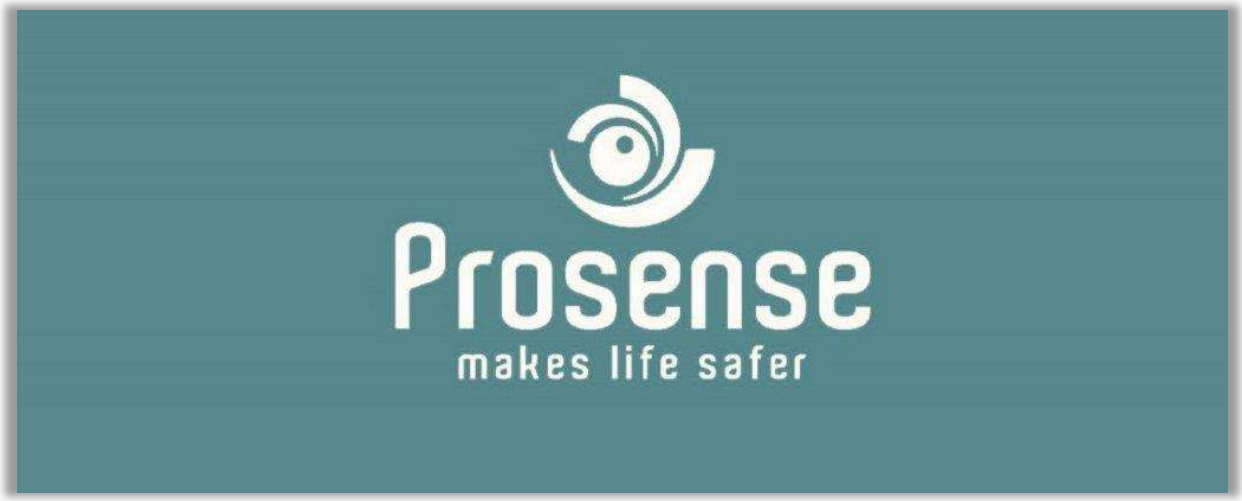


PROSENSE PDM
(Prosense Detector Monitor)

Software Manual

Prosense Teknoloji San. Ltd. Şti.
www.prosense.com.tr

Index

1. Introduction 2
1.1. Scope 2
1.2. Purpose 2
1.3. Who should use this document 2
1.4. References 2
1.5. Prequisites 2
1.6. Compatible Gas Detectors 2
2. Detector Configurations 3
2.1.PQ Series 3
2.2.P Series 4
2.3.PC3 Series 4
4. Software Installation 5
4.1. Access Database Engine Installation 5
4.2. PDM Software Installation 5
4.3. Licensing 5
5. PDM Software 6
5.1. Running the Software 6
5.2. Overview 7
5.2. Settings Tab 7
5.3. Display Mode Tab 8
5.3.1. Device Information 9
5.3.2. Display Mode Tab 10
5.3.3. Sensor Information 10
5.3.4. Alarm Levels 11
5.3.5. Base 11
5.3.6. Calibration 12
5.3.7. Voltages 12
5.3.8. Outputs 13
5.3.9. IR 13
5.4. Data Graph Tab 14
5.5. Data Recording Tab 15
5.6. Certificate Tab 16
5.7. User Reports Tab 16
5.8. License Information Tab 17
5.9. Calibration Tab 18
5.10. Detector Programming Tab 19
5.10.1. Overview 19
5.10.2. Sensor Settings 20
5.10.3. Alarm Settings 21
5.10.4. Status Currents 21
5.10.5. Base Settings 22

1. Introduction

1.1.Scope

Prosense PQ, P, PC3 series gas detectors support RS485 communication for diagnostic and configuration purposes. Prosense Detector Monitor is a tool for detector monitoring, configuration, calibration, data recording, automatic calibration certificate processing. This manual includes information about usage of PDM tool.

1.2.Purpose

This manual is designed to guide users about usage of this tool. Also highlights key points for problem solving and diagnostic purposes.

1.3.Who should use this document

This manual created for Prosense partners and distributors. Please contact Prosense for additional information.

1.4.References

- Prosense DPX Series Modbus Communication Manual.pdf
- Prosense Gas Detectors Modbus Communication Manual.pdf
- https://www.prosense.com.tr
- https://modbus.org/
- https://www.microsoft.com/en-us/download/details.aspx?id=54920

1.5.Prequisites

- Microsoft Access Database Engine 2010 or higher version.
- USB to RS485 converter or onboard RS485 port.
- License key acquired from Prosense.

1.6.Compatible Gas Detectors

All Prosense gas detector models with serial communication ports are compatible.

PQ Series

P Series

PC3 Series

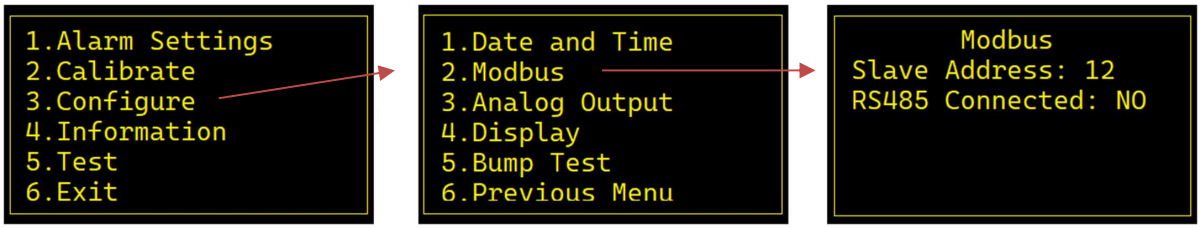
2. Detector Configurations

This section describes detector connections and settings for PDM communication. Detector Id(address) must be configured or known before performing connection. Configuring detector IDs differs depending of the detector series.

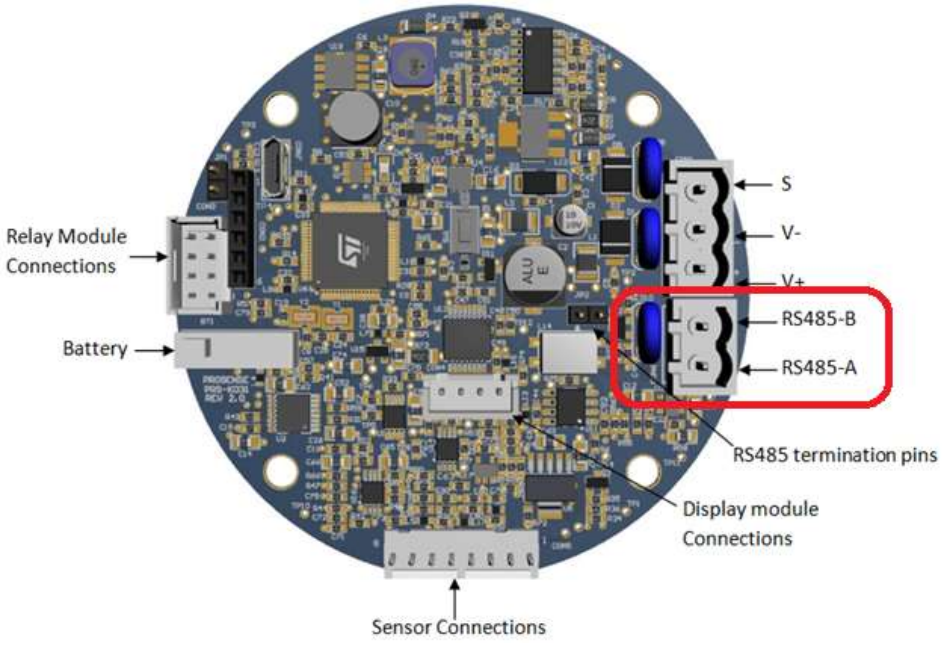
2.1.PQ Series

PQ series detectors don't have switches for addressing. Address is configurable via display for PQD series. For PQN series hand held terminal (Purchased separately) could be used. Address is also configurable via PDM software as described in this manual.

For configuring detector address, please enter the display menu. Default password is **"1234"**. Go to 3.Configure -> 2.Modbus by pressing up down and menu buttons. Set the Slave Address as desired. If address change is not needed press and hold menu button to go back previous menu.



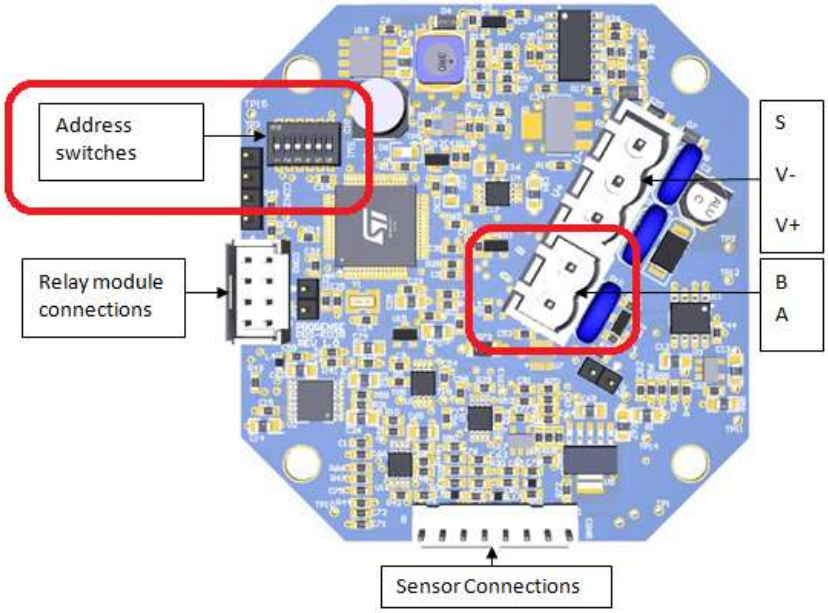
RS485 connection must be done to following ports.



Please visit www.prosense.com.tr/pq-series for additional information about PQ series detectors.

2.2.P Series

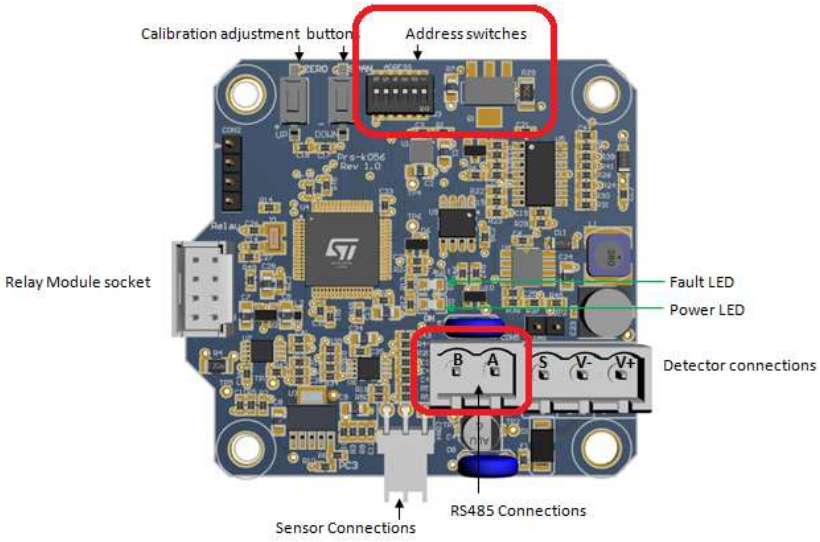
P series detectors are addressable via dip switches or PDM software. 5 dip switches are used for addressing. Addressing via switches are limited from 1 to 31. If a different address will be used addressing must be done via PDM. All 5 switches must be in off position for software addressing.



Addressing via dip switches is binary. Please visit www.prosense.com.tr/p-series for additional information about PQ series detectors.

2.3.PC3 Series

PC3 series detectors are addressable via dip switches or PDM software. 5 dip switches are used for addressing. Addressing via switches are limited from 1 to 31. If a different address will be used addressing must be done via PDM. All 5 switches must be in off position for software addressing.



Addressing via dip switches is binary. Please visit www.prosense.com.tr/pc3-series for additional information about PQ series detectors.

3. RS485 Port Configuration

A and B ports of detectors must be connected to RS485 converter. Please check for a properly configured serial port via device manager. For usb to serial converters suitable drivers must be installed.

4. Software Installation

4.1.Access Database Engine Installation

Before installing PDM software please visit the link below and download and follow instructions to install Access Database Engine.

https://www.microsoft.com/en-us/download/details.aspx?id=54920

4.2. PDM Software Installation

There is no need for an installer to be executed for PDM software. Copy the PDM software folder to desired location, create a shortcut for “Prosense Detector Monitor.exe” to desktop.

4.3. Licensing

To use PDM software a license key from Prosense must be obtained. There are multiple functions for this tool and license may differ for usage.

Please refer following table for licensing details.

Detector Monitoring / Diagnostics	Free for one user
Data Recording	Free for one user
Detector Programming	Free for one user
Detector Calibration	License limited. Please contact sales team for quotation.
Automatic Certificate Processing	License limited. Please contact sales team for quotation.

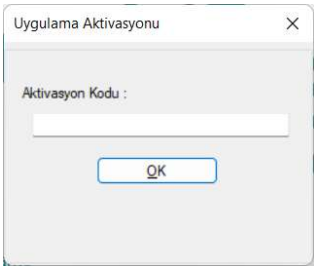
Licenses are produced depending on calibration and user quantity. User licenses are based on MAC addresses of computers that PDM software installed. For each installation of software activation code must be entered and user quantity drops. If user quantity reaches the license limit, software could not be activated.

5. PDM Software

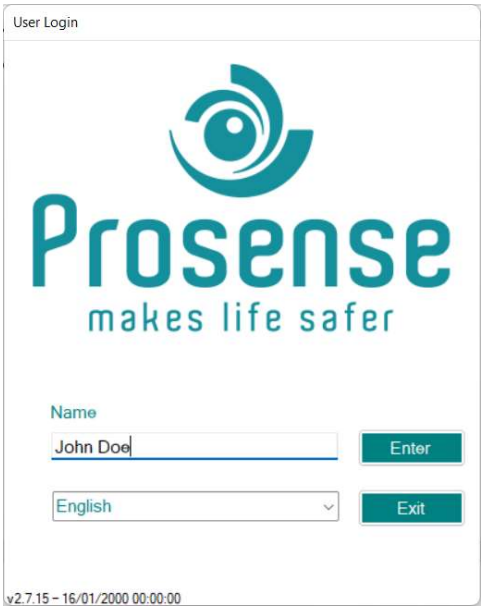
5.1.Running the Software

Double click “Prosense Detector Monitor.exe” or shortcut.

At first run, a window will be prompt and license key must be entered. Please click OK after entering the license key.



Entering the license key is not required after first run.

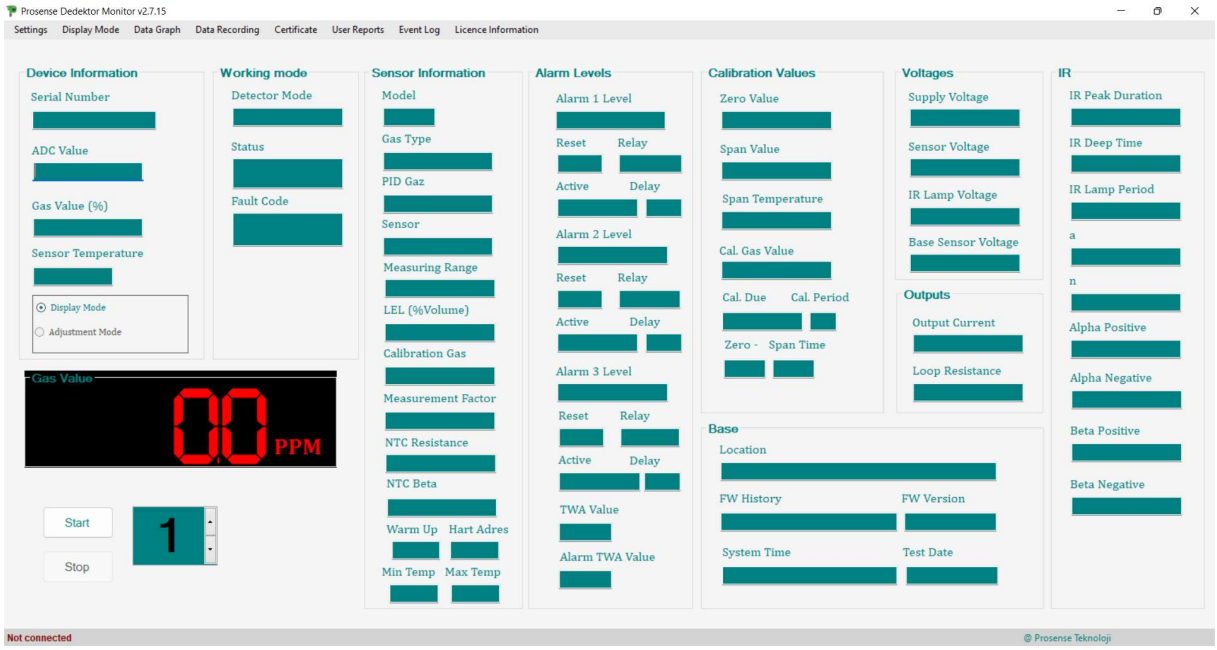


PDM software login screen will prompt. PDM software supports English, German and Turkish languages. Enter user name, select language then press “Enter”.

User name and active software duration is logged. It would be useful to enter valid credentials for logging.

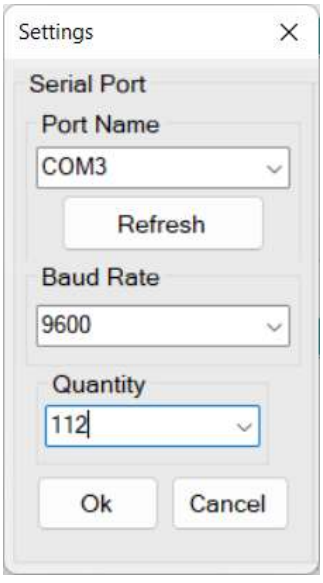
5.2. Overview

Overview of the software seems like this. Please refer to each section for detailed information.



5.2.Settings Tab

First thing to the is configuring connection settings.



Port Name	Click Refresh button to update all available COM ports. Then select correct COM port from dropdown menu.
Baud Rate	Select baud rate of detector.
Quantity	Quantity is the values read from detector. Usually, it is 112. If the quantity is above the limits, software will show connected but no values will be updated. If the quantity is below, you may have some issues entering the programming mode or saving configurations.

5.3.Display Mode Tab

Home page of the software is Display Mode and all the diagnostic information can be seen at this page.

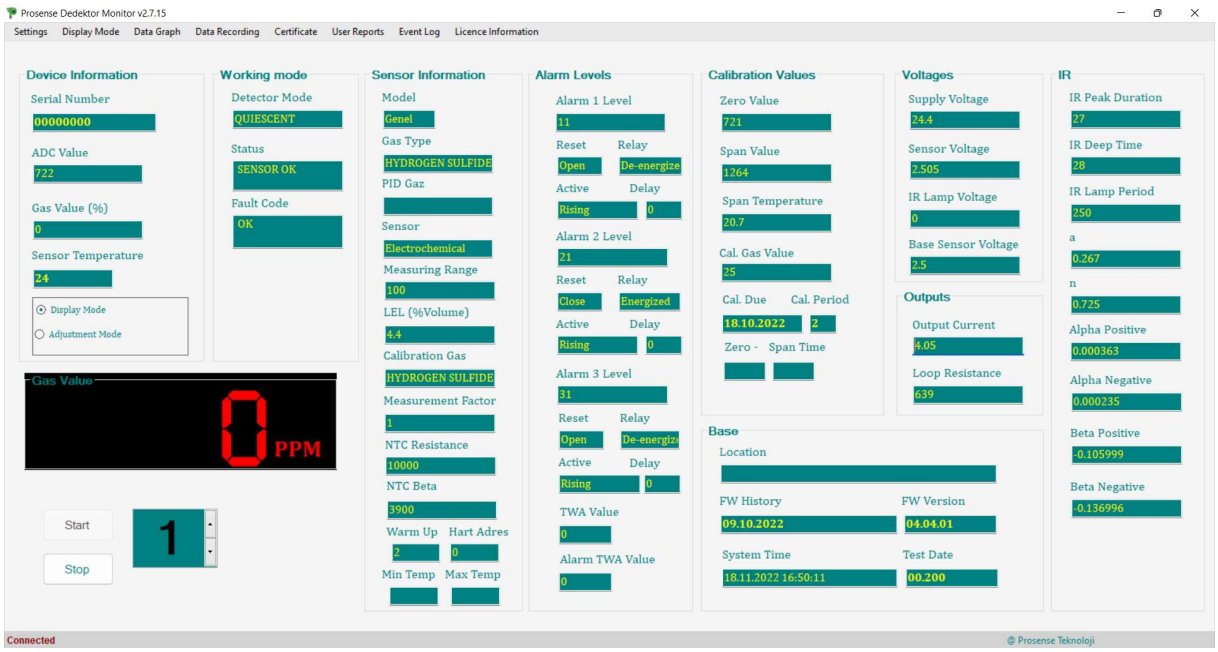
Set the address of the detector via up and down buttons and then click start button to connect.

There is an indication at the bottom left side of the screen.

If this indication show Connected at first then disappears, a valid COM port is selected but software could not connect to a detector. Please check if the correct COM port is selected, detector Id and baud rate, wiring and if detector energised and try again.

If this indication shows Connected but no updated values shown in screen click stop button. Change the quantity from settings window and try again.

If this indication shows Connected and values update a proper connection is done as following:



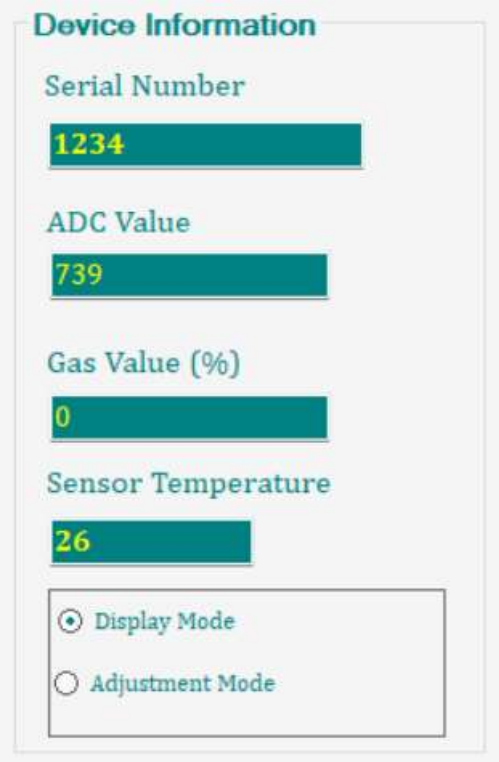
5.3.1. Device Information

Serial Number: Serial number of the connected detector.

ADC Value: ADC value is the direct sensor measurement value. When gas detected this value increases for semi conductor, catalytic, pellistor, PID and electrochemical sensors and decreases for IR sensor.

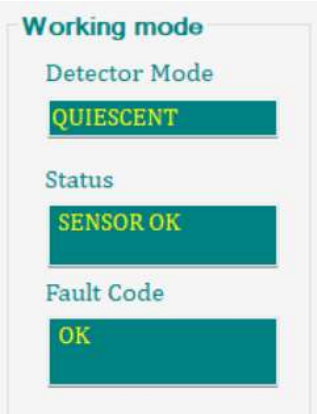
Gas Value (%): Measured gas value.

Sensor Temperature: Measured sensor temperature in °C.



Display Mode / Adjustment Mode: When adjustment mode is selected Calibration and Detector Programming tabs activates and can be entered.

5.3.2. Display Mode Tab



Detector Mode: General status of detector.

Status: General status of sensor.

Fault Code: Detailed fault information based on indication priority.

5.3.3. Sensor Information

Model: Indicates model of connected detector.

Gas Type: Indicates gas information of connected detector.

PID Gas: If PID sensor used Indicates PID gas, otherwise empty.

Sensor: Indicates sensor type.

Measuring Range: Indicates measuring range for detector.

LEL (%Volume): Indicates LEL value by %VOL of the detector if connected to a flammable gas detector. Otherwise 4.4 for methane. This parameter will not valid for toxic gases and oxygen.

Calibration Gas: Indicates calibration gas.

Measurement Factor: Indicates multiplier if a different gas was used for last calibration.

NTC Resistance: Thermistor information for temperature measurement.

NTC Beta: Thermistor information for temperature measurement.

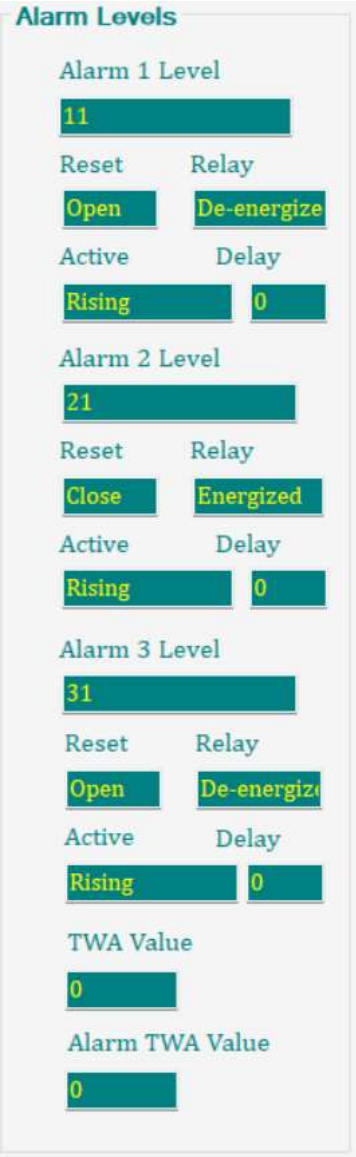
Warm Up: Warm up time in minutes.

Hart Address: HART address of the detector.

Min Temp: Min temperature for the detector in °C.

Max Temp: Max temperature for the detector in °C.

5.3.4. Alarm Levels



Alarm Level: Indicates alarm level configuration.

Reset: Indicates if auto-reset is active. Open means when the alarm cleared alarm indication will disappear automatically, closed alarm information is latched and reset is needed to clear the alarm.

Relay: If coil of relay is normally energised or not.

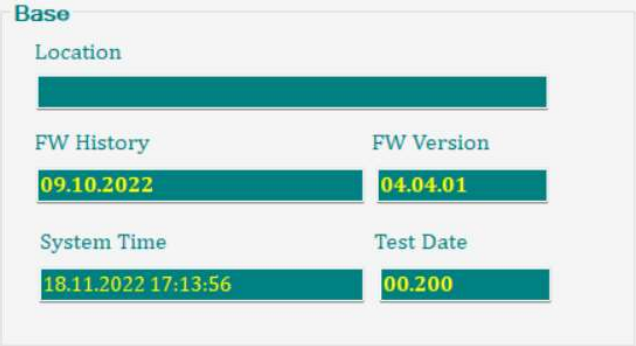
Active: Indicates if the alarm activates when the measured level is higher or lower then alarm value.

Delay: Some applications may require to clear the alarm after a period of time, for example ventilation or exhaust fan controlling. Displays the delay time in minutes.

TWA Value: Shows time weighted average value for STEL.

Alarm TWA Value: Shows alarm value for TWA.

5.3.5. Base



Location: Location information of connected detector.

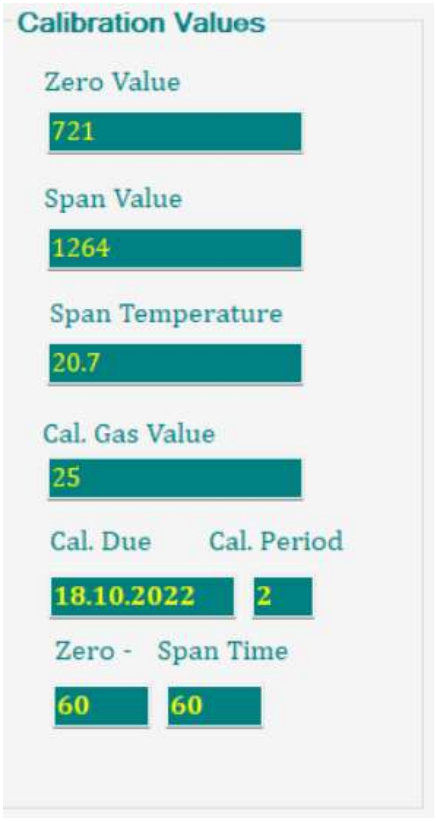
FW History: Firmware version date.

FW Version: Firmware version.

System Time: System time. Available only for PQ series.

Test Date: Test date or period.

5.3.6. Calibration



Zero Value: This is the recorded Zero measurement value at last calibration. When ADC level in Device Information group is close to this level when absence of gas. If ADC value is lower than this value (Except IR sensors) negative drift occurred and detector might need calibration.

Span Value: This is the gas measurement value of the sensor at last calibration.

Span Temperature: Temperature at last calibration. Might be useful when temperature differences are too wide and this situation effects sensor measurement.

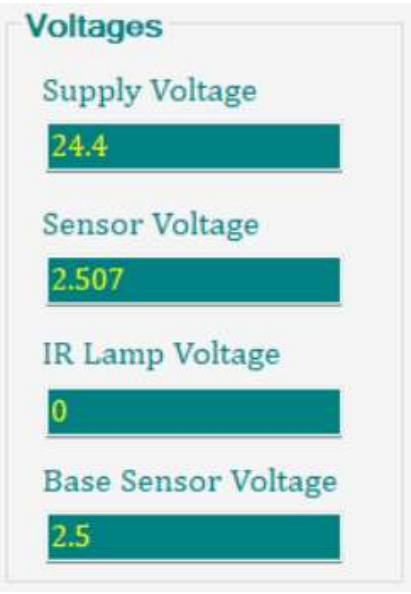
Cal. Gas Value: Calibration gas concentration for last successful calibration.

Cal. Due: Next calibration date.

Cal. Period: Calibration period in months.

Zero – Span Time: Zero and span calibration durations in seconds. Detector will need calibration gas applied for this period while counting down on display.

5.3.7. Voltages



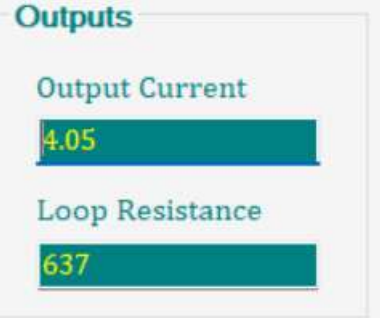
Supply Voltage: Input voltage of detector. Must be 15-30V

Sensor Voltage: Sensor voltage provided from base. Sensor voltage can be vary depending of the sensor type used to sense target gas.

IR Lamp Voltage: Sensor voltage provided from base if IR sensor used. Otherwise it will be 0.

Base Sensor Voltage: Sensor voltage setting.

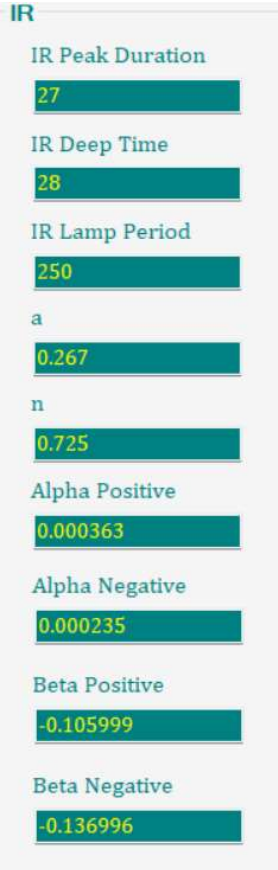
5.3.8. Outputs



Output Current: Indicates the analogue output current in mA real-time.

Loop Resistance: Indicates loop resistance. If too high it means open circuit. If close to zero it means short circuit at analogue output. Must be checked first for current output faults. Please check detector user manual for details.

5.3.9. IR

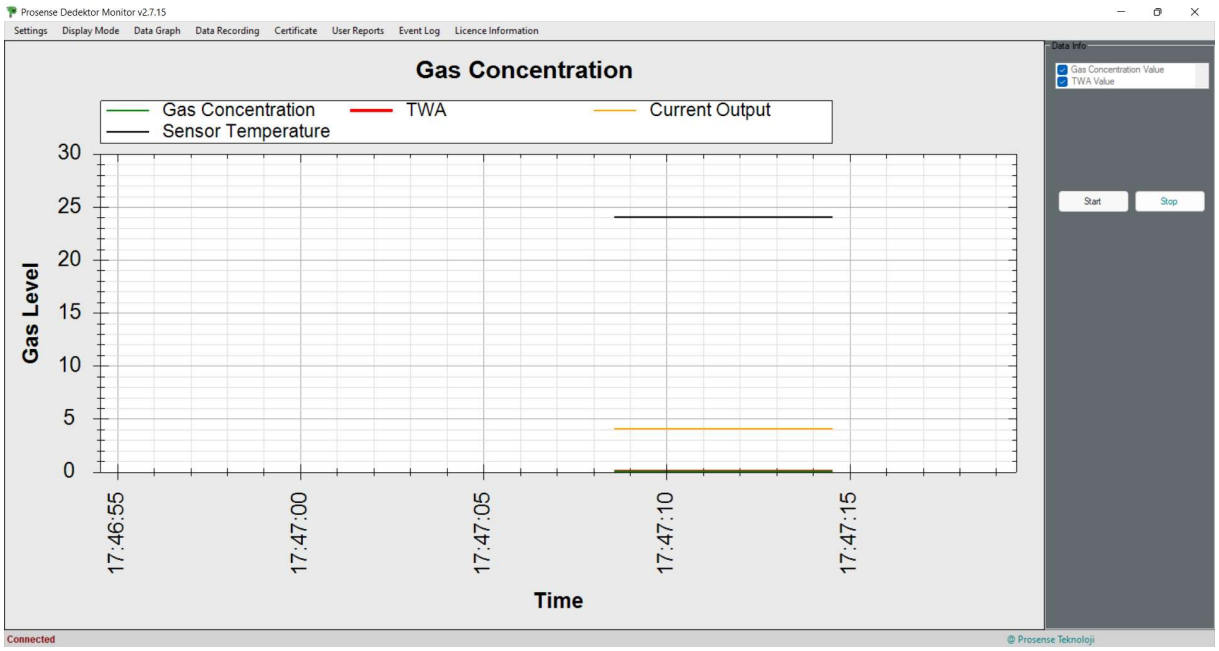


Indicates IR diagnostic values in case of IR sensor usage.

5.4.Data Graph Tab

This page displays a real-time value chart for diagnostic purposes. Click start to activate the live chart.

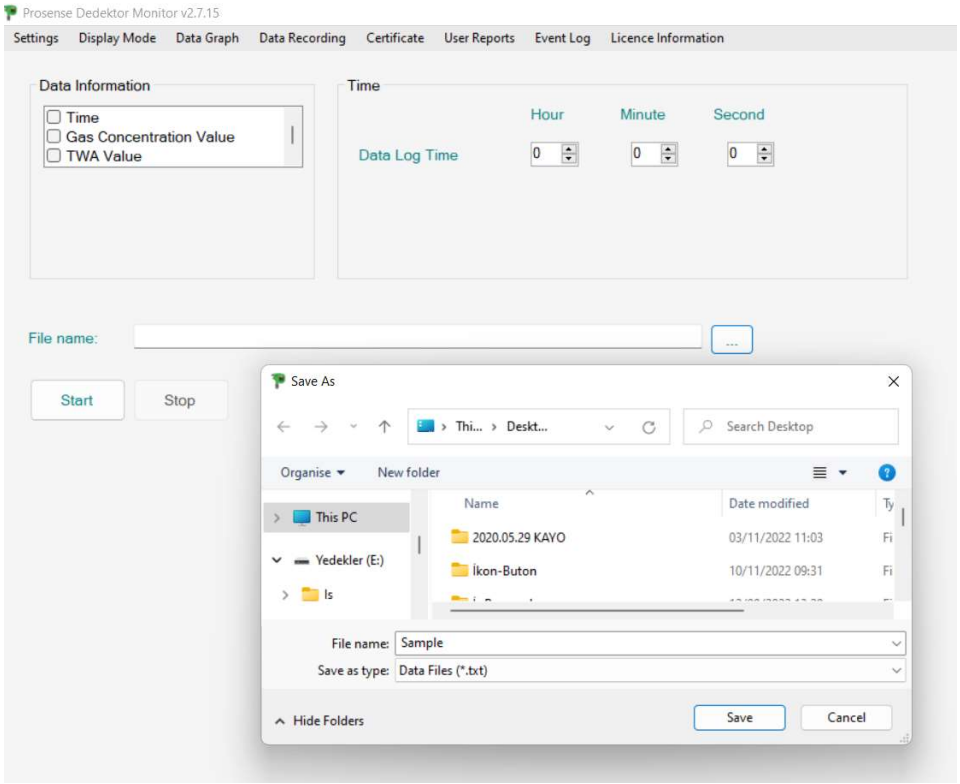
Gas concentration, TWA, Current Output, Sensor Temperature measurements can be selected.



5.5.Data Recording Tab

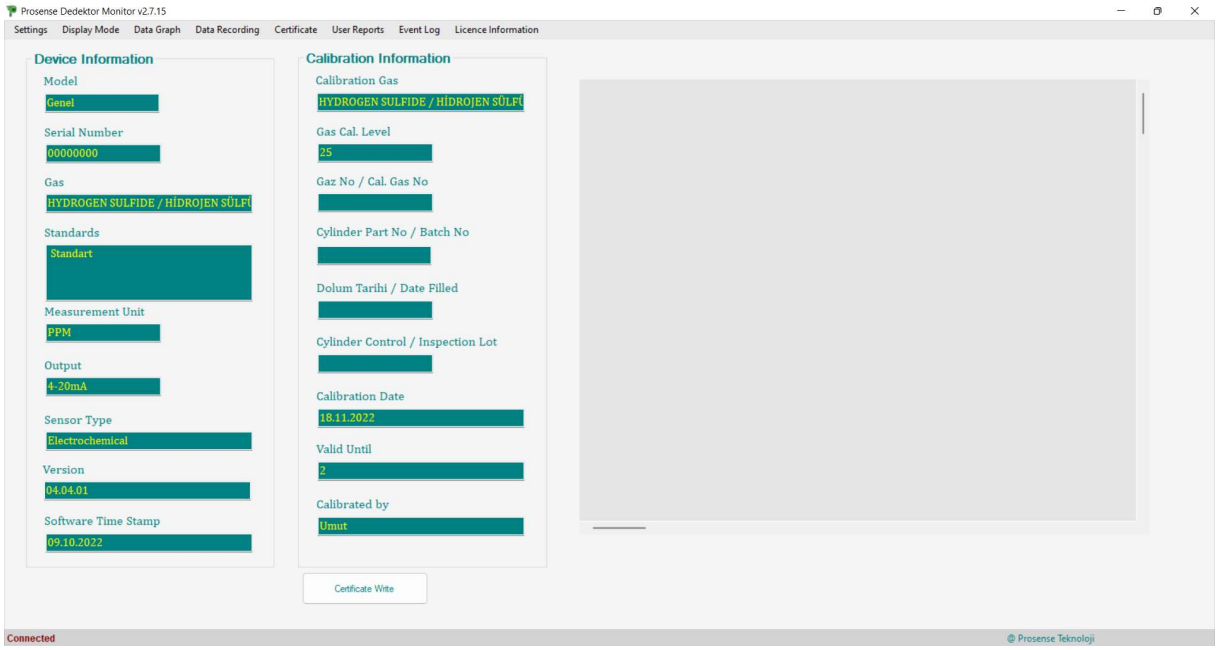
PDM software can be used as data logger for diagnostic purposes.

Gas concentration, TWA, Current Output, Sensor Temperature measurements can be selected for logging. Data log time can be used using up and down buttons. A txt file must be selected or created by pressing "…" button. Start button starts and stop button stops data logging.



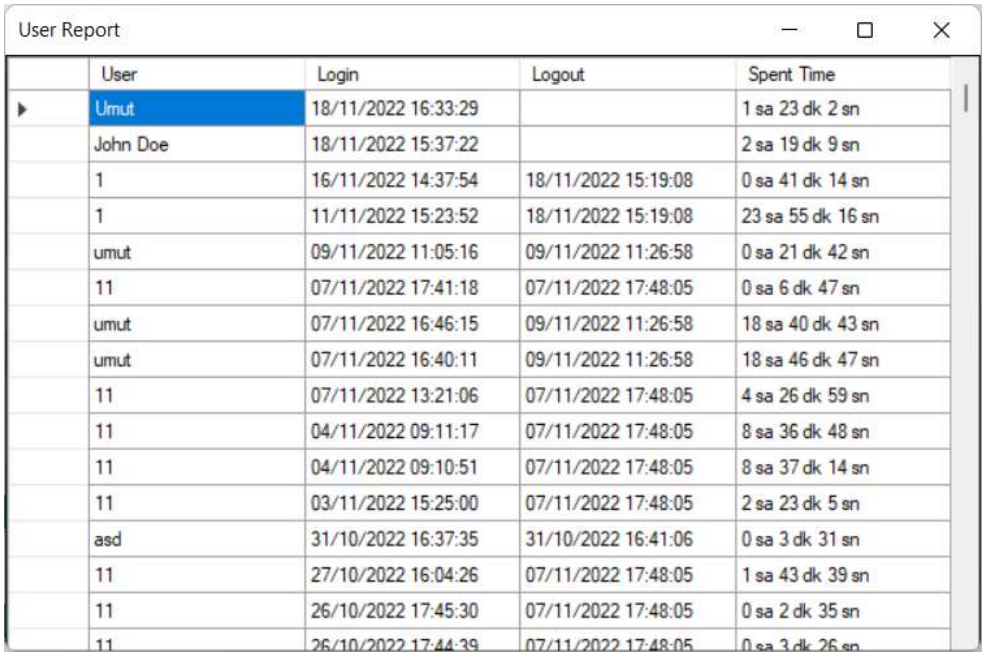
5.6.Certificate Tab

This page is to produce calibration certificates. After performing a successful calibration additional information for calibration gas must be entered. After all the necessary information is completed click “Certificate Write” button to create calibration certification.



5.7. User Reports Tab

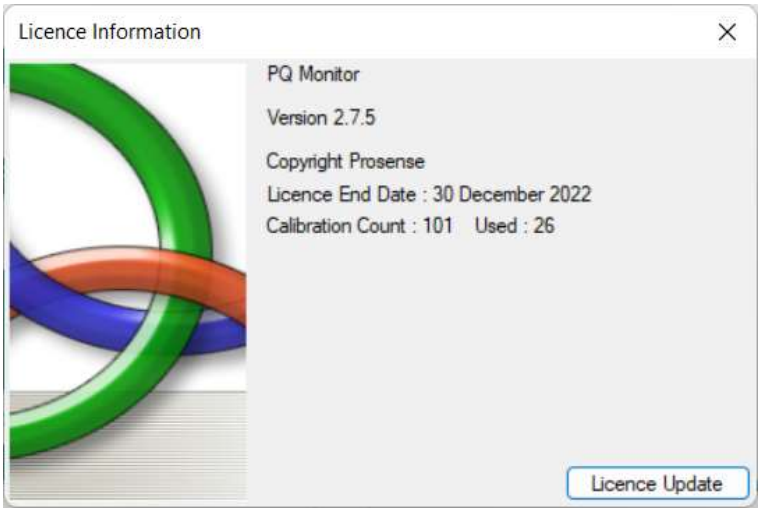
This window shows the user log and duration of usage of PDM software.



User	Login	Logout	Spent Time
Umut	18/11/2022 16:33:29		1 sa 23 dk 2 sn
John Doe	18/11/2022 15:37:22		2 sa 19 dk 9 sn
1	16/11/2022 14:37:54	18/11/2022 15:19:08	0 sa 41 dk 14 sn
1	11/11/2022 15:23:52	18/11/2022 15:19:08	23 sa 55 dk 16 sn
umut	09/11/2022 11:05:16	09/11/2022 11:26:58	0 sa 21 dk 42 sn
11	07/11/2022 17:41:18	07/11/2022 17:48:05	0 sa 6 dk 47 sn
umut	07/11/2022 16:46:15	09/11/2022 11:26:58	18 sa 40 dk 43 sn
umut	07/11/2022 16:40:11	09/11/2022 11:26:58	18 sa 46 dk 47 sn
11	07/11/2022 13:21:06	07/11/2022 17:48:05	4 sa 26 dk 59 sn
11	04/11/2022 09:11:17	07/11/2022 17:48:05	8 sa 36 dk 48 sn
11	04/11/2022 09:10:51	07/11/2022 17:48:05	8 sa 37 dk 14 sn
11	03/11/2022 15:25:00	07/11/2022 17:48:05	2 sa 23 dk 5 sn
asd	31/10/2022 16:37:35	31/10/2022 16:41:06	0 sa 3 dk 31 sn
11	27/10/2022 16:04:26	07/11/2022 17:48:05	1 sa 43 dk 39 sn
11	26/10/2022 17:45:30	07/11/2022 17:48:05	0 sa 2 dk 35 sn
11	26/10/2022 17:44:39	07/11/2022 17:48:05	0 sa 3 dk 26 sn

5.8.License Information Tab

This window shows information about license. Via clicking License Update button current information can be downloaded from online server. “Calibration Count” shows total license defined for activation code and “Used” shows how many calibration licenses have been used.



5.9.Calibration Tab

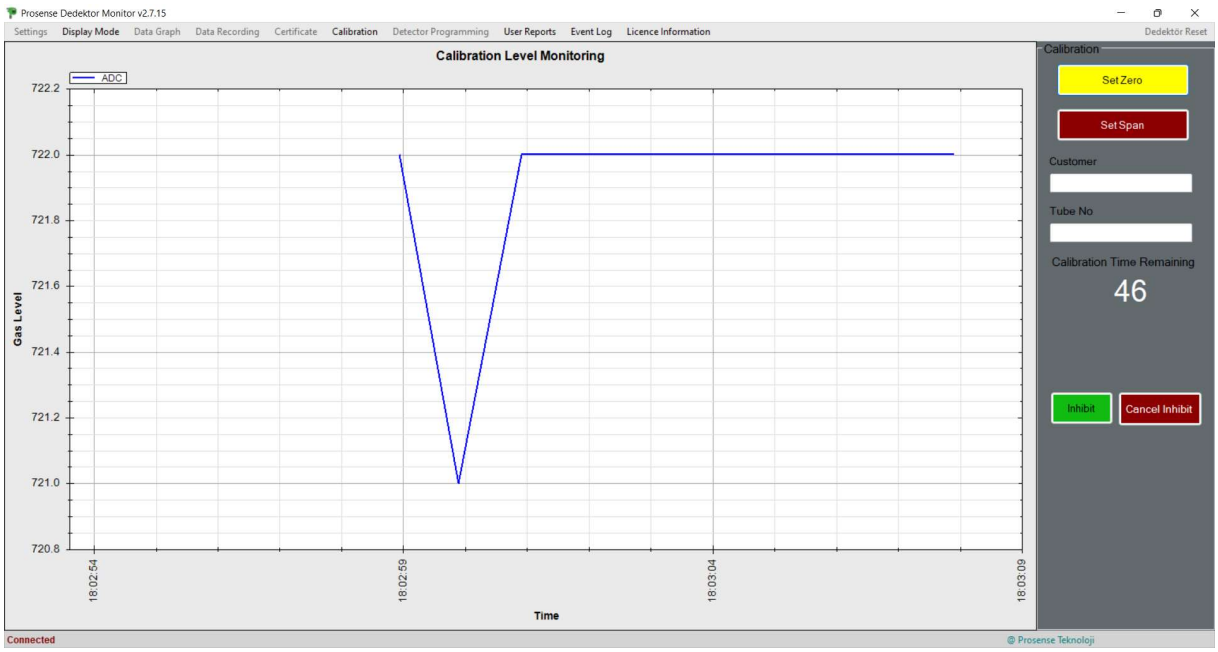
This tab is used for calibration.

Zero Calibration: “Set Zero” button performs a zero calibration. Make sure clean air applied to detector and press “Set Zero”. After countdown finishes check if the zero value at “Display Mode” is updated.

Span Calibration: “Set Span” button performs a span calibration. Prior to span calibration please check “Detector Programming” tab for calibration gas information. “Calibration Gas” and “Calibration Gas Value” parameters must be entered correctly and saved before performing span calibration as all the cross multipliers for different gasses are recorded in database.

“Customer” and “Tube No” information are mandatory and must be filled.

After countdown finishes, span calibration is completed if no additional warning shown. Check if the span value at “Display Mode” is updated.



If the calibration license number exceeded “Set Span” button will not function.

5.10. Detector Programming Tab

"Detector Programming" tab is used for detector configuration.

5.10.1. Overview

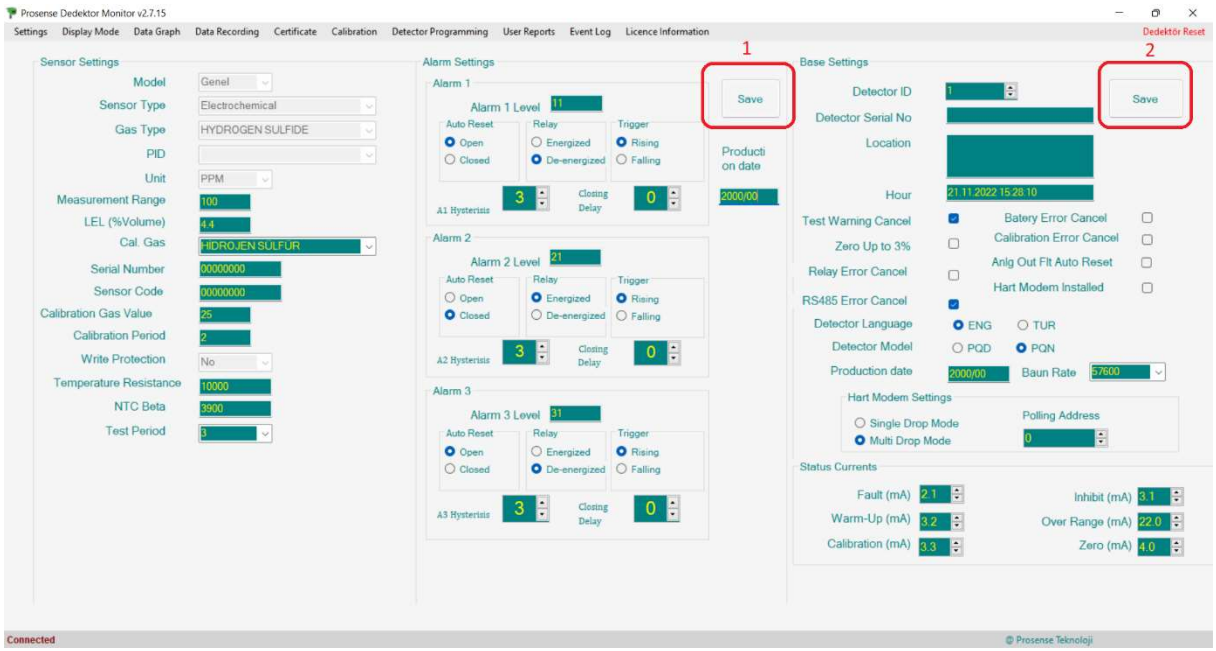
Overview of "Detector Programming" tab is shown below. There are two save buttons and three configuration and information groups at this page.

Save Button 1: Saves "Sensor Settings" and "Alarm Settings" to sensor head. This information is recorded at sensor head so there is no need additional calibration process after sensor head is replaced.

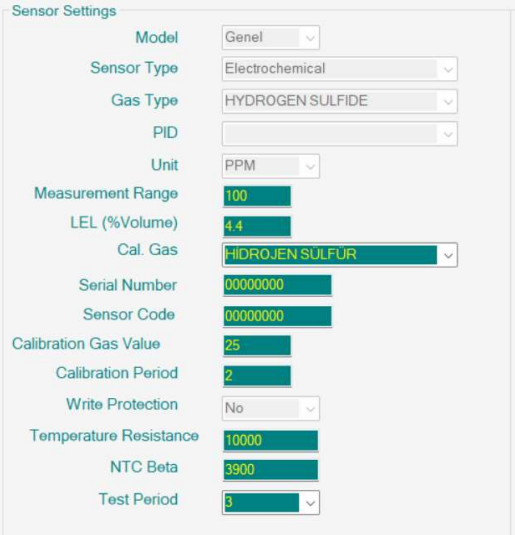
Save Button 2: Saves "Base Settings" and "Status Currents" group to transmitter.

Some values are not valid for all types and series. Some values are just for information purposes and can not be changed.

If data entered are not valid, a warning pops up at saving process that indicates "illegal data". For example, alarm 1/2/3 must be ascending values; if alarm 2 is lower than alarm 1 for a %LEL sensor this is not a valid configuration and tool provides a warning and data can not be uploaded.



5.10.2. Sensor Settings



Model: Model information. Can not be changed.

Sensor Type: Sensor Type information. Can not be changed.

Gas Type : Gas Type information. Can not be changed.

PID: PID gas information. Valid only for PID sensors, otherwise blank. Can not be changed.

Unit: Measurement unit information. Can not be changed.

Measurement Range: Measurement range information. 100 for LEL or volume sensors. Differs for ppm/ppb sensors.

LEL (%Volume): %Volume LEL value for flammable gasses. Default 4.4 for methane, not valid for ppm/ppb sensors.

Cal. Gas: Displays calibration gas information. Please select appropriate gas prior to calibration and save. If Cal. Gas value could not be saved or changes back to its old value, selected gas is not suitable for calibration. If gas type changed and no calibration performed, value will change back to last calibration gas after a period of time.

Serial Number: Serial number information. Can not be changed.

Sensor Code: Sensor code information. Can not be changed.

Calibration Gas Value: Displays calibration gas concentration value information. Please select appropriate concentration prior to calibration and save. If value could not be saved or changes back to its old value, selected concentration is not suitable for calibration. If gas concentration changed and no calibration performed, value will change back to last calibration concentration after a period of time.

Calibration Period: Calibration period in months. Can be changed between 1-12. Detector may produce calibration error upon exceeding calibration period.

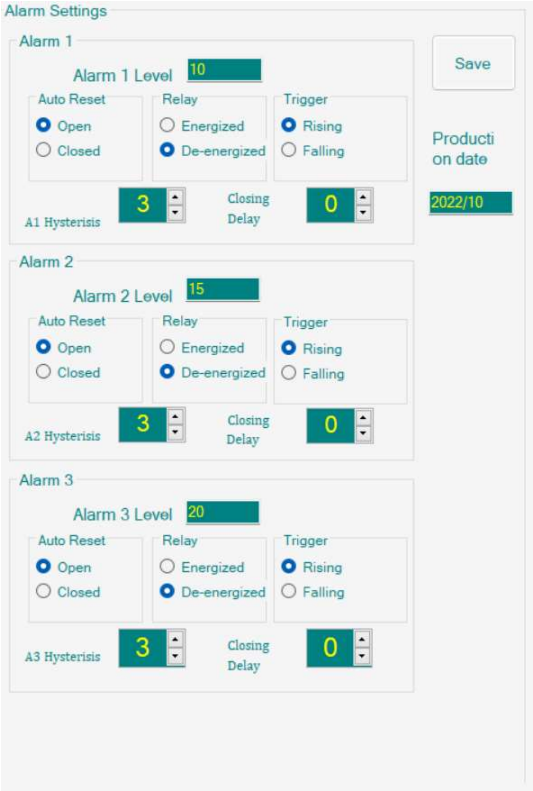
Write Protection: Information only, can not be changed. Configured at factory. If yes writing data to detector is prevented.

Temperature Resistance: Temperature NTC sensor information. Can not be changed.

NTC Beta: Temperature NTC sensor information. Can not be changed.

Test Period: Test period in months. Can be changed between 1-3. Detector may produce test due upon exceeding calibration period.

5.10.3. Alarm Settings



Alarm Level : Alarm level configuration.

Auto Reset : Auto-reset setting. Open means when the alarm cleared alarm indication will disappear automatically, closed alarm information is latched and reset is needed to clear the alarm.

Relay : If coil of relay is normally energised or not. When set to "Energised", relay will change contacts when detectors power is off.

Trigger : Indicates if the alarm activates when the measured level is higher or lower then alarm value.

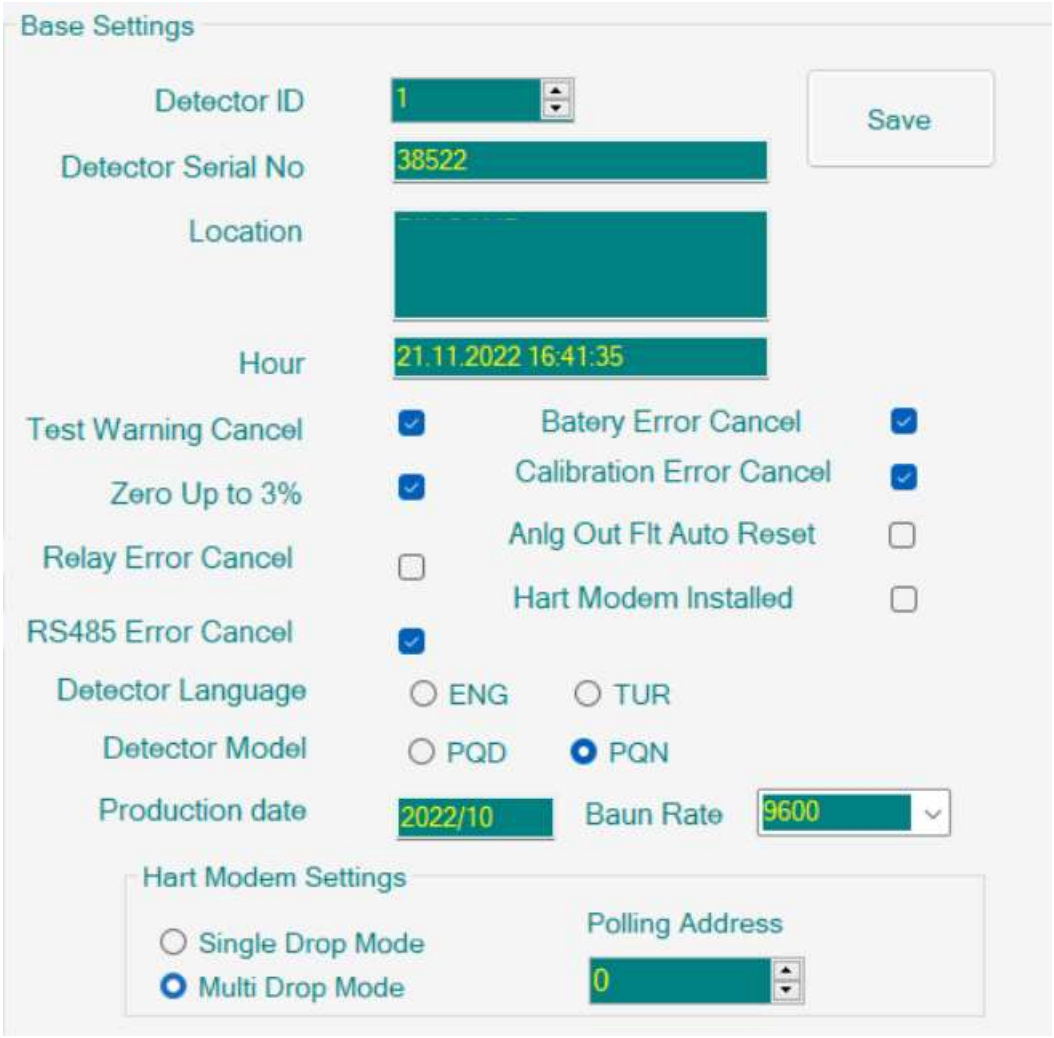
Closing Delay : Some applications may require to clear the alarm after a period of time, for example ventilation or exhaust fan controlling. Displays the delay time in minutes.

Hysteresis: Alarm hysteresis setting. After an alarm condition occurs, gas value must be measured alarm value - hysteresis value for alarm indication to be cleared.

5.10.4. Status Currents

These are the current output settings. At example below detector produces 2.0mA output while at "Fault" status, 3.0mA for "Inhibit", "Warm-Up" and "Calibration status", 22.0mA at "Over Range" status and 4.0mA at "Zero" status.

5.10.5. Base Settings



Detector ID: Detector address setting. For all detector series addressing via PDM tool is possible. For P and PC3 series addressing switches must be in off position for software addressing.

Detector Serial No: Detector serial number information. Can not be changed.

Location: Location/Name Text/Company information. Maximum 24 characters.

Hour: Date and time information. Only PQ series stores date and time information. When base data saved, current local time of computer written to detector.

Test Warning Cancel: If ticked: Detector will **not** produce test due error upon exceeding the test period.

Battery Error Cancel: Only appliable in PQ series. PQ series includes a battery for internal logging and data recording and storing time information. Detector will produce a fault message if battery is not installed. If logging functions are not needed battery might not be installed. If ticked: Detector will **not** produce battery error if battery is missing or battery run out.

Zero Up to 3%: If ticked: Detector will not produce fault for %3 negative drift and will not display measurement until 3% of range is reached. For example, if this setting is ticked and you have a ppm sensor with 0-1000ppm range, there will be no measurement until gas concentration exceeds 30ppm.

Calibration Error Cancel: If ticked: Detector will **not** produce calibration due error upon exceeding the calibration period. Note that according to EN 60079:29-2 standard gas detectors should be calibrated periodically between 3 to 12 months.

Relay Error Cancel: SIL certified detectors (PQS series) will shut off if any problem to relay card occurs. If ticked: Detector will continue to function normally if relay error occurs.

Analogue Out Flt Auto Reset: In case of any fault at analogue current output, for example short or open circuit, detector base will produce fault. If this setting ticked: After fault situation fixed analogue output fault message is cleared. If not ticket: Detector must be reset to clear the message.

Hart Modem Installed: Only appliable for PQS series detectors. Hart modem is optional and plugged in to base card. If hart modem is installed this setting must be ticked.

RS485 Error Cancel: Detectors will produce RS485 Error message when RS485 communication via panel, Scada or 3rd party systems goes down. If this setting ticked: Detector will **not** produce RS485 error message.

Detector Language: Detector display language setting. Only appliable to PQD series of detectors.

Detector Model: Detector display setting. Only appliable to PQ series detectors. If PQD selected and display not installed detector will produce display fault message.

Production date: Show production date. Year/Month.

Baud Rate: Detector communication baud rate. Factory default is 9600. 57600 and 9600 can be selected.

Hart Modem Settings

Single Drop Mode / Multi Drop Mode: HART communication mode selection. If single drop mode is selected analogue current output and HART communication is active. If multi drop mode is selected analogue output will be pulled to 4mA and only HART communication will be active. Multi drop mode means detectors are connected daisy chain and only communicates via serial HART communication. Single drop mode means detector will modulate HART communication data over analogue output signal and both signals can be used simultaneously.

Polling Address: HART address of detector.