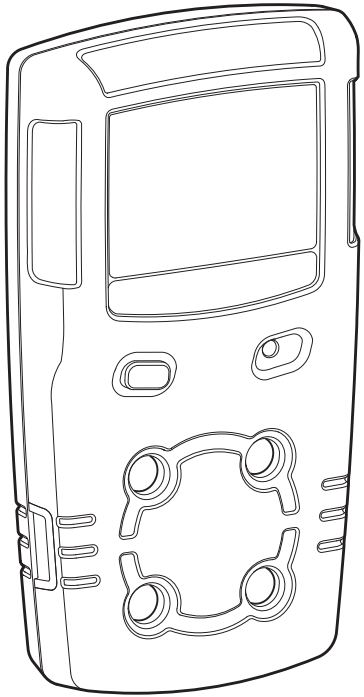


GasAlert MicroClip

1, 2, 3, and 4-Gas Detector

User Manual

BW Technologies
by Honeywell

Limited Warranty and Limitation Liability

BW Technologies LP (BW) warrants the product to be free from defects in material and workmanship under normal use and service for a period of two years, beginning on the date of shipment to the buyer. This warranty extends only to the sale of new and unused products to the original buyer. BW's warranty obligation is limited, at BW's option, to refund of the purchase price, repair or replacement of a defective product that is returned to a BW authorized service center within the warranty period. In no event shall BW's liability hereunder exceed the purchase price actually paid by the buyer for the Product.

This warranty does not include:

a) fuses, disposable batteries or the routine replacement of parts due to the normal wear and tear of the product arising from use;
b) any product which in BW's opinion, has been misused, altered, neglected or damaged, by accident or abnormal conditions of operation, handling or use;
c) any damage or defects attributable to repair of the product by any person other than an authorized dealer, or the installation of unapproved parts on the product; or

The obligations set forth in this warranty are conditional on:

a) proper storage, installation, calibration, use, maintenance and compliance with the product manual instructions and any other applicable recommendations of BW;
b) the buyer promptly notifying BW of any defect and, if required, promptly making the product available for correction. No goods shall be returned to BW until receipt by the buyer of shipping instructions from BW; and
c) the right of BW to require that the buyer provide proof of purchase such as the original invoice, bill of sale or packing slip to establish that the product is within the warranty period.

THE BUYER AGREES THAT THIS WARRANTY IS THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. BW SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL, OR BASED ON CONTRACT, TORT OR RELIANCE OR ANY OTHER THEORY.

Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of this warranty is held invalid or unenforceable by a court of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

BW Technologies by Honeywell
Corporate Headquarters
2840 - 2nd Ave. SE
Calgary, AB
Canada T2A 7X9

BW Technologies by Honeywell
America
3279 West Pioneer Parkway
Arlington, TX
USA 76013

BW Technologies by Honeywell
Europe
5 Canada Close
Banbury, Oxfordshire
United Kingdom OX16 2RT

Table of Contents

Title **Page**

Title **Page**

Title **Page**

List of Figures

Figure Title **Page**

List of Tables

Table Title **Page**

Introduction

⚠ Warning

To ensure personal safety, read Safety Information - Read First and the Cautions before using the detector.

The GasAlertMicroClip ("the detector") warns of hazardous gas at levels above user-defined alarm setpoints.

The detector is a personal safety device. It is your responsibility to respond properly to the alarm.

Table 1 lists the gases monitored.

Table 1. Gases Monitored

Gas Detected	Unit of Measure
Hydrogen sulfide (H_2S)	parts per million (ppm)
Carbon monoxide (CO)	parts per million (ppm)
Oxygen (O_2)	percent by volume (%)
Combustible gases (LEL) Field selectable for:	1. percent of lower explosive limit (% LEL) 2. percent by volume methane 0-5.0% v/v

Contacting BW Technologies by Honeywell

To contact BW Technologies by Honeywell, call

USA: 1-888-749-8878
Canada: 1-800-663-4164
Europe: +44 (0) 1295 700300
Other countries: +1-403-248-9226

Address correspondence to

BW Technologies by Honeywell
2840 – 2 Avenue S.E.
Calgary, AB T2A 7X9
CANADA

Email: info@bwtnet.com

BW Technologies by Honeywell's website: www.gasmonitors.com

ISO 9001

Safety Information - Read First

Use the detector only as specified in this manual and the quick reference guide, otherwise the protection provided by the detector may be impaired.

International symbols on the detector and in this manual are explained in Table 2.

Read the **Cautions** on the following pages before using the detector.

Warning

This instrument contains a lithium polymer battery. Dispose of lithium cells immediately. Do not disassemble and do not dispose of in fire. Do not mix with the solid waste stream. Spent batteries must be disposed of by a qualified recycler or hazardous materials handler.

⚠ Cautions

- ***Warning:*** **Substitution of components may impair Intrinsic Safety.**
- **Before using the detector, refer to Sensor Poisons and Contaminants.**
- ***Warning:*** **For safety reasons, this equipment must be operated and serviced by qualified personnel only. Read and understand the user manual completely before operating or servicing.**
- **Do not use the detector if it is damaged. Inspect the detector before using. Look for cracks and/or missing parts.**
- **If the detector is damaged or parts are missing, contact BW Technologies by Honeywell immediately.**
- **Use only sensor(s) that are specifically designed for the GasAlertMicroClip detector. Refer to Replacement Parts and Accessories.**
- **Calibrate the detector before first-time use and then on a regular schedule, depending on use and sensor exposure to poisons and contaminants. BW recommends at least once every 180 days (6 months).**
- **BW recommends to "bump test" the sensors before each day's use to confirm their ability to respond to gas by exposing the detector to a gas concentration that exceeds the alarm setpoints. Manually verify that the audible and visual alarms are activated. Calibrate if the readings are not within the specified limits.**
- **BW recommends the combustible sensor be checked with a known concentration of calibration gas after any known exposure to catalyst contaminants/poisons (sulfur compounds, silicon vapors, halogenated compounds, etc).**
- **The combustible sensor is factory calibrated to 50% LEL methane. If monitoring a different combustible gas in the % LEL range, calibrate the sensor using the appropriate gas.**
- **Caution: High off-scale readings may indicate an explosive concentration.**
- **Only the combustible gas detection portion of this instrument has been assessed for performance by CSA International.**
- **Protect the combustible sensor from exposure to lead compounds, silicones, and chlorinated hydrocarbons.**
- **Sensor exposure to certain organic vapors (such as leaded gasoline and halogenated hydrocarbons) may temporarily inhibit sensor performance. After exposure, a bump test or calibration is recommended.**

⚠ Cautions

- **For use only in potentially explosive atmospheres where oxygen concentrations do not exceed 20.9% (v/v).**
- **Any rapid up-scaling reading followed by a declining or erratic reading may indicate a gas concentration beyond upper scale limit, which may be hazardous.**
- **Calibrate only in a safe area that is free of hazardous gas.**
- **Use only BW approved batteries for the GasAlertMicroClip detector. Refer to Specifications.**
- **Charge the detector before first-time use. BW recommends the detector be charged after every workday.**
- **Charge the detector using the recommended charging adapter only. Do not use any other charging adapter. Failure to adhere to this caution can lead to fire and/or explosion.**
- **Extended exposure of the detector to certain concentrations of combustible gases and air may stress a detector element, which can seriously affect its performance. If an alarm occurs due to high concentration of combustible gases, a calibration should be performed, or if needed, the sensor replaced.**
- **Do not test the combustible sensor's response with a butane cigarette lighter; doing so will damage the sensor.**
- **Do not expose the detector to electrical shock and/or severe continuous mechanical shock.**
- **Do not attempt to disassemble, adjust, or service the detector unless instructions for that procedure are provided in the user manual, and/or that part is listed as a replacement part. Use only BW Technologies by Honeywell replacement parts. Refer to Replacement Parts and Accessories.**
- **The detector warranty will be voided if customers, personnel, or third parties damage the detector during repair attempts. Non-BW Technologies by Honeywell repair/service attempts void this warranty.**

Table 2. International Symbols

Symbols	Description
	Approved to both U.S. and Canadian Standards by CSA International
	European Explosive Protection
CE	Conforms to European Union Directives
ATEX	Conforms to European ATEX Directives
IECEx	International Electrotechnical Commission Scheme for Certification to Standards for Electrical Equipment for Explosive Atmospheres

Sensor Poisons and Contaminants

Several cleaners, solvents, and lubricants can contaminate and cause permanent damage to sensors. Before using cleaners, solvents, and lubricants in close proximity to the detector sensors, read the following caution and refer to Table 3.

⚠ Caution

Use only the following BW Technologies by Honeywell recommended products and procedures:

- **Water based cleaners and non-alcohol based cleaners**
- **Clean the exterior of the detector with a soft, damp cloth. Do not use soaps, polishes, or solvents.**

Table 3. Sensor Poisons and Contaminants

Cleaners and Lubricants	Silicones	Aerosols
Brake cleaners	Silicone cleaners and protectants	Bug repellents and sprays
Lubricants	Silicone based adhesives, sealants, and gels	Lubricants
Rust inhibitors	Hand/body and medicinal creams that contain silicone	Rust inhibitors
Window and glass cleaners	Tissues containing silicone	Window and glass cleaners
Dishsoaps	Mold releasing agents	
Citrus based cleaners	Polishes	
Alcohol based cleaners		
Hand sanitizer		
Anionic detergents		
Methanol (fuels and antifreezes)		

Getting Started

The list below provides the standard items included with the detector. If the detector is damaged or parts are missing, contact the place of purchase immediately.

- Sensors: H_2S, CO, O_2, and combustible (LEL)
- Calibration cap and hose
- External auxiliary filter
- Charging adapter
- IR Connectivity Kit (includes IR adapter and Soft Tools)
- Quick reference guide
- Quick reference card
- CD-ROM

Fleet Manager II Options

Fleet Manager II software can be downloaded for free from BW Technologies website: www.gasmonitors.com.

Fleet Manager II CD-ROM is shipped with the MicroDock II base station.

The detector is shipped with the sensors and rechargeable battery installed.

Battery Replacement: To replace the battery, contact BW Technologies by Honeywell. The battery can only be replaced by the manufacturer.

Charge Battery and Replace Sensors: To charge the battery and replace the sensors and/or sensor filter, refer to the following:

- Battery Cautions
- Replacing a Sensor or Sensor Filter

To order replacement parts, refer to Replacement Parts and Accessories.

To become oriented with the features and functions of the detector, refer to the following figures and tables:

- Figure 1 and Table 4 describes the detector's components.
- Figure 2 and Table 5 describes the detector's display elements.
- describes the detector's pushbutton.

Parts of the GasAlertMicroClip

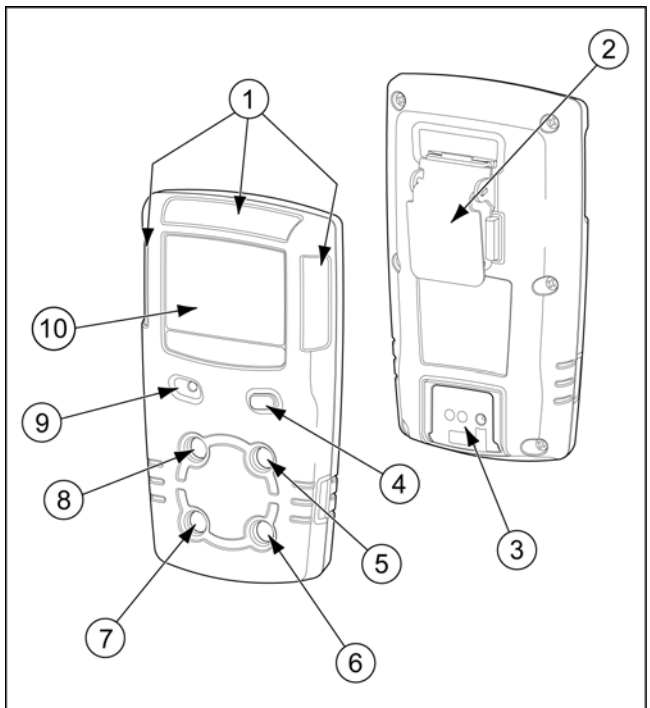


Figure 1. Parts of the GasAlertMicroClip

Table 4. Parts of the GasAlertMicroClip

Item	Description
1	Visual alarm indicators (LEDs)
2	Alligator clip
3	Charging connector / IR interface
4	Pushbutton
5	Carbon monoxide (CO) sensor
6	Hydrogen sulfide (H_2S) sensor
7	Oxygen (O_2) sensor
8	Combustible (LEL) sensor
9	Audible alarm
10	Liquid crystal display (LCD)

Display Elements

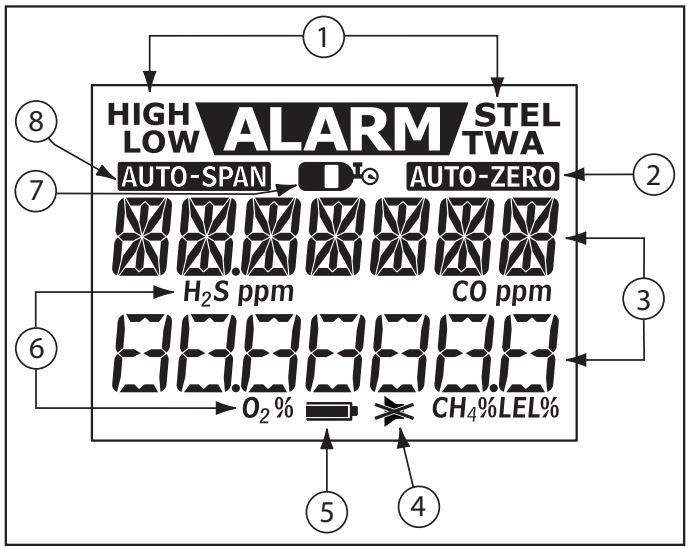


Figure 2. Display Elements

Table 5. Display Elements

Item	Description
1	Alarm condition
2	Automatically zero sensor
3	Numeric value
4	Stealth mode
5	Battery life indicator
6	Gas identifier bars
7	Gas cylinder
8	Automatically span sensor

Pushbutton

Table 6. Pushbutton

Pushbutton	Description
	• To activate the detector press ◯. • To deactivate the detector, press and hold ◯ until the **OFF** countdown is complete and the LCD deactivates. • To view the TWA, STEL, and peak (maximum) readings, press ◯ twice. To clear the TWA, STEL, and peak readings, press ◯ when the LCD displays **RESET**. • To initiate calibration, deactivate the detector. Press and hold ◯ while the detector performs the **OFF** countdown. Continue holding ◯ while the LCD briefly deactivates and then begins the **CAL** countdown. Release ◯ when the **CAL** countdown is complete. • To activate the backlight in normal operation, press ◯. • To acknowledge latched alarms, press ◯. • To acknowledge a low alarm and disable the audible alarm, press ◯ (if the **Low Alarm Acknowledge** option is enabled).

Activating the Detector

⚠ Caution

Only activate the detector in a safe area that is free of hazardous gas in an atmosphere of 20.9% ambient air.

To activate the detector, press ◯.

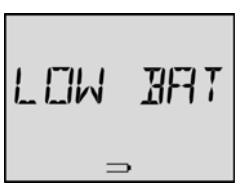
Self-Test

The following startup tests are written as startup performance is intended. If an error occurs, refer to Startup Troubleshooting.

When the detector is activated, it performs several startup tests. Confirm the following tests occur.

Battery Test

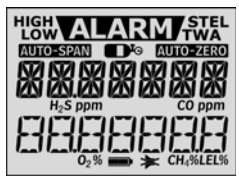
The detector performs a battery test during startup. If the battery has insufficient power to operate, the following screen displays before the detector deactivates.



Charge the battery for 2-3 hours before restarting the detector. Refer to Charging the Battery.

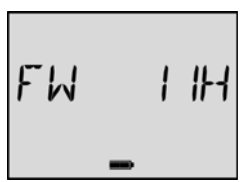
Audible/Visual Test

1. All of the LCD elements display simultaneously as the detector beeps, flashes, vibrates, and activates the backlight.



Detector Version

2. The current firmware version of the detector then displays on the LCD.



Startup Message

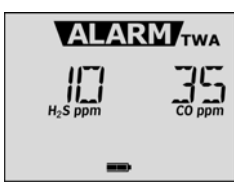
3. If data is entered in the **Startup** option (25 characters maximum) of *Soft Tools* or *Fleet Manager II*, that data will display during the startup self-test. To enter a startup message, refer to Detector Identification or the *GasAlert-MicroClip Soft Tools Instruction Sheet*.

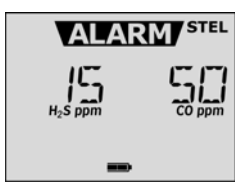
Alarm Setpoints

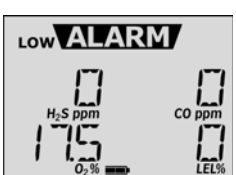
4. Next, the TWA, STEL, low, and high alarm setpoints display.

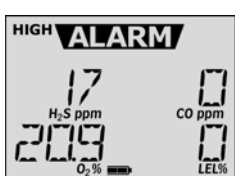
Note

Alarm setpoints may vary by region. Refer to Resetting Gas Alarm Setpoints.









Sensor and Power Test

5. The detector then tests the sensors.

After testing the sensors, the following screen displays to verify all sensors have passed.

If an error message displays, refer to Startup Troubleshooting.

Note

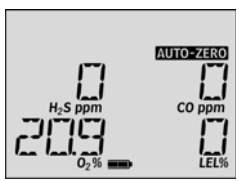
The sensors are tested continuously while the detector is activated.

Automatic Zero and O_2 Calibration (optional)

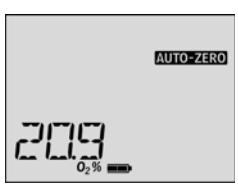
6. **Auto-Zero on Startup:** If enabled, the H_2S, CO, and LEL sensors are automatically zeroed during startup. Each sensor is enabled individually.

   O_2 Auto-Calibration on Startup: If enabled, the O_2 sensor is automatically calibrated during startup.

   The detector beeps twice to signal a successful zero and span, and the following screen displays.



   If the **O_2 Auto-Calibration on Startup** option is enabled, and the **Auto-Zero on Startup** option is disabled for all sensors, the following screen displays.



Note

If oxygen is configured to measure 20.8% vol., the oxygen calibration screen displays ***20.8% O_2****.*

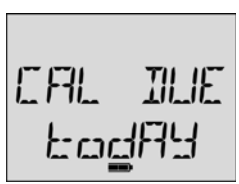
Calibration Due Date (optional)

7. The following screen displays the number of days remaining before calibration is due. The number of days that displays is the earliest calibration due date (overall of all sensors) that calibration must be performed.

Note

If the ***Calibration Interval*** *option is set to* ***0****, the calibration due date is bypassed during startup.*

   If any sensor is past due for calibration, the detector beeps, flashes, vibrates, and the following screen displays.



   If calibration is overdue and the **Force Calibration When Overdue** option is enabled, calibration must be performed to enter normal operation. Refer to Calibration.

Note

If calibration is not performed, or ◯ is not pressed within 2 minutes, the detector automatically deactivates.

If the **Force Calibration When Overdue** is disabled, press ◯ to acknowledge the warning. The detector continues with the startup self-tests and then enters normal operation.

If the **Cal Lock** option is enabled, the following screen displays.

Refer to Startup Troubleshooting.

Bump Check

Note

*Sensors cannot be bump checked if the detector has just been calibrated. If the Bump Interval option is defined as **0** in Soft Tools or Fleet Manager II, the bump check is bypassed.*

BW recommends to "bump check" the sensors, before each day's use, to confirm their ability to respond to gas by exposing the detector to a gas concentration that exceeds the alarm setpoints.

8. If the **Force Bump** option is enabled and the sensors are due to be bump checked, the following screen displays.

A bump check must be performed to enter normal operation. Apply gas to the sensors. Ensure the visual, audible, and vibrator alarms activate. When the gas is removed, the detector briefly remains in alarm until the gas has cleared from the sensors.

When the sensors successfully pass the bump check, the following screen displays showing the number of days remaining until the next bump check is due (**1 d** = 1 day).

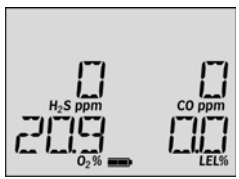
If **Force Bump** is disabled, press ◯ to continue with the startup self-tests.

Note

*If **BUMPCHK todAY** displays again after performing a bump check, refer to Startup Troubleshooting.*

Self-Test Pass

When all of the startup self-tests pass successfully, the detector enters normal operation. The LCD displays the ambient gas readings.

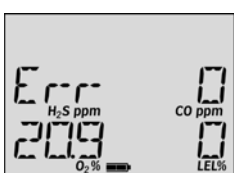


The detector automatically begins

- recording the peak (maximum) gas exposure,
- calculating the short-term exposure level (STEL), and
- calculating the time-weighted average (TWA) exposures.

Self-Test Fail

If the following error message displays after entering normal operation, refer to Startup Troubleshooting.



Battery Test

The battery is tested when the detector is activated and continuously thereafter. A newly charged battery will typically operate for 10-12 hours.

Battery power is continually displayed during normal operation. If battery power is low, ▭ flashes and the detector emits one beep and one flash every 5 seconds.

Note

If enabled, ***Confidence Beep*** *automatically deactivates during a low battery alarm. Refer to Confidence Beep.*

Backlight

The backlight automatically activates

- during startup,
- when the pushbutton is pressed (then deactivates after 10 seconds), and
- when there is an alarm condition (unless **Stealth** is enabled).

Deactivating the Detector

To deactivate the detector, press and hold ◯. The detector beeps and flashes to the corresponding countdown.

When the countdown is complete, the detector emits one short beep before deactivating.

Note

If ◯ is released before the countdown is complete, the detector will not deactivate.

Installing Fleet Manager II (With Soft Tools)

The Fleet Manager II application or the Soft Tools application is required to configure the detector and sensors.

Note

Soft Tools can be purchased separately or as part of the Fleet Manager II application.

Soft Tools

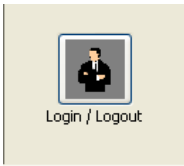
To install Soft Tools separately, refer to the *GasAlertMicroClip Soft Tools Instruction Sheet* and *Soft Tools CD-ROM.*

Fleet Manager II

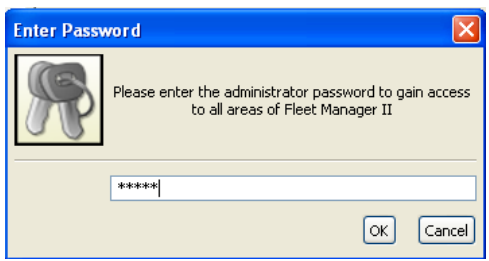
To install Fleet Manager II with Soft Tools included, complete the following:

1. Install Fleet Manager II using the Fleet Manager CD-ROM (available only with MicroDock II), or download (no cost) from BW Technologies by Honeywell website: www.gasmonitors.com.
2. Follow the installation wizard.
3. When installation is complete, open Fleet Manager II.
4. Click **Administration** located on the left tool bar.

5. Click the Login/logout button.

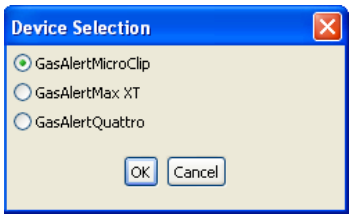


6. When the Password popup displays, enter **Admin** (password is case sensitive).



7. Click **OK**.
8. Click **Configure Device via IR Link**.

9. When the Device Selection popup displays, select **GasAlertMicroClip** and click **OK**.



Fleet Manager II displays the **Sensors** tab that includes the following sections:

- Detector Identification
- CO, O_2, H_2S, LEL Sensor Configuration
- User Options
- Language Menu

Using Fleet Manager II to Configure the Detector

When Fleet Manager II is installed, refer to Table 7, Figure 3, and the following procedures:

Table 7. Connecting the IR Link

Item	Description
1	Detector
2	IR and charger interface
3	IR Link
4	USB cable

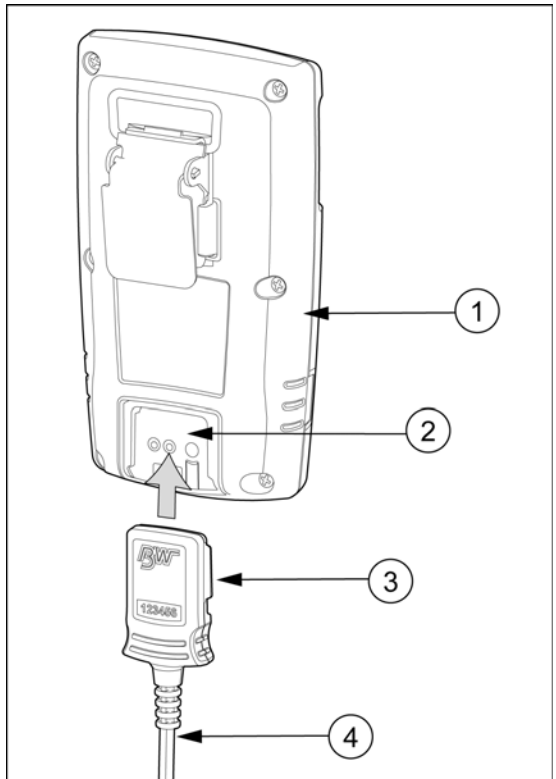


Figure 3. Connecting the IR Link

1. Activate the detector and wait for the startup tests to complete.
2. Connect the USB cable to the USB port on the computer.
3. Connect the USB cable to the IR Link.
4. Insert the IR link onto the IR interface on the back of the detector.
5. Open Fleet Manager II and access the **GasAlertMicro-Clip Soft Tools Sensor** tab. Refer to Installing Fleet Manager II (With Soft Tools).
6. From the GasAlertMicroClip sensor tab, click **Retrieve from Device** at the bottom of the window.

   The fields will populate with the detector's current configurations.
7. Refer to the descriptions in the following sections to define settings and enable/disable options:
   - Detector Identification
   - Sensor Configuration (CO, O_2, H_2S, and LEL)
   - User Options
   - Language Menu
8. When configuration of new settings is complete, click **Save to Device** at the bottom of the window. The detector automatically updates with the new settings.

Detector Identification

The **Detector Identification** section provides information about the detector, current firmware revision, and hardware revision. Data can also be entered (25 characters per line) to display as a startup message on the detector LCD each time it is activated.

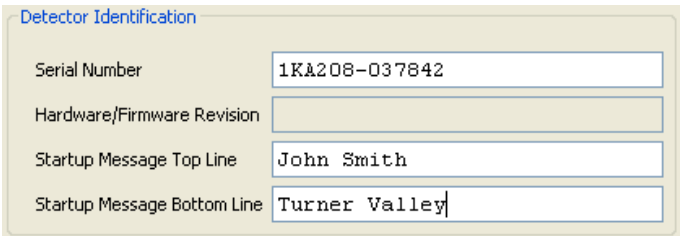


Figure 4. Detector Identification

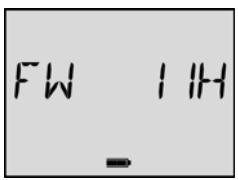
Serial Number

Enter the serial number of the detector. The serial number is located on the back of the detector. The serial number is listed above the **S:** bar code.

Hardware/Firmware Revision

The **Hardware/Firmware Revision** requires no entry. The field automatically populates when data is retrieved from the detector. If new firmware is downloaded to the detector, the field automatically updates when data is retrieved.

The firmware version displays on the detector LCD during the startup self-tests.



Startup Message

Enter text (25 characters per line) to display on the detector LCD during startup. Enter information such as employee name, plant, area, emergency numbers, etc.

Depending upon the length of the message, it will either

a display on the LCD for 3 seconds (shorter message), or

b scroll twice on the LCD (longer message).

Sensor Configuration

Settings for the sensors are configured individually. Enter values or enable/disable options. Refer to Resetting Gas Alarm Setpoints for setpoint values.

Note

Depending upon the sensor, the options may vary.

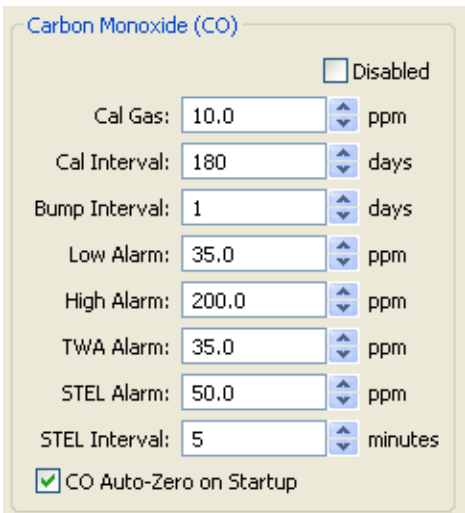


Figure 5. CO Sensor Configuration

Sensor Disabled

⚠ Warning

Use extreme caution when disabling a sensor. The disabled sensor cannot detect and alarm against the applicable gas.

1. Click **Retrieve from Device** to populate the fields with the current detector settings.
2. Click the **Disabled** checkbox for the required sensor.

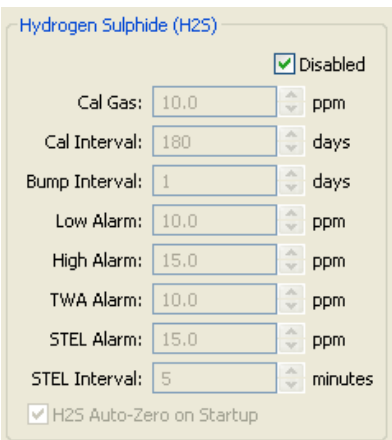
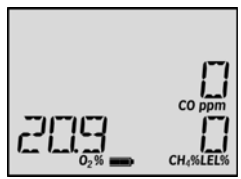


Figure 6. Disabled Sensor

The fields for the applicable sensor become inactive (greyed out) until the sensor is again enabled.

3. Click the **Save to Device** button located at the bottom of the window.
4. The detector LCD automatically updates. The gas type and sensor readings no longer display on the LCD for the applicable sensor.



5. Enable the sensor as soon as possible. If the sensor is damaged, replace it immediately. Refer to Replacing a Sensor or Sensor Filter.

Calibration Gas Concentration

⚠ Caution

The gas concentration value entered in Fleet Manager II or Soft Tools must match the gas concentration value on the gas cylinder.

1. Refer to the following list of recommended gas mixtures:
   - CO: 100 ppm balance N_2
   - H_2S: 25 ppm balance N_2
   - LEL: 50% LEL or 2.5 to 25% by vol. methane balance air
   - O_2: 18.%

2. Select/enter the gas concentration value in the **Cal Gas** field of the applicable sensor.

Calibration Interval

⚠ Caution

BW recommends that the sensors be calibrated once every 180 days (6 months).

Define how often a sensor must be calibrated in the **Cal Interval** field. A different calibration interval can be defined for each sensor.

1. Enter the value (**0**-**365** days) for each sensor.
2. Enter **0** to disable the calibration interval option. Entering zero automatically deactivates the **Force Calibration When Overdue** user option. The detector is shipped with the factory default set to **180** days.

Bump Interval

Define how often a bump check must be performed for each sensor in the **Bump Interval** field. A different bump interval can be defined for each sensor.

1. Enter the value (**1**-**365** days) for each sensor.
2. Enter **0** to disable the **Bump Interval** option. Entering **0** automatically disables the **Force Bump When Overdue** option. The detector is shipped with the factory default set to **1** day.

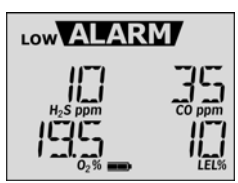
Note

BW recommends to bump check (test) the sensors before each day's use to confirm their ability to respond to gas by exposing the detector to a gas concentration that exceeds the alarm setpoints. Verify that the audible and visual alarms activate. Calibrate if the readings are not within the specified limits.

Low Alarm

Enter the low alarm setpoints for each sensor. Refer to Resetting Gas Alarm Setpoints for factory defined alarm setpoints.

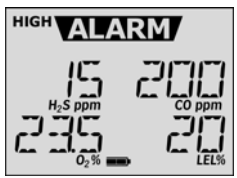
Applicable to all sensors.



High Alarm

Enter the high alarm setpoints for each sensor. Refer to Resetting Gas Alarm Setpoints for factory defined alarm setpoints.

Applicable to all sensors.

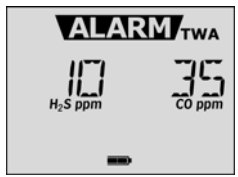


TWA Alarm

The time-weighted average (TWA) is a safety measure used to determine accumulated averages to gases. An average is determined using the Occupational Safety and Health Administration (OSHA) method to ensure the worker is warned when the maximum average is accumulated.

OSHA: The OSHA method is defined as a moving average that accumulates over an 8-hour average. If the worker is in the field longer, the oldest accumulated values (first hour) are replaced by the newest values (ninth hour). This continues for the duration of the work shift until the detector is deactivated.

1. Refer to Resetting Gas Alarm Setpoints for the factory alarm setpoints.
2. Enter the setpoint for the H_2S and CO sensor in the **TWA Alarm** field. Applicable to CO and H_2S sensors only.



STEL Alarm

The short-term exposure limit (STEL) is the maximum permissible gas concentration a worker can safely be exposed to for short periods of time (5-15 minutes maximum).

Note

Standard factory Alarm Setpoints vary by region. Refer to Resetting Gas Alarm Setpoints for OSHA factory settings.

1. Refer to the applicable regulatory requirements in your area for defining STEL alarm setpoints.
2. Enter the setpoint for the CO and H_2S sensor in the **STEL Alarm** field. Applicable to CO and H_2S sensors only.
3. Proceed to STEL Interval.

STEL Interval

The **STEL Interval** option provides protection for workers from over exposure to high concentrations of gas, and is based on used-defined **5**-**15** minute intervals. When the maximum STEL is reached, the detector alarms to notify the worker.

⚠ Caution

Follow all safety procedures as defined by your employer.

Enter the interval (**5**-**15** minutes) in the **STEL Interval** field. The detector is shipped with the factory default setting of **15** minutes.

Auto Zero on Startup

When enabled, the sensors automatically zero during the startup self-tests. The **Auto Zero on Startup** option is available for the CO, H_2S, and LEL sensors. Not applicable to O_2.

1. Click the checkbox of each sensor that is to be auto zeroed during startup.

   The detector is shipped with the **Auto Zero on Startup** option enabled for the CO, H_2S, and LEL sensor.

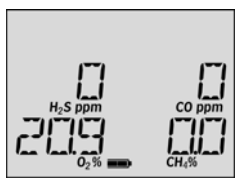
Automatic O_2 Calibration

If the **O2 Auto-Calibration on Startup** option is enabled, the oxygen sensor is automatically calibrated during the startup self-tests.

The detector is shipped with the **O2 Auto-Calibration on Startup** option enabled.

LEL By Vol CH4

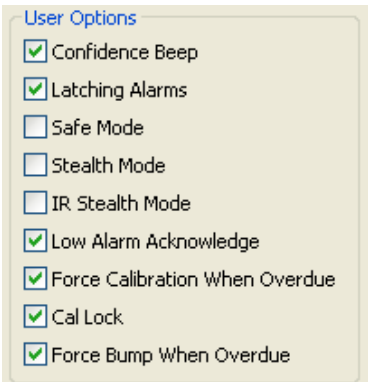
If enabled, the detector displays the LEL value as **%vol**, assuming a methane environment.



The **LEL By Vol CH4** option is applicable to the LEL sensor only. The detector is shipped with the **LEL by Vol CH4** option disabled.

User Options

The user options section provides detector features that can be enabled or disabled. The green checkmark indicates the option is enabled. Click the checkmark to disable the option.



Confidence Beep

If enabled, the confidence beep provides continuous audible confirmation that the detector is operating correctly by beeping every 10 seconds.

Note

Confidence beep automatically disables during a low battery alarm.

The detector is shipped with the **Confidence Beep** option disabled.

Latching Alarms

If enabled, a low alarm persists until the alarm is acknowledged and gas concentrations are below the low alarm setpoint. The audible alarm can be temporarily deactivated by pressing ◯, but the LCD continues to display the peak concentration values until the alarm condition no longer exists.

Safe Mode

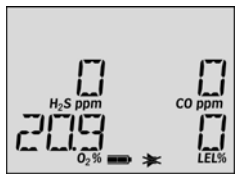
If enabled, **SAFE** displays continuously unless an alarm condition occurs. The **Safe Mode** option provides visual confirmation that no (monitored) hazardous gas is present.

The detector is shipped with the **Safe Mode** option disabled.

Stealth Mode

The **Stealth Mode** disables the backlight, visual alarms, and audible alarms when concealment is required. During an alarm, the vibrator activates and readings display on the LCD.

When **Stealth Mode** is enabled, displays continuously on the LCD.



The detector is shipped with the **Stealth Mode** option disabled.

Low Alarm Acknowledge

If enabled, the audible alarm can be deactivated during a low alarm condition for the CO, H_2S, and LEL sensors. The LED and visual alarm indicators remain active until the alarm condition changes or the detector deactivates.

Press ◯ to acknowledge the low alarm and deactivate the audible alarm.

Note

*The **Low Alarm Acknowledge** option is not applicable to O_2.*

The detector is shipped with **Low Alarm Acknowledge** disabled.

Force Calibration When Overdue

Enable the **Force Calibration When Overdue** option to ensure calibrations are performed regularly and sensors are operating correctly. If the **Force Calibration When Overdue** option is enabled and a sensor is past due for calibration, the following screen displays.

When this option is enabled and a sensor is past due, the sensor(s) must be calibrated immediately, otherwise the detector deactivates. Refer to Calibration.

To enable the **Force Calibration When Overdue** option, complete the following:

1. Click the **Force Calibration When Overdue** checkbox to enable.
2. Enter a value (**1**-**365** days) in the Calibration Interval (**Cal Interval**) field.

⚠ Caution

If 0 (zero) is entered in the Cal Interval field, the Force Calibration When Overdue option is automatically disabled.

The detector is shipped with the **Force Calibration When Overdue** option disabled.

Cal Lock

If the calibration IR lock option (**Cal Lock**) is enabled, the sensors can only be calibrated using an IR device to ensure calibrations are recorded. To calibrate using an IR device, select one of the following:

- IR Link with Fleet Manager (refer to Fleet Manager II),
- IR Link with Soft Tools (refer to Soft Tools), or
- MicroDock II station (refer to the *MicroDock II User Manual*).

If **Cal Lock** is enabled and calibration is attempted, the following screen displays.

Note

*If the **Cal Lock** option is enabled, the detector will still auto zero the sensors.*

The detector is shipped with the **Cal Lock** option disabled.

Force Bump When Overdue

A bump check must be performed regularly to ensure the sensors are responding correctly to gas. If **Force Bump When Overdue** is enabled and the sensors are past due, the following screen displays.

A bump check must be performed, otherwise the detector will deactivate.

To enable the **Force Bump When Overdue** option, complete the following:

1. Click the **Force Bump When Overdue** checkbox to enable.
2. Enter a value (**1**-**365** days) in the Bump Interval field.

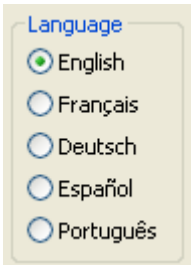
⚠ Caution

If 0 is entered in the Bump Interval field, the Force Bump When Overdue option is automatically disabled.

For information and procedures, refer to Bump Check.

Language Menu

The detector can display LCD screens in five different languages. Refer to the following illustration.



Click the required language. When the settings are saved to the detector, the LCD displays all LCD screens in the selected language.

The detector is shipped with **English** as the default language.

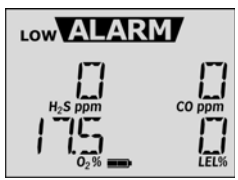
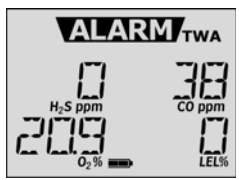
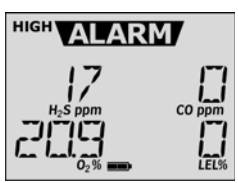
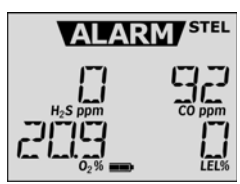
Alarms

Table 8 describes the detector alarms and corresponding screens.

During an alarm condition, the detector activates the backlight, audible/visual/vibrator alarms, (only vibrator when **Stealth** is enabled) and displays the current ambient readings. If more than one type or level of alarm occurs simultaneously, a multi-gas alarm results.

To change the factory-defined alarm setpoints, refer to Low Alarm, High Alarm, TWA Alarm, and STEL Alarm.

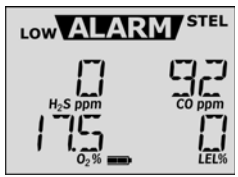
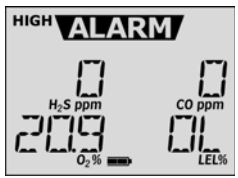
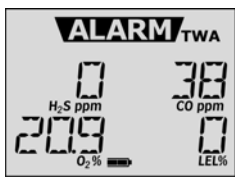
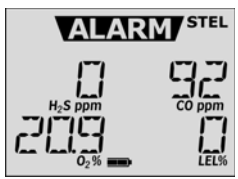
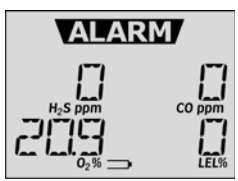
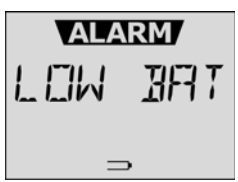
Table 8. Alarms

Alarm	Screen	Alarm	Screen
Low Alarm • Slow siren • Slow alternating flash • ALARM and gas bar flash • Vibrator alarm activates		**TWA Alarm** • Slow siren • Slow alternating flash • ALARM and gas bar flash • Vibrator alarm activates	
High Alarm • Fast siren • Fast alternating flash • ALARM and gas bar flash • Vibrator alarm activates		**STEL Alarm** • Fast siren • Fast alternating flash • ALARM and gas bar flash • Vibrator alarm activates	

Note

If the **Low Alarm Acknowledge** *option is enabled, the audible alarm can be disabled during a low alarm condition. The vibrator and visual alarm indicators remain active until the alarm condition changes or the detector deactivates. Press ◯ to acknowledge the low alarm and deactivate the audible alarm. If the alarm escalates to a high, TWA, or STEL alarm, the audible alarm reactivates.*

In ***Stealth Mode*** *the backlight, audible, and visual alarms are disabled. Only the vibrator alarm and LCD activate during an alarm condition.*

Alarm	Screen	Alarm	Screen
Multi-Gas Alarm: • Alternating low and high alarm siren and flash • ALARM and gas bars flash • Vibrator alarm activates		**Over Limit (OL) Alarm:** • Fast siren and alternating flash • ALARM and gas bar flash • Vibrator alarm activates • **OL** displays	
Sensor Alarm: • **Err** displays		**Confidence Beep:** • One beep every 10 seconds	
Low Battery Alarm: (Confidence beep disabled) • One beep and one flash every 5 seconds • and ALARM flash		**Automatic Shutdown Alarm:** • Eight beeps and eight flashes • **LOW BAT** and ALARM display • Vibrator alarm activates • Displays **OFF** before deactivating	
Normal Shutdown: • Four beeps and flashes • Vibrator alarm activates		*Note* *If enabled, during an alarm condition the* **Latched Alarms** *option causes the low and high gas alarms (audible, visual, and vibrator) to persist until the alarm is acknowledged and the gas concentration is below the low alarm setpoint. The audible alarm can be temporarily deactivated by pressing ◯, but the LCD displays the high peak concentration until the alarm condition no longer exists. Enable/disable* **Latching Alarms** *in Fleet Manager II. Local regulations may require* **Latching Alarms** *be enabled.*	

Computed Gas Exposures

⚠ Warning

To avoid possible personal injury, do not deactivate the detector during a work shift. TWA, STEL, and MAX readings reset once the detector is deactivated.

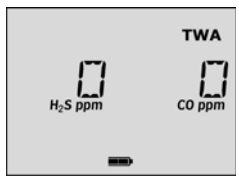
Table 9. Computed Gas Exposures

Gas Exposures	Description
TWA (H_2S and CO only)	Time-weighted average (TWA) based on accumulated exposure to toxic gases averaged over a workday according to OSHA method. OSHA: 8 hour moving average
STEL (H_2S and CO only)	Short-term exposure limit (STEL) to gas based on a 5-15 minute user-defined period.
Maximum* (peak)	Maximum (MAX) concentration encountered during work shift.

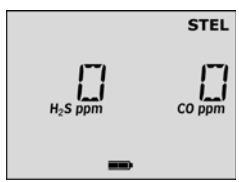
* For oxygen, it is the highest or the lowest concentration encountered.

Viewing Gas Exposures

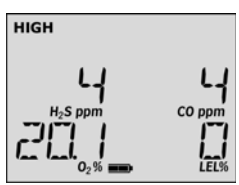
To view the TWA, STEL, and peak (maximum) readings, press ◯ twice. The LCD first displays the TWA gas exposures.



Then the LCD displays the STEL gas exposures.



Finally the LCD displays the peak (maximum) readings.



Clearing Gas Exposures

⚠ Caution

Follow all safety procedures as defined by your employer.

Confirm with your supervisor before clearing TWA and STEL alarms.

To clear the TWA, STEL, and peak exposure readings, press ◯ when the LCD displays **RESET**.

Gas Alarm Setpoints

Gas alarms are activated when detected gas concentrations are above or below the user-defined setpoints. Gas alarms are described below.

Table 10. Gas Alarm Setpoints

Alarm	Condition
Low	*Toxics and combustibles:* Ambient gas level above low alarm setpoint. *Oxygen:* Ambient gas level may be set above or below 20.9% (or 20.8%).
High	*Toxics and combustibles:* Ambient gas level above high alarm setpoint. *Oxygen:* Ambient gas level may be set above or below 20.9% (or 20.8%).
TWA	*Toxics only:* Accumulated value above the TWA alarm setpoint.
STEL	*Toxics only:* Accumulated value above the STEL alarm setpoint.
Downscale	*Toxics only:* If sensor reading is negative (half of the TWA setpoint)
Multi-gas	Two or more gas alarm conditions.
Over Limit (OL)	**OL** displays when readings are above or below the sensor detection range. Refer to Specifications for detection ranges.

Resetting Gas Alarm Setpoints

Note

Standard factory alarm setpoints may vary by region.

Table 11 lists the factory alarm setpoints as defined by Occupational Safety and Health Association (OSHA).

Table 11. Sample Factory Alarm Setpoints

Gas	TWA	STEL	Low	High
O_2	N/A	N/A	19.5% vol.	23.5% vol.
LEL	N/A	N/A	10% LEL	20% LEL
CO	35 ppm	50 ppm	35 ppm	200 ppm
H_2S	10 ppm	15 ppm	10 ppm	15 ppm

Note

To disable an alarm, set the alarm setpoint to **0** *(zero) in Fleet Manager II or Soft Tools. Refer to Fleet Manager II or the GasAlertMicroClip Soft Tools Instruction Sheet for complete instructions.*

To change the factory-defined alarm setpoints, refer to the following:

- Low Alarm
- High Alarm
- TWA Alarm
- STEL Alarm

Stopping a Gas Alarm

The low and high alarms stop when the ambient gas concentration returns to the acceptable range.

Note

If alarms are set to latch, press ◯ to reset the alarms.

The detector calculates the TWA value based on OSHA standards and the STEL value based on a user-defined 5 to 15 minute period. Refer to STEL Interval.

To stop a TWA or STEL alarm, perform one of the following:

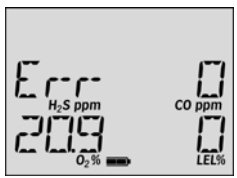
1. Deactivate and reactivate the detector.
2. Reset the TWA/STEL/peak exposure readings. Refer to Viewing Gas Exposures).

⚠ Warning

Follow all safety procedures as defined by your employer. Confirm with your supervisor before clearing TWA and STEL alarms.

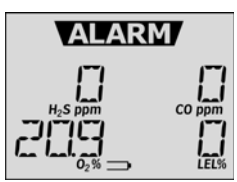
Sensor Alarm

The detector tests for missing or defective sensors during the startup self-test and continuously thereafter. If a sensor fails the self-test, **Err** displays above the gas type of the failed sensor.
Refer to Troubleshooting.



Low Battery Alarm

Battery power is continually displayed during normal operation. If the battery voltage is too low, flashes. The audible and visual alarms activate briefly (approximately 30 minutes) before the detector deactivates.



Charge the battery immediately. Refer to Charging the Battery.

Note

Confidence Beep automatically disables during a low battery alarm.

Automatic Deactivation Alarm

An automatic deactivation alarm will occur if

- the battery voltage is too low to operate the detector,
- calibration is due but not performed (when the **Force Calibration** option is enabled), and
- all sensors fail during the startup self-test.

The detector beeps and flashes eight times, and **OFF** displays on the LCD before it deactivates. Refer to Troubleshooting.

Bump Check

Gas Cylinder Guidelines (Bump Check)

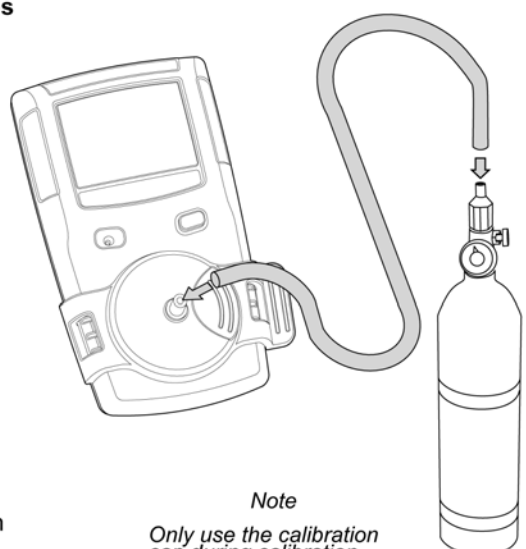
- **To ensure an accurate bump check, use a premium-grade gas. Use gases approved by the National Institute of Standards and Technology.**
- **Do not use a gas cylinder that is past its expiration date.**

Gas Cylinder Connection

1. Connect the calibration hose to the 0.5 l/min regulator on the gas cylinder. For use with the MicroDock II, use a demand flow regulator.

   NOTE: Cylinders that are used with a demand flow regulator must meet the following maximum inlet pressure specifications:
   - Disposable cylinders 0-1000 psig/70bar
   - Refillable cylinders 0-3000 psig/270 bar

   To bump check using the MicroDock II station, refer to the *MicroDock II User Manual*.
2. Connect the calibration hose to the calibration cap.
3. Attach the calibration cap to the detector.
4. Apply gas. Verify the visual and audible alarms activate.
5. Close the regulator and remove the calibration cap from the detector. NOTE: The detector will temporarily remain in alarm until the gas clears from the sensors.
6. Disconnect the hose from the calibration cap and the regulator.
7. Ensure the gas cylinder is stored according to manufacturer's specifications.



Note

Only use the calibration cap during calibration and bump check.

Calibration

Guidelines

When calibrating the detector, adhere to the following guidelines:

- Recommended gas mixture:
  CO: 100 ppm balance N2
  H_2S: 25 ppm balance N2
  LEL: 50% LEL or 2.5% by vol. methane balance air
  O_2: clean air, 18%
- To ensure accurate calibration, use a premium-grade calibration gas. Gases approved by the National Institute of Standards and Technology (NIST) improve the accuracy of the calibration.
- Do not use a gas cylinder beyond its expiration date.
- Calibrate a new sensor before use. Install the sensor, activate the detector, and allow the sensor to stabilize before starting calibration (used sensor: 60 seconds / new sensor: 5 minutes).
- Calibrate the sensors at least once every 180 days, depending on use and sensor exposure to poisons and contaminants.
- Calibrate the detector if the ambient gas varies during startup.
- Calibrate the sensor before defining the alarm setpoints.
- Calibrate only in a safe area that is free of hazardous gas in an atmosphere of 20.9% oxygen.
- Do not calibrate the detector during or immediately after charging is complete.
- The oxygen sensor can be automatically calibrated each time upon activation (if this feature is enabled). Activate the detector in a normal (20.9%/20.8% oxygen) atmosphere.
- Allow the detector to stabilize for 1 minute after activation before performing a calibration or bump test.
- If a certified calibration is required, contact BW Technologies by Honeywell.

Diagnostics Test

The detector tests the ambient air (auto zero) and the test gas that is applied (auto span) to ensure it meets expected values. Auto zero sets the zero-gas level of the sensor.

Auto Zero: If target gas is present, the zero level will be incorrect and the sensor will fail. If a sensor fails, an error message displays.

Auto Span: If the target gas does not meet expected values, an error message displays.

A sensors that fails to span retains the previous span value, and does not continue with the calibration process.

Connecting the Gas Cylinder to the Detector

Refer to the following Figure 7, Table 12, and procedures to connect the gas cylinder to the detector for calibration.

Note

Wind currents may cause false readings and poor calibrations.

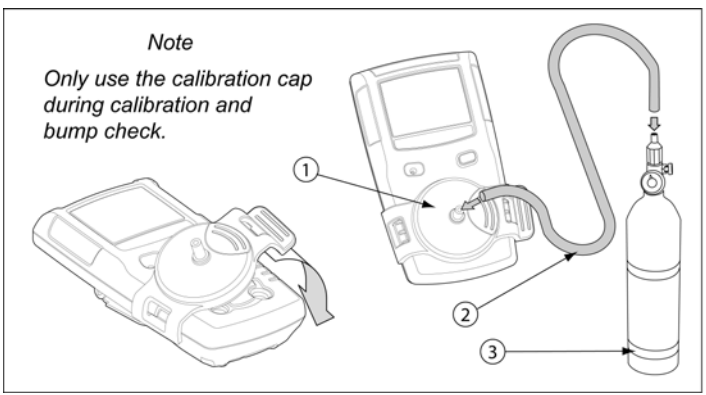


Figure 7. Connecting the Gas Cylinder to the Detector

Table 12. Connecting the Gas Cylinder to the Detector

Item	Description
1	Calibration cap
2	Calibration hose
3	Gas cylinder with 0.5 ml/min regulator

Read the following steps (1-7) before beginning calibration.

1. Verify the calibration gas being use matches the span concentration value(s) that are set for the detector. Refer to **Cal Gas** in Fleet Manager II.
2. Attach a 0.5 ml/min regulator to the gas cylinder. To calibrate with the MicroDock II station, use a demand flow regulator. Refer to the *MicroDock II User Manual*.
3. Connect the calibration hose to the calibration cap.
4. Connect the other end of the calibration hose to the regulator on the gas cylinder.
5. Refer to Calibration Setup to apply gas.
6. When calibration is complete, disconnect the hose from the calibration cap and regulator.
7. Ensure the gas cylinder is stored according to the manufacturer's specifications.

Calibration Setup

The following calibration procedures are written as calibration performance is intended. If an error or failure occurs, refer to Calibration Troubleshooting.

⚠ Caution

Calibrate only in a safe area that is free of hazardous gas in an atmosphere of 20.9% oxygen. Do not calibrate the detector during or immediately after charging.

Note

Calibration can be aborted at any time. To abort calibration, press ◯. The following screen displays.

Setting Span Gas Concentration Values

1. Activate the detector and allow startup to complete.
2. Connect the IR Link to the computer.
3. Insert the IR Link into the IR interface on the back of the detector. Refer to Figure 8.

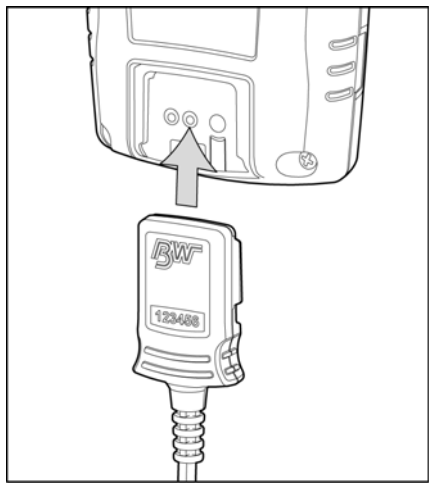


Figure 8. Connecting the Detector and IR Link.

4. On the PC, open Fleet Manager II or Soft Tools.
5. Click Retrieve From Device. The fields populate with the detector's current settings.
6. Refer to *Calibration Gas Concentration* for span gas values.
7. Ensure the sensors to be calibrated are enabled in Fleet Manager II or Soft Tools.

8. Using  , select the concentration value(s) in the **Cal Gas** field for each sensor. The values entered in Fleet Manager II or Soft Tools must match the gas concentration values on the gas cylinder.

9. Click Save To Device to save the settings to the detector.

Calibration Procedure

⚠ Caution

Calibrate only in a safe area that is free of hazardous gas in an atmosphere of 20.9% oxygen. Do not calibrate the detector during or immediately after charging.

1. Press and hold ◯. The detector performs the **OFF** countdown. Continue holding ◯ as the detector briefly deactivates.

2. The detector then reactivates and performs the **CAL** countdown. Continue holding ◯ until the **CAL** countdown is complete.

Note

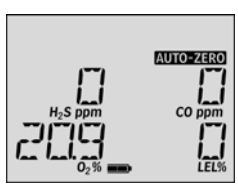
If ◯ is not held for the entire countdown, the detector will deactivate.

Auto Zero and Oxygen Sensor Calibration

Note

Do not apply calibration gas until **APPLY GAS** displays, otherwise the auto zero function will fail.

3. AUTO-ZERO flashes while the detector automatically zeroes the combustible and toxic sensors, and calibrates the oxygen sensor.



When auto zero is complete, the detector beeps twice.

Auto Zero Successful: If the sensors successfully zero, the detector proceeds to the Auto Span function.

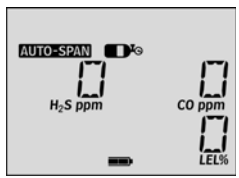
Auto Zero Unsuccessful: If the sensors fail auto zero, an error message displays showing which sensor failed. Refer to Calibration Troubleshooting.

Auto Span

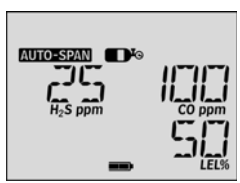
4. When auto zero is complete, **APPLY GAS** displays.

5. Attach the calibration cap to the detector (Figure 7). Open the valve on the regulator and apply gas at a flow rate of 250-500 ml/min.

   flashes and AUTO-SPAN displays.



When a sufficient amount of gas has been detected (approximately 30 seconds), the audible alarm beeps once, AUTO-SPAN flashes, and remains lit while the detector completes the span (approximately 2 minutes).



Successful Span

If the sensors have spanned successfully, the audible alarm beeps and the calibration procedure continues.

Unsuccessful Span

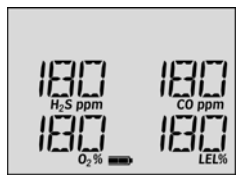
If any sensors fail the span, the following screen displays. Refer to Calibration Troubleshooting.

Calibration Due Date

Note

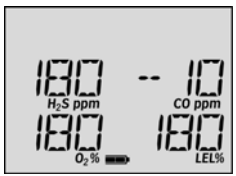
If a sensor fails calibration, the next due date for that sensor will not reset. Refer to Calibration Troubleshooting.

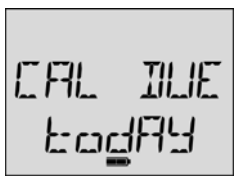
6. After calibration is complete, **CAL DUE** displays and all successfully calibrated sensors automatically reset to the number of days that are defined in Fleet Manager II or Soft Tools.



7. The number of days shown in the last screen is the earliest date (overall of all sensors) a calibration must be performed.

Failed Sensor Past Calibration Due Date: If a sensor fails to span and it is past the calibration due date, the following three screens display.





Press ◯ to acknowledge the warning. The detector returns to normal operation.

Verification

1. After calibration is complete and the detector returns to normal operation, verify the calibration using a gas cylinder other than the one used for calibration.
2. The gas concentration should not exceed the sensor's detection range. Confirm the LCD shows the expected concentration.
3. To ensure the readings are accurate, apply the verification gas for the same amount of time as was applied to the sensor when it was calibrated.

   Example: H_2S span time 2 minutes therefore, apply verification gas for 2 minutes.

Datalogs

The detector records various information that can be compiled to create a report. The detector records a sample every 15 seconds. The detector is capable of storing 16 hours of information. When the memory is full, the detector replaces the oldest datalogs with the most recent datalogs.

Event Logs

The detector records the ten most recent gas alarm events. Information that is recorded is as follows:

- Serial number of the detector
- Start time of alarm
- Type, level and duration of alarm
- Peak exposure level (ppm or %)
- Status of the sensor

Downloading Datalogs and Event Logs

The datalog and event log files can only be downloaded to a PC using an IR Link or the MicroDock II Base Station. Refer to the

- *Fleet Manager II Operator's Manual*, or
- *GasAlertMicroClip Soft Tools Instruction Sheet*.

Software Requirements

To create spreadsheet reports of event logs, datalogs, and bump and calibration results, the following software applications are required:

- Fleet Manager II or Soft Tools, and
- MicroSoft Excel.

Maintenance

To maintain the detector in good operating condition, perform the following basic maintenance as required.

- Calibrate, bump check, and inspect the detector at regular intervals.
- Maintain an operations log of all maintenance, bump checks, calibrations, and alarm events.
- Clean the exterior with a soft damp cloth. Do not use solvents, soaps, or polishes.
- Do not immerse the detector in liquids.

Battery Cautions

⚠ Warning

To avoid personal injury and/or property damage, adhere to the following:

- **The detector must be deactivated to charge the battery.**
- **Charge the battery immediately when the detector emits a low battery alarm. Refer to Charging the Battery.**
- **Charge the battery in a safe area that is free of hazardous gas in temperatures of 32°F to 113°F (0°C to 45°C).**
- **Charge the battery using the BW Multi-Unit Cradle Charger or charger adapter only. Do not use any other charging adapters. Failure to adhere to this caution can lead to fire and/or explosion.**
- **The charging adapter is voltage specific to your region. Use of the charging adapter outside your region will damage the charger and the detector.**
- **Do not calibrate the detector during or immediately after charging the battery.**
- **The battery can only be replaced by the manufacturer. Failure to adhere to this caution can lead to fire and/or explosion.**
- ***Warning:* The GasAlertMicroClip uses a lithium battery that may present a risk of fire or chemical burn hazard if misused. Do not disassemble, heat above 212° (100°C), or incinerate.**
- ***Warning:* Lithium polymer cells exposed to heat at 266°F (130°C) for 10 minutes can cause fire and/or explosion.**

Charging the Battery

To charge the detector, refer to Figure 9, Table 13, and the following procedures (1-8).

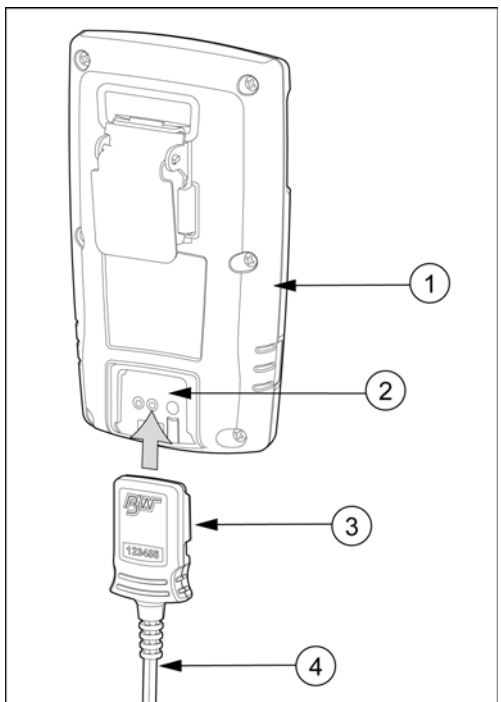


Figure 9. Connecting the Charging Adapter

Table 13. Connecting the Charging Adapter

Item	Description
1	Detector
2	IR and charger interface
3	Charging adapter
4	Charging cable

⚠ Warning

The detector must be charged in a safe area that is free of hazardous gas in temperatures of 32°F to 113°F (0°C to 45°C).

1. Deactivate the detector.
2. Plug the charger into an AC outlet.

⚠ Caution

The charging adapter is voltage specific to your region. Use of the charging adapter outside your region will damage the charger and the detector.

3. Attach the charging adapter to the charger interface.
4. Allow the battery to charge for 2-3 hours. The charging indicator flashes on the LCD while the detector is being charged.

low mid high

5. When charging is complete, the charging indicator stops flashing and displays ▬ to indicate a full charge. Remove the charging adapter and activate the detector.

   If the battery indicator does not display, refer to Troubleshooting.

Note

To reach full battery capacity, allow the battery to fully charge and fully discharge three times.

Charging the detector in temperatures above 113°F will greatly reduce the number of charges the detector can accept.

The detector may be warm immediately following charging. This is normal.

Replacing a Sensor or Sensor Filter

⚠ Warning

To avoid personal injury, only use sensors that are specifically designed for the detector. Refer to Replacement Parts and Accessories.

- Each sensor has a high degree of resistance to common vapors and gases. To clear a sensor, move the detector to a non-hazardous environment and wait 10 to 30 minutes.
- Do not expose a sensor to vapors of inorganic solvents such as fumes from paint thinners, or organic solvents such as benzoic acids and acrylic acids.

To replace a sensor or sensor filter, refer to

- Table 14,
- Figure 10,
- Figure 11, and
- the following procedures (1-8).

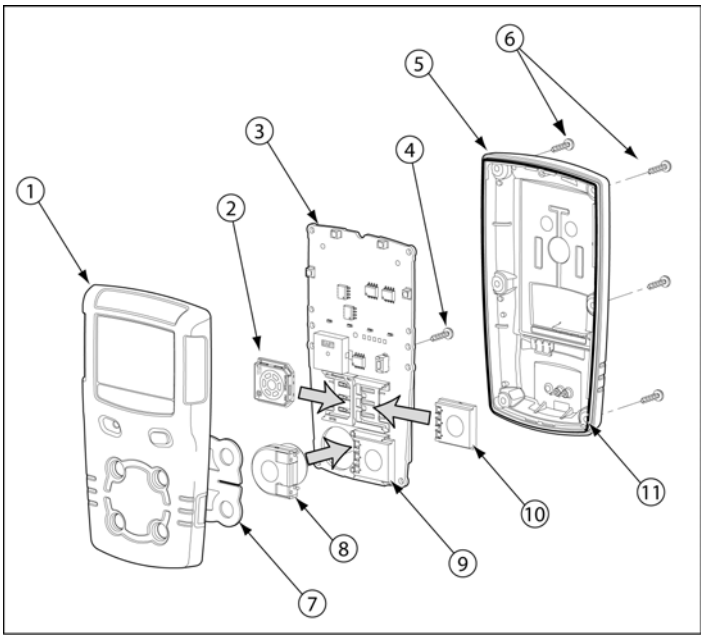


Figure 10. Replacing a Sensor or Sensor Filter

Table 14. Replacing a Sensor or Sensor Filter

Item	Description
1	Front shell
2	Combustible (LEL) sensor
3	PCB
4	PCB screws (2)
5	Rear shell
6	Machine screws (6)
7	Sensor filter
8	Oxygen (O_2) sensor
9	Hydrogen sulfide (H_2S) sensor
10	Carbon monoxide (CO) sensor
11	Sealing rib

1. Deactivate the detector.
2. Remove the six machine screws on the rear shell.
3. Remove the back cover by lifting the top and the bottom upwards simultaneously to prevent damaging the charger pins.

4. Remove the two screws on the PCB. Note the placement of the PCB to ensure it is replaced correctly. Remove the PCB carefully.

⚠ Caution

Ensure no damage occurs to the battery.

5. Remove the old sensor and/or sensor filter. For H_2S, CO, and LEL, slide the sensors out. For O_2, pull the sensor upward.

Note

Detectors that are configured for 1, 2, or 3 gases may contain a dummy sensor in one of the four sensor locations.

6. Insert the new sensor and/or sensor filter.

Note

When inserting a new sensor filter, ensure the black gasket is facing the front shell.

7. To re-assemble the detector, perform the following:
   - Verify the PCB is seated correctly and inserted exactly as it was removed (sensors face the front shell).
   - Replace the two PCB screws.
   - Visually inspect the battery to ensure no damage has occurred.
   - When replacing the rear shell, ensure the charging pins (bottom of inside rear shell) are aligned with the corresponding holes on the PCB. If the contact pins are bent, the battery will not charge correctly.
   - Ensure the rib on the interior rear shell inserts between the battery and the PCB.

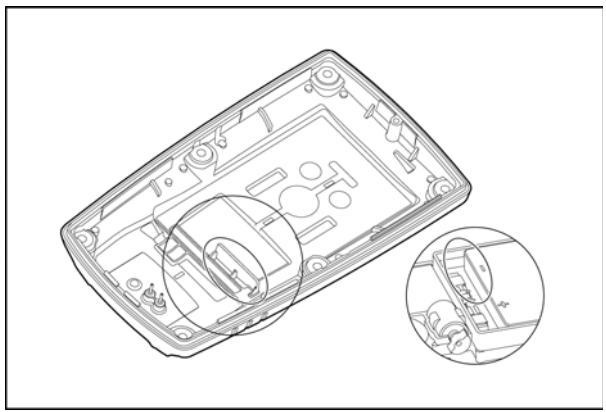


Figure 11. Replacing the Rear Shell

   - Press the front and rear shells together firmly to ensure a proper seal. Ensure the front and rear shell have a uniform, tight 1/16 in (1 mm) seal on all sides of the detector.
   - Replace the six machine screws in a crisscross pattern using 3-4 in-lbs torque.

8. New sensors must be calibrated. Activate the detector and calibrate the sensor(s). Refer to Calibration.

Troubleshooting

If a problem occurs, refer to the solutions provided in Table 15. If the problem persists, contact BW Technologies by Honeywell.

Table 15. Troubleshooting

Problem	Possible Cause	Solution
Startup		
The detector does not activate.	Depleted battery	Charge battery. Refer to Charging the Battery.
	Damaged or defective detector	Contact BW Technologies by Honeywell.
The detector enters alarm immediately when activated.	Sensor needs to stabilize	Used sensor: wait 60 seconds New sensor: wait 5 minutes
	Low battery alarm	Charge battery. Refer to Charging the Battery.
	Detector requires calibration	Calibrate the detector. Refer to Calibration.
	Hazardous environment	Leave the area immediately. Deactivate and reactivate in a safe area that is free of hazardous gas, in an atmosphere of 20.9% oxygen.
The activation self-test fails.	General fault	Contact BW Technologies by Honeywell.
	Sensor failure	Replace the sensor. Refer to Replacing a Sensor or Sensor Filter.
Detector automatically deactivates during startup.	Battery power too low to operate	Charge battery. Refer to Charging the Battery.
	Force Calibration When Overdue option is enabled and calibration is not attempted	Calibrate the sensor(s) immediately. Refer to Calibration.
	Force Bump When Overdue option is enabled and a bump test is not attempted	Bump test the sensor(s) immediately. Refer to Bump Check.

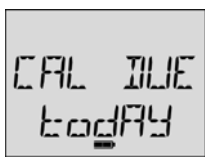
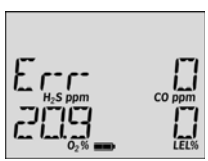
Table 14. Troubleshooting

Problem	Possible Cause	Solution
Detector Operation		
Detector does not display expected gas readings after activation self-test.	Sensor not stabilized	Used sensor: wait 60 seconds New sensor: wait 5 minutes
	Sensor(s) requires calibration	Calibrate the sensor(s). Refer to Calibration.
	Target gas is present	Detector is operating properly. Use caution in suspect areas.
Detector does not respond to pushbutton.	Battery is depleted	Charge battery. Refer to Charging the Battery.
	Detector is performing operations that do not require user input	Pushbutton operation restores automatically when the operation ends.
Detector does not accurately measure gas.	Sensor(s) requires calibration	Calibrate the sensors. Refer to Calibration.
	Detector is colder/hotter than ambient gas	Allow the detector to attain ambient temperature before use.
	Sensor filter is blocked	Replace the sensor filter. Refer to Replacing a Sensor or Sensor Filter.
Detector does not enter into alarm.	Alarm setpoint(s) defined incorrectly	Reset alarm setpoints. Refer to Resetting Gas Alarm Setpoints and Fleet Manager II.
	Alarm setpoint(s) set to zero	Reset alarm setpoints. Refer to Resetting Gas Alarm Setpoints and Fleet Manager II.
	Detector is in calibration mode	Complete the calibration procedure.

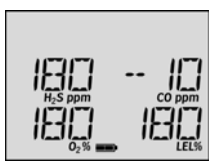
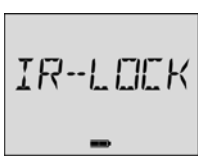
Table 14. Troubleshooting

Problem	Possible Cause	Solution
Detector intermittently enters alarm without reason.	Ambient gas levels are near alarm setpoint or the sensor is exposed to a puff of the target gas	Detector is operating normally. Use caution in suspect areas. Check the peak (maximum) gas exposure reading.
	Alarm setpoints defined incorrectly	Reset alarm setpoints. Refer to Resetting Gas Alarm Setpoints and Fleet Manager II.
	Detector requires calibration	Calibrate the sensors. Refer to Calibration.
	Missing or faulty sensor(s)	Replace the sensor. Refer to Replacing a Sensor or Sensor Filter.
Features and options are not operating as expected.	Changes have been made in Fleet Manager II or Soft Tools	Verify settings in Fleet Manager II or Soft Tools are correct.
Charging		
Battery has been charging for 3+ hours. The charging indicator on the detector LCD shows the battery is still charging.	Battery is trickle charging	Battery is fully charged and ready for operation.
Battery indicator does not display when charging.	Detector is depleted below normal levels	Charge the battery for 8 hours. Detector LEDs may light during first 5 hours. This is normal. If the battery indicator does not light after charging for 8 hours, contact BW Technologies by Honeywell.
When detector is activated after charging, the battery indicator does not display.	Battery is defective	Contact BW Technologies by Honeywell.

Startup Troubleshooting

Error Screen	Problem	Solution	Error Screen	Problem	Solution
	**Auto-zero Fail or O2 Calibration Fail** H_2S, CO, or LEL sensor fails to auto-zero, or O_2 sensor fails to calibrate.	Calibrate the sensor(s). Refer to Calibration. Reactivate the detector. If error displays again, replace the sensor. Refer to Replacing a Sensor or Sensor Filter.		**IR Lock Enabled** If the **IR Lock** screen displays, an IR device is required to calibrate the sensors.	Perform calibration using the IR Link with Soft Tools or Fleet Manager II software, or insert the detector into the MicroDock II station. Refer to **Cal Lock** in User Options and Calibration.
	**Calibration Overdue** Displays when calibration is past due. If the **Force Calibration When Overdue** option is enabled, the sensor(s) must be calibrated to enter normal operation.	Press ◯ to continue and calibrate the sensor(s) immediately. Refer to Calibration. If the **IR Lock enabled** screen displays, the MicroDock II station or the IR Link with Soft Tools or Fleet Manager II must be used to calibrate.		**Bump Check Fail** A bump check has just been performed. The detector is prompting for another bump check because a sensor(s) has failed.	Perform another Bump Check. Ensure the cylinder is not empty and that the cylinder is not past the expiry date. Ensure the regulator is fully opened to apply gas. If **Bump Check Today** displays again, calibrate the sensors. Refer to Calibration. If the calibration is unsuccessful, refer to Replacing a Sensor or Sensor Filter.
	**Forced Calibration** If **Force Calibration When Overdue** is enabled, the sensors must be calibrated to enter normal operation.	Press and hold ◯ to calibrate the sensors, or press ◯ and release to deactivate the detector. Refer to Calibration. If the **IR Lock enabled** screen displays, an IR device must be used to calibrate.		**Sensor Fail** A sensor has failed during the startup self-test.	Perform a Bump Check and reactivate the detector. If the sensor fails again, perform Calibration. Reactivate the detector again. If the sensor still does not pass, refer to Replacing a Sensor or Sensor Filter.

Calibration Troubleshooting

Error Screen	Problem	Solution	Error Screen	Problem	Solution
	**Auto-zero Unsuccessful** H_2S, CO, or LEL sensor fails to auto-zero, or O_2 sensor fails to calibrate.	Attempt calibration again. Refer to Calibration. If **ERROR** displays again, replace the sensor. Refer to Replacing a Sensor or Sensor Filter.		**No Gas Detected** If the applicable gas is not detected within 2 minutes, the detector fails the sensor.	Ensure the sensor is enabled. Verify gas cylinder is not empty or past the expiration date. Check/replace the regulator. Attempt calibration again. If the sensor fails the span a second time, refer to Replacing a Sensor or Sensor Filter.
	**Auto Span Unsuccessful** H_2S, CO, or LEL sensor fails to auto-zero, or O_2 sensor fails to calibrate.	Ensure sensor is enabled. Verify gas cylinder is not empty or past the expiration date. Check/replace the regulator. Attempt calibration again. If the sensor fails the span again, refer to Replacing a Sensor or Sensor Filter.		**Calibration Due Date Overdue** A sensor displays a negative number for a next due date after calibration is performed.	Calibration for the sensor was unsuccessful. The due date will not reset. Attempt calibration of the sensor again. If still unsuccessful, refer to Replacing a Sensor or Sensor Filter. Calibrate the new sensor immediately.
	**IR Lock Enabled** IR -- Lock displays when calibration is attempted.	An IR device is required to calibrate. Connect the detector to the IR Link and Fleet Manager II and Soft Tools, or use the MicroDock II station to calibrate.			

Replacement Parts and Accessories

⚠ Warning

To avoid personal injury and/or damage to the detector, use only the specified replacement parts.

To order parts or accessories listed in the following table, contact BW Technologies by Honeywell.

Table 16. Replacement Parts and Accessories

Model No.	Description	Qty
Sensors		
SR-W-MP75	MICROpeL combustible (LEL) sensor	1
SR-X-MC	MICROceL oxygen (O_2) sensor	1
SR-H-MC	MICROceL hydrogen sulfide (H_2S) sensor	1
SR-M-MC	MICROceL carbon monoxide (CO) sensor	1
Sensor filters		
MC-SS	Sensor filters (kit of 2)	1
MC-SS-K1	Sensor filters (kit of 10)	1
MC-AF-1	Auxiliary adapter (filters not included)	1
MC-AF-K1	Auxiliary kit (adapter with 5 filters)	1
MC-SS-AF-K1	Auxiliary kit (adapter with 10 filters)	1
Regulator		
Reg-0.5	Regulator (0.5 l/min)	1
Gas Cylinders		
CG-Q58-4	Quad gas cylinder: CH_4-2.5%, O_2-18.0%, H_2S-25 ppm, CO-100 ppm, bal. N_2 (58 l)	1
CG-Q34-4	Quad gas cylinder: CH_4-2.5%, O_2-18.0%, H_2S-25 ppm, CO-100 ppm, bal. N_2 (34 l)	1
CG-T34	Dual gas cylinder: 50% LEL (CH_4-2.5%) O_2-20.9%, bal. N_2 (34 l)	1
CK-Q58-4	Quad calibration kit with regulator, quad gas cylinder (CG-Q58-4), hose, and carrying case	1
G0042-H25	Single gas cylinder: H_2S 25 ppm, bal. N_2 (58 l)	1
CG2-M-200-103	Single gas cylinder: CO 200 ppm, bal N_2 (103 l)	1
CG-BUMP1	Bump alarm gas aerosol (CH_4-2.5%, O_2-10%, H_2S-40 ppm, CO-200 ppm)	1
Charger and Accessories		
MC-CO1-MC5*	Multi-unit (5) cradle charger	1
GA-PA-1-MC5*	Multi-unit power adapter	1

Model No.	Description	Qty
GA-PA-3	12-24 VDC direct-wire power adapter	1
GA-PA-1*	Replacement power adapter	1
GA-VPA-1	Vehicle charging kit	1
Confined space kit		
MC-CK-DL	GasAlertMicroClip deluxe confined space kit	1
MicroDock II and Module		
DOCK2-2-1C1L-00*	MicroDock II Automatic Test and Calibration System (with MicroClip module) Fleet Manager II CD-ROM included	1
DOCK2-0-1L-00*	GasAlertMicroClip docking module (with charging cable)	1
DOCK2-0-1L-00N	GasAlertMicroClip docking module	1
Datalogging Accessories		
GA-USB1-IR	IR Connectivity Kit (with Soft Tools)	1

Model No.	Description	Qty
Sampling/Testing Equipment		
GA-SPAK02	SamplerPak (motorized sampling pump kit)	1
MC-AS01	Manual aspirator pump kit with probe (1 ft. / 0.3 m)	1
MC-TC-1	Calibration cap	1
Carrying Accessories		
GA-HMC	Carrying holster	1
GA-NS-1	Neck strap with safety release	1
GA-LY-1	Short strap 6 in. (15.2 cm)	1
GA-ES-1	Extension strap 4 ft. (1.2 m)	1
GA-ARM-1	Arm band	1
GA-CH-2	Chest harness	1
MC-LC-1	Black leather PVC carrying holster	1
SPAK-CC1	Carrying case for Sampling Pump and/or detector	1

**Add one of the following applicable suffixes to the end of the order number to ensure power adapter is correct for region.*

-UK for United Kingdom

-EU for Europe,

-AU for Australia/China

Specifications

Instrument dimensions: 10.75 x 6.00 x 2.73 cm (4.2 x 2.4 x 1.1 in.)

Weight: 160 g (5.7 oz.)

Operating temperature: -20°C to +58°C (-4°F to +136°F)
+50°C to +58°C is certified by CSA International on the combustible sensor with ±5% accuracy

Storage temperature: -40°C to +50°C (-40°F to +122°F)

Operating humidity: 0% to 95% relative humidity (non-condensing)

Alarm setpoints: May vary by region and are user defined. All setpoints automatically display during the startup self-test

Detection range:
H_2S: 0 – 100 ppm (1 / 0.1 ppm increments)
CO: 0 – 500 ppm (1 ppm increments)
O_2: 0 – 30.0% vol. (0.1% vol. increments)
Combustible (LEL): 0 – 100% LEL (1% LEL increments) or
0 – 5.0% v/v methane

Sensor type:
H_2S, CO, O_2: Single plug-in electrochemical cell
Combustibles: Plug-in catalytic bead

O_2 measuring principle: Capillary controlled concentration sensor

Alarm conditions: TWA alarm, STEL alarm, low alarm, high alarm, multi-gas alarm, over limit (OL) alarm, low battery alarm, confidence beep, automatic deactivation alarm

Audible alarm: 95 dB at 30 cm (1 ft.) (100 dB typical) variable pulsed beeper

Visual alarm: Red light-emitting diodes (LED)

Display: Alphanumeric liquid crystal display (LCD)

Backlight: Activates when the pushbutton is pressed and deactivates after 5 seconds; also activates during an alarm condition

Self-test: Initiated upon activation

Calibration: Automatic zero and automatic span

Oxygen sensor: Automatic span upon activation (enable/disable)

User field options: Startup message, confidence beep, latching alarm, enable/disable safe display mode, oxygen measurement, combustible sensor measurement, sensor disable, calibration interval, force calibration, calibration due lock, force bump, bump interval, stealth mode, low alarm acknowledge, language selection, enable/disable automatic oxygen calibration, enable/disable auto zero at startup, set alarm setpoints, span concentration values, and STEL calculation period

Battery operating time: 1 rechargeable lithium polymer: 10-12 hours (typical)

Year of manufacture: The detector's year of manufacture is determined from the serial number. The second and third number after the letters determines the year of manufacture

Example: KA3**08**-000001 = 2008 year of manufacture

Approved battery:

Approved batteries for GasAlertMicroClip:
Varta PLF503759.06.7003/0238F as per standards EN50020, UL913, C22.2 No. 157

Rechargeable battery	**Temperature code**
Lithium polymer	T4

Battery charger: GasAlertMicroClip charging adapter

First-time charge: 2-3 hours

Normal charge: 2-3 hours

Warranty: 2 years including sensors

Approvals:
Approved by CSA to both U.S. and Canadian Standards
CAN/CSA C22.2 No. 157 and C22.2 152
ANS/UL – 913 and ANSI/ISA – S12.13 Part 1

CSA	Class I, Division 1, Group A, B, C, and D
ATEX	CE 0539 ⟨Ex⟩ II 1 G EEx ia IIC T4 KEMA 06ATEX0056
IECEx	Ex ia IIC T4 IECEx CSA 05.0015

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 and ICES-003 Canadian EMI requirements. 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 of 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.

General Datalogger Specifications

Storage: 16 hours at 15-second intervals

Memory type: Wraparound memory ensures most recent data is always saved

Sample rate: One reading every 15 seconds

Data recorded: All sensor readings, all alarm conditions, calibrations, event flags, battery status, sensor status, confidence beep activation, and detector status with the time and date for each reading and unit serial number

Operation: Requires no user intervention (automatic)

Compatible with: Desktop PC computer or laptop

Operating system: Windows 2000 or higher

Download via: IR device (IR Link adapter or MicroDock II Base Station)

Software required:

- Fleet Manager II application, or
- Soft Tools application with spreadsheet/database compatible with comma-separated-value (CSV) text files (Excel, Access, Quattro, etc.),
- Microsoft Excel (optional) to create custom reports.

EC Declaration of Conformity

Manufacturer:
BW Technologies by Honeywell
2840 2 Ave SE
Calgary, Alberta
Canada T2A 7X9

Products covered by this declaration:

Type:
GasAlertMicroClip

Description:
Intrinsically Safe, portable multi-gas detector for monitoring up to 4 gases (Toxic, O_2, and %LEL)

The technical file is maintained at the manufacturer's location.

Equipment and protective systems in potentially explosive atmospheres:

The product(s) listed above conform to the relevant provisions of ATEX Directive 94/9/EC of March 23, 1994. Conformity has been demonstrated with reference to the following Harmonized European Standards.

Standard	Description
EN 60079-0:2007	Electrical apparatus for potentially explosive atmospheres – Part 0: General requirements
EN 60079-11:2007	Electrical apparatus for potentially explosive atmospheres – Part II: Intrinsic Safety
EN50270:2006	Electromagnetic Compatibility – Electrical apparatus for the detector and measurement of combustible gases, toxic gases, or oxygen
EN60079-26:2004	Equipment with equipment protection level (EPL) Ga
IEC 60079-0:2007	Electrical apparatus for explosive gas atmospheres – part 0: General Requirements
IEC 60079-11:2007	Electrical apparatus for explosive gas atmospheres – part 11: Intrinsic Safety "I"

UL International DEMKO A/S
Testing and Certification
Lyskaer 8, PO Box 514
DK-2730
Herlev, Denmark
Identification Number: 0539

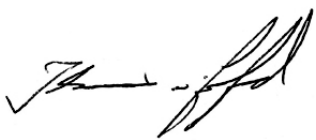
KEMA Quality B.V.
Ultechtseweg 310
6812 AR Arnhem
The Netherlands
Identification Number: 0344

Notified Body	Document	Identification Number
KEMA	EC Type Examination Certificate	06 ATEX 0056

Conformity of Production:
The manufacturer declares herewith that the production of all product(s) listed above meets the requirements of ISO 9001:2000. NSF International Strategic Registrations Quality Registrar, Canada under certificate No. 99167, certified this quality system on February 27, 2003

Name: Thomas A. Crawford, P. Eng.
Position: Manager Product Compliance, Certification, & Conformity

Signature:



Factory Addresses

System Sensor de Mexico S DE RL DE C V
Parque Industrial Intermex
Ave Valle Del Cedro 1681 CP 32570
Juarez Chih Mexico

BW Technologies by Honeywell
2840 2 Ave SE
Calgary, Alberta
Canada T2A 7X9

Wear yellow. Work safe.

iERP: 128720
D5908/3 [English]