Bump Test

Bump test can be run at any time when needed. The Bump test runs depending of the parameters defined for bump test in configuration details. To initiate bump test please select

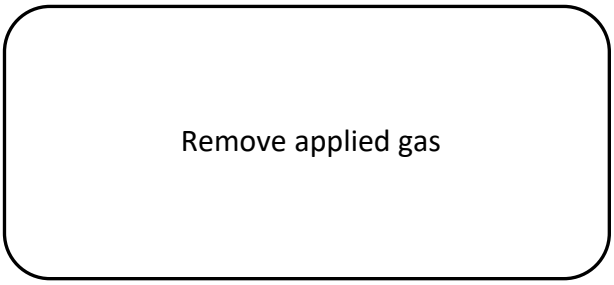
Bump test menu item in Test menu and press Enter key. Screen will display messages that requesting user to apply test gas and press Enter



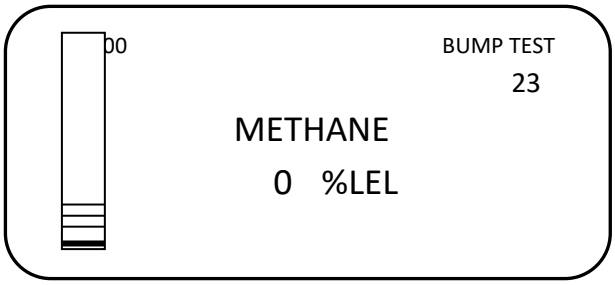
User should provide necessary gas and press Enter. The screen will return back to measurement screen and show the measurement for 30 seconds.



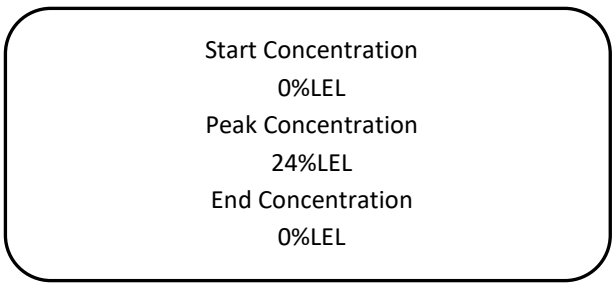
While test executed detector will automatically went in to inhibited mode and Fault LED will start blinking. After 30 seconds screen will alert user to remove the test gas from detector:



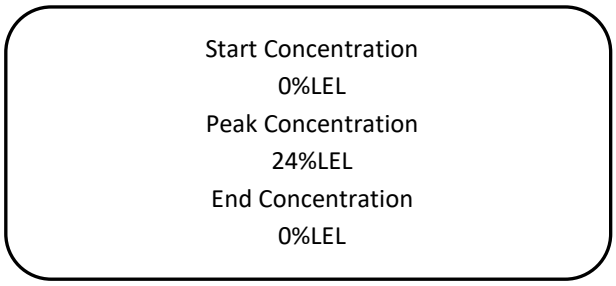
Detector will return to measurement screen for another 30 seconds with same message



Once the time counted down to zero the screen will display test results:



If test fails the screen will indicate the result

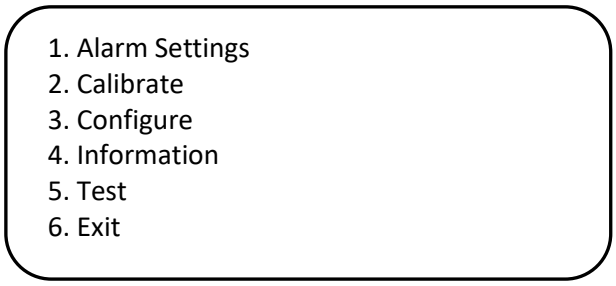


Once test completed screen will display back to Test menu items.

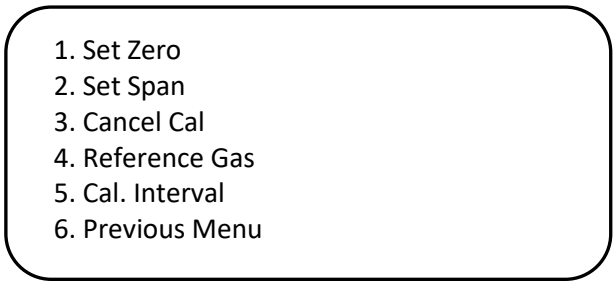
Calibration

It is recommended to periodically carry out calibration to ensure correct operation. Prosense PQ series detector calibration includes two steps as zero and span calibration. It is possible to perform each step independently. Prosense recommends to perform both calibration steps for correct calibration. Detector should be powered and stabilized for at least 4 hours before calibration. During the calibration phases the detector output is inhibited (default 3mA) to avoid false alarms. Zero calibration of infrared sensors should be done with N2 and zero calibration of other sensors should be done with zero air (O2 and N2 gas mixtures). It is possible to use calibration gas from 25%LEL to 75%LEL gas concentrations via adjusting reference gas details on detector menu for calibrating flammable gas detectors It is necessary to use international tracable gases.

To calibrate the detector, use an appropriate span gas cylinder, constant flow regulator and Prosense Gas Cap. The gas flow rate must be 0,5lt/min for correct calibration.
It is recommended to use a compressed air cylinder (20.9%Vol oxygen) to perform the zero calibration if the area where the detector is located contains any residual amount of the target gas. If no residual gas is present then the background air can be used to perform the zero calibration.
To perform calibration select Calibration from menu:



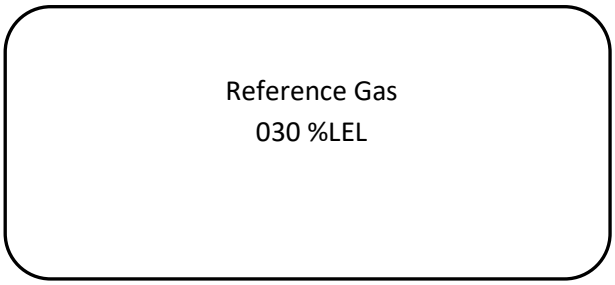
Screen will show calibration options:



It would be better to first set reference gas details and calibration cycle period as these values cannot be altered once calibration started for zero or span. Zero or Span calibration can be performed separately at any time. It is recommended to perform Zero calibration first and perform Span calibration following zero calibration completion.

Set Reference Gas details

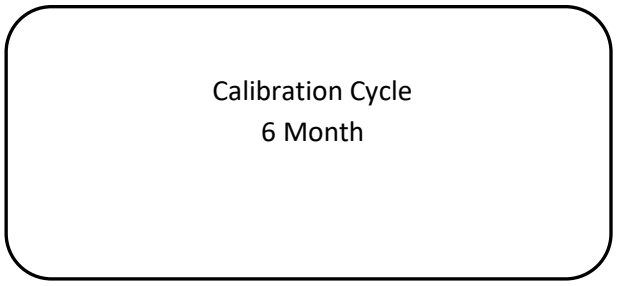
During calibration technician should use a certificated specific gas. The details of the gas should be entered before starting the calibration. Otherwise detector program will use default values entered at factory. If the calibration gas is different than default gas specifications the calibration will fail or will be wrong. Select fourth item 'Reference Gas' on calibration menu to set details of the gas you will use during calibration. The default value is % 30 LEL will be displayed:



The first digit will start blinking on screen. You can change the value of each digit with up and down keys. Once set, confirm value with Enter key and move to the next digit.

Set Calibration Cycle

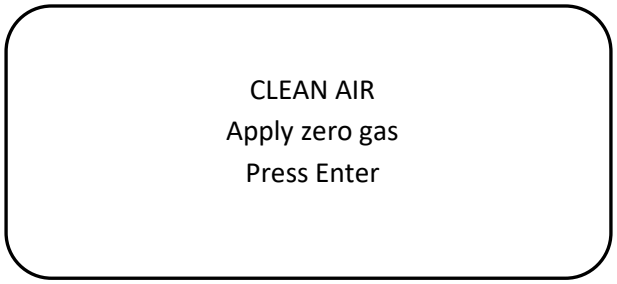
Prosense recommends performing calibration with six months period. Hence this default value is set to detector in factory. Detector will be faulted when calibration period expire. If user wants to use different calibration period this should be set via using the option "Cal Cycle" on calibration menu. Select "Cal Cycle" and press Enter. A new screen will display to allow you set your calibration period:



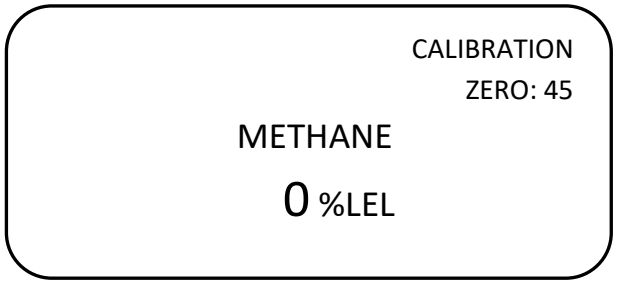
The number will be blinking. Value can be adjusted using up and down keys. Once set press Enter key to confirm and return back to calibration menu.

Zero Calibration

Select Set Zero option on calibration menu and press Enter key to start zero calibration. Program will request a confirmation to start zero calibration:



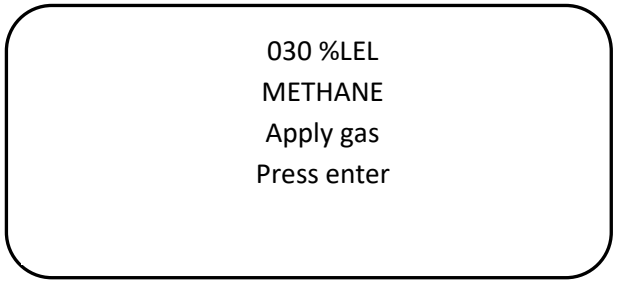
When entered zero calibration will start and calibration time will be counted down:



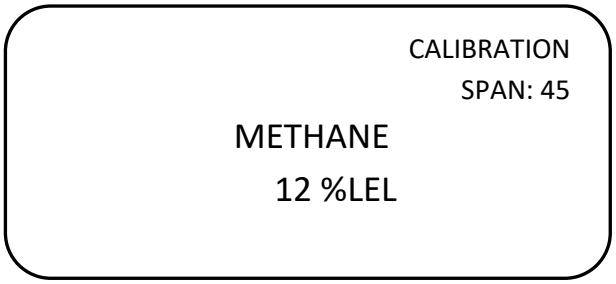
Zero gas should be applied to sensor during 60 seconds. For catalytic, pellistor and electrochemical sensors use clean air gas, for infrared sensors use N2 gas. For more details contact Prosense. Detector will automatically perform zero calibration while gas applied to sensor during this period.

Span Calibration

To perform Span calibration Select Set Span option on calibration menu and press Enter key to start span calibration. At same time prepare the span gas cylinder and regulator; mount the calibration adaptor to the sensor head and apply gas to the detector. Program will request a confirmation to start Span calibration:



After pressing Enter key screen will again show countdown for span period. The Span period may vary depends on target gas:

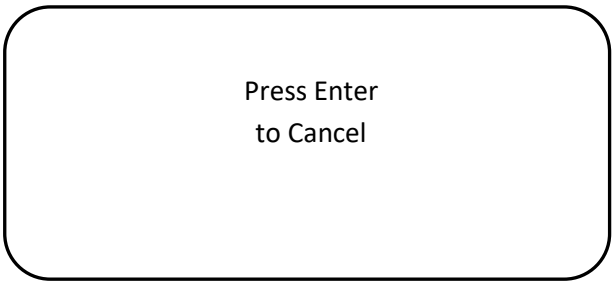


Span gas should be applied to sensor during span period. Detector will automatically set span level. When countdown completed it will return to monitoring screen via exiting from menu. If you try to enter menu detector will ask password again.

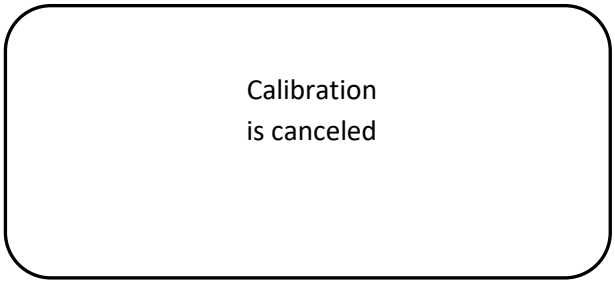
When the countdown is complete, the detector exits the menu steps and returns measurment screen but stays in calibration mode. In this case, the value is read on the screen as gas is applied to the detector. However, the detector does not generate an alarm because the detector is in calibration mode. After the calibration is completed, the detector continues to operate in calibration mode until the amount of gas detected falls below the value defined for alarm1 and the message “CALIBRATION” is displayed on the screen. When the amount of gas detected after the calibration falls below the alarm1 level, the detector switches to the normal operating mode from the calibration mode. The detector stays in calibration mode for up to 5 minutes and returns to normal operating mode. If the gas level does not decrease for 5 minutes after the calibration, the detector starts to generate an alarm.

Cancel Calibration

Calibration can be cancelled anytime during calibration operation. If user thinks something done wrong by mistake, should select “Cancel Cal” option on calibration menu. Detector will ask confirmation to cancel:



Press Enter key to cancel calibration operation. Detector will erase the values recorded during calibration steps and uses previously recorded calibration levels



Warranty statement

All products are designed and manufactured to the latest internationally recognized standards by Prosense under a Quality Management system that is ISO 9001 certified. As such Prosense warrants its products against defective parts and workmanship and will repair or (at its option) replace any instruments which are or may become defective under proper use within 12 months from date of shipment from Prosense Technology. The Product will be returned repaired or replaced if it is determined by Prosense that the part failed due to defective materials or workmanship. Warrant is only valid if product is shipped prepaid to Prosense at Kartal, Istanbul TURKEY, in a package equal to or in the original container accompanied by a detailed description of any issue. Prosense reserves the right to charge for any site attendance where any fault is not found with the equipment in case return of goods is not practicable. Prosense shall not be liable for any loss or damage whatsoever or howsoever occasioned which may be a direct or indirect result of the use or operation of the Contract Goods by the Buyer or any Party.

This warranty covers instrument and parts sold to the Buyer only by authorized distributors, dealers and representatives as appointed by Prosense Technology. The warranties set out in this clause are not pro rata, i.e. the initial warranty period is not extended by virtue of any works carried out there under.

Exclusions

If gas sensors are part of the Product, the gas sensor is covered by a twelve (12) month limited warranty of the manufacturer. The gas sensors are covered by this limited warranty is subject to inspection by Prosense for extended exposure to excessive gas concentrations if a claim by the user is made under this limited warranty. Should such inspection indicate that the gas sensor has been expended rather than failed prematurely, this limited warranty shall not apply to the Product.

This limited warranty does not cover consumable items, such as batteries, or items subject to wear or periodic replacement, including lamps, fuses, valves, vanes, sensor elements, cartridges, sinters or filter elements. This warranty does not cover damage caused by accident, abuse, abnormal operating conditions or poisoning of sensor.

Warranty Limitation and Exclusion

Prosense will have no further obligation under this limited warranty. All warranty obligations of Prosense are void in below cases:

- if the Product has been subject to abuse, misuse, negligence, or accident
- if the Distributor or User fails to perform any of the duties set forth in this limited warranty
- if the Product has not been operated in accordance with instructions
- if the Product serial number has been removed or altered

Limitation of Liability

In no event will Prosense Technology be liable for any incidental damages, consequential damages, special damages, punitive damages, statutory damages, indirect damages, loss of profits, loss of revenues, or loss of use, even if informed of the possibility of such damages.

It is understood and agreed that Prosense' liability, whether in contract, in tort, under any warranty, in negligence or otherwise shall not exceed the amount of the purchase price paid by the purchaser for the product. Under no circumstances shall Prosense be liable for special, indirect, or consequential damages. The price stated for the product is a consideration limiting Prosense' liability. No action, regardless of form, arising out of the transactions under this warranty may be brought by the purchaser more than one year after the cause of actions has occurred. To the extent permitted by applicable law, these limitations and exclusions will apply regardless of whether liability arises from breach of contract, warranty, tort (including but not limited to negligence), by operation of law, or otherwise.

Please contact info@prosense.com.tr for any inquiry or complaints.