SENSORCON

Sensing Solutions by **molex**

PROTECTOR

**Handheld Intrinsically Safe
and IP67-Rated Gas Detector**

Operating
Manual

KNOW YOUR ENVIRONMENT

Table of Contents

1. Introduction

1.1. Purpose

The Protector gas detector is a device that measures carbon monoxide levels precisely and dependably in various industries. The device is designed for indoor or outdoor use. This manual gives instructions on how to use, maintain, calibrate, update, and test the device properly, all of which can be done through the *Protector Mobile Connect* app that comes with the device.

1.2. Product Overview

The Protector gas detector uses advanced electrochemical sensor technology to detect carbon monoxide gas in the atmosphere. It has a durable and comfortable design, as well as intrinsic safety and IP67 rating, which makes it suitable for on-site applications in oil refineries, gas pipelines, and other facilities. The Protector can operate independently to show gas in parts per million (ppm) values and record shift, alarm, bump, and calibration data. The Protector handheld gas detector can store 1109 alarms, 359 bump tests, 19 calibrations, and 359 shifts in its internal memory. Each log in the handheld detector will keep these logs until full and then will start to overwrite from the beginning. In independent mode, the logs can be accessed through the menu system.

The Protector also has built-in Bluetooth Low Energy (BLE) technology that allows easy cloud data storage and connectivity. There are two options to connect and send data to the cloud. A phone app allows quick and efficient data synchronization and offers basic functions to initiate bumps, calibrations, and firmware updates. Alternatively, a small dock is available to assist with data synchronization, bumps, calibrations, and firmware updates through a slot that the Protector slides into.

The *Protector Fleet Manager* app provides online storage and data processing for a certain site that can be accessed from the web or mobile devices. Customers can view compliance reports and individual data for all devices in the protector system. They can also filter, view, and download data as they like. Settings for the Protector that can be modified are synced between the handheld and the *Protector Fleet Manager* cloud app, so adjustments can be made from the menu or from the cloud.

When the device is turned on, the main screen shows other parameters while displaying the continuously updating gas reading, including battery status, time, TWA, and STEL. The latter two are OSHA standards of interest. TWA is the time-weighted average, which is the max average exposure one should be

exposed to continuously for 8 hours. STEL is short-term exposure limit and is similar but represents the max exposure one should be exposed to for a 15-minute interval.

1.3. Protector main screen

1. Battery Status Indicator

2. The left button is pressed in conjunction with right button to start the detector. It is also used to select while navigating menus.

3. TWA, Time weighted average is the average exposure over 8 hours per OSHA calculations. This figure displayed is calculated to project TWA based on exposures up to this point of the shift. When the shift is complete actual TWA is compiled. An alarm will sound if level reaches set point. The Protector will automatically adjust alarm thresholds to different shift lengths if they are selected

4. Gas Type indicator

5. Current time

6. The right button is pressed in conjunction with left button to start the detector. It is also used to scroll through menus.

7. STEL, Short term exposure limit is the recommended 15- minute exposure limit. This is calculated on a moving 15-minute window. If the 15- minute window is above the set alarm limit an alarm will sound.

8. Current gas reading in parts per million (ppm). Readings are updated every second.

2. Technical Specifications

Technical Specifications	
Product Model	PRO-CO-1000
Manufacturer	Sensorcon
PRO-CO-1000 Measurement Range (ppm)	0 to 1000
Resolution (ppm)	1.0
Typical Response Time (sec)	(T90): <13 seconds
Operating Temperature Range	-22 to 122 °F (-30 to 50 °C)
Extended Intermittent Temperature Range	-40 to 140 °F (-40 to 60 °C)
Calibration Temperature	Ambient, 68 to 75 °F (20 to 24 °C)
Humidity Range (%RH)	15 to 90, non-condensing
Pressure Range	800 to 1200 mbar
Battery Life (yrs) (8hr shift, no alarms, 1 data upload)/day	5 years
Shelf Life Before Use	1 year
Warranty (yrs)	2 years
Hazardous Locations Certifications (US & Canada)	Intrinsically safe, CLASS I, GROUP A,B,C,D; CLASS II, GROUP E,F,G; CLASS III, T4 ZONE 0, AEx ia IIC T4 Ga; Ex ia IIC T4 Ga -40°C ≤ Ta ≤60°C
Communication IDs	FCC ID: 2BCPVPROT IC: 30855-PROT
Ingress Protection	IP67 (1 meter for 30 min)
Weight	4.5 oz./128 g (device with battery and clip)
Dimensions (L x W x H)	3.50 x 2.00 x 1.75 inches/89 x 51 x 44.5 mm
Volume of audible alarm	95 dBA @ 10 cm
Display	128 x 128 Graphic LCD with backlight
Battery Type	Primary lithium, tadiran TL-5935
Alarms (4 adjustable thresholds)	Flashing alarm LEDs, an audible alarm, and a vibrating alarm, programmable latches
Sensor Type	Electrochemical

Please note: Due to ongoing research and product improvement, specifications are subject to change without notice.

3. Product Features

3.1. Advanced Electrochemical Sensor Element

The gas detector has an advanced electrochemical sensor that provides reliable and stable gas readings. Electrochemical sensor elements are designed to have a linear output response over the operating range. Very small and very large levels of gas can be detected and accurately processed with a microcontroller.

The electrochemical sensor and corresponding circuit board are designed to be replaced as a pair. Factory calibration data specific to the sensor is stored on its companion circuit board. More information is available in later sections.

3.2. Carbon Monoxide (CO) Detection Capability

⚠ **IMPORTANT:** ELECTROCHEMICAL SENSORS TARGET SPECIFIC GASES, BUT NO SENSOR CAN BE COMPLETELY UNAFFECTED BY OTHER GASES. THE PROTECTOR USES A SENSOR THAT HAS VERY LOW SENSITIVITY TO OTHER COMMON GASES. ETHYLENE AND ACETYLENE ARE GASES THAT THE ELECTROCHEMICAL SENSOR IS SENSITIVE TO. THEREFORE, THE PRO-CO-1000 SHOULD NOT BE USED WHERE ETHYLENE OR ACETYLENE ARE PRESENT. THIS HOLDS TRUE FOR CALIBRATIONS.

⚠ **IMPORTANT:** LES CAPTEURS ÉLECTROCHIMIQUES CIBLENT DES GAZ SPÉCIFIQUES, MAIS AUCUN CAPTEUR NE PEUT ÊTRE COMPLÈTEMENT INSENSIBLE AUX AUTRES GAZ. LE PROTECTEUR UTILISE UN CAPTEUR QUI A UNE TRÈS FAIBLE SENSIBILITÉ AUX AUTRES GAZ COURANTS. L'ÉTHYLÈNE ET L'ACÉTYLÈNE SONT DES GAZ AUXQUELS LE CAPTEUR ÉLECTROCHIMIQUE EST SENSIBLE. PAR CONSÉQUENT, LE PRO-CO-1000 NE DOIT PAS ÊTRE UTILISÉ EN PRÉSENCE D'ÉTHYLÈNE OU D'ACÉTYLÈNE. CECI S'APPLIQUE ÉGALEMENT AUX ÉTALONNAGES.

Cross-Sensitivity Data		
Gas	**Concentration**	**Sensor Response**
Hydrogen Sulfide	50 ppm	0ppm
Sulfur Dioxide	20 ppm	0 ppm
Hydrogen	100 ppm	<30 ppm
Nitric Oxide	50 ppm	<10 ppm
Ethanol	200 ppm	<1 ppm
Ammonia	50 ppm	0 ppm
Chlorine	15 ppm	<1 ppm
Ethylene	100 ppm	96 ppm
Acetylene	100 ppm	90ppm

The PRO-CO-1000 detector is specifically designed to detect and measure carbon monoxide (CO) gas levels accurately. It can measure small CO levels and is designed to provide warnings of various exposure limits. The element should be exposed to the ambient environment by clipping the handheld on the exterior clothing. Precautions should be taken to ensure an article of clothing, or a coat does not cover the Protector. The recommended location is on the outside lapel not on the belt and never in a pocket.

3. Product Features

3.3. Audible and Visual Alarms

The Protector has four (4) different alarms that use sounds, vibrations, display changes, and lights to warn the user of different levels of gas detection. Alarm sequences become more intense with higher exposure risk. The low alarm is the simplest and can be turned off with a button push. TWA is based on an average exposure over an 8-hour shift. TWA has a unique alarm and can be turned off. Other alarms cannot be turned off—the Protector must be removed from the gas environment. High alarm has a specific alarm sequence and cannot be turned off. The highest exposure risk, STEL has the most severe alarm sequence. Alarm thresholds can be changed with the *Protector Fleet Manager* cloud storage application. Users can set alarm thresholds for low, high, TWA, and STEL. Low, high, and alarm thresholds depend on how and where the Protector is used. The user should read and understand gas safety discussed in section 4 before setting their threshold.

Default alarm thresholds are shown in Part Per Million (PPM) as follows:

Gas Type	Low	High	TWA	STEL
CO	35	200	35	200

Different agencies and places in California may have different exposure limits for gases. It is important to know the local regulations before changing the default alarm thresholds. Some of the regulatory agencies that have gas exposure limits are OSHA (Occupational Safety and Health Agency) and NIOSH (National Institute for Occupational Safety and Health Agency). These are the exposure limits for the Protector gases that should be checked before changing the alarm thresholds. TWA is the average exposure over a work shift. STEL is the maximum exposure for 15 minutes. NIOSH also has an IDLH (Immediate Danger to Life or Health) level that shows very high levels that should be avoided.

	OSHA TWA (ppm)	OSHA STEL (ppm)	NIOSH IDLH (ppm)
CO	50	200	1500

3.4. High-Resolution Display and Controls

The device has a high-resolution LCD screen that displays gas levels and other relevant information in real time. It also shows battery level, current time, STEL, and shift TWA on the main screen along with the gas level. The main screen has special alarm signs around the gas type when an alarm goes off. The display has a backlight that turns on when a button is pushed. Section 6 explains more about the display screens. The Protector has two (2) buttons and a menu system that let you change settings, access information, and operate gas functions. The button on the left when you see the display is the select button and the one on the right is the scroll button. Section 6 will show you more details about the menus and how to navigate them.

3.5. Replaceable Primary Battery

The gas detector runs on a non-rechargeable primary battery, which allows it to operate continuously without recharging. The Protector uses a 1700mAh lithium battery from Tadiran. The Tadiran TL-5935 can be replaced by connecting the three (3) pins on the battery to the three (3) sockets on the electronics board. It is advisable to change the battery with a new one when its capacity is reduced to the last bar on the status indicator. Battery replacement will be explained in more detail in 8.3.

3. Product Features

3.5.1 Battery Replacement Procedure

⚠ **WARNING:** EXPLOSION HAZARD – DO NOT OPEN OR CHANGE THE BATTERY IN A HAZARDOUS LOCATION. USE ONLY TADIRAN PART NO. TL-5935. SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. ENSURE THAT THE BATTERY INSULATOR DISC IS PROPERLY PLACED AND THAT SPACINGS AND COMPONENTS ON THE PRINTED CIRCUIT BOARD ARE NOT DAMAGED SO THAT THE INTRINSIC SAFETY OF THE DEVICE IS NOT COMPROMISED.

⚠ **AVERTISSEMENT:** RISQUE D'EXPLOSION - N'OUVREZ PAS ET NE REMPLACEZ PAS LA BATTERIE DANS UN ENDROIT DANGEREUX. UTILISEZ UNIQUEMENT LA RÉFÉRENCE TADIRAN TL-5935. LE REMPLACEMENT DES COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE. ASSUREZ-VOUS QUE LE DISQUE ISOLANT DE LA BATTERIE EST CORRECTEMENT PLACÉ ET QUE LES ESPACEMENTS ET LES COMPOSANTS DE LA CARTE DE CIRCUIT IMPRIMÉ NE SONT PAS ENDOMMAGÉS AFIN DE NE PAS COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE DE L'APPAREIL.

⚠ **WARNING:** FIRE, EXPLOSION AND SEVERE BURN HAZARD. DO NOT RECHARGE, DISASSEMBLE, HEAT ABOVE 100°C, INCINERATE, OR EXPOSE CONTENTS TO WATER. BATTERY TO BE REPLACED BY A TRAINED TECHNICIAN

⚠ **AVERTISSEMENT:** RISQUE D'INCENDIE, D'EXPLOSION ET DE BRÛLURES GRAVES. NE PAS RECHARGER, DÉMONTER, CHAUFFER À PLUS DE 100 °C, INCINÉRER OU EXPOSER LE CONTENU À L'EAU. LA BATTERIE DOIT ÊTRE REMPLACÉE PAR UN TECHNICIEN QUALIFIÉ.

❗ **IMPORTANT:** IT IS REQUIRED TO TAKE THE PROTECTOR APART TO CHANGE THE BATTERY SO IT IS RECOMMENDED THAT ONLY QUALIFIED PERSONNEL PERFORM THIS OPERATION. THE PROTECTOR HAS A WATER/DUST-TIGHT SEAL BETWEEN THE TOP AND BOTTOM COVER THAT MUST REMAIN UNMARRED TO FUNCTION PROPERLY. THE FOUR (4) SCREWS MUST BE TORQUED TO 3 TO 4 INCH-POUNDS AND NOT EXCEED 4 INCH-POUNDS.

❗ **IMPORTANT:** IL EST NÉCESSAIRE DE DÉMONTER LE PROTECTEUR POUR EFFECTUER L'ENTRETIEN, IL EST DONC RECOMMANDÉ QUE SEUL DU PERSONNEL QUALIFIÉ EFFECTUE CETTE OPÉRATION. LE PROTECTEUR EST ÉQUIPÉ D'UN JOINT ÉTANCHE À L'EAU ET À LA POUSSIÈRE ENTRE LE COUVERCLE SUPÉRIEUR ET INFÉRIEUR QUI DOIT RESTER INTACT POUR FONCTIONNER CORRECTEMENT. LES QUATRE (4) VIS DOIVENT ÊTRE SERRÉES À UN COUPLE DE 3 À 4 POUCES-LIVRES ET NE DOIVENT PAS DÉPASSER 4 POUCES-LIVRES.

To replace the battery, follow these steps:

1. Remove the four (4) screws from the back cover and carefully lift from the top cover.

2. Pull the battery away from the board in a straight line.

3. Verify the battery insulator is not missing and is completely intact with no noticeable damage which could affect intrinsic safety. If the battery insulator is missing or damaged, contact customer service for a replacement prior to replacement. Insert a new battery into the three (3) sockets taking care not to disturb the battery insulator attached to the main PCBA. Verify the battery is properly seated prior to reassembling the case.

4. Re-Assemble the case by placing the screws and wave washers in from the back into their original locations, ensuring the front and back sections are properly aligned. Apply and maintain a slight pressure between the two halves ensuring there isn't any noticeable space or gap along the perimeter of the case prior to screwing together. Begin hand tightening the screws on two opposite corners while maintaining a slight pressure between the halves. DO NOT force the screws into the holes by pushing them in. Continue with securing the two remaining screws. In a clockwise rotation begin tightening each screw to 3 - 4 in-lbs torque. Accurate torque is required to ensure the integrity of the IP seal and prevent damage.

5. Press and hold both the select and scroll buttons for a few seconds until the LEDs light up.

6. The "Battery Removed" warning screen will indicate a detected battery change. Select "REUSED" if the installed battery is unchanged. Select "REPLACED" if the installed battery is a new battery. Use the right button to highlight the desired option. Press the left button to select the highlighted option and continue to the home screen. The Protector lights will blink red to indicate that the battery has been installed. Once the proper menu selection is made the lights will flash green to indicate a successful battery change.
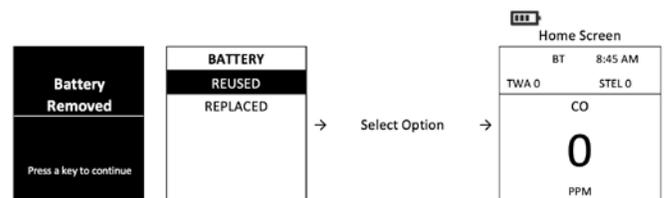
3. Product Features

3.6. Cloud Data Storage and Connectivity

The Protector has seamless cloud data storage and connectivity, thanks to its built-in Bluetooth Low Energy (BLE) technology. BLE technology lets the Protector connect wirelessly to a dock or mobile device, which then sends the data to the cloud. The BLE technology makes sure the data transmission to the cloud is fast, reliable, and encrypted while the cloud platform *Protector Fleet Manager* has data backup and data export features, improving data security and accessibility. The cloud data storage gives a secure and convenient way to handle, analyze, and share gas detection data across different devices and locations. Data in the cloud can be viewed, sorted, and downloaded on the *Protector Fleet Manager*. Through the app, users can see and monitor real-time data, historical measurements, and device settings remotely. Users can also link the gas detector to their smartphones or tablets using the *Protector Mobile Connect* app, which can be found on the Apple Store or Google Play. The *Protector Mobile Connect* transfers data from the Protector to the Cloud when the mobile device is linked to a Protector.

3.7. Calibration Function

There are different ways to calibrate the Protector in the field. The device has a menu system that allows a calibration with a calibration cup that fits on the housing. A phone app *Protector Mobile Connect* can also use the calibration cup and start the process from the app. A docking station can also be used to calibrate Protector devices.

Protectors should be calibrated every 6 months in an industrial setting to keep the sensors accurate as they get older. Different applications may require shorter or longer calibration intervals. The *Protector Fleet Manager* cloud application can be used to change the calibration intervals. The Protector will alert when the interval is over. The dock will calibrate a Protector automatically when the interval is over. The *Protector Mobile Connect* app will show if a Protector paired with it needs calibration and will help with the process.

3.8. Bump Testing Function

The device has a menu system that allows starting a bump test with a calibration cup that attaches to the housing. A phone app *Protector Mobile Connect* can also start the process

from the app by using the calibration cup. Another way to do a bump test is with a dock that can calibrate Protector devices. Protectors should be bump tested daily in an industrial setting to confirm the accuracy of the sensors as they get older. The bump test intervals should be adjusted according to the specific applications. The *Protector Fleet Manager* cloud application can change the bump test intervals. The Protector will notify when the interval is due. The dock will automatically bump test a Protector when the interval is due. The *Protector Mobile Connect* will indicate if the bump test interval is due for a Protector paired with it and will assist with the process.

3.9. Replaceable Sensor

The Protector gas detector has a replaceable sensor module so that the device does not have to be sent away for repairs. The sensor module has two parts: a sensor element and a circuit board. These two parts should stay together and not be swapped with parts from other modules. The circuit board has calibration data for the element that is used for calculations. For the Protector to work properly after a sensor module change, the components need to be paired correctly.

⚠ **IMPORTANT: IT IS REQUIRED TO TAKE THE PROTECTOR APART TO CHANGE THE SENSOR MODULE, SO IT IS RECOMMENDED THAT ONLY QUALIFIED PERSONNEL PERFORM THIS OPERATION. THE PROTECTOR HAS A WATER-TIGHT SEAL BETWEEN THE TOP AND BOTTOM COVER THAT MUST REMAIN UNMARRED TO FUNCTION PROPERLY. THE FOUR (4) SCREWS MUST BE TORQUED TO 3 TO 4 INCH-POUNDS AND NOT EXCEED 4 INCH-POUNDS.**

⚠ **IMPORTANT: IL EST NÉCESSAIRE DE DÉMONTER LE PROTECTEUR POUR EFFECTUER L'ENTRETIEN, IL EST DONC RECOMMANDÉ QUE SEUL DU PERSONNEL QUALIFIÉ EFFECTUE CETTE OPÉRATION. LE PROTECTEUR EST ÉQUIPÉ D'UN JOINT ÉTANCHE À L'EAU ET À LA POUSSIÈRE ENTRE LE COUVERCLE SUPÉRIEUR ET INFÉRIEUR QUI DOIT RESTER INTACT POUR FONCTIONNER CORRECTEMENT. LES QUATRE (4) VIS DOIVENT ÊTRE SERRÉES À UN COUPLE DE 3 À 4 POUCES-LIVRES ET NE DOIVENT PAS DÉPASSER 4 POUCES-LIVRES.**

3. Product Features

3.9.1 Sensor Module Replacement Procedure

⚠ **WARNING:** EXPLOSION HAZARD – DO NOT OPEN OR CHANGE THE BATTERY IN A HAZARDOUS LOCATION. USE ONLY TADIRAN PART NO. TL-5935. SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. ENSURE THAT THE BATTERY INSULATOR DISC IS PROPERLY PLACED AND THAT SPACINGS AND COMPONENTS ON THE PRINTED CIRCUIT BOARD ARE NOT DAMAGED SO THAT THE INTRINSIC SAFETY OF THE DEVICE IS NOT COMPROMISED.

⚠ **AVERTISSEMENT:** RISQUE D'EXPLOSION - N'OUVREZ PAS ET NE REMPLACEZ PAS LA BATTERIE DANS UN ENDROIT DANGEREUX. UTILISEZ UNIQUEMENT LA RÉFÉRENCE TADIRAN TL-5935. LE REMPLACEMENT DES COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE. ASSUREZ-VOUS QUE LE DISQUE ISOLANT DE LA BATTERIE EST CORRECTEMENT PLACÉ ET QUE LES ESPACEMENTS ET LES COMPOSANTS DE LA CARTE DE CIRCUIT IMPRIMÉ NE SONT PAS ENDOMMAGÉS AFIN DE NE PAS COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE DE L'APPAREIL.

⚠ **WARNING:** FIRE, EXPLOSION AND SEVERE BURN HAZARD. DO NOT RECHARGE, DISASSEMBLE, HEAT ABOVE 100°C, INCINERATE, OR EXPOSE CONTENTS TO WATER. BATTERY TO BE REPLACED BY A TRAINED TECHNICIAN

⚠ **AVERTISSEMENT:** RISQUE D'INCENDIE, D'EXPLOSION ET DE BRÛLURES GRAVES. NE PAS RECHARGER, DÉMONTER, CHAUFFER À PLUS DE 100 °C, INCINÉRER OU EXPOSER LE CONTENU À L'EAU. LA BATTERIE DOIT ÊTRE REMPLACÉE PAR UN TECHNICIEN QUALIFIÉ.

To replace the sensor module, follow these steps:

1. Remove the four (4) screws from the back cover and carefully lift from the top cover.

2. Pull the battery away from the board in a straight line.

❗ **IMPORTANT:** THERE ARE TWO (2) TINY CONNECTORS THAT JOIN THE SENSOR MODULE TO THE MAIN CIRCUIT BOARD. THEY CAN BREAK IF YOU TWIST OR PRY THEM. YOU MUST PULL THE SENSOR MODULE UP IN A STRAIGHT LINE WHEN YOU UNPLUG IT TO PREVENT DESTROYING THE CONNECTORS ON THE MAIN CIRCUIT BOARD BEYOND REPAIR.

❗ **IMPORTANT:** DEUX (2) MINUSCULES CONNECTEURS RELIENT LE MODULE DU CAPTEUR À LA CARTE DE CIRCUIT IMPRIMÉ PRINCIPALE. ILS PEUVENT SE CASSER SI VOUS LES TORDEZ OU LES FORCEZ. VOUS DEVEZ TIRER LE MODULE DU CAPTEUR VERS LE HAUT EN LIGNE DROITE LORSQUE VOUS LE DÉBRANCHEZ POUR ÉVITER DE DÉTRUIRE LES CONNECTEURS DE LA CARTE DE CIRCUIT IMPRIMÉ PRINCIPALE DE MANIÈRE IRRÉPARABLE.

3. Gently detach the sensor module from the main circuit board.

4. Position the new sensor module over the connectors on the main circuit board, with the curve facing the battery location and the tab at the bottom. Press down vertically to seat the connectors.

5. Insert battery into the three (3) sockets taking care to align the battery insulator between the board and battery.

6. Align the edges of the plastic housing covers carefully before applying force to the sealing surface between them.

8. Press covers together until seated.

9. Put the four (4) screws in from the back slowly tightening to a torque of 3-4 inch-pound without exceeding 4 inch-pounds. Accurate torque is needed for the integrity of the water-tight seal without causing damage with excessive force.

4. Safety Precautions

⚠ **WARNING: IF THE EQUIPMENT IS USED IN A MANNER NOT SPECIFIED BY SENSORCON/MOLEX IN THIS MANUAL, THE PROTECTION PROVIDED BY THE EQUIPMENT MAY BE IMPAIRED. ANY REPLACEMENT COMPONENTS MUST BE THE EXACT TYPE AS SPECIFIED BY SENSORCON/MOLEX IN THIS DOCUMENT, AND THE SAFETY OF THE DEVICE MUST BE VERIFIED TO BE INTACT AFTER ANY REPAIRS PER THE INSTRUCTIONS IN THIS DOCUMENT.**

⚠ **AVERTISSEMENT: SI L'ÉQUIPEMENT EST UTILISÉ D'UNE MANIÈRE NON SPÉCIFIÉE PAR SENSORCON/MOLEX DANS CE MANUEL, LA PROTECTION FOURNIE PAR L'ÉQUIPEMENT PEUT ÊTRE ALTÉRÉE. TOUT COMPOSANT DE REMPLACEMENT DOIT ÊTRE DU TYPE EXACT SPÉCIFIÉ PAR SENSORCON/MOLEX DANS CE DOCUMENT, ET LA SÉCURITÉ DE L'APPAREIL DOIT ÊTRE VÉRIFIÉE COMME ÉTANT INTACTE APRÈS TOUTE RÉPARATION CONFORMÉMENT AUX INSTRUCTIONS DE CE DOCUMENT**

4.1. General Safety Guidelines

The Protector is a handheld gas detector designed to give warning of various levels of gas exposures. Gases the Protector measures all can have serious health implications in high enough concentrations. Read this manual carefully to understand exposure risks and how to use the Protector to warn of gas exposures. Please comply with all relevant safety regulations and guidelines in your workplace.

Safety and Usage Warnings:

Read the Manual: Before using or servicing, read and understand the manual to ensure safe and efficient operation. Ignoring instructions can reduce performance and could violate the intrinsic safety of the device.

Safe Usage and Servicing: Only qualified individuals should operate or service this equipment. Service of the device, changing the battery, etc., should only be done in safe locations. The device is not designed for use or service in oxygen-rich environments (greater than 21%).

Component Substitution: Do not substitute components; this can compromise the intrinsic safety of the device.

Battery Replacement: Use a Tadiran TL-5935 battery only. Do not replace in hazardous locations. Please read and understand all warnings posted in this manual relating to battery and sensor replacement before proceeding.

Sensor Maintenance: Keep sensor openings clean and dry. Obstructions can affect gas readings. Replace sensor filters and gaskets if needed. Calibration should be done by qualified individuals only.

Device Issues: Contact service if the unit seems faulty.

Environmental Variables: Pressure, temperature, or humidity changes can momentarily affect sensor readings.

Bump Test: It is recommended to bump test the unit regularly before use to ensure proper operation.

Calibration: Calibrate if the unit is dropped, exposed to water, fails a bump test, or has just had the sensor replaced.

Calibration Gas: Handle with care as calibration gases can be hazardous. Check Safety Data Sheets online for more precise safety information.

Time and Date: After replacing the battery, verify and adjust the time and date if necessary. This can be done automatically through the Protector Mobile Connect app by connecting to the device or by placing the device in a Protector docking station or set manually in the menu on the device.

Recycling: Follow local regulations for recycling devices or components. Do not dispose of in landfills.

4.2. Carbon Monoxide Exposure and Health Risks

Carbon monoxide (CO) is a colorless, odorless, and tasteless gas that is a common industrial hazard resulting from the incomplete combustion of carbon-containing materials. CO exposure is a serious workplace health hazard and can occur across various industries, including manufacturing, steel production, transportation, and construction.

Health Risks:

CO interferes with the body's ability to carry oxygen in the blood, with potentially fatal consequences. The severity of symptoms associated with CO exposure is influenced by several factors, including the concentration of CO in the air, duration of exposure, and the individual's health condition. Here are common health risks associated with varying levels of exposure:

4. Safety Precautions

Low Exposure: Mild effects may include headache, fatigue, shortness of breath, and dizziness, which often resemble the flu. These symptoms can lead to a delay in seeking treatment, increasing the risk of prolonged exposure.

Moderate Exposure: Continued or heightened exposure can result in more serious health concerns such as chest pain, palpitations, impaired vision, and concentration difficulties. Individuals with pre-existing heart disease may experience increased chest pain.

High Exposure: At very high levels, CO can be life-threatening, causing confusion, incapacitation, loss of consciousness, seizures, cardiorespiratory failure, and even death.

Vulnerable Populations:

• People with pre-existing cardiovascular and respiratory illnesses.

• Pregnant women, as high levels of CO can impair fetal development.

• Young children and the elderly, who may be more susceptible to the effects of CO.

Preventive Measures:

To protect workers from the dangers of CO exposure, the following preventative strategies should be enacted:

• Installation and maintenance of effective ventilation systems to prevent CO build-up.

• Regular inspection and maintenance of equipment and appliances that produce CO to ensure they are functioning properly.

• Placement of CO detectors in high-risk areas, with alarms set to trigger before CO concentrations reach dangerous levels.

• Provision of personal CO monitors for workers in areas where CO exposure is possible.

• Educational programs to increase worker awareness of CO hazards, including recognition of symptoms and appropriate response measures.

First Aid for CO Exposure:

If CO exposure is suspected, immediate action is essential:

• Remove the affected individual from the exposure area to fresh air immediately.

• Call emergency services to report a possible CO poisoning.

• Administer 100% oxygen with a tight-fitting mask if trained to do so and if available.

• Perform CPR if the patient is not breathing until medical help arrives, only if properly trained and without risking your own exposure.

• Seek medical attention right away. Even if symptoms are mild or seem to improve, evaluation and treatment are necessary as the effects of CO can be delayed.

• It's crucial that this information is adapted to your specific industrial context and follows the latest health and safety regulations. Always consult with an occupational health professional to ensure the guidelines are adequate for your workplace's needs. It may also be beneficial to provide regular health screenings and CO exposure monitoring for employees in high-risk environments.

4.3. Operating in Hazardous Environments

The gas detector is intrinsically safe, meaning it is designed to operate in hazardous environments where flammable gases or vapors may be present. An intrinsically safe environment is one in which electrical equipment, like the gas detector, is constructed to prevent the ignition of flammable substances present in the atmosphere.

It is essential to only use intrinsically safe approved equipment in hazardous environments in accordance with industry and local regulations and guidelines. The Protector is UL tested and certified to be intrinsically safe.

⚠ **WARNING: EXPLOSION HAZARD – DO NOT OPEN OR CHANGE THE BATTERY IN A HAZARDOUS LOCATION. USE ONLY TADIRAN PART NO. TL-5935. SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY. ENSURE THAT THE BATTERY INSULATOR DISC IS PROPERLY PLACED AND THAT SPACINGS AND COMPONENTS ON THE PRINTED CIRCUIT BOARD ARE NOT DAMAGED SO THAT THE INTRINSIC SAFETY OF THE DEVICE IS NOT COMPROMISED.**

⚠ **AVERTISSEMENT: RISQUE D'EXPLOSION - N'OUVREZ PAS ET NE REMPLACEZ PAS LA BATTERIE DANS UN ENDROIT DANGEREUX. UTILISEZ UNIQUEMENT LA RÉFÉRENCE TADIRAN TL-5935. LE REMPLACEMENT DES COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE. ASSUREZ-VOUS QUE LE DISQUE ISOLANT DE LA BATTERIE EST CORRECTEMENT PLACÉ ET QUE LES ESPACEMENTS ET LES COMPOSANTS DE LA CARTE DE CIRCUIT IMPRIMÉ NE SONT PAS ENDOMMAGÉS AFIN DE NE PAS COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE DE L'APPAREIL.**

4. Safety Precautions

⚠ **WARNING:** FIRE, EXPLOSION AND SEVERE BURN HAZARD. DO NOT RECHARGE, DISASSEMBLE, HEAT ABOVE 100°C, INCINERATE, OR EXPOSE CONTENTS TO WATER. BATTERY TO BE REPLACED BY A TRAINED TECHNICIAN

⚠ **AVERTISSEMENT:** RISQUE D'INCENDIE, D'EXPLOSION ET DE BRÛLURES GRAVES. NE PAS RECHARGER, DÉMONTER, CHAUFFER À PLUS DE 100 °C, INCINÉRER OU EXPOSER LE CONTENU À L'EAU. LA BATTERIE DOIT ÊTRE REMPLACÉE PAR UN TECHNICIEN QUALIFIÉ.

4.4. Maintenance

The Protector can work for two (2) years with normal use and needs little maintenance. If it is exposed to high gas levels, constant high humidity, or long alarm periods, it may need maintenance sooner than two years.

⚠ **IMPORTANT:** IT IS REQUIRED TO TAKE THE PROTECTOR APART TO DO MAINTENANCE, SO IT IS RECOMMENDED THAT ONLY QUALIFIED PERSONNEL PERFORM THIS OPERATION. THE PROTECTOR HAS A WATER-TIGHT SEAL BETWEEN THE TOP AND BOTTOM COVER THAT MUST REMAIN UNMARRED TO FUNCTION PROPERLY. THE FOUR (4) SCREWS MUST BE TORQUED TO 3-4 INCH-POUNDS AND NOT EXCEED 4 INCH-POUNDS.

⚠ **IMPORTANT:** IL EST NÉCESSAIRE DE DÉMONTER LE PROTECTEUR POUR EFFECTUER L'ENTRETIEN, IL EST DONC RECOMMANDÉ QUE SEUL DU PERSONNEL QUALIFIÉ EFFECTUE CETTE OPÉRATION. LE PROTECTEUR EST ÉQUIPÉ D'UN JOINT ÉTANCHE À L'EAU ET À LA POUSSIÈRE ENTRE LE COUVERCLE SUPÉRIEUR ET INFÉRIEUR QUI DOIT RESTER INTACT POUR FONCTIONNER CORRECTEMENT. LES QUATRE (4) VIS DOIVENT ÊTRE SERRÉES À UN COUPLE DE 3 À 4 POUCES-LIVRES ET NE DOIVENT PAS DÉPASSER 4 POUCES-LIVRES.

Replaceable parts:
• Battery
• Sensor module and filter
• Sounder

4.5. Cleaning

The case of the Protector can be wiped down with mild soap and water if precautions are taken to not get any dirt or liquids in the detection area. There is a filter covering the sensor that can get plugged if it gets too dirty. Refrain from using chemicals such as alcohol as they could impact sensor detection.

5. Getting Started

5.1. Unpacking and Inspection

Open the Protector box gently and check it for any damage that might have happened during shipping.

If you see any damage, do not operate the device, and get in touch with your supplier right away. The box should have a Protector, Quick start manual, and a calibration cup inside.

5.2. Battery Installation

The Protector will be shipped with a battery pre-installed. The device is designed to conserve power and will be in sleep mode when you first receive it. To activate the gas detector, press and hold both the select and scroll buttons for a few seconds until the LEDs light up.

5.3. Power On/Off

To activate the Protector, press and hold both the select and scroll buttons for a few seconds until the LEDs light up. To power off press and hold both the select and scroll buttons and continue holding as the countdown is displayed on the display. When the screen goes blank, the unit is asleep.

5.4. Initial Calibration

The Protector comes with a factory calibration and does not require a calibration on arrival. Subsequent calibrations should be done at an interval suitable to the facility and use. In an industrial setting, it is recommended to have Protectors calibrated every 6 months to ensure maximum accuracy.

6. Operating Instructions

6.1. User Interface

Familiarize yourself with the gas detector's display symbols and icons. The main display includes a battery status icon, a Bluetooth active symbol, current time, TWA value, STEL value, gas type, gas reading, and corresponding units.

6.2. Gas Detection

In normal operation, the gas detector continuously monitors the ambient air for the presence of a gas. The detected gas concentration will be displayed on the screen in parts per million (ppm). The ppm value is continuously updated once per second.

6.3. Alarm System and Thresholds

The gas detector is equipped with adjustable alarm thresholds for gas concentrations. Alarm thresholds are customer-adjustable for low, STEL (short-term exposure limit), TWA (time-weighted average), and high, alarms. Alarms consist of display features, flashing LEDs, audible sound, and vibration. Each is unique and the intensity of the alarm increases with the hazard of the gas exposure. The thresholds can be set using the *Protector Fleet Manager* cloud software. The default thresholds for the Protector can be found in the following table. Default values are OSHA or NIOSH-recommended exposure limits.

Gas Type	Low	High	TWA	STEL
CO	35	70	35	200

6.4. Data Logging and Retrieval

The Protector handheld gas detector can store 1109 alarms, 359 bump tests, 19 calibrations, and 359 shift logs in its internal memory. The handheld detector will keep these logs until there is no more space and then will begin to replace them from the start. In standalone mode, you can access the logs through the menu system. *For menu structure, see figure 1.*

The menu lets you view the logs for bump tests, calibration, and alarms. Use the right button to scroll and the left button to select. The menus only display date, time, and pass/fail for bump tests and calibration logs. Alarm logs display the alarm type, date, time, and duration of the alarm in seconds. The *Protector Fleet Manager* cloud platform has more data to see. You can use the cloud-based platform to examine historical data and create reports for compliance and safety reasons.

6.5. Calibration Procedure

Regular calibration is essential to ensure accurate gas measurements. Use a certified calibration gas with a known concentration to calibrate the Protector. Time and exposure to gas and moisture can change the electrochemistry in the sensor element. Calibrating measures the sensitivity of the sensor element to a known calibration gas and adjusts the operating parameters for accurate operation.

Gas Type	Calibration Gas Concentration (ppm)
CO	50

To make sure gas measurements are precise, sensors need to be calibrated regularly. The suggested calibration frequency is every 6 months for industrial use but can be adjusted to suit different use cases.
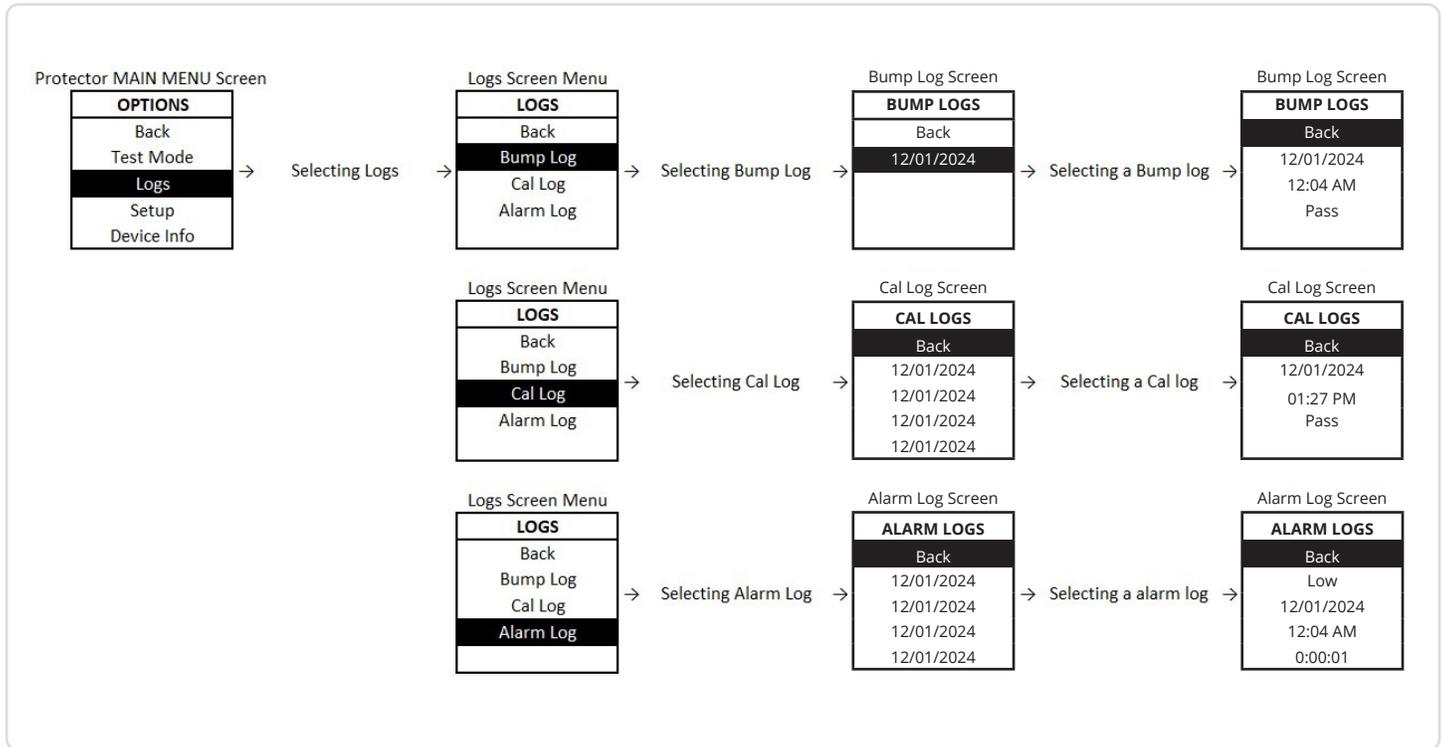
6. Operating Instructions

Figure 1: Menu Structure

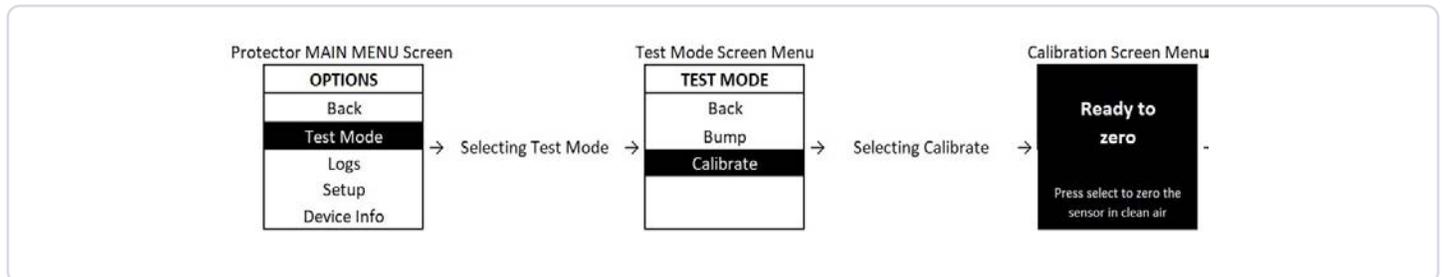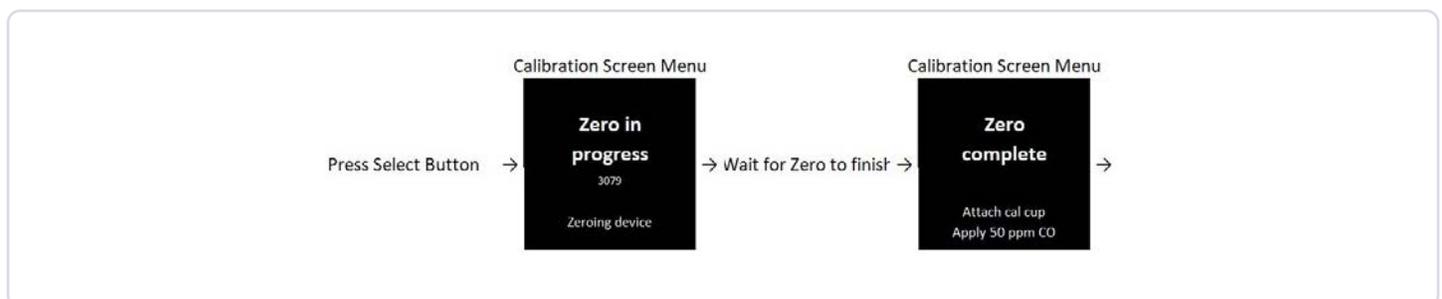*Figure 2: Menu Calibration Procedure*

Figure 3: Zero Procedure

6. Operating Instructions

6.5.1 Menu Calibration Instructions

A calibration involves two steps that will first measure the gas with zero concentration and then will measure the gas with a known concentration to find a sensitivity value that will be used for computing the accurate concentration of the measured gas. Take care to ensure there is no gas present when the device is measuring zero. Gas during the zeroing process will create an error in the zero reading that will impact the detector's accuracy. Calibrations should be done under a fume hood or in a well-ventilated area.

Menu calibration procedure:

1. From the main menu select Test Mode

2. From the Test Mode screen select Calibrate

3. Press Select to start zero in clean air. *See Figure 2.*

4. After the zero is initiated wait for the device to measure and calculate. *See Figure 3.*

5. When the zero is complete the calibration cup and calibration gas is prepared.

6. The calibration cup is put over the sensor area with a hose connected to the hose fitting and connected to a calibration gas source. *See Figure 4.*

7. When ready to calibrate start the gas and press the Select button to start the calibration. *See Figure 5.*

8. After the calibration is initiated wait for the device to measure and calculate.

9. Shut off the gas immediately when the calibration is complete.

10. Remove the calibration cup from the Protector.

11. When complete a screen will be displayed showing the calibration outcome.

12. After the screen is read pressing the Select button will direct the device to the home screen with a countdown timer. The timer allows for time to clear the calibration gas from the sensor before returning to normal operation. *See Figure 6.*

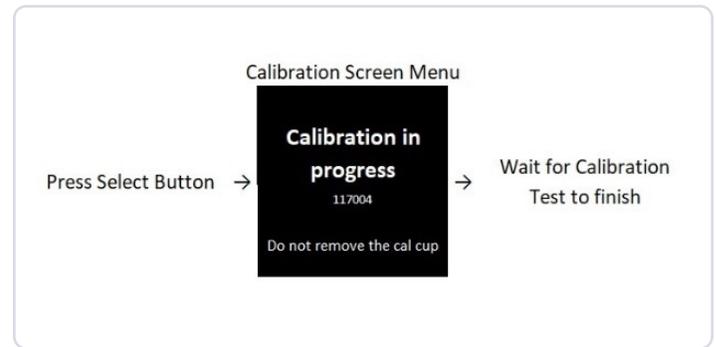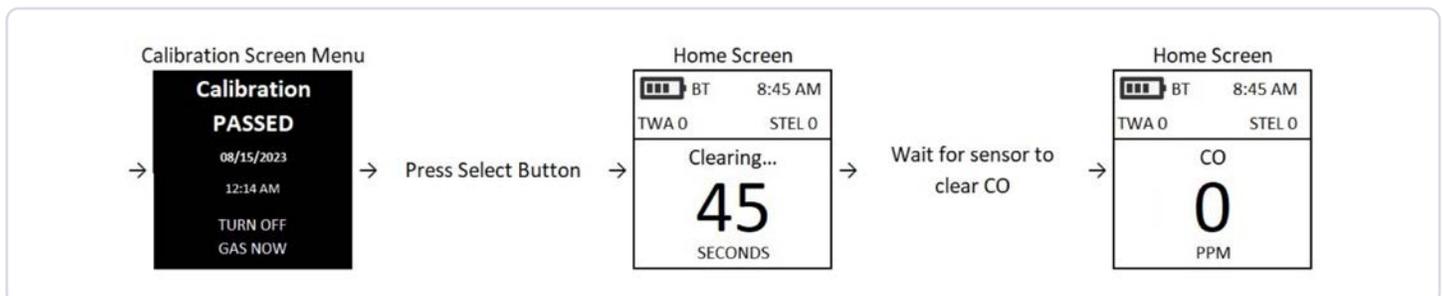*Figure 4: Calibration Cup Installed*

Figure 5: Starting Calibration

Figure 6: Returning to Normal operation

6. Operating Instructions

## 6.5.2 Calibration Using Protector Mobile Connect

Protector Mobile Connect is a mobile app that you can use on a phone or tablet to calibrate a Protector with a mobile device. This simplifies the calibration process by avoiding the built-in menu system. You still require the calibration cup and calibration gas.

The *Protector Mobile Connect* works with a Protector and offers some simple utility features. The *Protector Mobile Connect* User Manual has more details. When a device is paired, it connects to the cloud and exchanges settings and data. The app then goes to a main screen, which is the starting point of these instructions. *Note: The app will prevent the test from being repeated within 1 minute.*

Calibration with Protector Mobile Connect Procedure:

1. From the main option screen select the calibration button. The app communicates with the Protector and sends the required command to the device to initiate the calibration.

2. After the calibration is initiated, follow the on-screen directions. *See Figure 7.*

3. Press Select to start zero in clean air.

4. After the zero is initiated wait for the device to measure and calculate.

5. When the zero is complete the calibration cup and calibration gas is prepared.

6. The calibration cup is put over the sensor area with a hose connected to the hose fitting and connected to a calibration gas source.

7. When ready to calibrate start the gas and press the Select button to start the calibration. Gas flow should be started before attaching the cal cup.

8. After the calibration is initiated wait for the device to measure and calculate.

9. Shut off the gas immediately when the calibration is complete.

10. Remove the calibration cup from the Protector.

11. After the calibration is complete the outcome is displayed.

12. Pressing continue will start the transfer of the new data to the cloud, return the Protector back to normal operation, and return the *Protector Mobile Connect* back to the main option screen.

Figure 7: Calibration Using Protector Mobile Connect
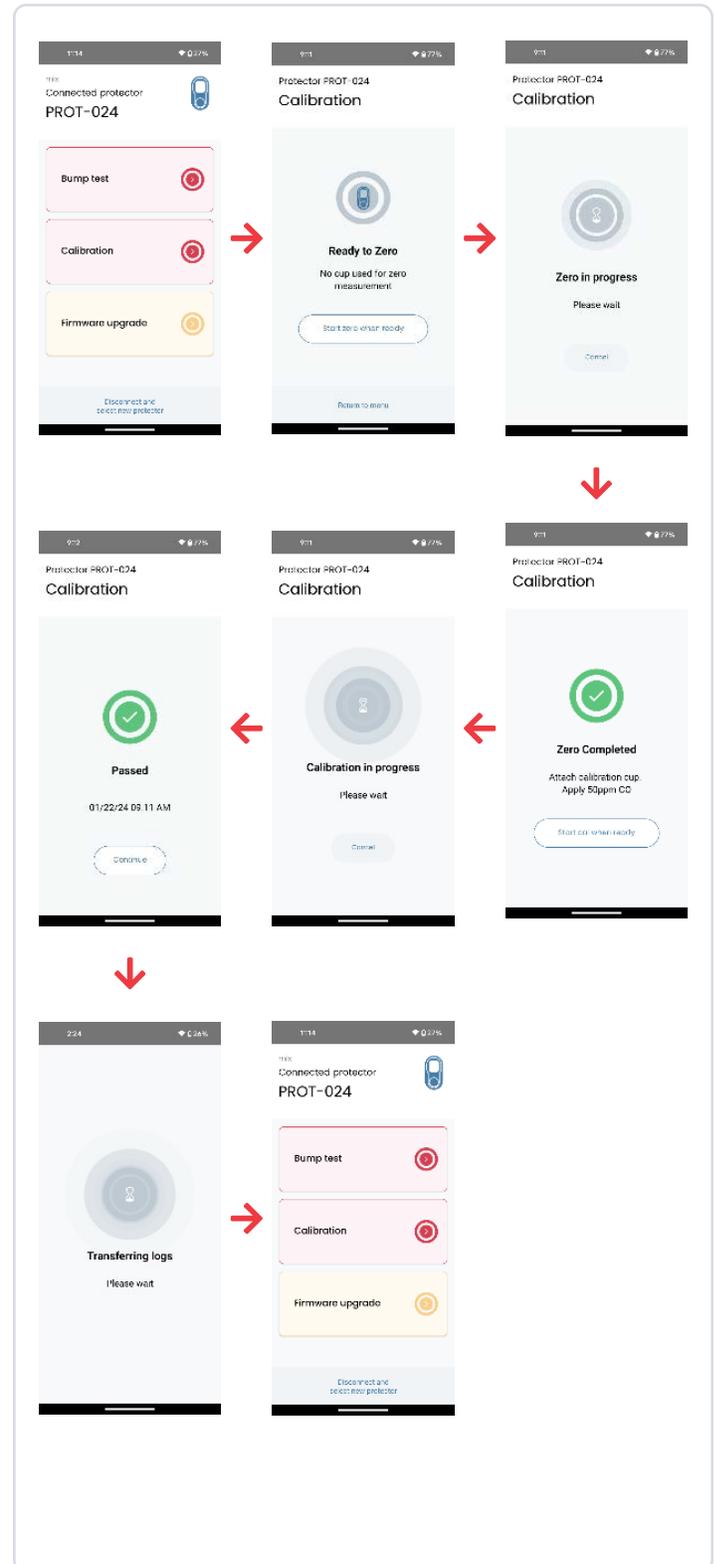
6. Operating Instructions

6.5.3 Calibration Using a Protector Dock Instructions

The protector system includes an option for a small-footprint stationary dock that can be used for communication to the cloud, bump testing, over-the-air (OTA) upgrades, and calibration. When a Protector is put into the carriage of the dock, communication between the Protector and dock is automatically set up. If the calibration interval previously set on the *Protector Fleet Manager* has expired the dock will automatically run a calibration when the device is in the carriage. If you wish to do a calibration before the interval has expired, a calibration button can be found on the front panel.

6.6 Bump Testing

A bump test is when a Protector is exposed to a known gas concentration, and it measures the gas concentration and checks it against the last calibration data. A good test shows that the quick test matches the last calibration. If the bump test is a lot lower than the old calibration, the bump test will fail and a calibration is required. The Protector system can handle the bump testing function in three (3) ways. Bump tests can be done with the internal menu of the device, with the *Protector Mobile Connect* app, or with a dock. Use a certified calibration gas with the proper calibration concentration of gas to calibrate the gas detector. Bump testing should be done under a fume hood or in a well-ventilated area.

Gas Type	Calibration Gas Concentration (ppm)
CO	50

To make sure gas measurements are precise, sensors need to be bump tested regularly. The suggested bump test frequency is every day or two for industrial use but can be adjusted to suit different use cases. Please follow your facility procedures regarding bump test frequency.

6.6.1 Menu Bump Testing Instructions

Menu Bump Testing procedure:

1. From the main menu select Test Mode
2. From the Test Mode screen select Bump
3. Attach the calibration cup and gas source and turn on gas when ready.
4. The Select button starts the bump test.
   See Figure 8.
5. After the Bump test is initiated wait for the device to measure and calculate.
6. Shut off the gas immediately when the bump test is complete.
7. Remove the calibration cup from the Protector.
8. When complete a screen will be displayed showing the bump test outcome.
9. After the screen is read pressing the Select button will direct the device to the home screen with a countdown timer. The timer allows for time to clear the calibration gas from the sensor before returning to normal operation.
   See Figure 9.
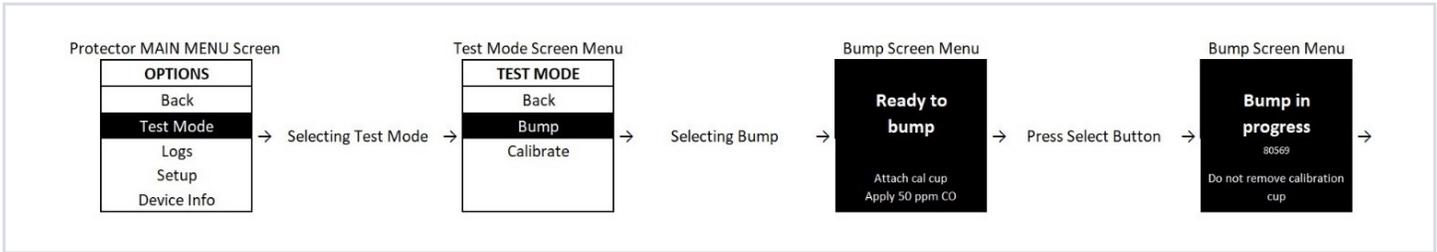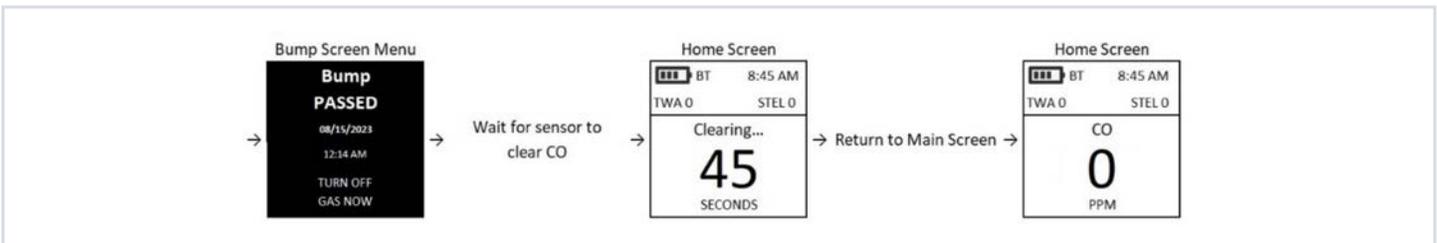
Figure 8: Starting the Bump Test

Figure 9: Clearing the Calibration Gas

6. Operating Instructions

## 6.6.2 Bump Testing Using Protector Mobile Connect

Protector Mobile Connect is a mobile app that you can use on a phone or tablet to bump test a Protector with a mobile device. This simplifies the bump testing process by avoiding the built-in menu system. You still require the calibration cup and calibration gas.

The *Protector Mobile Connect* works with a Protector and offers some simple utility features. The *Protector Mobile Connect* User Manual has more details. When a device is paired, it connects to the cloud and exchanges settings and data. The app then goes to a main screen, which is the starting point of these instructions. *Note: The app will prevent the test from being repeated within 1 minute.*

Bump testing with Protector Mobile Connect Procedure:

1. From the main option screen tap the bump test button. The app communicates with the Protector and sends the required command to the device to initiate the bump test.

2. Follow the on-screen directions. *See figure 10.*

3. The calibration cup is put over the sensor area with a hose connected to the hose fitting and connected to a calibration gas source.

4. When ready to perform a bump test start the gas and tap the Select button to start the bump test.

5. After the bump test is initiated wait for the device to measure and calculate.

6. Shut off the gas immediately when the bump test is complete.

7. Remove the calibration cup from the Protector.

8. After the bump test is complete the outcome is displayed.

9. Taping continue will start the transfer of the new data to the cloud, return the Protector back to normal operation, and return the *Protector Mobile Connect* back to the main option screen.

Figure 10: Bump Testing Using Mobile Connect
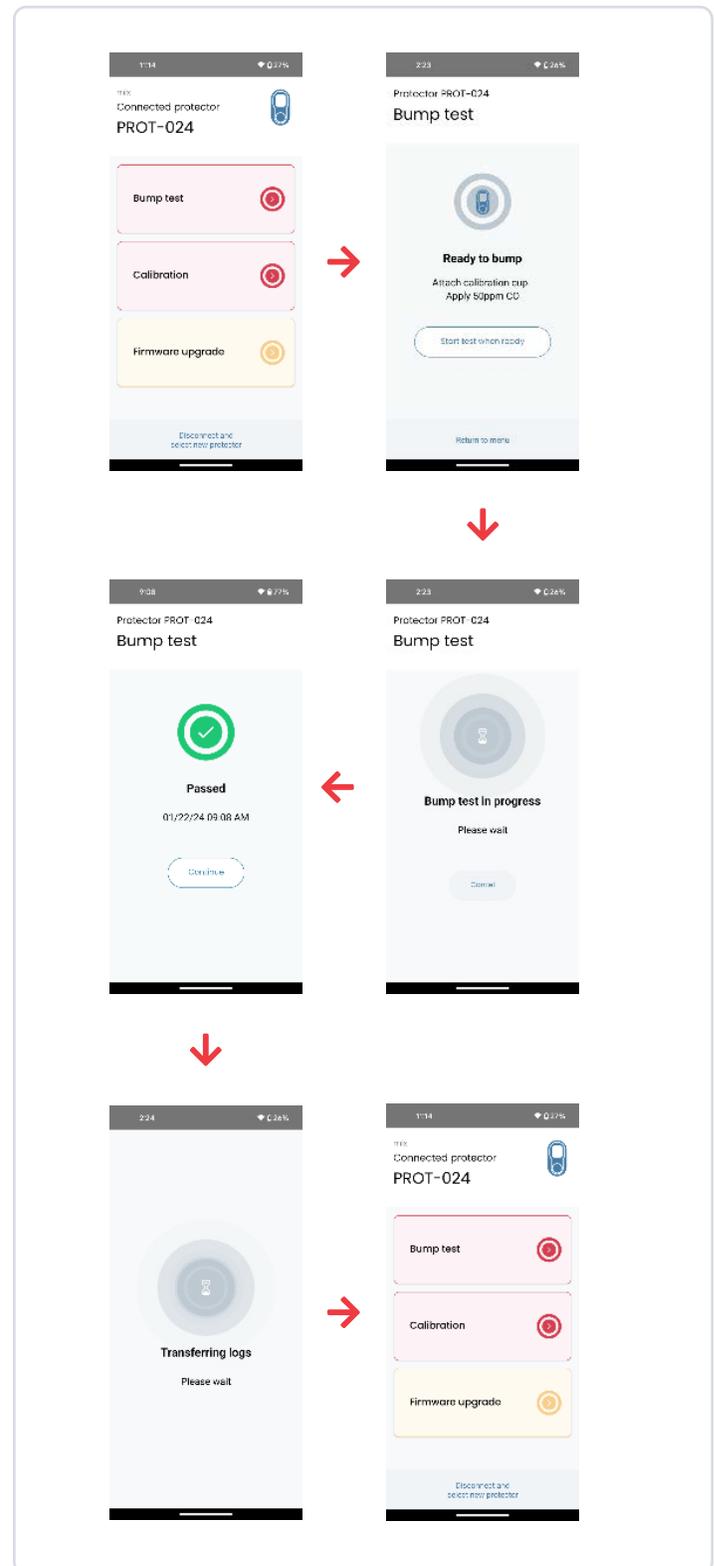
6. Operating Instructions

6.6.3 Bump Testing Using a Protector Dock

The protector system includes an option for a small-footprint stationary dock that can be used for communication to the cloud, bump testing, over-the-air (OTA) upgrades, and Calibration. When a Protector is put into the carriage of the dock, communication between the Protector and dock is automatically set up. If the bump test interval previously set on the *Protector Fleet Manager* has expired the dock will automatically run a bump test when the device is in the carriage. If you wish to do a bump test before the interval has expired, a bump test button can be found on the front panel.

6.7. Firmware Updates

Firmware updates on a Protector are accomplished over the air (OTA) using Bluetooth Low Energy (BLE) connecting to a phone or a dock. The firmware upgrade is stored on the cloud and is retrieved by either the *Protector Mobile Connect* or the Calibration Dock.

6.7.1 Firmware Updates Using Protector Mobile Connect

Protector Mobile Connect is a mobile app that you can use on a phone or tablet to update the firmware on a Protector using a mobile device. The *Protector Mobile Connect* works with a Protector and has some basic utility features. The *Protector Mobile Connect* User Manual explains more. When a device is paired, it connects to the cloud and transfers settings and data. The app then shows a main screen, which is the beginning of these instructions. *See figure 11.*
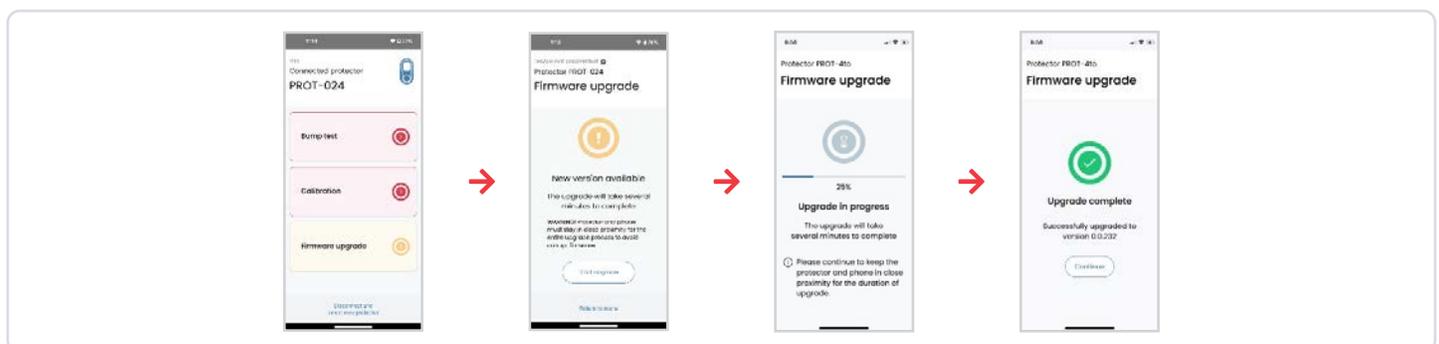
Firmware Upgrade with Protector Mobile Connect Procedure:

1. From the main option screen tap the firmware Upgrade button. The app communicates with the Protector and sends the required commands to the device to check if the firmware needs upgrading and initiates the upgrade if required.

2. Follow the on-screen directions. During a firmware upgrade, the mobile device should have enough battery life to remain powered for a few minutes and should remain close to the device being upgraded.

3. Tap the start upgrade button to begin the firmware upgrade.

4. Continue to keep the Protector and mobile device near each other until the upgrade is complete.

5. When complete a screen will be displayed showing the new firmware version.

6. Tap continue to complete the process and return the Protector to normal operating mode.

6.7.2 Firmware Updates Using a Calibration Dock

A protector system calibration dock can update the firmware of the Protector in its slot. The dock will do this automatically unless the cloud application has a delay set. The *Protector Fleet Manager* cloud software lets users know when there is a new firmware version and gives them the option to postpone automatic updates through a dock. The postponement allows some leeway to avoid doing the update right away for different reasons.

Figure 11: Firmware Updates Using Protector Mobile Connect

7. Troubleshooting

7.1. Common Issues and Solutions

Issue Description	Possible Cause	Solutions
Protector does not power on.	Depleted battery.	Replace the non-rechargeable primary battery as per section 3.5.1 for instructions.
Protector does not power on.	Defective power buttons.	Contact technical support for assistance.
Inaccurate or unstable gas readings.	Sensor out of calibration.	Calibrate the Protector as per section 6.5.
Inaccurate or unstable gas readings.	Interference from other devices.	Move away from potential RF sources of EMF such as walkie talkies
Display not functioning properly.	Screen damage.	Contact technical support for assistance.
Display not functioning properly.	Device is in sleep mode	Start Protector as per section 5.3.
Display not functioning properly	Software issue	Upgrade the firmware as per section 6.7. If the issue persists contact technical support for assistance.
Data not appearing on *Protector Fleet Manager*	Bluetooth turned off on Protector	Use the menu to turn Bluetooth on and reconnect with *Protector Mobile Connect* or a calibration dock.
Data not appearing on *Protector Fleet Manager*	No valid *Protector Fleet Manager* account	Verify login credentials used on *Protector Mobile Connect* or an account needs to be created.
Data not appearing on *Protector Fleet Manager*	Mobile device not onboarded to *Protector Fleet Manager*.	Follow the instructions on the *Protector Mobile Connect* app.
Data not appearing on *Protector Fleet Manager*	The calibration Dock has not been onboarded to *Protector Fleet Manager*.	Follow the instructions on the *Protector Mobile Fleet* cloud software.
Data not appearing on *Protector Fleet Manager* when in dock	Bluetooth communication error between Protector and dock.	Re-start the dock and try again. If the issue persists contact technical support.

7.2. Error Messages

The *Protector Fleet Manager* cloud software receives error codes from calibration docks related to the site. Errors can be viewed in several ways on the cloud software. As with all data on the *Protector Fleet Manager* cloud software the errors can be sorted, filtered, and downloaded.

8. Device Label

The device label provides important information about the Handheld Intrinsically Safe and IP67-Rated Protector Gas Detector. It includes details such as the model number, serial number, manufacturing date, safety warnings, intrinsic safety rating, and IP67 enclosure rating. Familiarize yourself with the information on the label before operating the gas detector.

9. Regulatory Compliance

To view the FCC/IC ID of this device, follow these steps:

1. Turn on the device.
2. Select "FCC/IC" from the main menu.
3. Select "FCC" or "IC" to view the relevant identification information
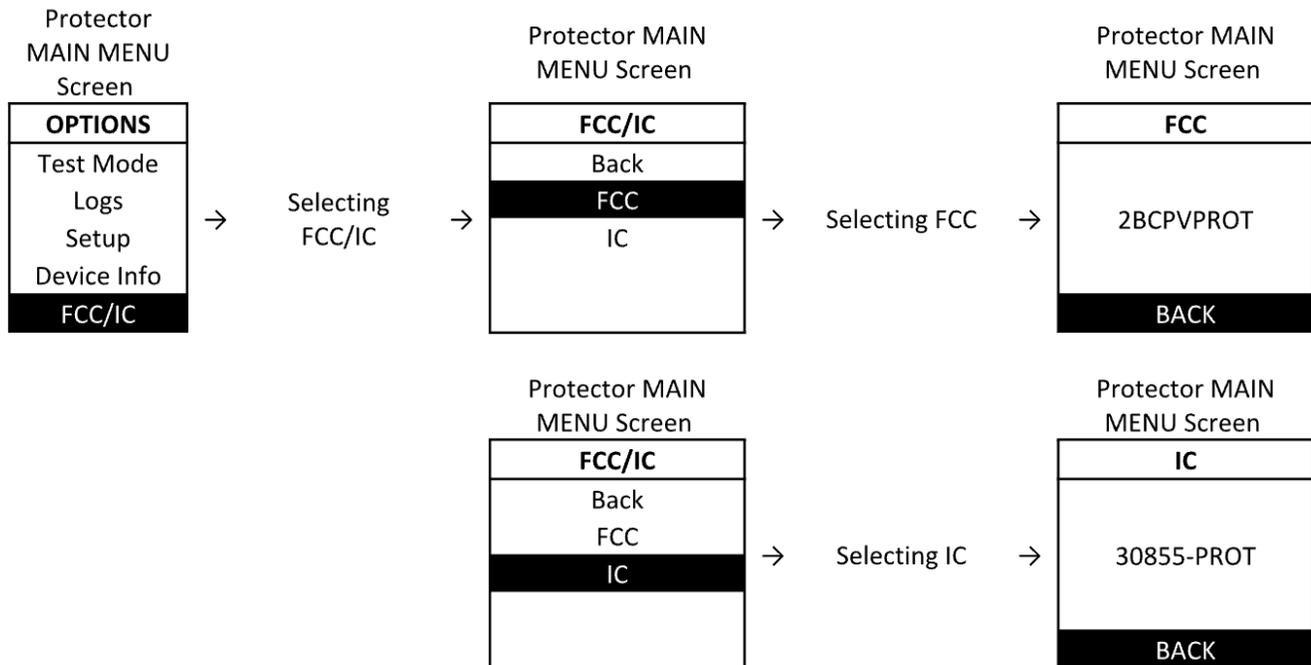
9. Regulatory Compliance

The Protector is designed and has been tested at UL to be certified for the following:

• IP67 (1 meter for 30 min)

• Intrinsically safe,
  CLASS I, GROUP A,B,C,D;
  CLASS II, GROUP E,F,G;
  CLASS III, T4
  ZONE 0, AEx ia IIC T4 Ga;
  Ex ia IIC T4 Ga -40°C ≤ Ta ≤60°C

• Drop test, 6 feet

• Volume of audible alarm 95 dBA @ 10 cm

• FCC:
  FCC ID: 2BCPVPROT
  IC: 30855-PROT

This device complies with Part 15 of the FCC Rules / Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditionssuivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur del'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage estsusceptible d'en compromettre le fonctionnement.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

FCC RF Exposure statement
The device shall be used in such a manner that the potential for human contact normal operation is minimized. This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 1.5 cm between the radiator and your body. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Industry Canada RF Exposure Statement
The device shall be used in such a manner that the potential for human contact normal operation is minimized. This equipment complies with RSS-102 radiation exposure limits. This equipment should be installed and operated with a minimum distance of 1.5 cm between the radiator and your body. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Le dispositif doit être utilisé de manière à minimiser le potentiel de fonctionnement normal par contact humain. Cet équipement est conforme aux limites d'exposition au rayonnement RSS-102. Cet équipement doit être installé et utilisé avec une distance minimale de 1.5 cm entre le radiateur et votre corps. Cet appareil et son (ses) antenne (s) ne doivent pas être co-localisés ou utilisés conjointement avec une autre antenne ou un autre émetteur.

10. Warranty and Support

All units are covered by a two-year warranty from the date of purchase. If your unit is defective upon arrival or malfunctions within the first year, please contact our customer service at sensorconsales@molex.com. Our team will assist you in troubleshooting and determining whether the unit needs to be returned. Should further evaluation be necessary, we will issue a Return Merchandise Authorization (RMA) number and provide a prepaid shipping label. Upon receipt of the defective product, we will either repair or replace it promptly if needed.

Exclusion: Negligence

Please note that this warranty does not cover damages or malfunctions resulting from negligence, misuse, accidents, or unauthorized alterations. It is important to follow all user instructions and guidelines to ensure proper use of the unit.

11. Contact Information

E-Mail: sales@sensorcon.com

Address:
307 Cayuga Rd, Suite 100
Cheektowaga, NY 14225

Hours of Operation:
Monday through Friday - 8am to 4pm EST

12. Revision History