

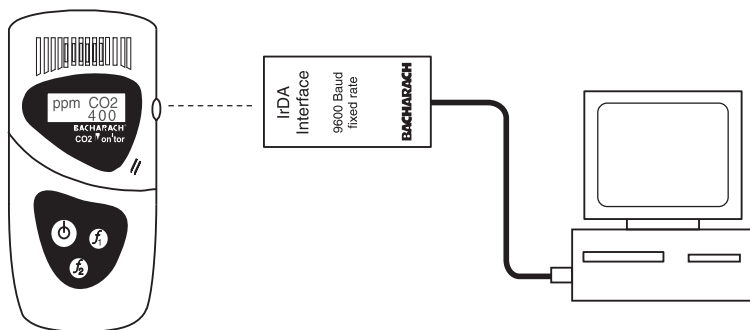


BACH-COM

Data Download Software

Part No. 19-3301

Instruction 19-9224
Installation/Operation
Rev. 7 – December 2005



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1. Introduction

1.1 Features

BACH-COM Data Download Software is designed to allow communication between a personal computer (PC) and the CO₂ Monitor 2800, CO₂ Analyzer 2810/2815/2820, StowSeek, N₂O Monitor 3010, and the MGC 100 (thereafter referred to as the “instrument” in this manual).

Communications between the instrument and PC is achieved through an IrDA communication device, which is supplied as part of the BACH-COM Software Package (Part No. 19-3301).

BACH-COM provides a user the ability to:

- Change instrument parameters such as: the logging frequency, units of measurement, alarm levels, and confidence chirp.
- Change an instrument’s calibration gas value, or change its current gas calibration setting.
- Download data from the instrument in a format that can be utilized by most spreadsheet programs.
- Produce basic tables and graphs of real-time-based exposure.
- Print stored data as either tables or graphs.

1.2 System Requirements

- Windows® 98/SE/ME/NT/2000/XP
- CD Drive
- 2 MB Hard Drive Space

1.3 Important Notes

After any of the instrument’s programming functions have been changed,, the instrument must be turned OFF and then ON for the new settings to take effect.

Do not use BACH-COM to carry out any communications with the instrument while the instrument is being charged.

Some of the options available in BACH-COM as described in this manual will vary depending on the model of instrument that is linked to the software (e.g., logging interval timing, user calibration functions).

1.4 Y2K Issues

When using BACH-COM with Windows 98, ensure that the operating system has been updated to be year 2000 compliant; otherwise, BACH-COM may display and print year 2000 dates as 1996.

To check if your installed version of Windows 98 needs updated, use Microsoft's Windows Update feature to display a list of *critical updates* specific to your computer, or log onto www.microsoft.com and select the Downloads tab and choose Windows Update. If the file "Year 2000 Update 2" is listed, then your version of Windows 98 needs updated. If this file is not listed, then either the update has already been installed, or you are running a newer version of Windows.

For the correct last two digits of the year to be shown when setting the time and date per Section 3.4.1, Windows must have its "short date format" or "short date style" set to mm/dd/yy and not mm/dd/yyyy.

2. Installation

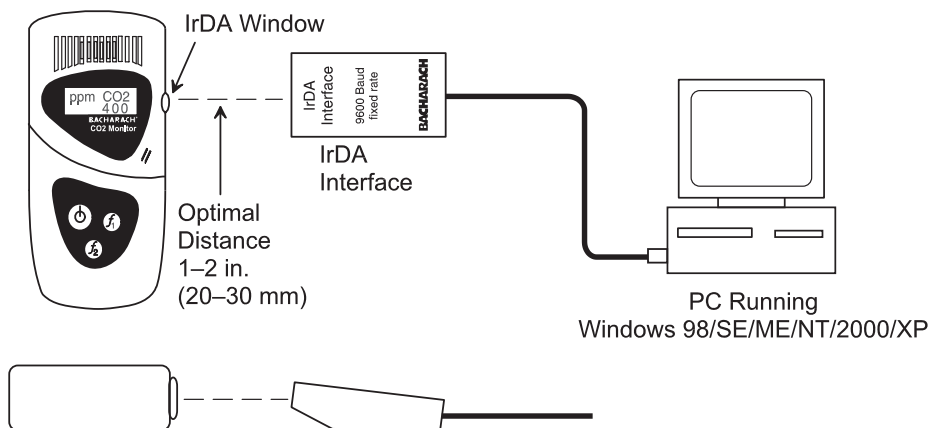
2.1 IrDA Communication Device Installation

With the personal computer (PC) turned OFF, connect the IrDA communication device to the PC's COM1 serial communication port (it may be necessary to use a 9-pin to 25-pin adapter to make this connection).

COM1 is the default port used by the software. If COM1 is already in use by another device, then connect the IrDA device to the next available COM port. The software, however, will need to be reconfigured as described in Section 3.2 to use this port.

To ensure a good communications link, aim the IrDA communication device directly at the IrDA window on the side of the instrument. The optimum distance between the instrument and the IrDA device is 1–2 inches and on the same plane as shown in the figure below. This positioning can later be checked as described in Section 3.3.

Important: For Notebook Computer Users – *If this software is being used on a notebook with an internal IrDA port, then disable that port before attempting communication with the instrument. Otherwise, communication may fail.*



2.2 Software Installation

Important: *Please read before installing. If this software is being installed as an upgrade, then ensure that all previous versions have been **uninstalled** before proceeding.*

1. Start the PC; then insert the BACH-COM CD into the PC's CD drive.

Note: *Make sure that no other programs are running; otherwise, BACH-COM will not install correctly if any shared files are in use.*

3. Type `D:\setup.exe` (where "D" corresponds to the drive letter of the CD drive) in the **Start | Run** dialog box; then click OK.
4. Follow the on-screen instructions to install the software.
5. After installation is complete, there will be a **Pm-com** program icon in the **Start | Programs** listing.

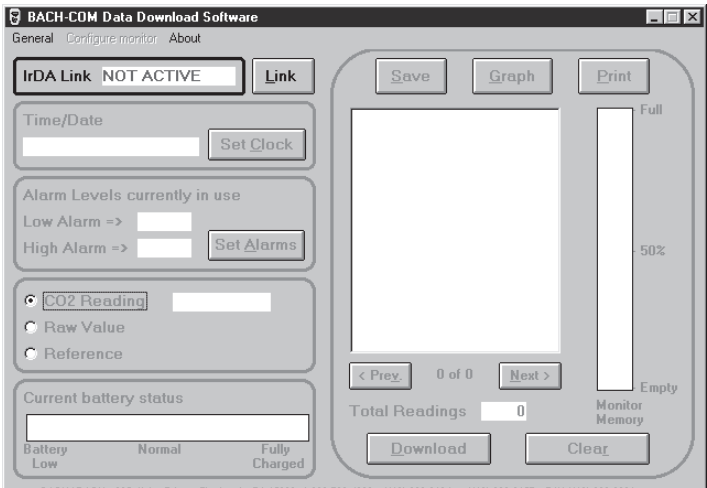
3. Operation

3.1 Starting BACH-COM

Start the BACH-COM program by clicking the filename **Pm-com** located in the **Start | Programs** list.

When the program is first started, its main screen is displayed as shown in the figure below.

***Note:** Sections of the screen that are “grayed out” are functions or features that are not operational at this time.*



3.2 Changing the COM Port Number

If the IrDA device is connected to anything other than COM1, then the software must be reconfigured by choosing **Select comms port** under the **General** menu, and then selecting the appropriate port number. The program provides a warning if the chosen port is not available for use.



3.3 Testing and Establishing an IrDA Link

Ensure that the instrument and IrDA device are properly positioned as described in Section 2.1. Then establish an IrDA link as follows:

1. Under the **General** menu, click **Test IrDA Position**.

In the **IrDA Link** box, observe that if the instrument and IrDA device are misaligned or too far apart, then the message **Re-position** will appear. When the instrument and IrDA device are moved into alignment, the message **Position OK** appears.



2. Click the **Link** button. The **IrDA Link** box will show the name of the instrument and also display the message **IrDA link established, please wait while Setup data is transferred. (8 secs approx)**.
3. When the link is achieved the IrDA link box will then display **Active - ID XXXXX**, where the Xs refer to the instrument's serial number. The Active ID number will stay in the link box throughout the communication process.



Note: If the IrDA link is disrupted during communications, then the message **NOT ACTIVE** will appear in the **IrDA Link** box. When this occurs, perform Steps 1 and 2 until the **Active** message reappears.

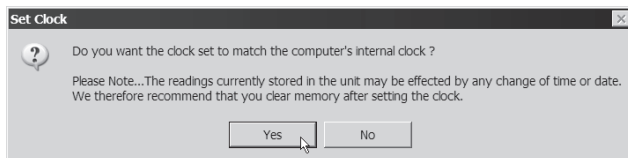
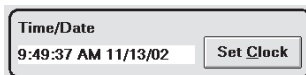
3.4 Main Screen Displays

After a link has been established between the instrument and the IrDA device, the screen's six dialogue boxes show the following information relating specifically to the instrument linked to the PC. This information (except for memory) is updated every 10 seconds.

- IrDA link status
- Time and date settings
- Alarm level settings
- Reading of instrument
- Current battery status
- Memory status (when the Download button is clicked), including a listing of all stored readings, the total number of memory locations used, and the percentage of memory used

3.4.1 Time and Date

The **Time/Date** box shows the instrument's current time and date settings in the format mm/dd/yy. To change the instrument's time and date to match the PC's internal clock, click the **Set Clock** button – the following box is then displayed:



By clicking **Yes**, the time/date changes and the following message appears: **Clock Set to match the computer's internal clock**. To continue, click **OK** to return to the main screen.

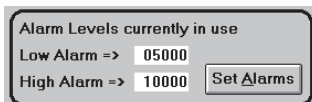
Notes: *It is advisable to use the "Set Clock" option only when the instrument's memory is empty, as changing the time/date may affect the data currently stored in the instrument. It is also advisable to clear the memory after setting the clock.*

If the first two digits of the year are displayed instead of the last two, ensure that the "short date format" or "short date style" in Windows is set up for "mm/dd/yy" and not "mm/dd/yyyy."

Setting the clock of an N₂O Monitor 3010 will re-start its TWA reading.

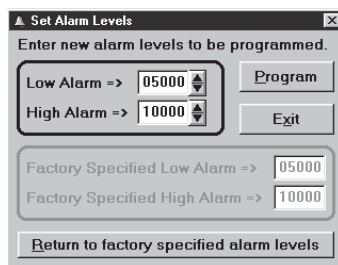
3.4.2 Alarm Levels

The **Alarm Levels currently in use** box shows the instrument's current alarm level(s). If the instrument does not have alarm capability, this box will be grayed out.



To change the alarm level(s), click the **Set Alarms** button – the **Set Alarm Levels** dialogue box is then displayed.

The alarm levels are changed by clicking the up and down arrows to the right of the alarm setting. Observe that when altering the alarm levels of a Model 2800, a difference of 0.01% (100 ppm) will automatically



be maintained between the low and high alarm levels to prevent entering a low alarm figure that is higher than the high alarm figure, and vice-versa.

After setting the new alarm level(s), click the **Program** button to store these levels. The following message is then displayed: **Alarm levels programmed OK. Please Note... Your instrument needs to be switched OFF/ON for the new settings to take effect.** To continue, click **OK** to return to the main screen.

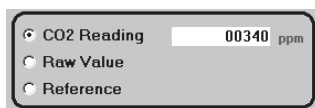
The **Factory Specified** alarm levels are also displayed in the **Set Alarm Levels** dialogue box. A user can return the instrument to these levels by clicking the **Return to factory specified alarm levels** button. The following message is then displayed: **Alarm levels returned to factory settings successfully. Please Note... Your instrument needs to be switched OFF/ON for the new settings to take effect.** To continue, click **OK** to return to the main screen.

3.4.3 CO₂/N₂O Reading

The **CO₂ Reading** or **N₂O Reading** dialogue box allows the user to display the instrument's reading in several ways. Note that the way the reading is displayed on the PC does not affect the reading displayed by, or stored by the instrument.

CO₂ Reading (2800, 2810, 2815, 2820 & StowSeek)

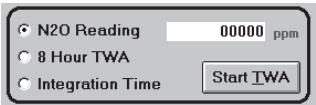
- **CO₂ Reading:** Is the main format for reading data, and is expressed as a % or ppm value in accordance with the instrument's configuration (refer to Section 3.6).



- **Raw Value:** Displays the raw sensor output reading and is used for diagnostic purposes only.
- **Reference:** Displays the raw reference sensor output reading and is used for diagnostic purposes only.

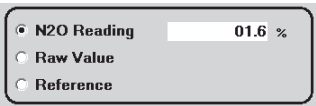
N₂O Reading (3010)

- **N₂O Reading:** Is the main format for reading data, and is expressed as a ppm value.
- **8 Hour TWA:** TWA ppm reading for an eight hour period (displayed when **8hr TWA calculation** is *checked* in the Configuration dialogue box, see Page 16).
- **Elapsed Time TWA:** TWA ppm reading calculated over a continuous time period (displayed when **8hr TWA calculation** is *unchecked* in the Configuration dialogue box, see Page 16).
- **Integration Time:** Displays the elapsed time for the current TWA.
- **Start TWA Button:** Resets integration time and starts a new TWA.



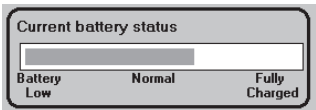
N₂O Reading (MGC 100)

- **N₂O Reading:** Is the main format for reading data, and is expressed as a % value.
- **Raw Value:** Displays the raw sensor output reading and is used for diagnostic purposes only.
- **Reference:** Displays the raw reference sensor output reading and is used for diagnostic purposes only.



3.4.4 Current Battery Status

The **Current battery status** box shows a continuous real time display of the instrument's approximate battery charge.



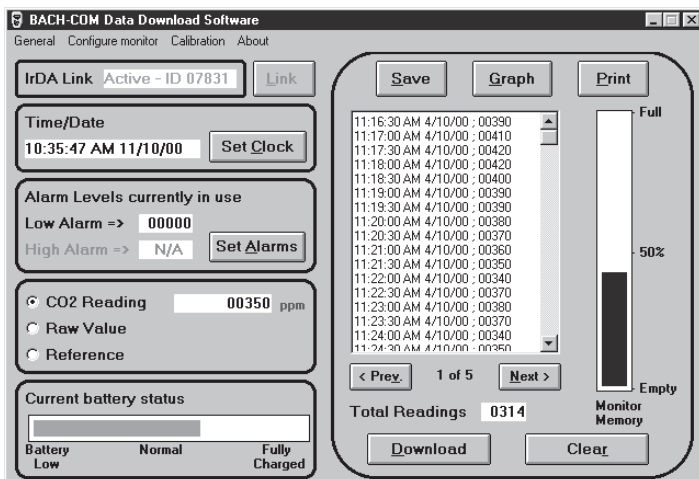
3.4.5 Memory Display Area

The data that is stored in the instrument is downloaded to the PC and displayed in the Memory dialogue box whenever the **Download** button is clicked. A complete description of the download process, and information on how to view, graph, and print the data is provided in Section 3.5.

3.5 Memory Download and Display

3.5.1 Downloading and Viewing Data

Begin downloading the data stored in the instrument's memory by clicking the **Download** button on the main screen. A progress bar will be displayed while the data is being transferred. Once the download is complete, the data will appear in an area to the right of the main screen as shown in the figure below.



Depending on what model of instrument is linked to the PC, its data is presented in the following ways:

- **CO₂ Monitor 2800:** Data is divided into files that correspond to each time the instrument was turned ON. For example, if the instrument was turned ON five times, the screen will show “1 of 5” directly below the data, indicating that there are five individual data files.
- **CO₂ Analyzer 2810/2815/2820, StowSeek & MGC 100:** These instruments store data in two types of data files: continuous and snapshot. The continuous data files contain gas readings that were logged when the instrument was placed into its data-logging mode. Each logging period is contained in a separate file, so if the instrument was used to log data four times, there will be four individual files. The snapshot file consists of multiple readings that were taken individually. There is only one snapshot data file, and it is always the last in the list (e.g., 5 of 5).
- **N₂O Monitor 3010:** Data is divided into files that correspond to each TWA cycle.

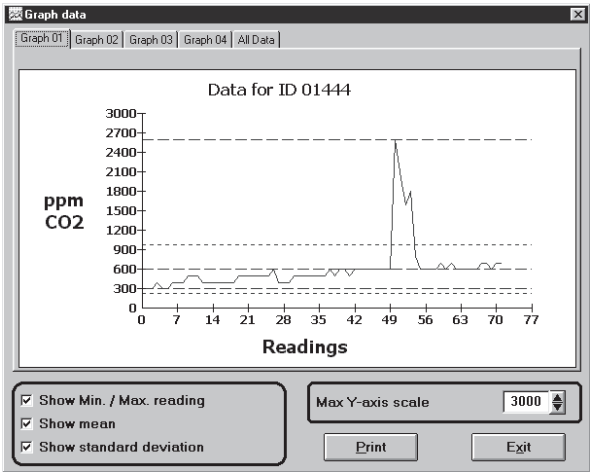
Note that for the 2800, any data above the low alarm level will appear in *blue*, while data above the high alarm level will appear in *red*.

The individual data files mentioned in the previous paragraphs are selected for viewing by clicking the **Prev.** and **Next** buttons.

3.5.2 Graphing Data

Click the **Graph** button on the main screen to display the downloaded data as a line-graph. A **Graph data** box similar to the one shown below will appear. The readings are along the X-axis and the gas levels on the Y-axis. The Y-axis scale can be adjusted to provide a better visual display of the data. For example, if all the data collected is within the range of 0 to 3000 ppm, the Y-axis scale can be set at a maximum of 3000 by clicking the up and down arrow buttons in the **Max. Y-axis scale** box.

Click the tabs at the top of the **Graph data** box to display the individual data files that were stored by the instrument.



In addition to showing the downloaded data as a line graph, the following calculated values can be displayed as dotted lines by clicking the appropriate check box:

☒ Show Min. / Max. reading
☒ Show mean
☒ Show standard deviation

3.5.3 Printing Data or Graph

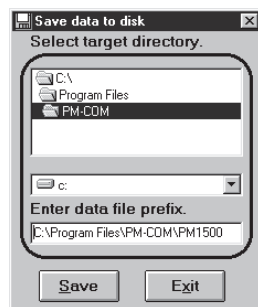
Clicking the **Print** button in the main screen prints ALL data, similar to the way the data is shown on the screen. Clicking the **Print** button in the **Graph data** box (refer to Section 3.5.2) prints the displayed graph.

Note: *Printed data will only appear in black, even if a color printer is used.*

3.5.4 Saving Data

When data is downloaded, it is temporarily stored in the PC's memory. To save the downloaded data to disk, click the **Save** button on the main screen – the box shown to the right is then displayed:

Select target directory – The dialogue box in the center of the screen shows the current drive and directory selection. The drive may be changed by clicking on the arrow button and then choosing the desired drive from the pull-down menu. The directory and any subdirectories may then be chosen by clicking on the available list in the top box. Observe that the chosen directory chain will appear in the **Enter data file prefix** box, along with a preselected file prefix. In this example the default prefix is PM1500.



Enter data file prefix – Users can enter their own unique prefix to the filename. For example, a user's name can be entered in place of PM1500 to identify the download of a particular instrument (e.g., John_Doe).

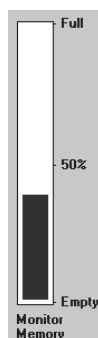
Filename – When data is saved, individual text files are created for each of the data records. For example, if an instrument has 35 data files, then 35 text files will be created. Each filename automatically includes the prefix (optional), instrument's ID number, file number, and date of storage (dd/mm/yy). For example, **John_Doe_07831_35_041002.TXT** identifies a instrument belonging to John Doe, ID 07831, 35th file record, downloaded on 4, October, 2002.

After selecting the desired drive, directory and prefix, click the **Save** button to save the downloaded data records to disk.

3.5.5 Monitor Memory

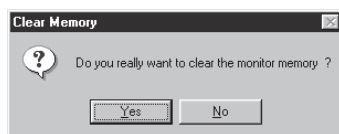
The percentage of memory that is used by the instrument is shown as a bar-gauge to the right of the data display. As memory is used, the bar will rise toward its “Full” mark.

The amount of data that can be stored depends on the model of the instrument. Refer to the instrument’s instruction manual for its particular memory capacity. Note, however, that a combination of data and snapshot readings will lower the available memory for each.



3.5.6 Clearing Memory

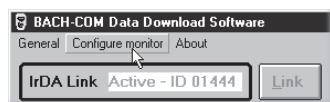
To clear memory, click the **Clear** button on the main screen – the box shown to the right is then displayed. Click **Yes** to clear the instrument’s memory. To continue, click **OK** to return to the main screen.



Note: For the N₂O Monitor 3010, clearing memory will automatically restart its TWA.

3.6 Configuring the Instrument

By clicking **Configure monitor** in the top menu bar, a dialogue box will appear that shows the functions or features of the instrument that can be altered, and the options available for selection. The figures on Pages 15 & 16 show the **Configure Options** box for each instrument. Note that the option items that are “grayed-out” are not available for that particular instrument.



Select an option by clicking the radio button next to it. Then click **Program** to store the new configuration. The following message is then displayed: **New user configuration programmed OK. Note... Your instrument needs to be switched OFF/ON for the new settings to take effect.** To continue, click **OK** to return to the main screen.

3.6.1 Logging Frequency

Determines how often the instrument logs gas readings to memory.

3.6.2 Storage Mode

Determines how the gas readings are stored in memory at the end of each logging period. The three storage modes available for selection are:

Snapshot – Stores the reading displayed on the instrument at the end of the logging period, regardless of any past readings that may have been displayed.

Average – The reading stored is an average of all readings taken during the logging period. For example, if the logging frequency is set to 5 minutes, then the reading stored is an average of all the gas levels that were detected during the past 5 minutes.

Peak – Stores the peak gas reading that occurred during the logging period. For example, if the logging frequency is set to 5 minutes and the instrument detected a peak gas level of 3,000 ppm CO₂ during that time, then a reading of 3,000 is stored at the end of 5 minutes.

3.6.3 Unit of Measurement

Configures the instrument to display the detected gas level in either % or ppm.

3.6.4 Confidence Chirp

Turns an instrument's confidence chirp on and off. The confidence chirp is a tone that is sounded by the instrument every 30 seconds to assure the user that the instrument is operational.

3.6.5 8hr TWA Calculation

When the **8hr TWA calculation** box is *checked*, the instrument's TWA value is calculated over an 8 hour period. When this box is *unchecked*, TWA is calculated over a continuous time period.

CO₂ Monitor 2800

Configure Monitor Options

Logging Frequency

☒ Log every 30 seconds

☐ Log every 1 minute

☐ Log every 2 minutes

☐ Log every 5 minutes

☐ Log every 10 minutes

Storage Mode

☐ Store a snapshot reading

☒ Store an average reading

☐ Store the peak reading

Unit of Measurement

☐ % CO₂

☒ ppm CO₂

Confidence Chirp

☒ Enable confidence chirp

☐ Disable confidence chirp

Program

Exit

CO₂ Analyzer 2810/2815

Configure CD98LR Options

Logging Frequency

☒ Log every 30 seconds

☐ Log every 1 minute

☐ Log every 2 minutes

☐ Log every 5 minutes

☐ Log every 10 minutes

☐ Log every 15 minutes

☐ Log every 20 minutes

☐ Log every 30 minutes

☐ Log every 1 hour

Storage Mode

☐ Store a snapshot reading

☒ Store an average reading

☐ Store the peak reading

Unit of Measurement

☐ % CO₂

☒ ppm CO₂

Program

Exit

CO₂ Analyzer 2820

Configure CD98HR Options

Logging Frequency

☒ Log every 30 seconds

☐ Log every 1 minute

☐ Log every 2 minutes

☐ Log every 5 minutes

☐ Log every 10 minutes

☐ Log every 15 minutes

☐ Log every 20 minutes

☐ Log every 30 minutes

☐ Log every 1 hour

Storage Mode

☐ Store a snapshot reading

☒ Store an average reading

☐ Store the peak reading

Unit of Measurement

☒ % CO₂

☐ ppm CO₂

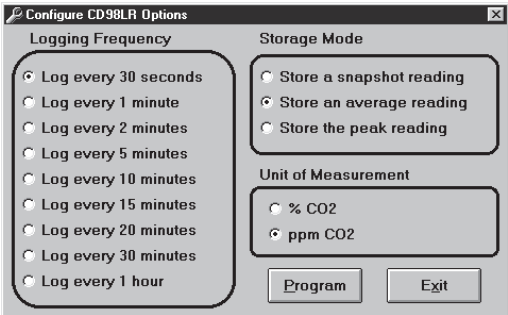
Program

Exit

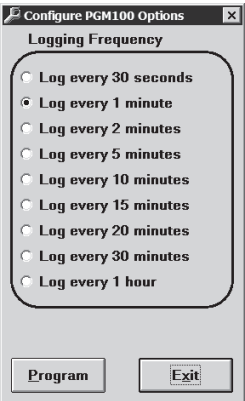
N₂O Monitor 3010



StowSeek

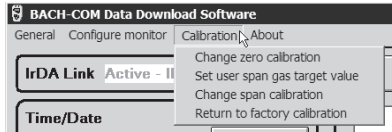


MGC 100



3.7 Calibration

The **Calibration** selection in the top menu bar only appears for instruments that can be calibrated by the user. The items listed in the drop down menu depend on the instrument being calibrated.

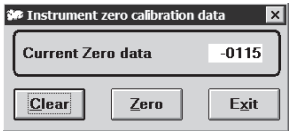


Typical Calibration Menu

Important! *Span gas calibration is normally not required, and only improves the accuracy of the instrument around the span point. A zero or ‘aircal’ is all that is required to maintain the instrument’s accuracy. The factory default calibration setting (refer to Section 3.7.4) provides optimum accuracy over the instrument’s entire measurement range.*

3.7.1 Change Zero Calibration

To clear or change the instrument’s zero calibration setting, select **Change zero calibration** from the **Calibration** drop down menu – the **Instrument zero calibration data** dialogue box will then appear. This box shows the instrument’s current “raw” zero calibration data.

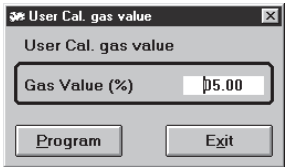


Click **Clear** to clear the data. The following message is then displayed: **Instrument zero data cleared OK.** To continue, click **OK** to return to the main screen.

Click **Zero** to re-zero the instrument. A message, however, is first displayed cautioning the operator to flush the instrument with either fresh air or nitrogen. While flushing the instrument with the appropriate gas, click **OK** to begin the calibration process. When the instrument has completed its zero-calibration process, the following message appears: **Instrument zeroed OK.**

3.7.2 Set User Span Gas Target Value

The “User Cal. Gas value” is the gas concentration that must be applied to the instrument during its gas-calibration procedure as described in the instrument’s operation manual. To change this value, select **Set User Span Gas Target Value** from the **Calibration** drop down menu to display the **User Cal. gas value** dialogue box.



Type in the desired gas value (ppm or % is automatically selected as determined by the instrument’s configuration). Then click **Program** to store the new calibration gas value. The following message is then displayed: **User gas value programmed OK. Please Note... Your instrument needs to be switched OFF/ON for the new settings to take effect.** To continue, click **OK** to return to the main screen.

3.7.3 Change Span Calibration

BACH-COM can be used to change an instrument’s gas calibration setting. The advantage of using BACH-COM is that the calibration-gas value can be entered at the time of calibration. It is also the only way to calibrate an N₂O Monitor 3010 using calibration gas.

Calibration Equipment:

- Certified calibration gas cylinder:
 - 2810/2815/StowSeek2,500 ppm CO₂
 - 2820 Low Level Calibration5% CO₂
 - 2820 High Level Calibration10 and 30% CO₂
 - 301080 ppm N₂O
 - MGC 10025–100% N₂O
- Bacharach Calibration Kit 19-8027

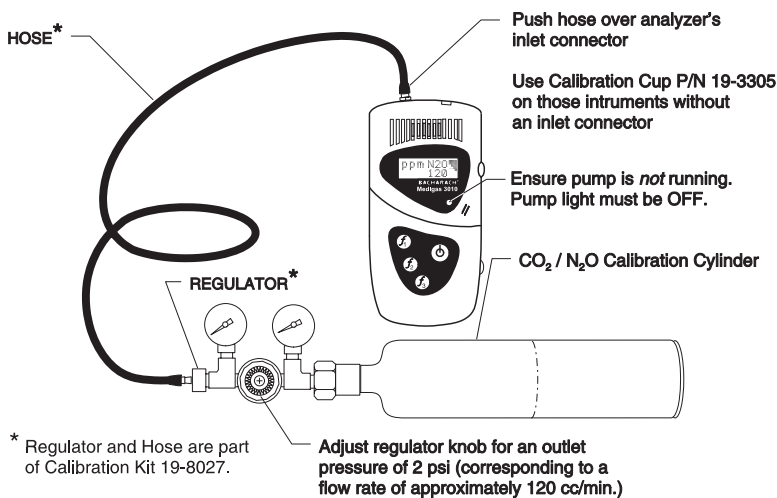
Important Information:

Please observe the following guidelines when calibrating the instrument.

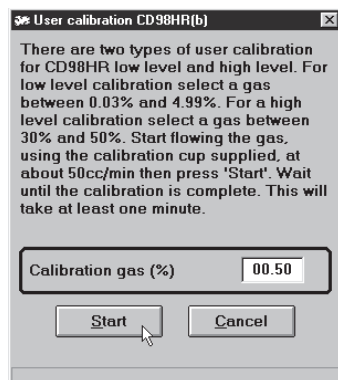
- An air calibration is NOT to be performed immediately after the measurement of a high concentration of gas.
- The calibration gas flow is not more than 120 cc/min.
- The instrument’s gas exhaust port is not blocked, and there are no leaks in the tubing or connections.
- Do not allow the instrument to become pressurized with gas. Pressurization could lead to gas entering the instrument’s case, in turn, causing erroneous readings.
- Calibration should be carried out in a properly ventilated area.
- Do not allow exhaust gases to build up in an enclosed area.

Procedure:

1. Turn on the instrument and leave it sample fresh air for at least 10 minutes to allow it to reach its working temperature (the pump, if part of the instrument, should be off).
2. Perform an air-calibration (or zero) as described in the instrument's operation manual.
3. Start BACH-COM and establish a communication link between the instrument and PC.
4. Connect calibration equipment to instrument as shown in the following figure.



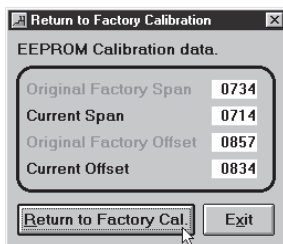
5. Select **Change Span Calibration** from the **Calibration** drop down menu. A dialogue box giving brief instructions is then displayed. (The box displayed depends on the instrument being calibrated. The box shown to the right represents a CO₂ Analyzer 2820.)
6. Open the gas regulator on the calibration equipment and allow gas to flow into the instrument.



7. Type into the dialogue box the **Calibration gas** value that is stamped on the gas cylinder. In the above example, the calibration gas value is 0.5%.
8. Click **Start** to begin calibration. A bar at the bottom of the dialogue box will show the progression of the calibration process.
9. The calibration process will take approximately 1 minute; after which, the user will be prompted to apply the new calibration setting by clicking **YES**, or aborting the just completed calibration process by clicking **NO**. If the new calibration setting was applied, then an option to print out the “raw” calibration data will be presented.
10. For the new calibration to take effect, the instrument must be turned OFF and then ON.

3.7.4 Return to Factory Calibration

An instrument can be returned to its factory calibration setting by selecting **Return to factory calibration** from the **Calibration** drop down menu. A dialogue box will be displayed giving the instrument's current calibration data and the factory calibration settings as shown below.



To proceed, click the **Return to Factory Cal.** button. The following message is then displayed: **Return to factory settings successful. Please Note... Your instrument needs to be switched OFF/ON for the new settings to take effect.** To continue, click **OK** to return to the main screen.

3.8 About

Selecting **About** from the top menu bar displays information about the software, including its version number and date of release. To continue, click **OK** to return to the main screen.



Notes:

Notes:



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