XP CPM Quick Reference

Explosion Proof Industrial Gas Monitor

(Version 1.03)

Warranty and Disclaimer

A gas monitoring system alone cannot prevent hazardous conditions from occurring. The reliability of a gas monitoring system, and the resultant safety level is dependent on, and the responsibility of the user. The user's responsibilities include, but are not limited to:

- Ensuring that the correct equipment is specified for conditions at the particular site
- Following recommended installation guidelines
- Following recommended wiring guidelines
- Meeting applicable safety and electrical codes
- Scheduling regular calibrations and servicing
- Replacing inoperative or questionable parts or units

WARRANTY

Conspec Controls Inc. provides warranty service for one (1) year from the shipping date on all electronic and mechanical components. Sensor elements are covered under warranty for a period of six (6) months. Warranty service is limited to defects in materials and workmanship on units which fail under normal use. Conspec will repair or replace any unit found to have failed due to defects in materials or workmanship. This warranty is voided if the unit has been misused, damaged due to incorrect wiring, or altered before return to the factory. No other warranty is authorized other than the above.

Before returning a product for service, call Conspec Controls Inc. for a Return Authorization Number (RA#) at (800) 487-8450. Returned units should be packaged securely as damages incurred during shipping are not covered under warranty.

Wiring/Installation

Locate a suitable location free of drips and drafts that allows the user to safely access the unit. The Industrial Gas Monitor shall be mounted so the detection head is pointing downward. Securely mount the unit using industry approved methods and materials taking into account sound mechanical and electrical practices.

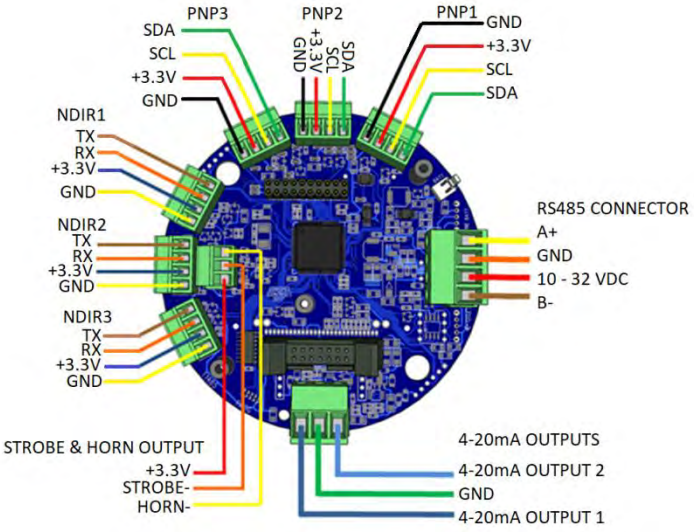
It is the user's responsibility to follow all applicable Federal, State, Local Building and Electrical Codes including NEC Guide Lines.

The Industrial Gas Monitor is powered via a 4-conductor 18-22AWG shielded cable.

Installation Recommendations

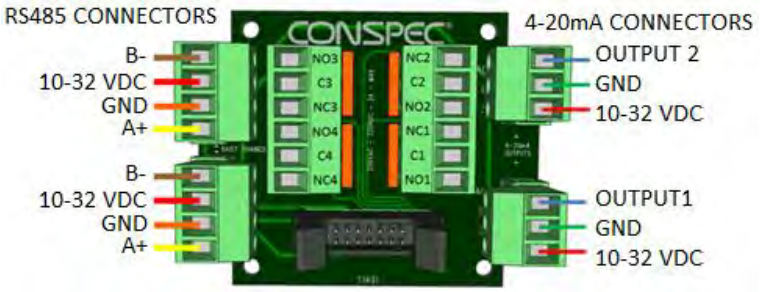
1. Isolate process power from safety equipment power with proper grounding techniques
2. Install ALL equipment to meet class 1 div 2 standards
3. Do not install cabling to Conspec monitor parallel with cabling to burner igniters
4. Ground all cable shields
5. Isolate DC common from earth ground
6. Bond earth grounds to prevent ground loops

CPM Processor Board Connections



Relay Expansion Board Connections

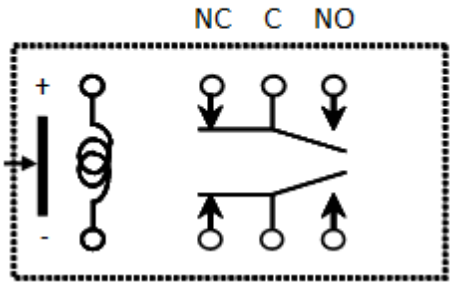
If the below relay expansion board is installed, use the following wiring diagram:



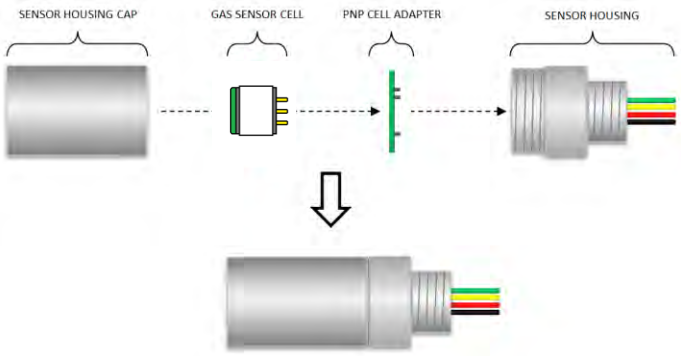
Relay Ratings

Maximum Switching Power	60 W, 125 VA
Maximum Switching Voltage	220 VDC, 250 VAC
Maximum Switching Current	2 A
Maximum Carrying Current	2 A

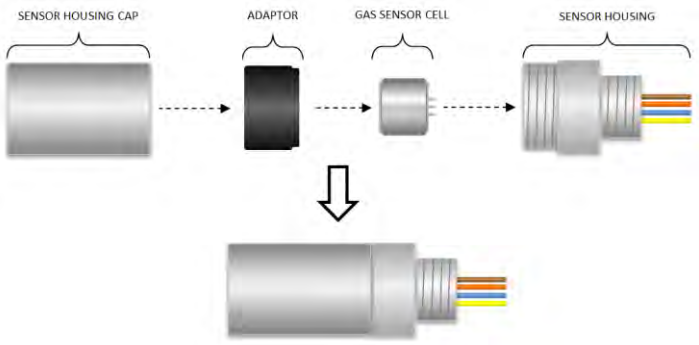
Non-latch type
(Non-energized position)



PNP Gas Sensor Assembly

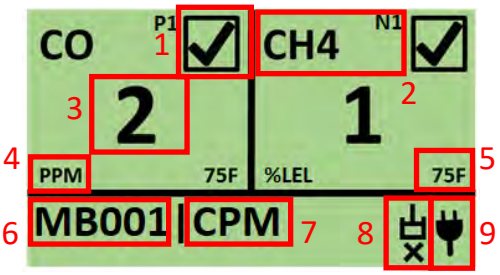


NDIR Gas Sensor Assembly



MAIN SCREEN

Once the warm up timer clears, the display will show the “Main Screen”:

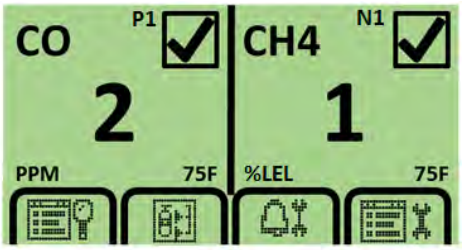


1. **Status:** Gas sensor status. See table below for different statuses.

	Normal gas reading and no alarms breached.
	Sensor Fail High (Above MAX range)
	Sensor Fail Low (Below MIN range). *May occur when sensor ages.
	Sensor reading is in alarm 1
	Sensor reading is in alarm 2
	Sensor reading is in alarm 3
	Sensor reading is in alarm 4
	Calibration is due, calibration period is user defined
	Sensor is in warm up delay
	Dislodged sensor. The sensor element is mechanically dislodged from the board or is missing.

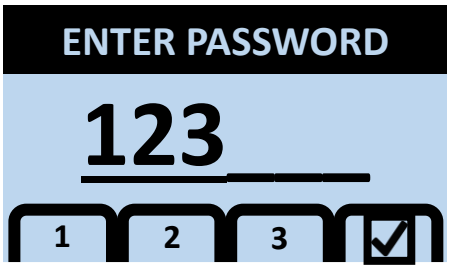
2. **Sensor Type:** Sensor type and port number
3. **Reading:** Live reading.
4. **Units:** Gas unit of measurement (e.g. PPM)
5. **Temperature:** Sensor temperature reading. The user can switch between °C/°F.
6. **Address:** MODBUS address of the monitor.
7. **Name:** Device name (default: CPM)
8. **Communications Status:** Connected serial, connecting to wireless network, connected wireless or disconnected.
9. **Power:** Power source: Wired or Battery

When the user presses any of the on-board push buttons, the menu pops up onscreen:



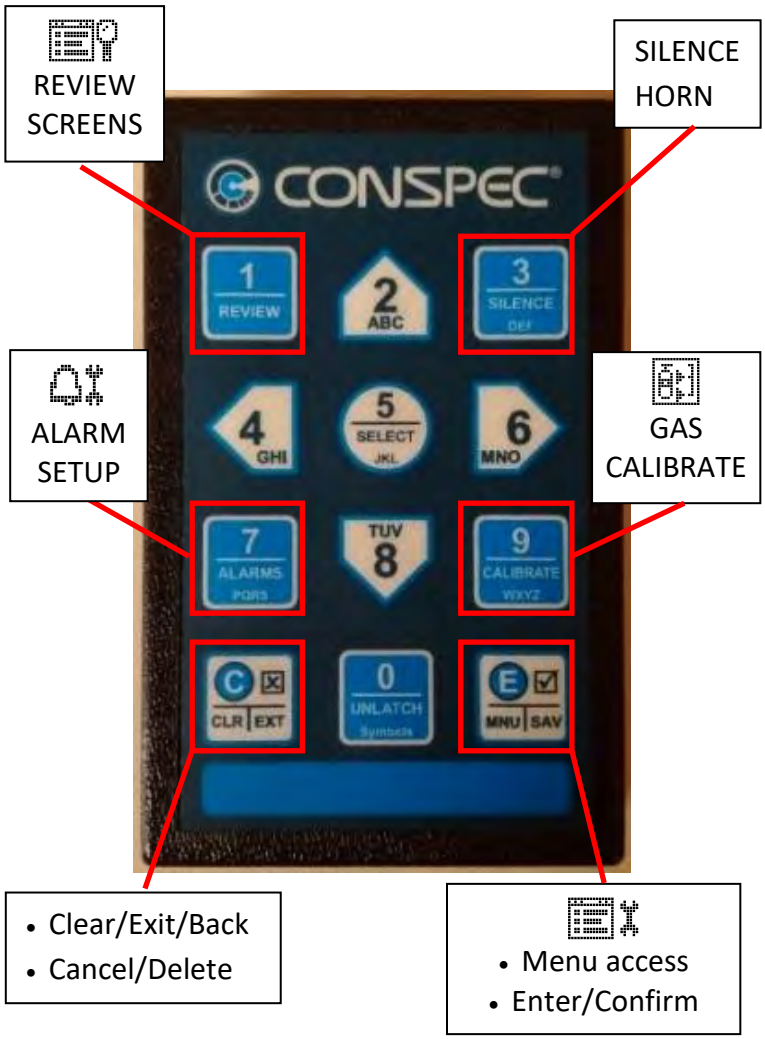
	Review Screens: provides additional information screens such as: sensor info, calibration info, I/O status, Modbus statistics, etc. Scroll Left/Right
	Calibration: shortcut button to calibrate sensors.
	Alarm Setup: shortcut button to configure alarm levels
	Menu access: Menu access button to configure monitor settings. (USER or ADMIN access based on password)

The default USER password is: 123



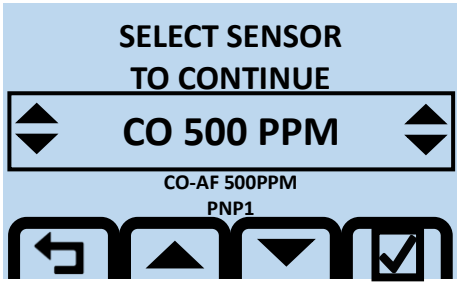
IR Remote Menu Shortcuts

The menus can also be accessed using the shortcut buttons on the IR remote while on the main screen.

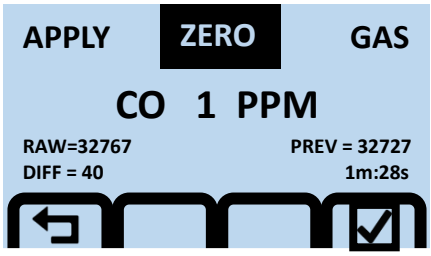


CALIBRATION

Select target sensor if multiple sensors are installed



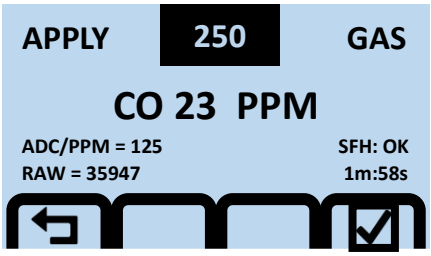
ZERO GAS CALIBRATION



- **RAW:** The current ADC reading.
- **PREV:** The previous calibration ADC.
- **DIFF:** The difference between the previous and the current ADC values.

Apply zero air (20.9% oxygen balanced in N_2) until the RAW ADC stabilizes. Minimum time of 2-3min is recommended. Most EC sensors have a zero ADC reading of 32767. **For oxygen sensors, use 18% oxygen instead**.

SPAN GAS CALIBRATION



Apply the target gas value shown on screen until RAW ADC stabilizes. A minimum time of 2-3min is recommended. **For oxygen sensors, use zero air (20.9% oxygen balanced in N_2) instead**.

Rules for a successful calibration

NDIR sensors (CH4 and CO2):

1. For CH4 sensors, Zero must be less than 0.5%VOL or 10%LEL
2. Span reading must be ±50% of the Span value. Example: if the span value is 50%LEL, the span reading must fall between 25%LEL and 75%LEL to pass.
3. For NDIR ONLY, zero calibration can be completed independently from Span by exiting the span mode. This is Manual Zero.

PNP sensors (CO, O2, H2S, H2, NO, NO2, and NH3):

1. Minimum SPAN resolution (ADC/PPM) must be greater than 10 ADC/PPM.
2. The current SPAN resolution must be within ±50% of the previous SPAN resolution.
3. Sensor Fail High (SFH) must be < 65535.
4. ZERO ADC must not equal SPAN ADC.

Purge Screen

1. If the reading is greater than AL1 when the calibration is completed, the display is automatically taken into the purge screen.
2. The reading must be below the AL1 value before exiting the purge screen.
3. The monitor remains in calibration mode until the user EXITS the purge screen.
4. If the user exits the purge screen while reading is above AL1, the monitor will alarm.

ALARMS SETUP

It is the user's responsibility to make sure the correct alarm levels are specified.

1. If more than one sensor is installed, select target sensor to configure its alarms.
2. Select the target alarm to configure

 Sensor Fail High	 Sensor Fail Low	 Alarm 1	 Alarm 2	 Alarm 3	 Alarm 4

Alarm options are:

a. **Alarm Level**: Sensor reading that will trigger the alarm. The current set value is displayed at the top of the screen (now = X).
b. **Hysteresis Level** (ADMIN only): when the sensor is in alarm, the reading must fall below the alarm level + hysteresis level to clear the alarm.
c. **Alarm Hold Delay** (ADMIN only): The delay time that needs to elapse before alarm status is asserted. For example, if the delay hold time is 3 seconds, then if the value goes into an alarm state, it needs to stay in that state for a minimum of 3 seconds before the state is changed from normal to alarm. This is used to prevent nuisance alarms.
d. **Alarm Enable/Disable**: The option to enable or disable an alarm. For example, if only the first 2 alarms are needed, then it is recommended to disable alarm 3 and alarm 4.
e. **Alarm Direction**: Certain gases are dangerous as the values increase, such as CO. In a situation like that, select the rising condition. For other gases such as O2, it is dangerous to have falling levels. In that situation, use a falling condition.

MENU SETTINGS

The USER password menu access is limited to Span Setup, Gas Calibration, Alarm Setup, Serial Setup and Relay Setup. All menu options are available for ADMIN password.

Device Setup	Sensor Setup	Span Setup	Gas Calibrate
Alarm Setup	Serial Setup	Relay Setup	4-20mA Setup

1. **DEVICE SETUP (ADMIN only)**:
   a. **Set Device Name:** Allows the user to assign a specific name to the monitor.
   b. **Set Alarm SIL Time:** Specifies how long an alarm associated with a relay is silenced (only when alarm is asserted). This is mostly used for audible alarms (horn).
   c. **Set Temperature Unit:** Set to Celsius or Fahrenheit.
   d. **Set Backlight Brightness:** LCD backlight brightness.
   e. **Set User Password:** Change user password.
   f. **Set Admin Password:** Change admin password.
   g. **Set Date/Time:** Setting time and date is important for data logger time-stamps and tracking calibration due events.
2. **SENSOR SETUP (ADMIN only)**:
   a. **Sensor Name Tag:** Allows the user to select a specific name for the sensor.
   b. **Span Gas Value:** Calibration Span gas used. Recommended 50% of full range.
   c. **Cal Period:** How often the gas monitor must be calibrated (e.g. 90 days). A CALDUE warning is displayed when specified number of days has passed since last calibration.
3. **SPAN SETUP**: A shortcut to "Span Gas Value".
4. **GAS CALIBRATE**: See page 4 for details.
5. **ALARM SETUP**: See page 5 for details.
6. **SERIAL SETUP**:
   a. **Address:** MODBUS address (1-247)
   b. **Serial Input:** RS485 ONLY (XP CPM)
   c. **Baud Rate:** 4800, 9600, 19200, or 38400
   d. **Stop Bits:** ONE or TWO
   e. **Parity Bit:** EVEN/ODD/NONE
7. **RELAY SETUP**: This menu works by selecting items in the drop down for each option.
   a. **Relay:** Select (RELAY1 to RELAY6) to setup
   b. **Control:** Selects which ALARM# will control this relay. Select MODBUS if the relay is controlled via register map (Reg#336).
   c. **Drive:** STANDARD (Normally De-energized) or FAIL SAFE (Normally Energized).
   d. **Silence:** Allows remote IR button [3] to silence this relay in the event of an alarm. Enable it if a Horn is attached to the relay.
   e. **Relay Off:** Specify if a different alarm turns off the relay (default: Same Alarm). This is used in Fan control applications.
   f. **Sensor:** Select which sensor(s) the Relay will be associated with. For example, if relay needs to trigger at Alarm 1 from ANY of the sensors attached then select: ALL (OR).
8. **4-20mA SETUP (ADMIN only)**:
   a. **4-20mA Calibrate:** Calibrate 4mA or 20mA outputs. Use a multimeter to verify output.
   b. **4-20mA In Source:** Associate the output of the 4-20mA port with an attached sensor.

MAINTENANCE

This Gas Detection Monitor requires evaluation every thirty (30) days to ensure accuracy by performing a bump test. Replace any inoperative or questionable parts immediately. This gas detection monitor requires calibration every ninety (90) days to ensure accuracy and to correct sensor drift. Conspec recommends that no modifications be made to this monitor without first consulting Conspec Technical Services. Modifying this equipment will void any warranty authorized by Conspec Controls Inc.

REPAIR

Any monitor found to be defective or questionable should be returned to Conspec Controls for evaluation and repair. Conspec requires any returned equipment to first be issued a Return Authorization Number (R.A.#) by calling Conspec at (800) 487-8450 Mon.-Fri. 8AM-5PM EST. Conspec also offers on-site Repair and Start-up service for Conspec Gas Detection Equipment.

REPLACEMENT PARTS

Spare parts can be stored under conditions that fall within the limits of the operation specifications. Please note, time frames for storing replacement sensor cells should be followed based on the manufacturer specifications.

SENSOR REPLACEMENT

***WARNING: Remove power or declassify area before opening the sensor housing.**

1. The Hazardous/Classified Area sensor housing is opened by loosening the Allen screw and unthreading sensor housing part B from part A.
2. The replaceable cell can be removed by unplugging the cell from the cell holder card.
3. Plug the new cell into the cell holder card and rethread sensor housing part B then retighten the Allen screw.

Contaminant/Small particulates Effects

Dust, coal fines, and rust are all small particulates that are encountered often within industrial environments. If preventative measures are not taken, these contaminants will likely block the flow of target gas into the sensor chamber. Once blocked, it can be nearly impossible to clean some sensor housings, and the housing may need to be entirely replaced. Preventive measures should be taken to avoid the sintered metal filter from becoming clogged. Available options include PTFE Hydrophobic disc filters to prevent moisture, rust and build up of small particulates.

CONTACT INFORMATION

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