



INSTRUMENTS

SDM-Force PC Controller Program Operator's Manual

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Warranty

RKI Instruments, Inc. warrants gas alarm equipment sold by us to be free from defects in materials and workmanship, and performance for a period of one year from date of shipment from RKI Instruments, Inc. Any parts found defective within that period will be repaired or replaced, at our option, free of charge. This warranty does not apply to those items which by their nature are subject to deterioration or consumption in normal service, and which must be cleaned, repaired, or replaced on a routine basis. Examples of such items are:

- Absorbent cartridges
- Pump diaphragms and valves
- Fuses
- Batteries
- Filter elements

Warranty is voided by abuse including mechanical damage, alteration, rough handling, or repairs procedures not in accordance with the instruction manual. This warranty indicates the full extent of our liability, and we are not responsible for removal or replacement costs, local repair costs, transportation costs, or contingent expenses incurred without our prior approval.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF RKI INSTRUMENTS, INC. INCLUDING BUT NOT LIMITED TO THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL RKI INSTRUMENTS, INC. BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND CONNECTED WITH THE USE OF ITS PRODUCTS OR FAILURE OF ITS PRODUCTS TO FUNCTION OR OPERATE PROPERLY.

This warranty covers instruments and parts sold to users only by authorized distributors, dealers, and representatives as appointed by RKI Instruments, Inc.

We do not assume indemnification for any accident or damage caused by the operation of this gas monitor and our warranty is limited to replacement of parts or our complete goods.

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***CAUTION:** Read and understand this manual before using the SDM-Force. Also read and understand the GX-Force Operator's Manual.*

Chapter 1: Introduction

Manual Overview

The SDM-Force Docking Station is an advanced, reliable system that can charge, bump test, calibrate, alarm check, and provide test records for up to 10 GX-Force portable gas monitors at once. It is designed for desktop or benchtop use (standalone functionality) or to be connected directly to a computer (PC controlled functionality).

When used in the standalone configuration, test records are stored in the docking station's memory. The records can be saved to a USB drive and imported into the SDM-PC3 program.

If you are using the SDM-PC3 program while operating in the PC Controlled configuration, you may retrieve instrument data, bump test, calibrate, and alarm check instruments. Instrument information and data for each instrument can be viewed directly using the SDM-PC3 program and can be printed from the SDM-PC3 program. For instructions to use the SDM-Force in the Standalone configuration, see the *SDM-Force Docking Station Operator's Manual*.

The purpose of this manual is to explain how to set up and use the SDM-Force in PC Controlled configuration. It also explains how to use the SDM-Force PC Controller Program. You will learn how to:

- install and launch the SDM-PC3 PC Controller program
- setup the SDM-PC3 program for use with the SDM-Force
- prepare the SDM-Force for use
- bump test and calibrate up to 10 GX-Forces using the PC Controller program
- use the SDM-Force to charge a GX-Force
- view, print, and export calibration, bump test, and alarm check records
- view instrument information and data using the PC Controller program
- update instrument parameters using the PC Controller program

CAUTION: *The GX-Force detects oxygen deficiency and elevated levels of oxygen, combustible gases, carbon monoxide, hydrogen sulfide, and other toxic gases, all of which can be dangerous or life threatening. When using the GX-Force, you must follow the instructions and warnings in the GX-Force Operator's Manual to assure proper and safe operation of the GX-Force and to minimize the risk of personal injury.*

CAUTION: *The operator of this instrument is advised that if the equipment is used in a manner not specified in this manual, the protection provided by the equipment may be impaired.*

System Requirements

To use the SDM-Force Docking Station program (SDM-PC3), your personal computer must meet the following requirements:

- **Operating Systems:** Windows 10, Windows 11
- **Processor:** IBM® compatible PC running Pentium® 2 processor or equivalent minimum
- **Memory:** 32 MB RAM minimum
- **Hard Disk Space:** 32 MB minimum
- **Available USB Port**

About this Manual

The *SDM-Force Docking Station PC Program Operator's Manual* uses the following conventions for notes, cautions, and warnings.

NOTE: Describes additional or critical information.

CAUTION: *Describes potential damage to equipment.*

WARNING: *Describes potential danger that can result in injury or death.*

Cautions & Safety Information

- Use only polyurethane sample tubing with the SDM-Force. Consult RKI Instruments, Inc. for other materials.
- Do not subject the SDM-Force to infrared or intense light. This may cause communication errors.
- Do not expose the SDM-Force to water.
- Do not subject the SDM-Force to any hard impact.

Specifications

Table 1: SDM-Force Specifications

Input Power	5.99 VDC
Environmental Conditions	<ul style="list-style-type: none"> • For Indoor Use Only • 0° C to 40° C, below 95% Relative Humidity, Non-Condensing
Applicable Instrument	GX-Force
Memory Capacity	150 KB
Record Size	<ul style="list-style-type: none"> • Bump test: 698 bytes • Calibration: 749 bytes • Alarm check: 320 bytes
Maximum Number of Records Saved	<ul style="list-style-type: none"> • Bump test: 214 OR <ul style="list-style-type: none"> • Calibration: 200 OR <ul style="list-style-type: none"> • Alarm check: 468
Number of Calibration Gas Cylinders	Infinite if you change cylinders during a test.
Standard Accessories	<ul style="list-style-type: none"> • Instruction Manual* • SDM-Force PC Controller Program* • Inlet Air Filter • 10-Foot Long Exhaust Tube • 3-Foot Long Calibration Tube • USB Cable, Type A to Type B • Ethernet Cable • Single-Station AC Adapter • USB Drive
Available Accessories	<ul style="list-style-type: none"> • SDM-Force PC Controller Program* • Wall Mounting Brackets and Screws • Cylinder Holder • Demand Flow Regulator • Calibration Cylinder • Connection Brackets

* Not sent with SDM-Force. Download from www.rkiinstruments.com/sdm-force-calibration-station/

Building a System

Solenoid Valves

The SDM-Force is sold with either 1 or 2 solenoid valves.

1 Solenoid Valve (1XX Versions): For instruments that will only use up to 2 calibration cylinders

- 4-gas (LEL/O₂/H₂S/CO) calibrated with a 4-gas cylinder
- 4-gas (LEL/O₂/H₂S/H₂-compensated CO) calibrated with a 4-gas cylinder and an H₂ cylinder (manual cylinder change required)

NOTE: SDM-Force docking stations in the Standalone configuration with one solenoid valve can calibrate instruments that require up to 2 calibration cylinders as long as the user changes the cylinder when prompted.

SDM-Force docking stations intended for use in the PC-Controlled configuration with 2 or more cylinders must have at least 2 solenoid valves installed.

2 Solenoid Valves (2XX Versions): For instruments that will use 2 calibration cylinders

- 4-gas (LEL/O₂/H₂S/H₂-compensated CO) calibrated with a 4-gas cylinder and an H₂ cylinder

Bundles

Various accessories are included with the SDM-Force depending on the bundle. See the table below for what's included with each basic bundle. The accessories are described in more detail in "Chapter 2: Description" on page 12.

<u>Accessories</u>	<u>81-SDMFRCX01</u>	<u>81-SDMFRCX02</u>	<u>81-SDMFRCX03</u>	<u>81-SDMFRCX04</u>
Docking Station	X	X	X	X
Exhaust Tube, 10 ft.	X	X	X	X
Calibration Tubing, 3 ft.	X	X	X	X
Instrument USB-C Cable	X	X	X	X
USB Type-A to Type-B	X	X	X	X
Ethernet Cable, 5 ft.	X	X	X	X
Single-Station AC Adapter	X	X	X	X

Accessories

	<u>81-SDMFRCX01</u>	<u>81-SDMFRCX02</u>	<u>81-SDMFRCX03</u>	<u>81-SDMFRCX04</u>
USB Drive	X	X	X	X
Demand Flow Regulator		X	X	X
Calibration Cylinder Holder			X	X
58 Liter Aluminum 4-Gas Calibration Cylinder			X	
34 Liter 4-Gas Calibration Cylinder				X

Chapter 2: Description

Overview

This section describes the SDM-Force docking station's components, standard accessories, and optional accessories.

SDM-Force

The instrument cradle is a recessed area in the middle of the SDM-Force that is designed to accept the GX-Force. Insert the GX-Force in the instrument cradle with the display facing down before you perform a bump test, calibration, alarm check or charge a GX-Force.

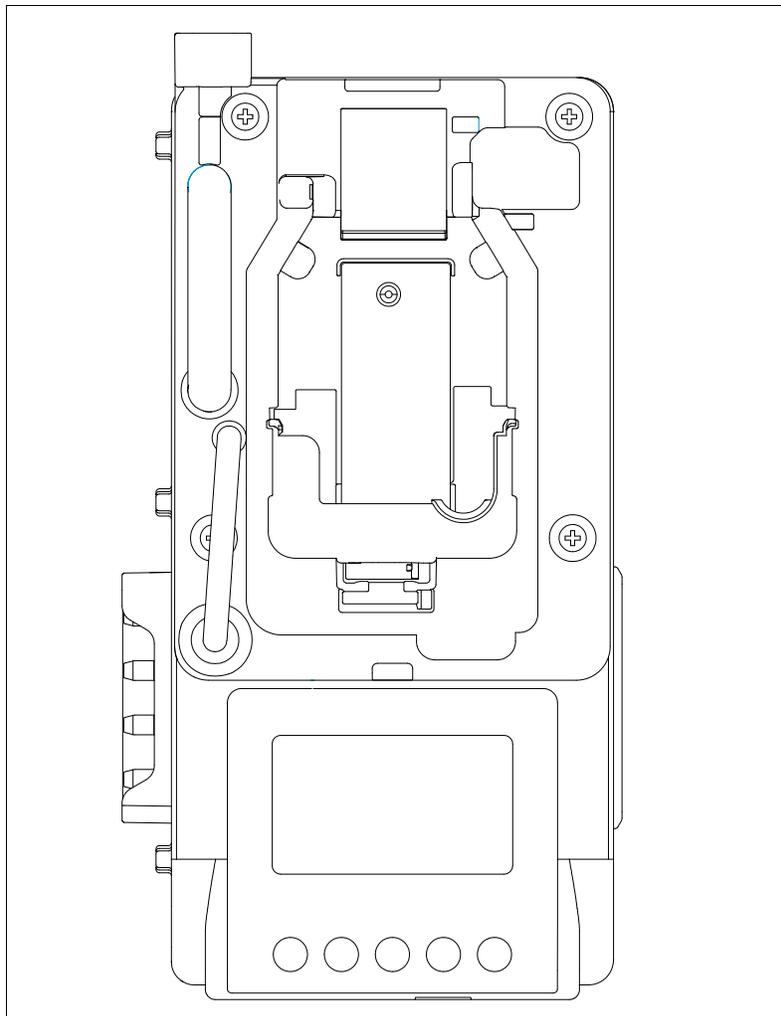


Figure 1: Instrument Cradle and Tubing

Control Buttons and LEDs

Use the control buttons to initiate docking station functions as outlined in the table below. The LEDs above the control buttons indicate the button function's status. The CHARGE LED functions as a pilot LED and a system failure LED.

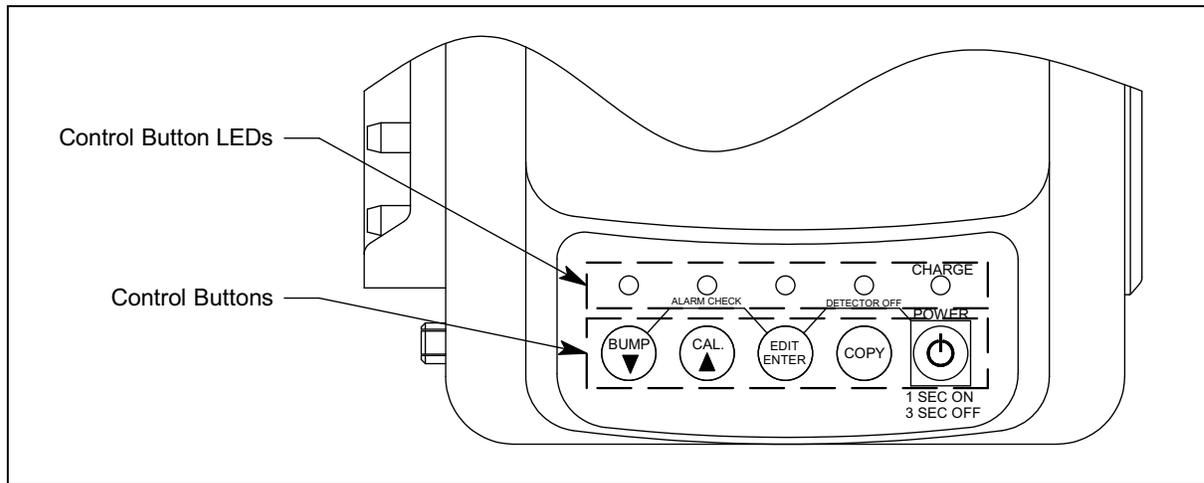


Figure 2: Control Buttons and LEDs

Control Button	Function	LED Meaning
BUMP ▼	<ul style="list-style-type: none"> Initiates/cancels a bump test Initiates/cancels an alarm check when used with EDIT ENTER 	<p><u>Flashing</u>: bump test in process</p> <p><u>Green</u>: bump test passed</p> <p><u>Red</u>: bump test failed</p>
CAL ▲	<ul style="list-style-type: none"> Initiates/cancels a calibration Clears SDM-Force memory when use with COPY 	<p><u>Flashing</u>: calibration in process</p> <p><u>Green</u>: calibration passed</p> <p><u>Red</u>: calibration failed</p>
EDIT ENTER	<ul style="list-style-type: none"> Enters Configuration Menu Initiates an alarm check when used with BUMP ▼ Turns off GX-Force when used with POWER 	<p><u>Green</u>: alarm check passed</p> <p><u>Red</u>: alarm check failed</p>
COPY	<ul style="list-style-type: none"> Copies bump test, calibration, and alarm check records to a USB drive Clears SDM-Force memory when use with CAL ▲ 	<p><u>Off</u>: no records saved</p> <p><u>Green</u>: More than 20% of SDM-Force memory remains</p> <p><u>Orange</u>: Less than 20% of SDM-Force memory remains</p> <p><u>Red</u>: No memory available. Oldest records will be deleted as new records are created.</p>
POWER	<ul style="list-style-type: none"> Turns SDM-Force on/off Turns off GX-Force when used with EDIT ENTER 	<p>(POWER button's LED is labeled "CHARGE")</p> <p><u>Solid green</u>: GX-Force fully charged</p> <p><u>Flashing orange</u>: GX-Force charging</p> <p><u>Solid red</u>: SDM-Force problem detected</p>

Tubing

Air Filter and Sample Tubing

A cylindrical particle filter with a short length of tubing is supplied with the SDM-Force for installation to the AIR fitting on the side panel. The filter keeps particulate contamination out of the docking station.

Two types of sample tubes are included with the docking station. A 3 foot length of 3/16 inch ID polyurethane tubing is provided to connect the regulator on a calibration cylinder to the GAS 1 and GAS 2 fittings on the side panel. In addition, a 10 foot length of 5/16 inch ID polyurethane tubing is provided for connection to the exhaust fitting on the back panel to allow routing of the exhaust to a location such as an open window where the exhaust can disperse.

WARNING: Do not use an exhaust tube that is longer than 10 feet. The increased flow restriction caused by a longer tube may affect gas response and cause inaccurate calibration and bump test results.

Instrument Inlet and Exhaust Tubes

A set of two tubes with mating fittings are provided to install onto the GX-Force's inlet fitting (on the top of the instrument) and the exhaust fitting (on the back of the instrument). These tubes must be installed correctly onto the SDM-Force and GX-Force as shown in the following figure before proceeding with operation.

Cylinder and SDM Connections (Side Panels)

NOTE: When multiple SDM-Force docking stations are connected together, they only share sample connections. They are not connected electronically.

Four gas fittings are located on the left side of the SDM-Force. Three are for gas cylinders and one is for the particle filter or a zero air cylinder. The left to right order is GAS 3, GAS 2, GAS 1, and AIR. All four fittings accept 3/16 inch ID tubing.

The right side of the SDM-Force is shipped from the factory with a small panel attached to it with two screws. That panel should remain in place if the SDM-Force is being used alone or if it is the right-most station in a bank of connected stations. The panel needs to be removed in order to connect another SDM-Force to it. Beneath the panel are plugged fitting connections that mate to the stubs on the left side of another SDM-Force. See “Connecting Multiple SDM-Force Docking Stations Together, Optional” on page 20.

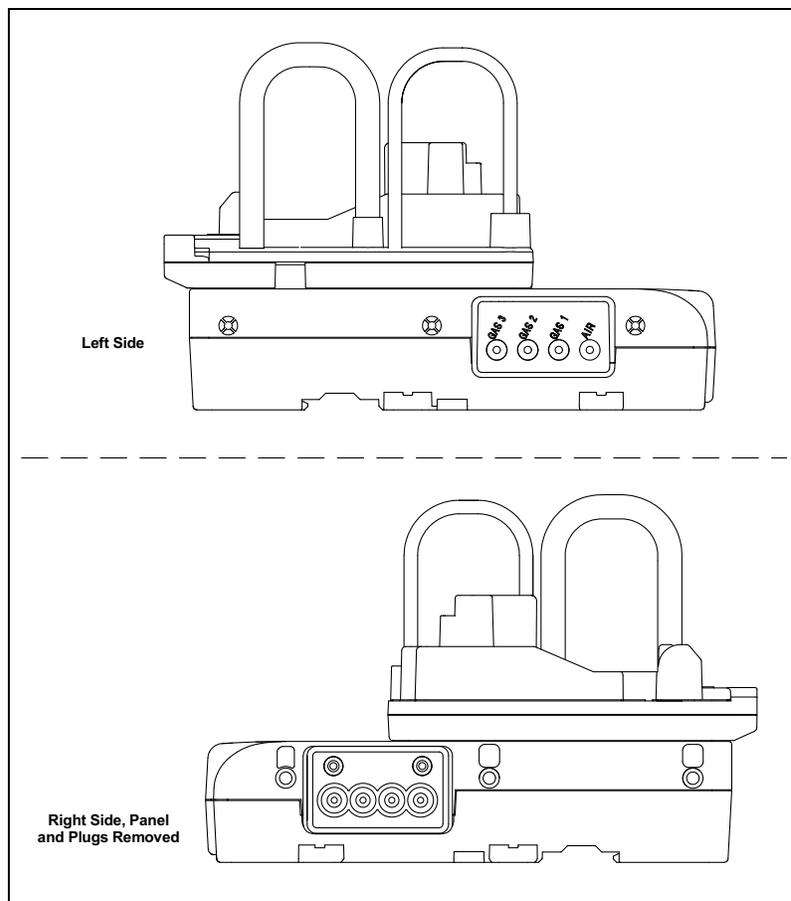


Figure 3: Cylinder and SDM Connection Panels

Power and Network Connections (Back Panel)

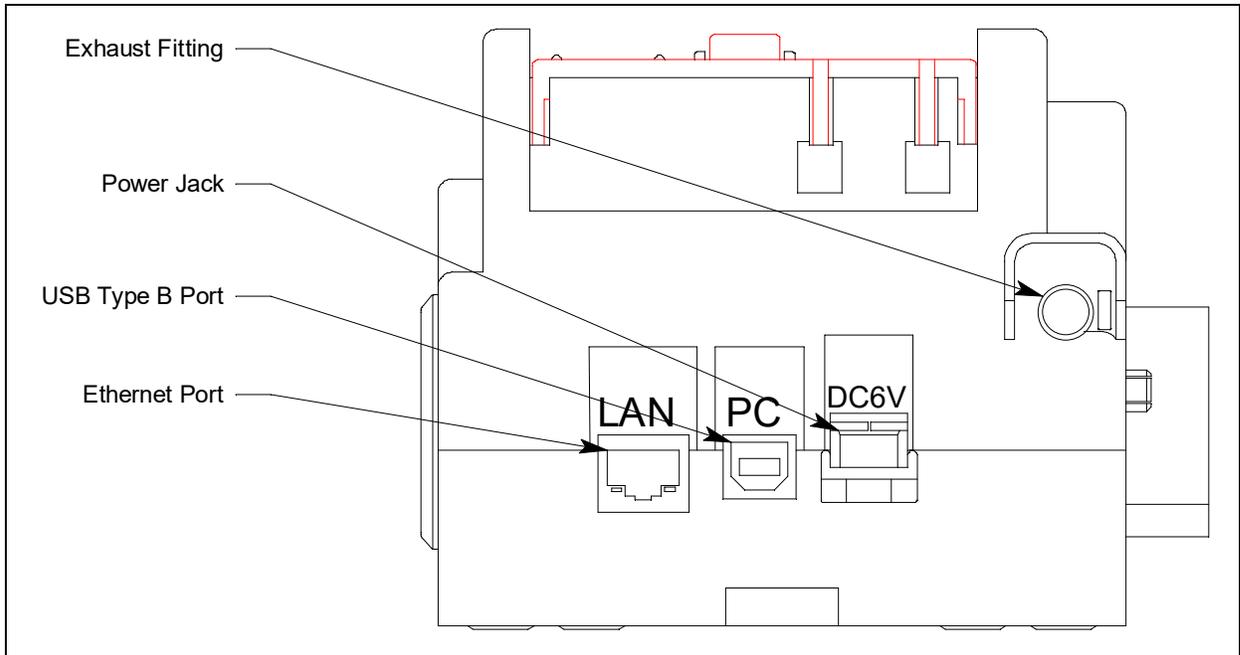


Figure 4: Back Panel

USB PC Connector

A type B USB connection allows for the SDM-Force to be connected to a PC using a Type A to Type B USB cable. Connection to a PC is necessary for setting up the LAN function and for using the SDM-Force in its PC controlled configuration.

LAN Connector

The LAN connector allows for the SDM-Force to be connected to a building's network using an Ethernet cable. This function allows for the docking station's data to be downloaded to a computer connected to the same network.

Power Jack

The rectangular power jack is located on the far right side of the back panel. The plug on the end of the AC adapter cable mates to the power jack.

Exhaust Fitting

An exhaust fitting is located on the right side of the back panel. It allows routing of the exhausted calibration gas to a convenient location. This fitting accepts 5/16 inch ID tubing. Even though the exhaust gas can be routed to an area to be safely dispersed, the docking station should still be installed in a well ventilated area.

Standard Accessories

Air Filter and Exhaust Tubing

A cylindrical particle filter with a short length of tubing is supplied with the SDM-Force for installation to the AIR fitting on the back panel. The filter keeps particulate contamination out of the docking station.

A 10 foot length of 5/16 inch ID polyurethane tubing is provided for connection to the exhaust fitting on the back panel to allow routing of the exhaust to a location such as an open window where the exhaust can disperse.

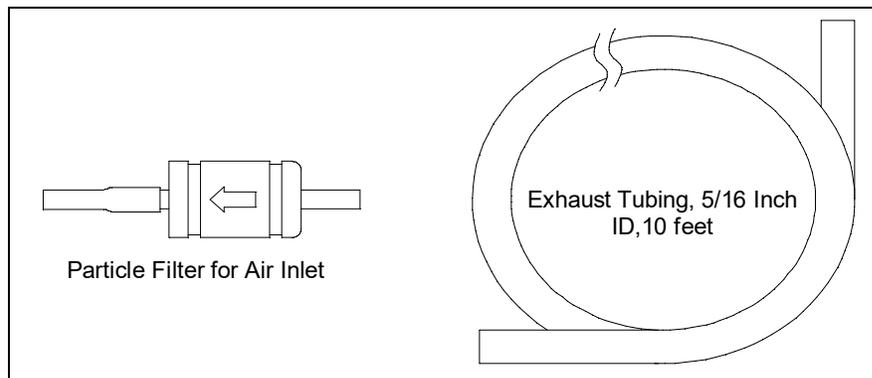


Figure 5: Air Filter & Exhaust Tubing

WARNING: Do not use an exhaust tube that is longer than 15 feet. The increased flow restriction caused by a longer tube may affect gas response and cause inaccurate calibration and bump test results.

Calibration Tubing

A 3-foot 3/16 inch ID tube is included for connecting a demand flow regulator to an SDM-Force gas inlet fitting.

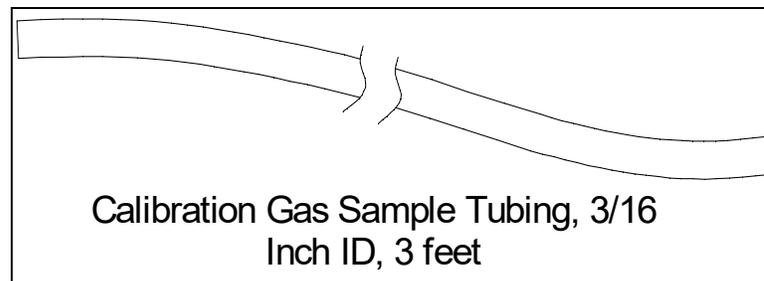


Figure 6: Air Filter & Exhaust Tubing

Single-Station AC Adapter

The single-station AC adapter is a wall plug style adapter with a 4 foot cable. The end of the cable has a plug that connects to the docking station's power jack. A screw included with the SDM-Force allows you to secure the plug to the docking station's jack if desired. The AC adapter is rated 100 - 240 VAC input, 5.99 VDC 2 A output.

USB Cable

A Type A to Type B USB cable is used to connect the SDM-Force to a PC which is required for using the SDM-Force in the PC Controlled configuration. If you have a multi-station system, each SDM-Force must have its own USB connection.

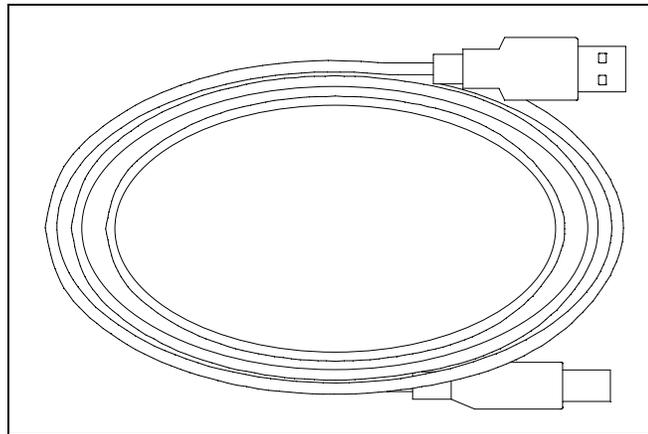


Figure 7: USB Cable

Ethernet Cable

A 5 foot length of black Ethernet cable allows for the LAN connectivity function of the SDM-Force to be used. One end of the cable is plugged into the LAN port on the left side of the SDM-Force and the other end is plugged into one of the building's network ports. If you have a multi-station system, each SDM-Force must have its own Ethernet connection.

USB Drive

A USB drive is used for copying data from the docking station's memory and importing it into the PC Program.

Optional Accessories

USB Hub

If you have more docking stations than you have available USB ports, you will need a USB hub. RKI offers both a 4-port hub and a 7-port hub. If you have more than 7 docking stations, you will need to purchase one of each hub. Do not connect one hub to the other. Make sure that each USB hub has its own USB port on your computer.

If your USB hub has an AC adapter, it does not need to be plugged in for SDM-Force operation.

Connection Brackets

Each SDM-Force is provided with 2 connection brackets that are used to mechanically connect one SDM-Force to another.

Wall Mounting Brackets

The SDM-Force can be mounted to the wall, if desired, using 2 mounting brackets. See “Wall Mounting the SDM-Force, Optional” on page 24 for a description of how many wall mounting brackets are needed depending on how many SDM-Forces are in your system.

Cylinder Holder

A cylinder holder allows a calibration cylinder to securely sit on a desktop or benchtop.

Demand Flow Regulator

A demand flow regulator installs on a calibration cylinder to allow the SDM-Force to draw calibration gas.

Calibration Cylinder

A cylinder with a known gas concentration must be used for bump testing and calibration.

Chapter 3: Mechanical Setup of SDM-Force

Overview

Mechanical setup for the SDM-Force includes the following procedures:

- connecting multiple SDM-Force docking stations together, optional (page 20)
- assembling the hardware (page 22)
- wall mounting the station, optional (page 24)
- connecting calibration gas (page 28)

Connecting Multiple SDM-Force Docking Stations Together, Optional

Up to 10 SDM-Force docking stations can be connected together.

1. Be sure that the docking stations are not connected to power.
2. Perform the following steps for every station except the one that will be located on the far right side of the bank:
 - a. Unscrew the two screws that retain the panel on the right side of the SDM-Force. The screws are not captive. Be sure not to lose them.
 - b. Pull the panel away from the SDM-Force.
 - c. Use needle nosed pliers to remove the clear plugs that are installed in the four mating sample fittings.
 - d. Save the panel, the screws, and the four plugs in a safe place.

- Starting with the two left-most stations, line up the sample fitting connections and push the two stations together until the housings are touching.

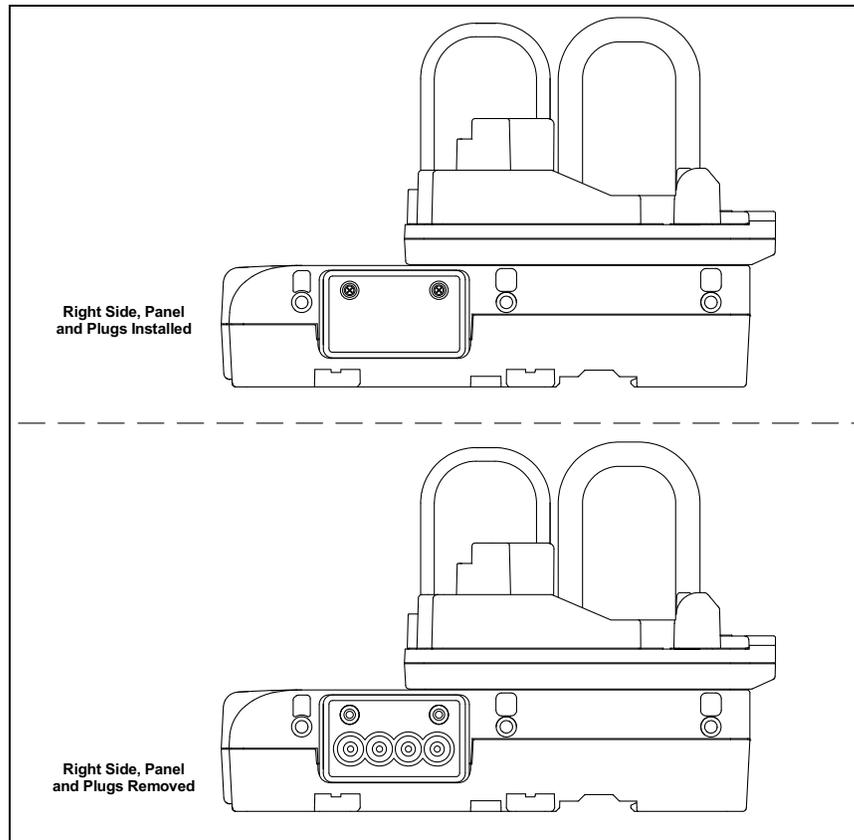


Figure 8: Panel and Plug Removal

- Add stations to the right side of the bank using the same procedure. The last station installed should have its connection panel still installed on the right side.

5. (Optional) Use the metal connection brackets and screws to secure the two connection points on the bottom of the SDM-Force to each other.

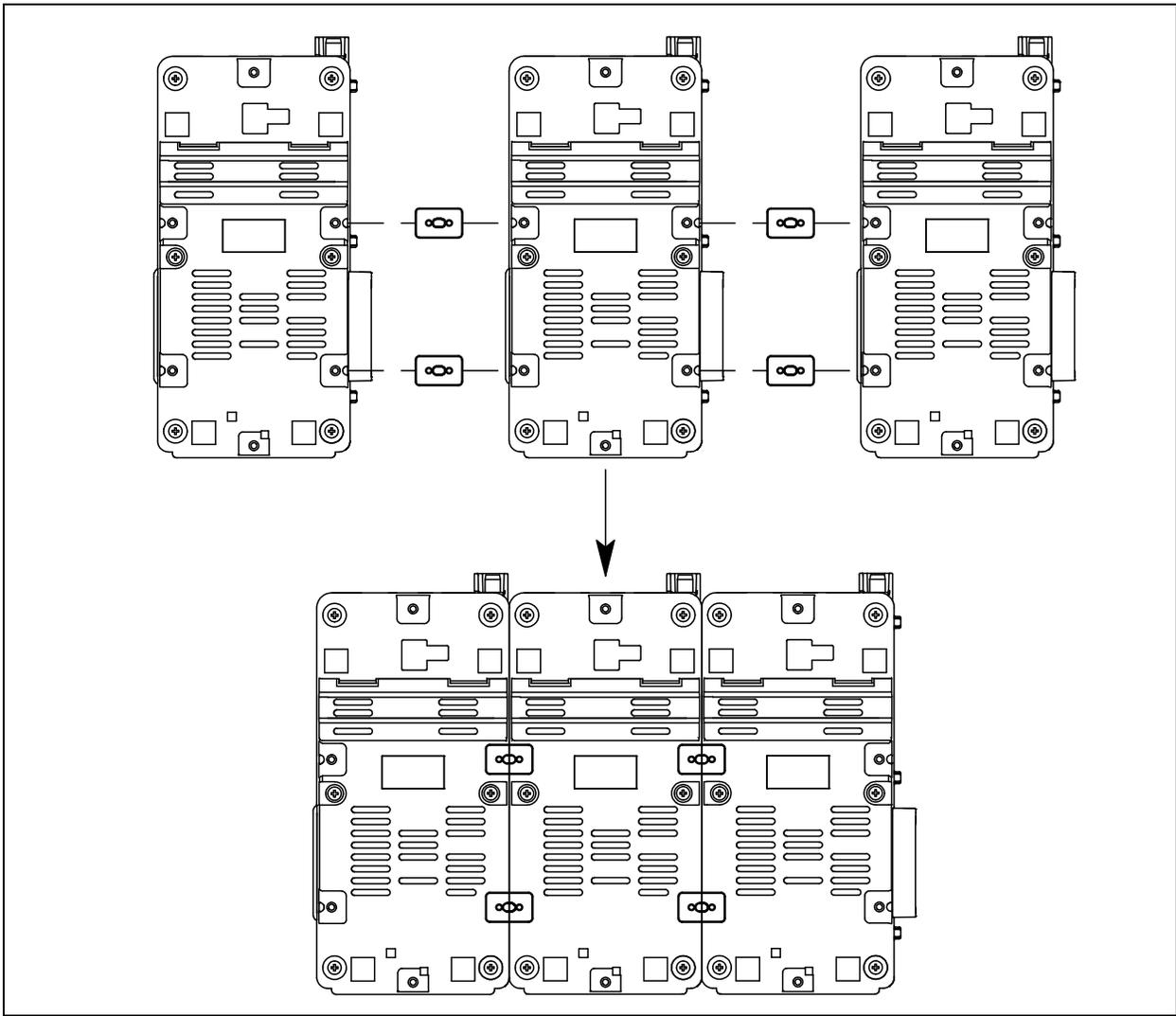


Figure 9: Connecting SDM-Force Docking Stations Together

Hardware Assembly

The hardware assembly consists of connecting the AC adapter, installing the air filter, and connecting the exhaust tubing. Perform the following to complete the hardware assembly:

1. Place the SDM-Force docking stations on a convenient table top near an AC wall socket in a well-ventilated area. A location near a window that can be opened is best so that the exhaust can be routed to the window.
2. Connect the AC adapter's wall plug into a wall AC socket.

3. Insert the plug on the end of the AC adapter's output cable into the power jack on the back of the SDM-Force.

NOTE: If you have multiple SDM-Force docking stations connected to each other, each docking station needs its own power.

4. Install the air filter so that the arrow on the filter that indicates direction of flow is pointing towards the AIR fitting.
5. Install the 10 foot long 5/16 inch ID flexible tube that is included with the SDM-Force on the exhaust fitting. Route the tube to an area where the exhaust can be safely dispersed, such as an open window.

Exhaust tubing from multiple SDM-Force docking stations can be daisy chained together in a manifold for more convenient operation. If you wish to manifold the exhaust, you must order 1 T-fitting (17-0611RK) and 1 check valve (32-0504RK) per SDM-Force. See "Assembling an Exhaust Manifold for Multiple SDM-Force Docking Stations" for instructions.

CAUTION: *The maximum recommended length for the exhaust tube is 10 feet. Using tubing longer than 10 feet or with an ID smaller than 5/16 inch may adversely affect bump test and calibration accuracy.*

Assembling an Exhaust Manifold for Multiple SDM-Force Docking Stations

Up to 10 SDM-Force docking stations can be manifolded together. The exhaust lines can also be manifolded together and be routed away from the docking stations with only one 10 foot long 5/16 inch piece of tubing.

Each SDM-Force is shipped with exhaust tubing. If you wish to manifold the exhaust, you must order 1 T-fitting (17-0611RK) and 1 check valve (32-0504RK) per SDM-Force.

Exhaust Tubing

Reference Figure 10 for the instructions below.

1. Cut a 1-2 inch piece of 5/16 inch tubing for each SDM-Force and connect it to each unit's exhaust fitting.
2. Connect the check valves to the short pieces of tubing already installed at the exhaust fittings. Be sure that the arrows that appear on the check valve are pointing **away** from the exhaust fitting.
3. Cut a 2-3 inch piece of 5/16 inch tubing for every SDM-Force except the first one and connect it to the other end of the check valve.
4. Insert the T-fittings into the tubing so that the remaining two ports on the T-fitting are perpendicular to the exhaust tube and check valve.

5. For the first SDM-Force, cut a 9-10 inch piece of 5/16 inch tubing and connect it from the check valve on the first SDM-Force to the closest port on the second docking station's exhaust T-fitting.
6. Use one of the provided 10 foot lengths of tubing and connect it to the T-fitting on the last SDM-Force. The maximum recommended exhaust tube length is 10 feet.
7. For the remaining SDM-Force docking stations, cut 6-7 inch pieces of 5/16 inch tubing and connect the remaining T-fittings.

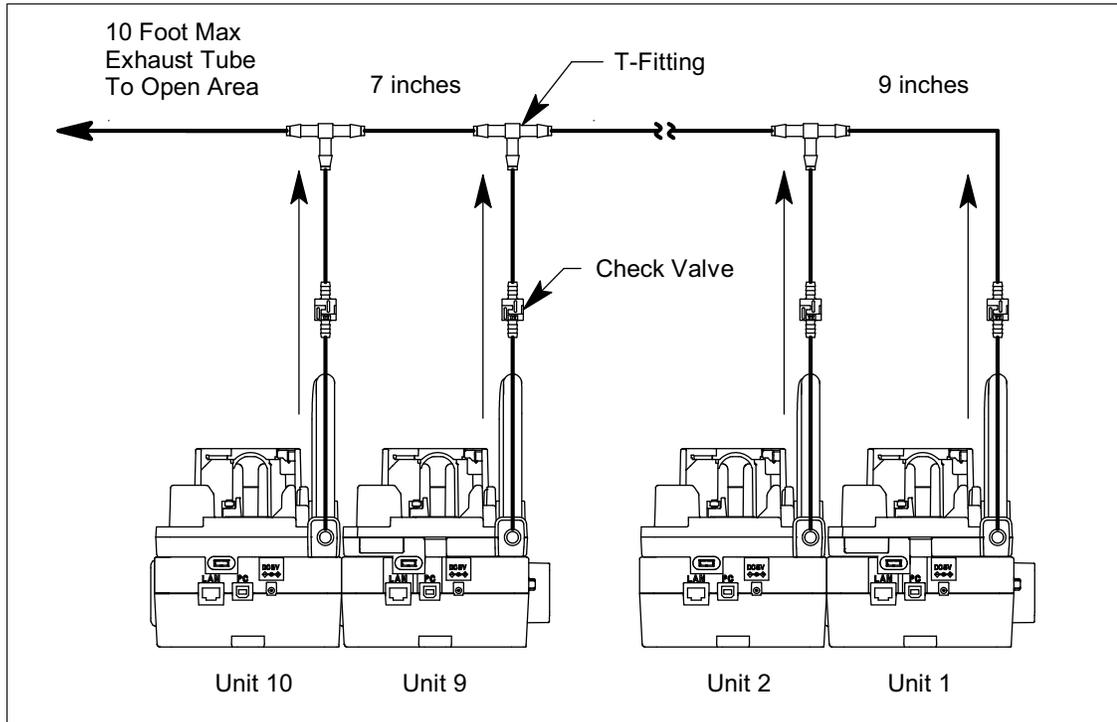


Figure 10: Exhaust Tubing Connections

Wall Mounting the SDM-Force, Optional

Single SDM-Force docking stations or multiple SDM-Force docking stations connected together can be mounted to the wall using mounting brackets as described in “Connecting Multiple SDM-Force Docking Stations Together, Optional” on page 20. The wall mounting brackets are not supplied as standard with the SDM-Force.

If you are wall mounting a bank of SDM-Force docking stations, not every SDM-Force will need wall mounting brackets but each SDM-Force that will use wall mounting brackets needs 2. See Table 2 and Figure 11 (1-7 stations) and Table 3 and Figure 12 (8-10 stations) to determine how many wall mounting brackets you need to order.

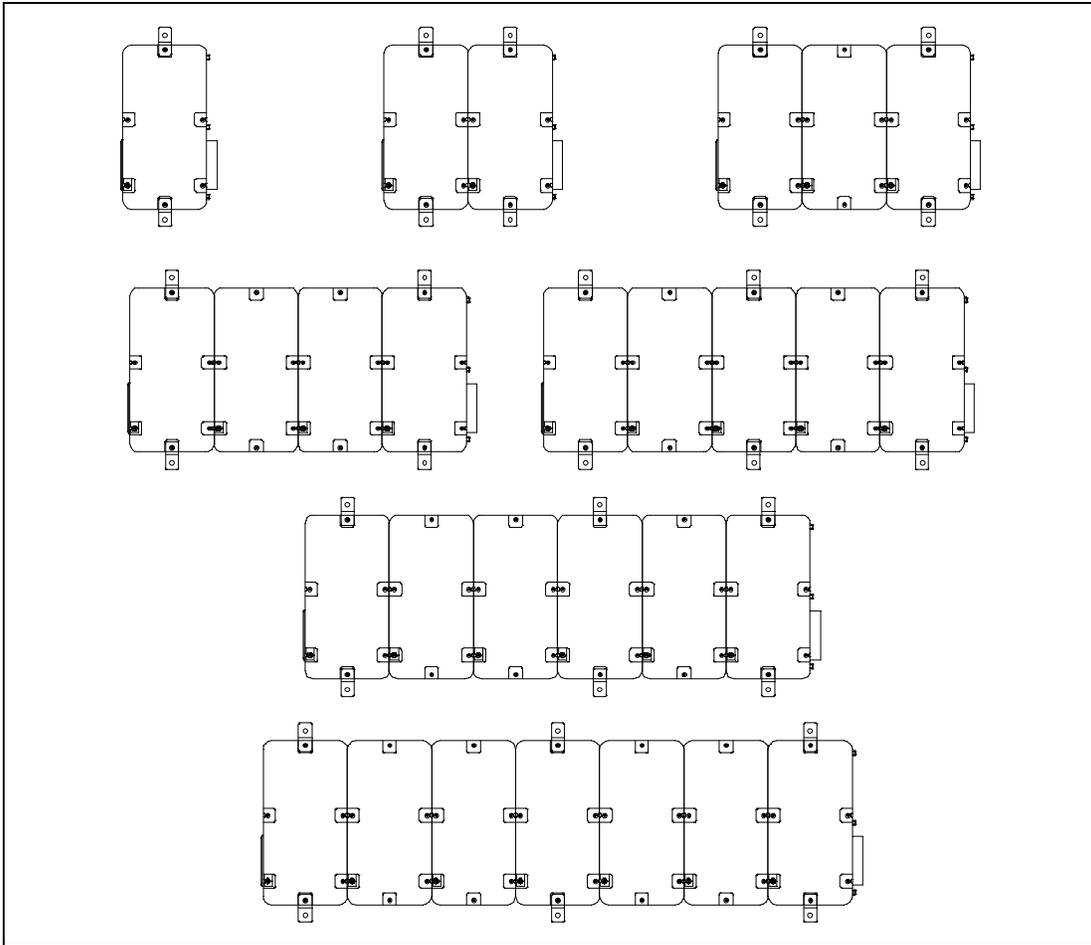


Figure 11: Wall Mounting 1-7 SDM-Force Stations

Table 2: Mounting Bracket Requirements for Up to 7 SDM-Force Docking Stations

# of Docking Stations	Total # of wall mounting brackets necessary
1 SDM-Force	2 wall mounting brackets
2-4 SDM-Force stations	4 wall mounting brackets
5-7 SDM-Force stations	6 wall mounting brackets

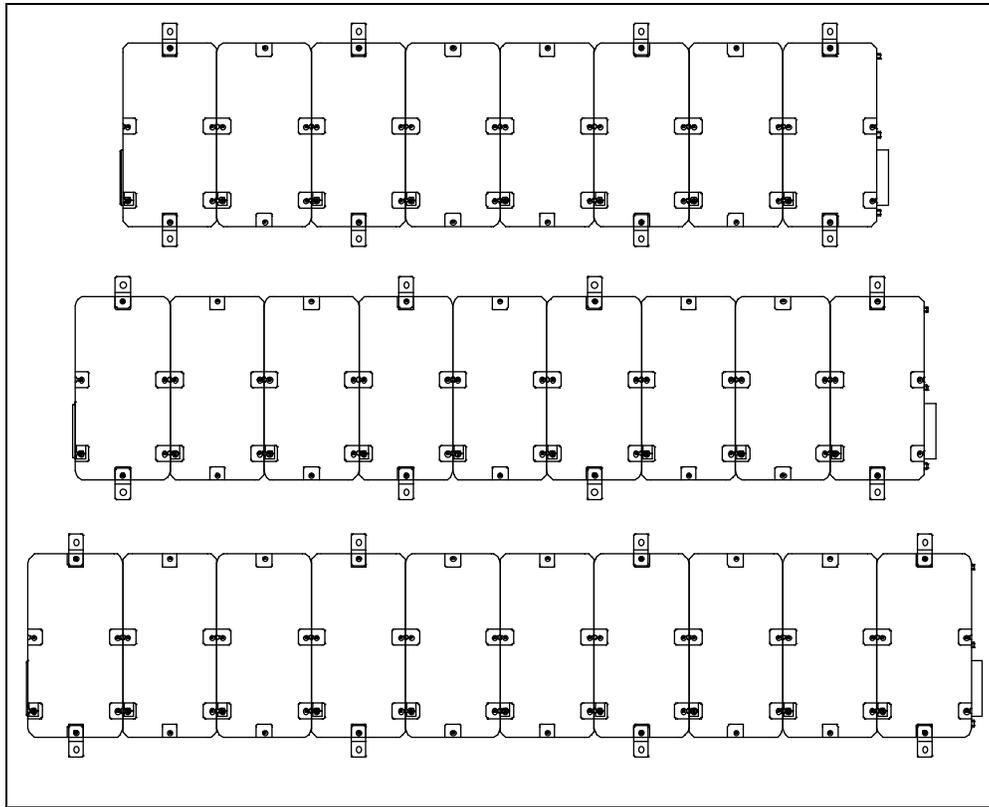


Figure 12: Wall Mounting 8-10 SDM-Force Stations

Table 3: Mounting Bracket Requirements for 8 to 10 SDM-Force Docking Stations

# of Docking Stations	Total # of wall mounting brackets necessary
8-10 SDM-Force stations	8 wall mounting brackets

1. If you are mounting multiple SDM-Force docking stations, be sure your docking stations are properly connected and secured to each other.

2. Connect the wall mounting brackets to the docking station(s) using the provided screws. The wall mounting brackets are not straight. They have a short section and a long section. The short section has a smaller hole than the long section. Screw the short section into the SDM-Force making sure that the long section points away from the station and is flush with the back of the station.

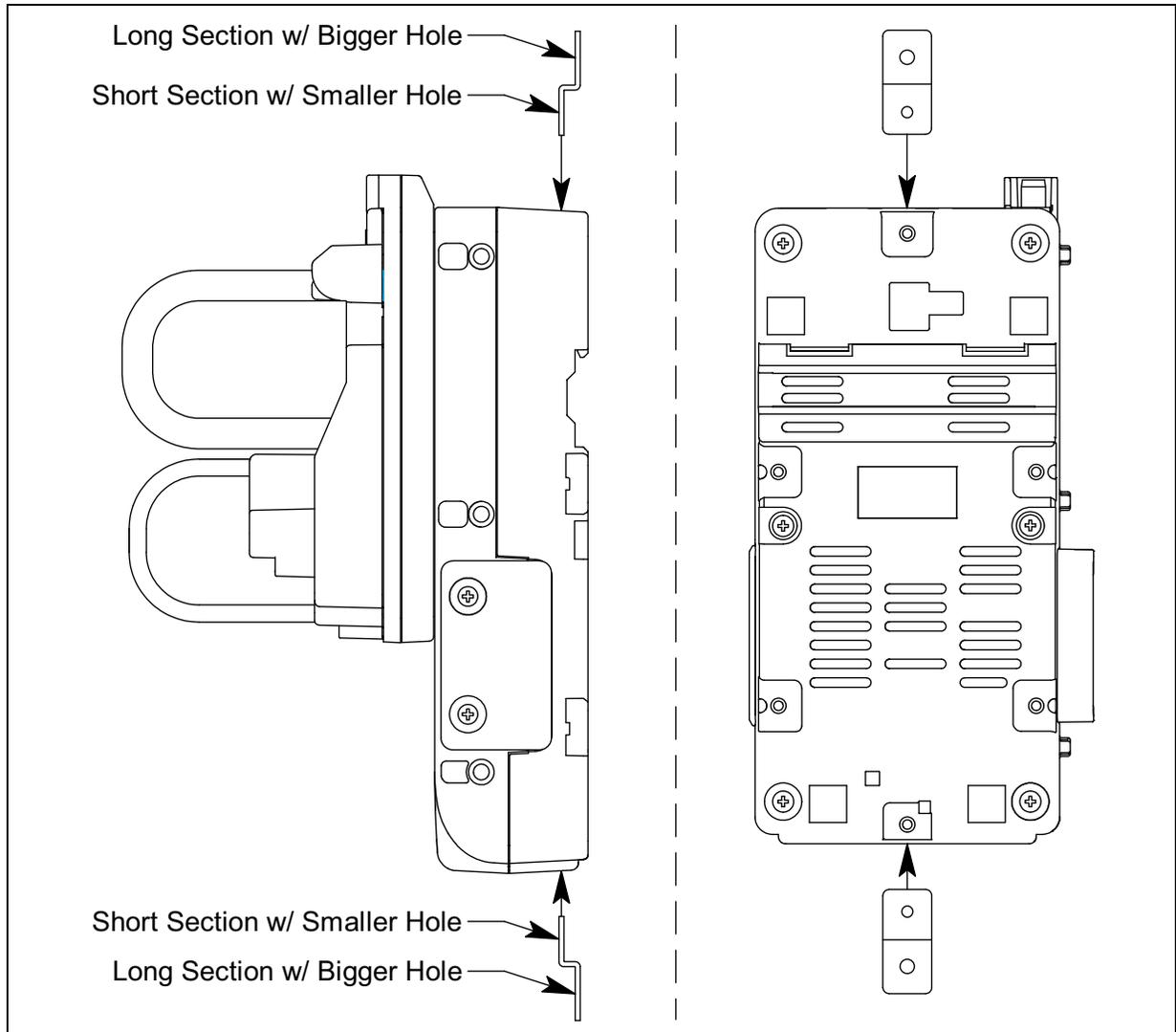


Figure 13: Wall Mounting Bracket Installation

3. Position the SDM-Force docking station(s) on the wall where you intend to mount the docking station(s).
4. Screw the wall mounting brackets into the wall. Make sure the mounting screws and the material they are screwed into are appropriate to support the weight of the system.

Installing the Cylinder Holder, Optional

1. Choose a location for the calibration cylinders that is close to the SDM-Force. 4 pads with adhesive on each side are included with each cylinder holder.
2. Remove the backing from one side of each pad and stick it to a corner on the bottom of the cylinder holder.
If desired and/or practical, 2 pads can be used for the bottom and 2 pads can be used for the back.
3. Remove the backing from each of the installed pads and press the cylinder holder firmly into position.

Connecting Calibration Gas

The GAS 1, GAS 2, and GAS 3 fittings on the left side of the docking station are designed to be used with a calibration gas cylinder that is fitted with a demand flow regulator. See page 146 for part numbers of available cylinders.

The number of active gas fittings depends on how many solenoid valves are installed in your docking station. The AIR and GAS 1 fittings are always active. The GAS 2 fitting is only active if the docking station was ordered with 2 solenoid valves. The GAS 3 fitting on the SDM-Force is generally not needed.

Up to 10 SDM-Force docking stations can be manifolded together to draw gas using the same regulator and cylinder. See “Connecting Multiple SDM-Force Docking Stations Together, Optional” on page 20.

AIR Fitting

The AIR fitting needs one of the following:

- a. A cylinder of zero emissions air

OR

- b. A fresh air area

GAS 1 - GAS 3 Cylinders

See Table 4 below for information about necessary calibration cylinders and what inlet to connect them to.

If a GX-Force combination requires more cylinders than the number of installed solenoid valves, any additional cylinders defined in the **Cylinders** window (see “Setting Up Cylinders” on page 32) can be assigned to the last solenoid valve during bump test and/or calibration setup. The PC program will prompt you to change cylinders during bump testing and/or calibration. You can change cylinders as many times as needed.

Table 4: Instrument Types and Cylinder Assignment Combinations

Instrument Types		Gas Inlet: Calibration Cylinder
3-gas (LEL/O ₂ /CO)		GAS 1: 3-gas mix with LEL/O ₂ /CO
3-gas (LEL/O ₂ /H ₂ -compensated CO)	Option 1	GAS 1: 3-gas mix with LEL/O ₂ /CO GAS 2: H ₂ (only needed if calibrating an H ₂ -compensated CO sensor)
	Option 2	GAS 1: 3-gas mix with LEL/O ₂ /CO C1: H ₂ (only needed if calibrating an H ₂ -compensated CO sensor)*
4-gas (LEL/O ₂ /CO/H ₂ S)		GAS 1: 4-gas mix with LEL/O ₂ /CO/H ₂ S

* This gas is automatically assigned to **C1** when starting a bump test or calibration. **C1** is not a user-selectable setting in the **Cylinders** window.

Connecting Calibration Cylinders

1. If the area around the docking station is not considered a fresh air area (an area free of combustible and toxic gases and of normal oxygen content, 20.9%) install a tube not longer than 10 feet on the filter attached to the AIR fitting on the left side of the docking station and route it to a fresh air area or connect a cylinder of zero air with a demand flow regulator to the AIR fitting.

NOTE: Up to 10 SDM-Force docking stations can be manifolded together to draw gas using the same regulator and cylinder. See “Connecting Multiple SDM-Force Docking Stations Together, Optional” on page 20.

2. Install the demand flow regulator(s) on the calibration gas cylinder(s).

NOTE: Do not connect pressurized gas directly to the SDM-Force. Be sure to install a demand flow regulator on the cylinder before connecting it to the SDM-Force.

3. Connect the demand flow regulator to the appropriate inlet fitting using 3/16 inch ID sample tubing.

Chapter 4: Program Setup

Overview

This chapter describes how to install the SDM-Force PC Controller program (SDM-PC3), set up cylinders in the **Cylinders** window, and set up the PC program operation in the **Config** window. See “Chapter 5: Operation” on page 52 for a description of program operation.

Installing the SDM-PC3 PC Controller Program

1. Launch Windows[®].
2. Exit from all applications and open windows.
3. Go to www.rkiinstruments.com/sdm-force-calibration-station/
4. Click on the **Download** tab.
5. Click the **SDM-Force PC Controller Program** link.
6. A .zip file will begin to download. Save the .zip file.
7. Extract the contents of the .zip file.
8. Double click the setup.exe file.
9. The SDM-PC3 PC Controller InstallShield Wizard comes up to guide you through installation. Follow the InstallShield Wizard instructions.
10. A Device Driver Window will appear prompting you to install necessary drivers. You cannot continue the installation without installing the drivers.



Figure 14: Device Driver Installation

11. Follow the on-screen instructions to agree to license agreement for installation and to select the installation location.
12. Click **Install** in the pop up window to install the drivers. The Wizard will find the appropriate drivers.
13. Click **Finish** once the drivers are successfully installed.



Figure 15: Finish Device Driver Installation

14. To complete the driver installation, ensure that your docking station (or the master docking station if you plan to have a bank of them) are connected to your computer.
15. Turn on the docking station by holding the POWER button until “**SDM-Force**” is displayed on the LCD.
16. Search for the SDM-PC3 PC Controller Program by entering “**SDM-PC3**” in the Search bar.
17. Click on the result to open the program.
18. The COM light icon will flash green to indicate its connecting with the docking station. A connection message will be displayed in the status area of the SDM-PC3 program.

Setting Up Cylinders

The **Cylinders** window defines the cylinders that will be used for testing and allows you to keep track of cylinders in use and their expiration dates. If a cylinder's expiration date is nearing or has passed, the SDM-PC3 program will alert you in the message area of the main program window.

The **Cylinders** window shows the cylinder name, part number, expiration date, and active status, for each cylinder. It comes with a list of predefined cylinders that are fairly common. If a cylinder that you need to use is not on this list, you can define your own cylinder.

Defining Cylinders

1. Click **Start** on the Windows Icon Tray, then select **Programs/SDM-PC3**. You may also double click the shortcut created on your desktop.
2. If you are starting the software for the first time, a message window appears informing you that a database has been created. Click **OK**.
3. Click **Cylinders** along the top of the main program window. The **Cylinders** window will appear.

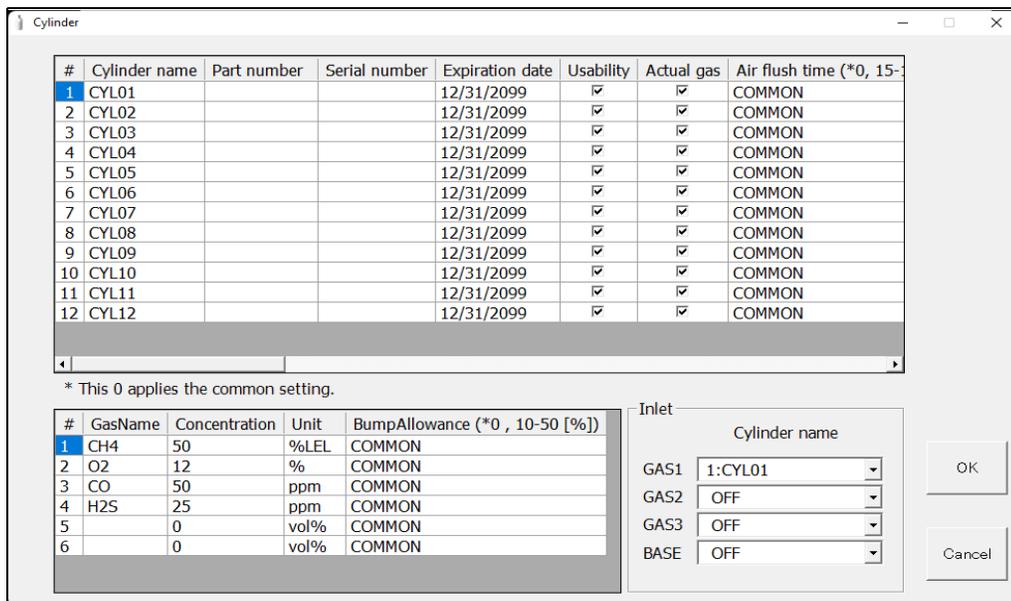


Figure 16: Cylinders Window

- Click a cell in the **Cylinder Name** column. Select a cylinder name and it will auto-populate the entire row and included gases in the lower table.

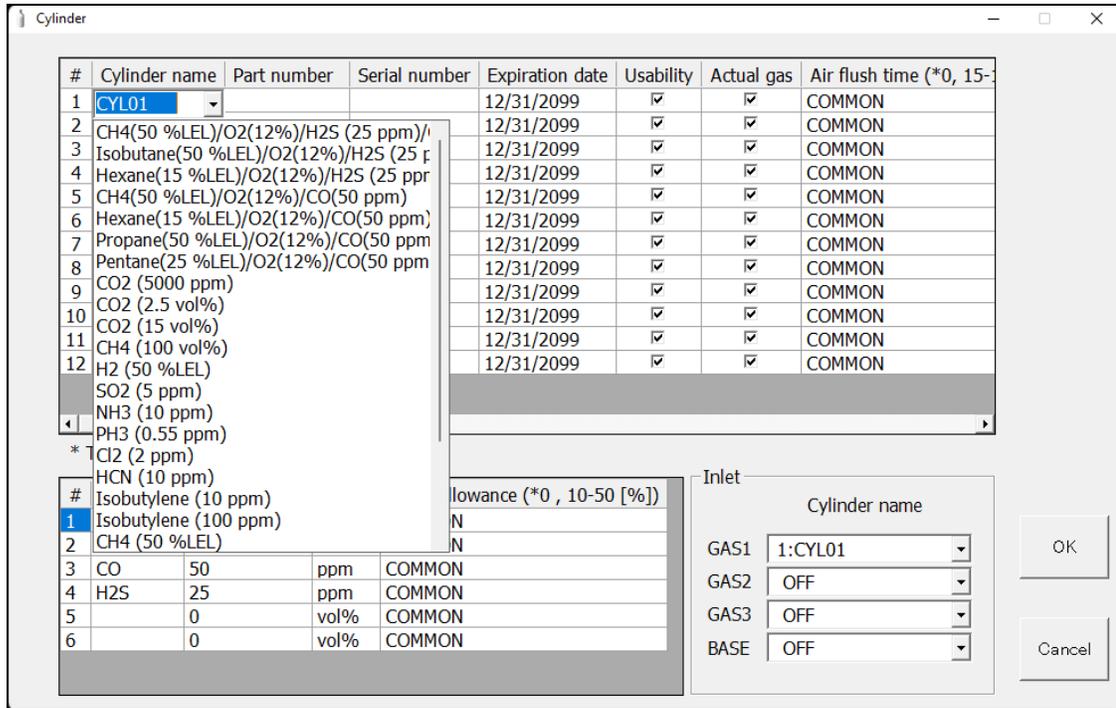


Figure 17: Predefined Cylinders List

- Refer to Table 5 below for descriptions of each column. To set any parameters to their **COMMON** setting, click on the current value, delete it, and type in “0”.

Table 5: Cylinders Window Columns

Entry Name	Description
Cylinder Name	To edit, double-click in the Cylinder Name field and change the cylinder name. Clicking on the cell also displays a dropdown menu with preset options with gas and concentration information.
Part Number	To edit, double-click in the Part Number field and change the cylinder’s part number. If a preset is assigned to the Cylinder Name , the Part Number field automatically populates when the Tab key is pressed or another field is selected.
Serial Number	To edit, double-click in the Serial Number field and change the cylinder’s serial number.
Expiration Date	Set expiration date by clicking in the Expiration Date field and clicking the dropdown menu that appears. Use the calendar to choose an expiration date. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>Expiration date</p> <p>12/3/2025 : the cylinder’s expiration date is less than 10 days away</p> <p>11/30/2025 : the cylinder’s expiration date has passed</p> </div>

Table 5: Cylinders Window Columns

Entry Name	Description
Usability	If Usability is selected, the PC program will alert at start up if the cylinder's expiration date has passed and will include the associated cylinder in testing. If Usability is deselected, the program will consider the cylinder to be inactive and won't be used for testing.
Actual Gas	The Actual Gas option does not affect SDM-Force operation.
Air Flush Time	Defines the cylinder's air flush time during bump tests and calibrations performed with the SDM-PC3 program, the default is set to COMMON , which is 15 seconds
Air Purge Time	Defines the cylinder's air purge time during bump tests and calibrations performed with the SDM-PC3 program, the default is set to COMMON , which is 15 seconds
Gas Suction Time During Bump	Defines how long gas is drawn from the cylinder during bump testing, the default is set to COMMON , which uses the current Gas Exposure Time parameter in the Parameter window (page 42)
Gas Suction Time During Calibration	Defines how long gas is drawn from the cylinder during calibrations, the default is set to COMMON , which uses the current Gas Exposure Time parameter in the Parameter window (page 43)
Retention Type Gas Suction Time	N/A
Retention Type Retention Time	N/A

6. Up to 6 gases can be defined for each cylinder. Refer to Table 6 below for descriptions of each column.

Table 6: Gas Info Window Columns

Entry Name	Description
Gas Name	Name for the gas, double-click in the Gas Name field and type in a name for the cylinder.
Concentration	0 - 99999
Unit	<ul style="list-style-type: none"> • %LEL • vol% • ppm • ppb
Bump Allowance	<ul style="list-style-type: none"> • COMMON (uses the current Tolerance parameter in the Parameter window, see page 44) • 10-50%

7. Make any other changes to other cylinders.
8. When finished, click **OK** to display a prompt to save the changes made in the window. Click **Yes** to return to the main window.

Assigning Cylinders to Inlets

Assigning cylinders to inlets defines which cylinder will be used on which gas inlet. Always ensure the correct cylinder is connected to the intended inlet.

1. Click **Cylinders** along the top of the main program window.



2. The **Cylinders** window appears. The **Inlet** section of the window is used to assign cylinder profiles to inlets.

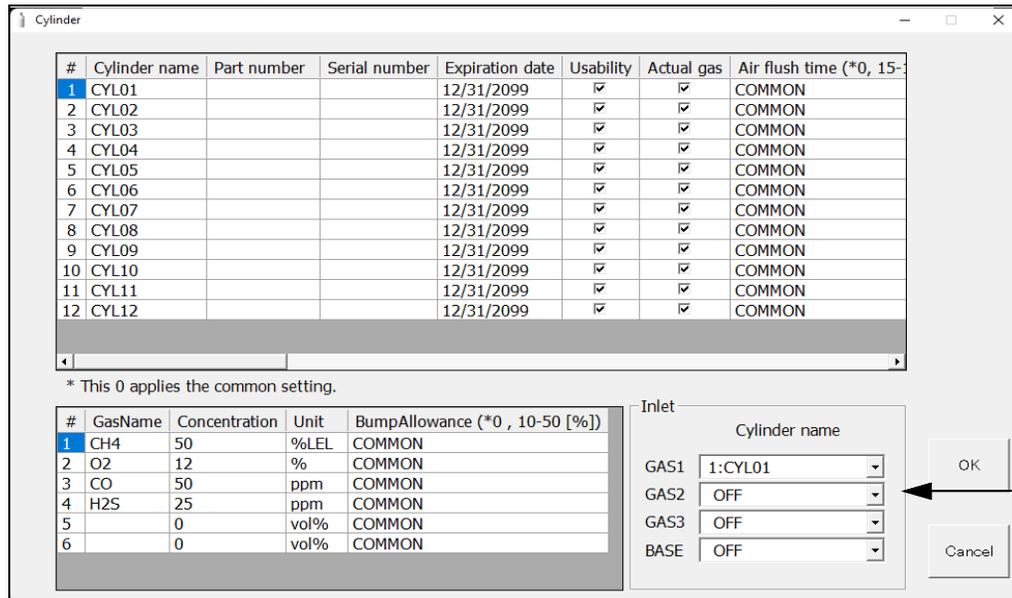


Figure 18: Cylinders Window - Inlet Assignment Section

3. For each inlet (with a solenoid valve installed), click on its text field to display the dropdown list of all cylinder names.

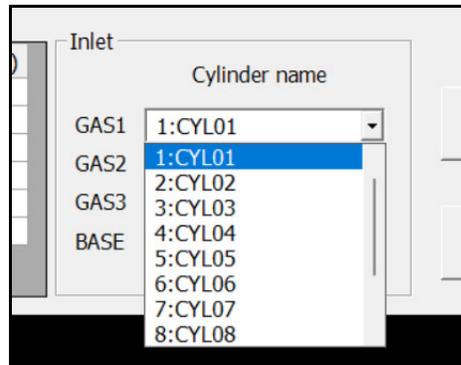


Figure 19: Inlet Assignment Cylinder List

4. Click on the desired cylinder in the list to assign that cylinder to the inlet.
5. When finished, click **OK**.
6. A prompt displays to save the changes made in the **Cylinders** window. Click **Yes** to return to the main window.

Defining PC Program Operation in the Config Window

The Configuration window allows you to update parameters that only affect SDM-PC3 program operation, view database information, and change the password to enter the **Config** window.

Parameter Tab

The **Parameter** tab allows you to view or change bump test and calibration settings that only apply to the SDM-PC3 program operation. Changing anything in the **Parameter** tab of the Config window does not change any settings in the SDM-Force and, therefore, does not affect Standalone Mode operation.

1. While in the main program window, click the **Config** button.
2. Enter the password and click **OK**. The default password is **ABCDE** (case sensitive).

3. The **Parameter** tab is displayed.

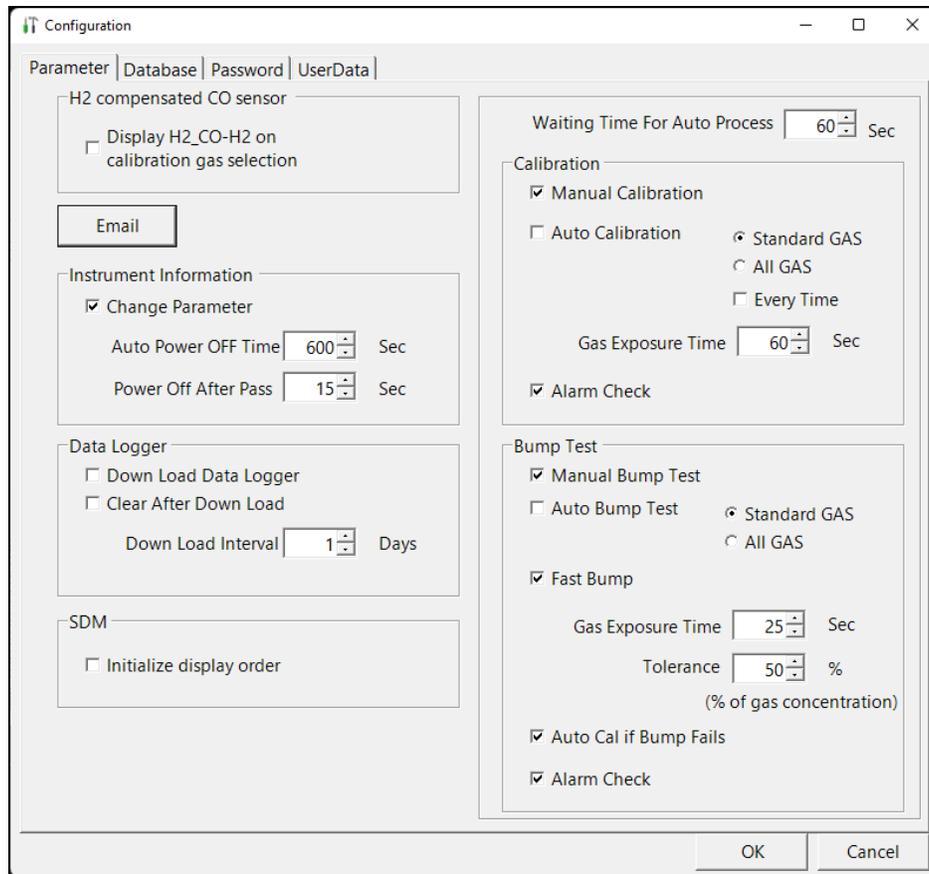


Figure 20: Config Window Parameter Tab

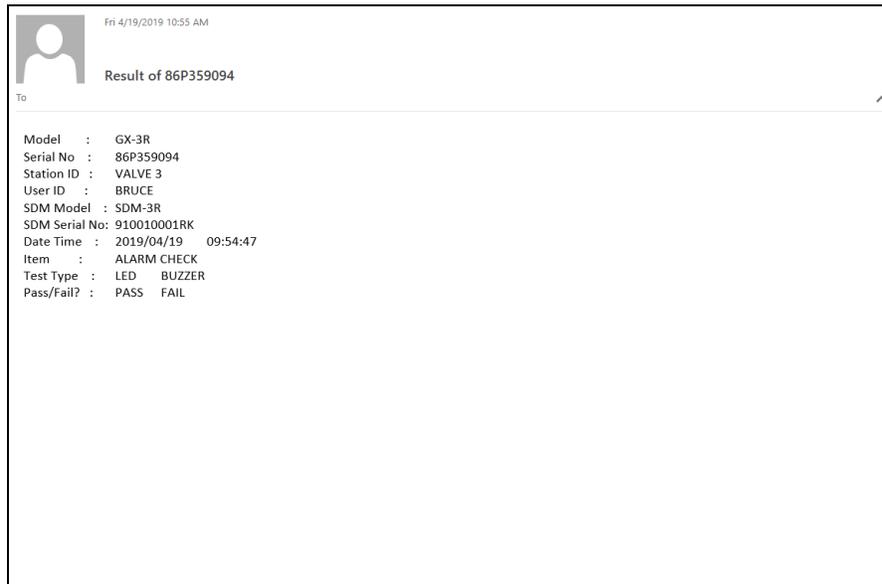
4. Change parameters, as necessary.
5. Click **OK** and then click **Yes** in the window that comes up to save the settings and return to the main window.

H2-Compensated CO Sensor

- **Selected:** When performing a calibration on a H₂-compensated CO sensor, both the CO and the H₂ response appear calibration gas choices that can be selected or deselected for calibration. The H₂-response needs to be set both monthly and after a new sensor is installed.
- **Deselected** (factory setting): When performing a calibration on a H₂-compensated CO sensor, the H₂ response does not appear as a calibration gas and cannot be calibrated. The CO response for the sensor can still be calibrated.

Email

The SDM-PC3 program can be configured to send emails out whenever an instrument is bump tested, calibrated, or alarm checked. An example of an alarm check email is shown below.



1. Click **Email**.

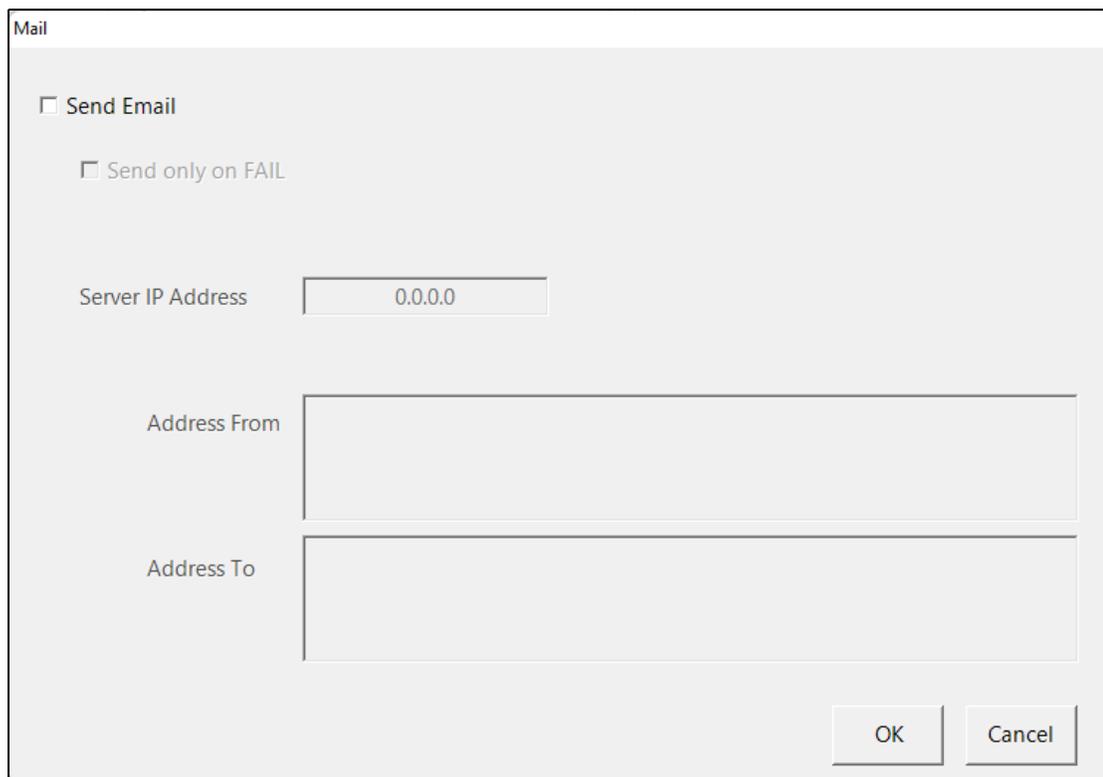


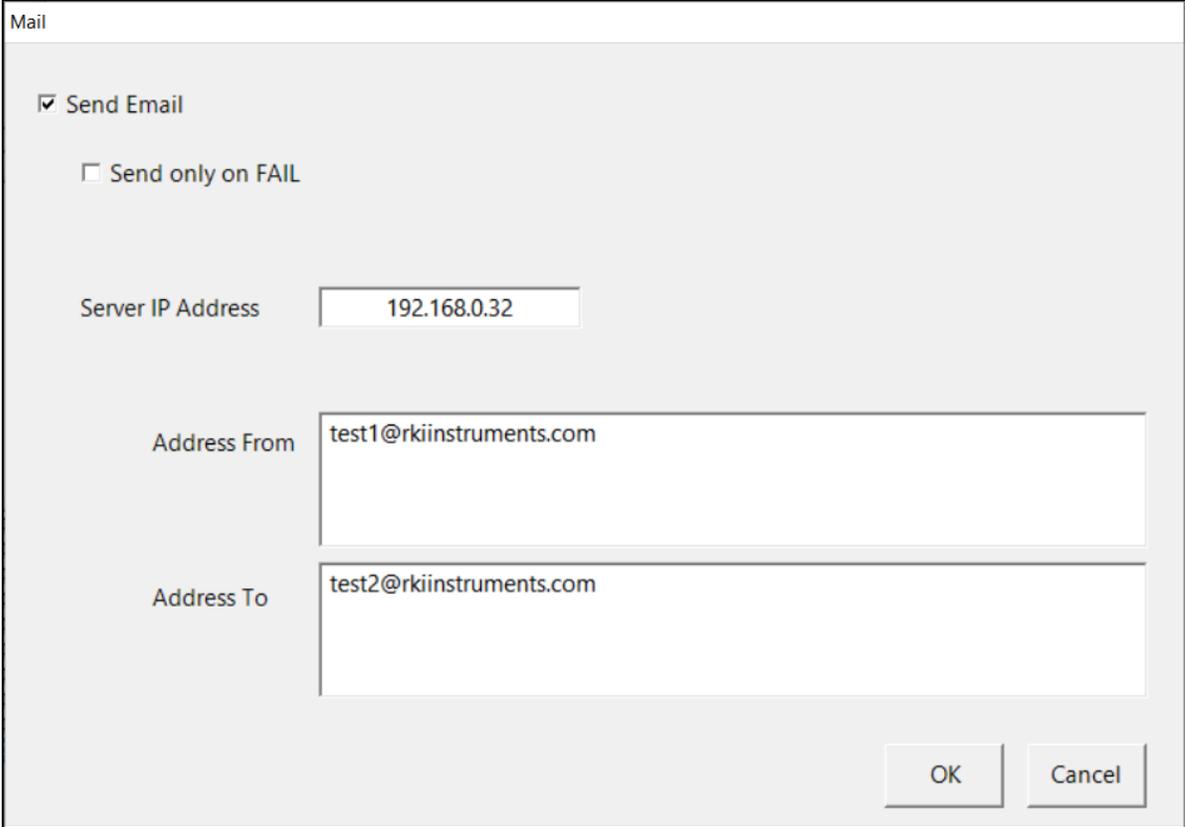
Figure 21: Email Setup Window, Blank

2. Select **Send Email**.

3. If you only want an email to send when a test fails and don't want an email to send when a test passes, select **Send only on FAIL**.
4. Type IP address of your mail server. This information will likely need to be obtained from your IT department.
5. **Address From:** Type in the email address that you want to use to send emails. This address doesn't have to be an address that's currently used on the computer but it does have to be an address on the server.
6. **Address To:** Type in the email address where you want to receive emails. You can only send an email to one email address. This address does not need to be associated with the server information entered in **Server IP Address** but some servers may block an email to an outside address (such as an @gmail address).

If your server blocks emails to an outside address, you will need to get help from your IT department. In general, ensure the following:

- a. Your computer's IP address is static.
- b. In the server configuration, allow non-exchange servers to relay email from exchange servers by creating a new Receive Connector on the Hub Transport server.
- c. Change the default remote network's IP address to the computer's static IP address.



The screenshot shows a window titled "Mail" with the following settings:

- Send Email
- Send only on FAIL
- Server IP Address: 192.168.0.32
- Address From: test1@rkiinstruments.com
- Address To: test2@rkiinstruments.com

Buttons for "OK" and "Cancel" are located at the bottom right of the window.

Figure 22: Email Setup Window, Filled In

7. Click **OK** to return to the Parameter tab.

Instrument Information Section

Change Parameter

- **Selected** (factory setting): The **Edit** function is active, allowing you to change parameters in connected instruments. See page 90 for information about instrument parameters.
- **Deselected**: The **Edit** function is not active and instrument parameters cannot be edited.

Auto Power OFF Time

This is the length of time that will pass after the last operation is finished before the program will automatically shut off the GX-Force. It is defined in seconds with a maximum setting of **3600** seconds. The factory setting is **3600** seconds.

Power Off After Pass

This is the length of time that will pass after a successful bump test, calibration, or alarm check before the program will automatically shut off the GX-Force. It is defined in seconds with a maximum setting of **3600** seconds. The factory setting is **15** seconds. If this parameter is set to **0** seconds, the GX-Force will not be turned off after a successful bump test, calibration, or alarm check.

NOTE: If a successful bump test, calibration, or alarm check is performed, the program will automatically shut off the GX-Force in the time defined in **Power Off After Pass** regardless of the **Auto Power Off** setting.

Data Logger Section

Down Load Data Logger

- **Selected**: Instrument data is automatically downloaded based on the **Down Load Interval** setting.
- **Deselected** (factory setting): Instrument data is not automatically downloaded. Instrument data can always be manually downloaded.

Clear After Down Load

- **Selected**: The GX-Force's data will be cleared after a data download.
- **Deselected** (factory setting): The GX-Force's data will not be cleared after a data download.

Down Load Interval

The **Down Load Interval** is the length of time, in days, that will pass since the last download before the PC Program automatically downloads data from an instrument if **Down Load Data Logger** is selected. If the instrument is connected to the program before the interval has passed, a data download will not automatically occur. The **Down Load Interval** can be set anywhere from **1** to **60** days. The factory setting is **1** day.

SDM Section

Initialize Display Order

Selecting **Initialize Display Order** resets the numbers assigned to specific docking stations and reassigns the numbers as you connect SDM-Forces to the PC Program.

1. Select **Initialize Display Order**.
2. Click **OK** and then click **Yes** in the window that appears.
3. A window will appear informing you that you need to turn off all SDMs and restart the program. Click **OK**.
4. Click the **Exit** button in the upper right corner of the main program window to exit the program.
5. Turn off all docking stations.
6. Open the PC Program again.
7. Turn on your SDM-Forces in the order that you wish for them to appear on the main program window. Typically the order in which the docking stations appear on the screen corresponds to their left to right arrangement on the tabletop.
8. Your docking stations should all appear on the screen in numerical order. The program will remember each docking station's number. Once the display order is set, if fewer than all of the docking stations are turned on, the stations will still appear in numerical order on the main window, but the stations which are off will not be shown.
9. If you need to reorder the docking stations, repeat steps 1 through 8.

Waiting Time for Auto Process

This parameter defines the time between the instrument connecting to the PC Program and the start of an automatic calibration or automatic bump test. You can set the delay from **0** seconds to **3600** seconds (factory setting is **60** seconds).

Calibration Section

If neither **Manual Calibration** nor **Auto Calibration** is selected, you will not be able to perform a calibration. Select the box for the desired operation.

Manual Calibration

- **Selected** (factory setting): A manual calibration can be performed by selecting an instrument or instruments in the main program window and clicking **Calibration** in the lower right corner of the window.
- **Deselected**: A manual calibration cannot be performed.

Auto Calibration

- **Auto Calibration** selected and **Every Time** deselected (factory setting): An automatic calibration is performed only if the instrument is due for calibration.
- **Auto Calibration** selected and **Every Time** selected: An automatic calibration is performed every time an instrument is connected to the PC program regardless of whether a calibration is due or not.

- **Auto Calibration** deselected (factory setting): A calibration is not automatically performed.

Standard GAS/All GAS

- **Standard GAS** (factory setting): Only the standard sensors (catalytic LEL, O₂, CO, and H₂S) will be calibrated during an automatic calibration.
- **All GAS**: All installed sensors will be calibrated during an automatic calibration as long as:
 - A cylinder change is not required. If a cylinder change is required on GAS 2 or GAS 3, no GAS 2 or GAS 3 testing will be done.

Gas Exposure Time

The **Gas Exposure Time** parameter defines how long gas is applied during a calibration. The **Gas Exposure Time** can be set to **20, 25** (factory setting), **30, 45, 60, 90**, or **120** seconds.

NOTE: This parameter also defines the **COMMON** value used by the **Gas Suction Time During Calibration** available in the **Cylinders** window (see page 34).

Alarm Check

- **Selected** (factory setting): An LED and buzzer test is automatically done on the GX-Force at the end of the calibration.
- **Deselected**: An LED and buzzer test is not automatically done on the GX-Force at the end of the calibration. A manual alarm check can still be done by selecting the instrument and clicking **Alarm Check** in the lower right-hand corner of the main window.

Bump Test Section

NOTE: If neither **Manual Bump Test** nor **Auto Bump Test** is selected, you will not be able to perform a bump test. Select the box for the desired operation.

Manual Bump Test

- **Selected** (factory setting): A manual bump test can be performed by selecting an instrument or instruments in the main program window and clicking **Bump Test** in the lower right corner of the window.
- **Deselected**: A manual bump test cannot be performed.

Auto Bump Test

- **Selected**: An automatic bump test is performed only if the instrument is due for bump testing.
- **Deselected** (factory setting): A bump test is not automatically performed.

Standard GAS/All GAS

- **Standard GAS** selected (factory setting): Only the standard sensors (catalytic LEL, O₂, CO, and H₂S) will be bump tested during an automatic bump test.
- **All GAS** selected: All installed sensors will be bump tested during an automatic bump test as long as:
 - A cylinder change is not required. If a cylinder change is required on GAS 2 or GAS 3, no GAS 2 or GAS 3 testing will be done.

- More than one solenoid valve is installed in the SDM-Force. If only one solenoid valve is installed, then only the standard sensors (catalytic LEL, O₂, and CO or H₂S) will be tested.

Fast Bump

- **Deselected:** The gas application during a bump test will continue for the time period defined by the **Gas Exposure Time** parameter regardless of the sensor reading(s).
- **Selected** (factory setting): If the gas reading for the sensor(s) being tested is within the factory-defined fast bump tolerance (37% for O₂ channels and 50% for all other channels) at the end of a 15-second gas application, then the sensor(s) will pass bump testing, the gas application will be stopped, and the test will move on to the next sensor(s) or to the fresh air purge.

If the gas reading on any of the tested channels is outside of the factory-defined fast bump tolerance (37% for O₂ channels and 50% for all other channels) at the end of the 15-second gas application, then the bump test will fail, and the next step will depend on the **Auto Cal if Bump Fails** setting.

Turning Fast Bump on conserves calibration gas when the tested sensors respond quickly and accurately.

Consider the following scenario as an example:

- 50% LEL methane used for bump testing the combustible gas channel
- **Fast Bump** is **Selected**

Table 7 shows possible readings after the 15-second gas application and the effect on the gas application.

Table 7: Example Fast Bump Scenarios

Gas Reading After 15 Seconds of Gas Application	Outcome
15% LEL (-70% of 50% LEL)	<ul style="list-style-type: none"> • Bump test fails • Next step depends on AUTO CAL setting
35% LEL (-30% of 50% LEL)	<ul style="list-style-type: none"> • Gas application stops • Sensor passes bump testing
60% LEL (+20% of 50% LEL)	<ul style="list-style-type: none"> • Gas application stops • Sensor passes bump testing
80% LEL (+60% of 50% LEL)	<ul style="list-style-type: none"> • Bump test fails • Next step depends on AUTO CAL setting

Gas Exposure Time

The **Gas Exposure Time** parameter defines how long gas is applied during a bump test. The **Gas Exposure Time** can be set to **20, 25** (factory setting), **30, 45, 60, 90**, or **120** seconds.

NOTE: This parameter also defines the **COMMON** value used by the **Gas Suction Time During Bump** found in the **Cylinders** window (see page 34).

Tolerance

NOTE: This parameter's setting defines the **COMMON** setting used by the **Bump Allowance** parameter in the **Cylinders** window (see Table 6 on page 34).

The **Tolerance** can be set between **10%** and **50%**. The factory setting is **50%**. It determines how close the instrument gas reading must be to the calibration gas concentration for each channel during a bump test in order to pass the bump test. It is defined as a percentage of the calibration gas concentration. The amount that the instrument gas reading differs from the calibration gas concentration must be equal to or less than this percentage of the calibration gas concentration. For example, if the tolerance is set to 50%, and the %LEL calibration gas concentration is 50% LEL, then the bump test gas reading for the LEL channel on the instrument must be 50% LEL \pm 25% LEL.

NOTE: The **Fast Bump** feature has its own factory-set tolerances: $\pm 37\%$ for oxygen (O₂) and $\pm 50\%$ for all other gases. The **Tolerance** setting has no effect on the fast bump feature.

Auto Cal if Bump Fails

- **Selected** (factory setting): If a bump test fails, a calibration will automatically begin. The Calibration section's **Gas Exposure Time** defines how long gas flows (see page 42).
- **Deselected:** If a bump test fails, a calibration will not automatically begin.

Alarm Check

- **Selected** (factory setting): An LED and buzzer test is automatically done on the GX-Force at the end of the bump test.
- **Deselected:** An LED and buzzer test is not automatically done on the GX-Force at the end of the bump test. A manual alarm check can still be done by selecting the instrument and clicking **Alarm Check** in the lower right-hand corner of the main window.

6. Navigate to a new location where a database exists, click on the database to select it, and click **Open**. The new database location will be displayed in the **Database Location** field.
7. Click **OK** in the lower right corner of the screen and **Yes** in the window that appears.
8. Another window will appear telling you to restart the PC Program. Click **OK**.
9. Click the **Exit** control button in the upper right corner of the main program window and **OK** in the window that appears.
10. Reopen the PC Program.

Creating a New Database

1. While in the main program window, click the **Config** button.
2. Enter the password and click **OK**. The default password is **ABCDE** (case sensitive).
3. Click the **Database** tab.
4. Click the **Create** button located along the left side of the **Database** tab.
5. Choose a database location, enter a database name, and click **Save**. The file will have a .mdb extension.
6. Click **OK** to confirm that a log database was created.
7. Change the database location as described above.

Importing a .mdb File Into the Database

1. While in the main program window, click the **Config** button.
2. Enter the password and click **OK**. The default password is **ABCDE** (case sensitive).
3. Click the **Database** tab.
4. Click the **Import** button located along the left side of the **Database** Tab.
5. Select an existing .mdb file that you wish to import. You can import a .mdb file that was created on another computer and moved to your computer, you can select a file that was generated on your computer using the **Create** button, or you can navigate to another network computer's .mdb file.

The default location for the .mdb file is C:\Program Data\SDM-PC3\SDM-PC3Log.mdb. Hidden folders must be visible on the computer in order to locate the .mdb file.

6. Click **Open**.
7. The data from the .mdb file will be added to your current data. New data will be visible in the **Logs** window.
8. Make any other desired changes in the **Parameter** and **Password** tabs.
9. Click **OK** and then click **Yes** in the window that comes up to save the settings and return to the main window.

Exporting Data to a .mdb File

1. While in the main program window, click the **Config** button.
2. Enter the password and click **OK**. The default password is **ABCDE** (case sensitive).
3. Click the **Database** tab.
4. Select the desired GX-Forces from the list on the bottom of the **Database** tab.
5. If you want a GX-Force's information removed from the database after export, be sure the instrument is not currently connected to the PC Program, then select **Remove**.
6. Click **Export**.
7. Select where you would like to save the file, and click **Save**.
8. The program will indicate that it is exporting the data and will confirm that it has finished. Click **OK** in the window that comes up.
9. Make any other desired changes in the **Parameter**, **Password**, and **UserData** tabs.
10. Click **OK** and then click **Yes** in the window that comes up to save the settings and return to the main window.

Password Tab

The **Password** tab allows you to change 3 passwords:

- **Config Window:** Allows access to the **Config** window. The password can be up to 12 characters long and contain any letter, number, or symbol. It is case sensitive. Factory setting is **ABCDE**.
- **Open/Edit Maintenance Access:** Allows access to User Mode and Maintenance Mode items in **Open** or **Edit**. Factory set password is **1939**.
- **Open/Edit User Access:** Allows access to User Mode items in **Open** or **Edit**. Factory set password is **0000**.

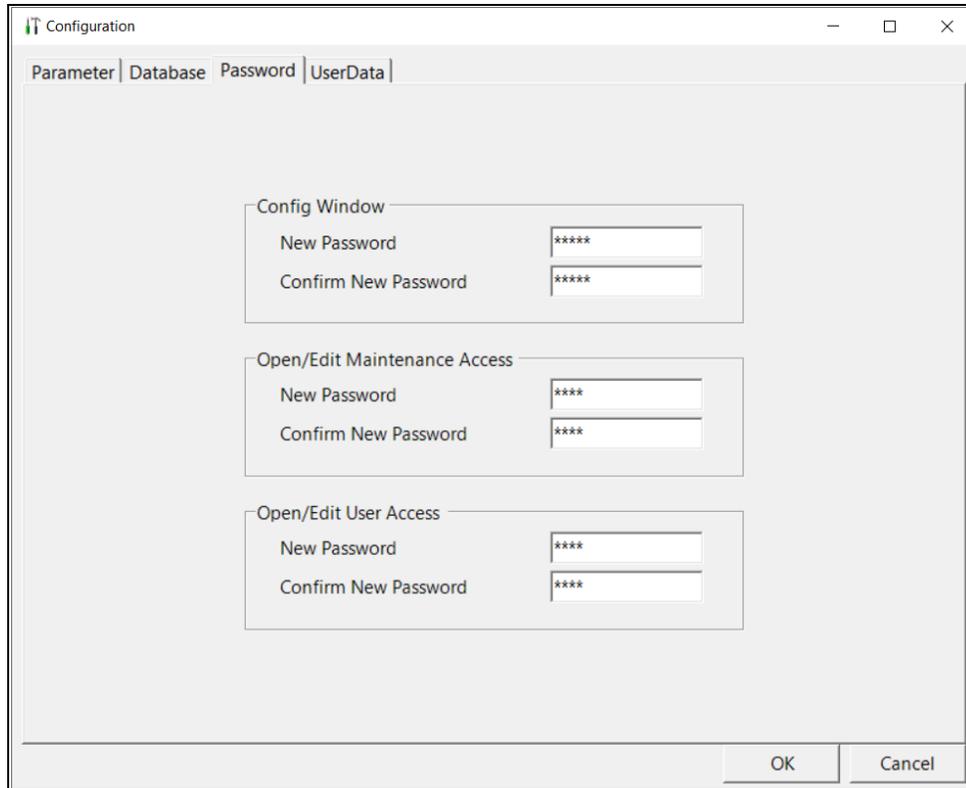


Figure 24: Config Window Password Tab

1. While in the main program window, click the **Config** button.
2. Enter the password and click **OK**. The default password is **ABCDE** (case sensitive).
3. Click on the **Password** tab.
4. For each password, enter the new password in the top box and confirm it in the bottom.
5. Make any other desired changes in the **Parameter**, **Database**, or **UserData** tabs.
6. Click **OK** and then **Yes** to confirm the changes and return to the main window.

UserData Tab

The **UserData** tab contains settings for calibration certificates:

- **Certificate Number prefix:** Each calibration certificate generated by the PC Program is assigned a prefix and a number starting with “1”. Both items can be edited before you print a certificate but if you’d like all certificates to have a certain numbering scheme, it can be defined here.
- **Logo Location:** If desired, a logo or some other picture can be printed in the bottom left corner of the calibration certificate.

	Result	Pass	Pass	Pass	
9. Alarm	*****				
10. Buzzer	*****				
11. Environmental Condition	***** ; *****				
12. Observation					
13. Replacement part					
14. Next Calibration Date					

This calibration certificate results that the inspection and calibration was carried out in accordance with the operation manual or the maintenance manual officially published by the manufacturer Riken Keiki Co., Ltd.



Issued Date : 7 January 2026
 Company Name :
 Diploma No. :
 Signature :

Logo Location

Figure 25: Calibration Certificate Logo Location

- **Printer:** You can select a printer for the calibration certificate. You can also select “AdobePDF” and create a PDF file instead of printing a hard copy of a certificate.

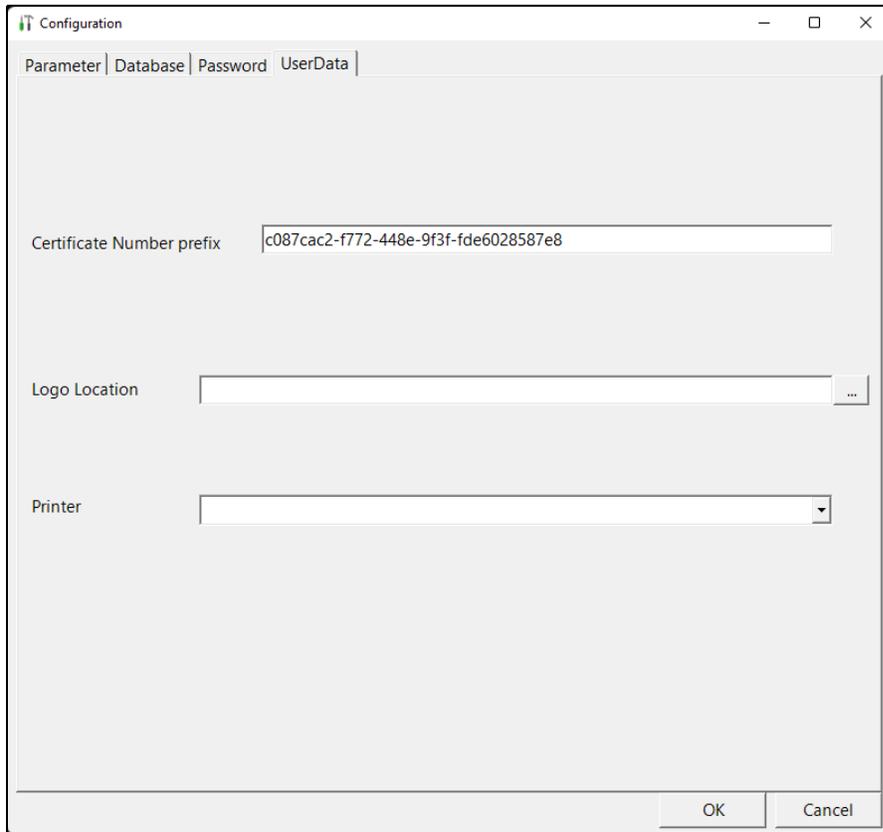


Figure 26: Config Window UserData Tab

1. While in the main program window, click the **Config** button.
2. Enter the password and click **OK**. The default password is **ABCDE** (case sensitive).
3. Click on the **UserData** tab.

4. Enter a certificate prefix, navigate to a logo location, and/or select a printer.

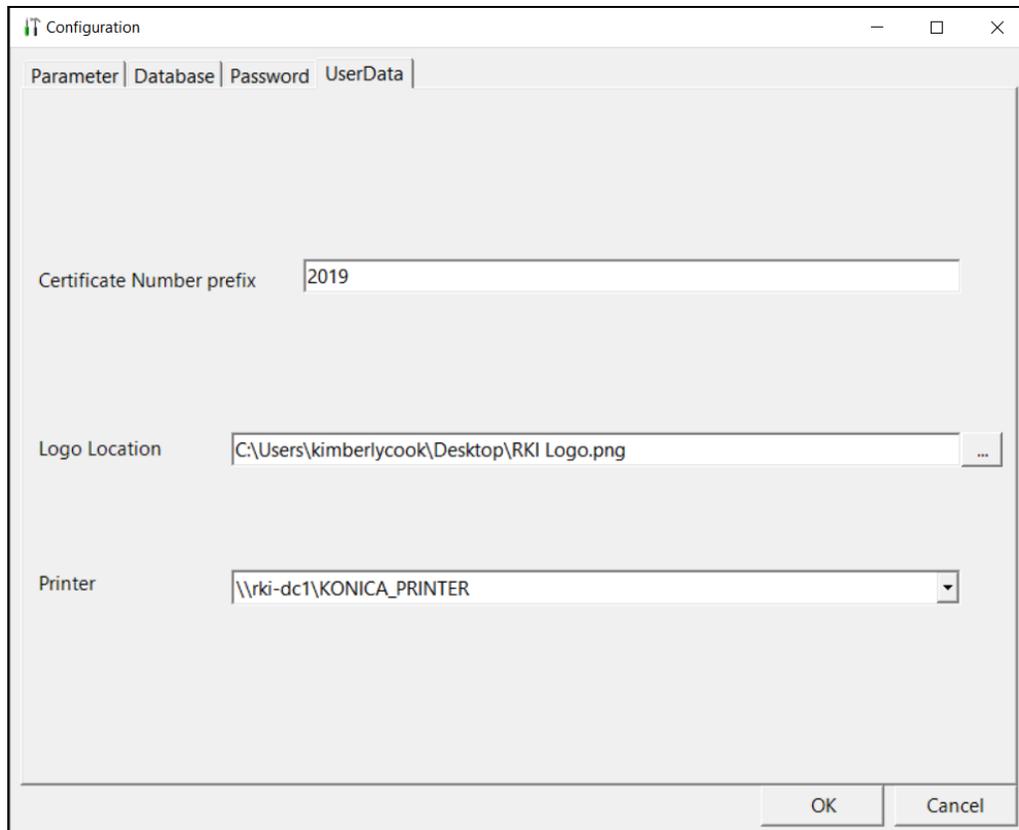


Figure 27: Config Window UserData Tab with User-Defined Data

5. Make any other desired changes in the **Parameter**, **Database**, or **Password** tabs.
6. Click **OK** and then **Yes** to confirm the changes and return to the main window.

Chapter 5: Operation

Overview

This chapter provides a brief overview of the SDM-PC3 program and describes how to perform a bump test, calibration, and alarm check. It also contains troubleshooting information and instructions for instrument charging.

NOTE: When the SDM-Force is connected to the SDM-PC3 Program, the date and time of the docking station are automatically updated to the current date and time on the SDM-PC3 program's screen.

NOTE: The SDM-PC3 program is required for using the SDM-Force docking station (and GX-Force) and the SDM-04 (and 04 Series instruments) in a PC-controlled configuration. The SDM-PC3 program is available on RKI Instruments' website.

Overview of the SDM-PC3 Controller Program

This section provides a brief overview of the program and a description of the main program window. Instructions for using the program are given in other parts of this manual. Use this section to become familiar with the main program window, but before attempting to use the program, make sure to perform the program setup as described in "Setting Up Cylinders" on page 32 and "Defining PC Program Operation in the Config Window" on page 36.

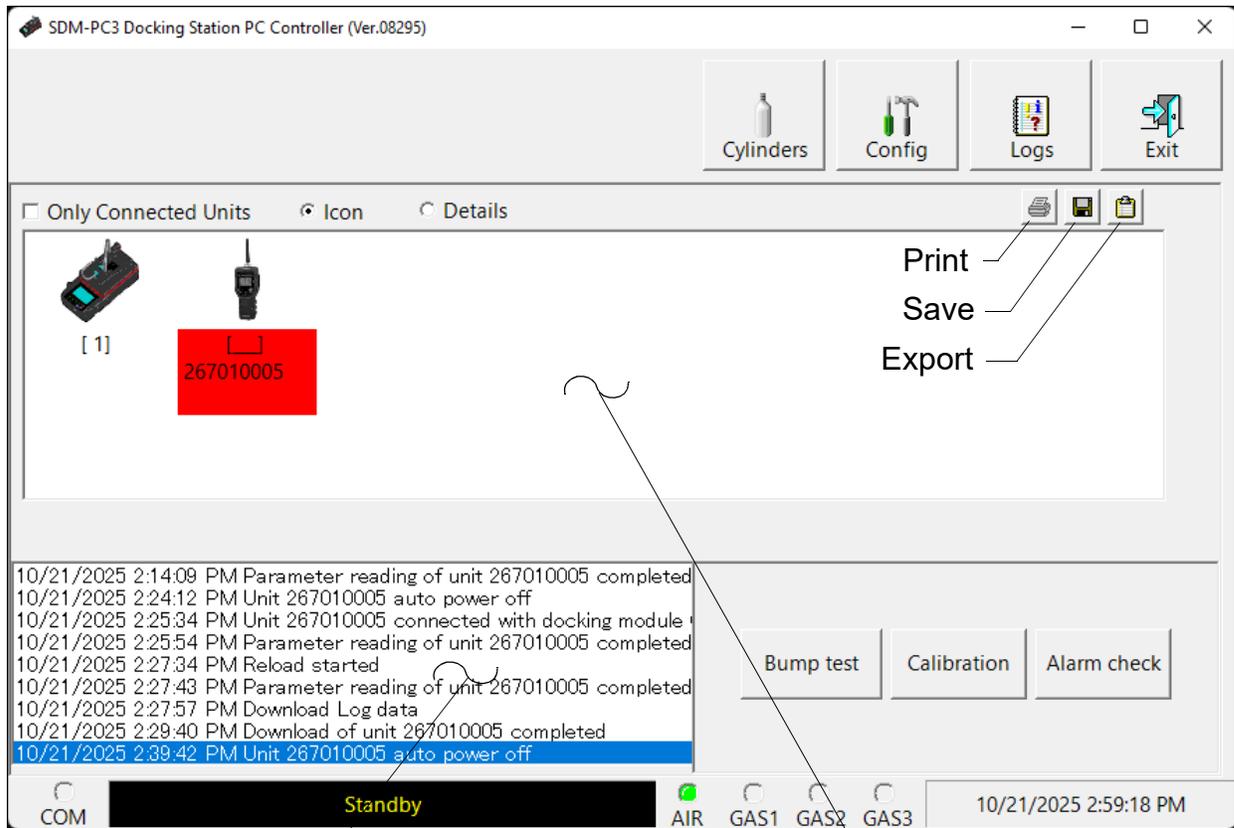
SDM-PC3 PC Program Functions

The PC Program has the following basic functions accessed or controlled by buttons in the main program screen.

- Gas cylinder setup accessed by the **Cylinders** control button
- Program and system configuration accessed by the **Config** control button (this function is password protected)
- Data viewing accessed by the **Logs** control button
- GX-Force bump testing controlled by the **Bump test** control button
- GX-Force calibration controlled by the **Calibration** control button
- GX-Force alarm checking controlled by the **Alarm check** control button

Main Program Window

The main program window is where the current status of the program operation is shown. Any SDM-Forces and GX-Forces that are currently connected to the program are shown as well as any GX-Forces that have previously been but are not currently connected to the program. The program's various functions are initiated or accessed from this screen. The current date and time are always displayed in the lower right corner of the main program window.



Message Area

SDM-Force/GX-Force Display Area

Figure 28: Parts of the Main Program Window

Control Buttons

The **Cylinders**, **Config**, **Logs**, and **Exit** control buttons are located along the top right of the window. The **Bump test**, **Calibration**, and **Alarm check** control buttons are located in the lower right of the window. The use of these control buttons is described in other parts of this manual.

SDM-Force/GX-Force Display Area

The large middle portion of the main program window displays SDM-Forces and GX-Forces that are currently connected to the PC Program and GX-Forces that are in the database. The SDM-Forces are identified by a number. The GX-Forces are identified by their serial number.

By selecting either the **Icon** radio button or the **Details** radio button, the SDM-Forces and GX-Forces can be displayed either as icons or in a table format that shows various GX-Force parameter details such as station ID, user ID, the next scheduled bump test date, and the next scheduled calibration date among others.

If the **Only Connected Units** box is checked, then only GX-Forces that are currently connected to the PC Program will be shown.

Program Status

Three areas of the main program window indicate the program status. The smaller area in the lower left below the SDM-Force/GX-Force display area is the message area. It displays messages that indicate actions and status of the program.

Below this area is the communications port indicator (**COM**) which shows when the program is communicating with the docking station(s).

To the right of the communications port indicator is the status field. It displays the current status of the program. It can indicate if the software is in standby mode or if it is downloading data among other indications.

Gas Inlet Fitting Indicators

To the right of the status field are 4 indicators for each inlet fitting on the left side of the docking station (AIR, GAS1, GAS2, GAS3). They indicate whether the corresponding solenoid is activated so it can allow gas to flow through the fitting it controls. When the indicator is green, the fitting is active. When the indicator is blank, the fitting is not active.

Connecting GX-Forces

1. Confirm that the AC adapter is connected to the SDM-Force and to an AC wall socket.
2. Connect the Type A to Type B USB cable to the SDM-Force and to an available USB port on your computer or to a USB hub that is connected to your computer.
3. Click **Start** on the Windows Icon Tray, then select **Programs/SDM-PC3**. You may also double click the shortcut created on your desktop.
4. If you are starting the software for the first time, a message window appears informing you that a database has been created. Click **OK**.
5. Press the docking station's POWER button.
6. The docking station's CHARGE LED will be solid green if it is operating properly or solid red if there is a system failure.

- When a connection is established between the PC Program and the docking station, the main program window appears as shown below.

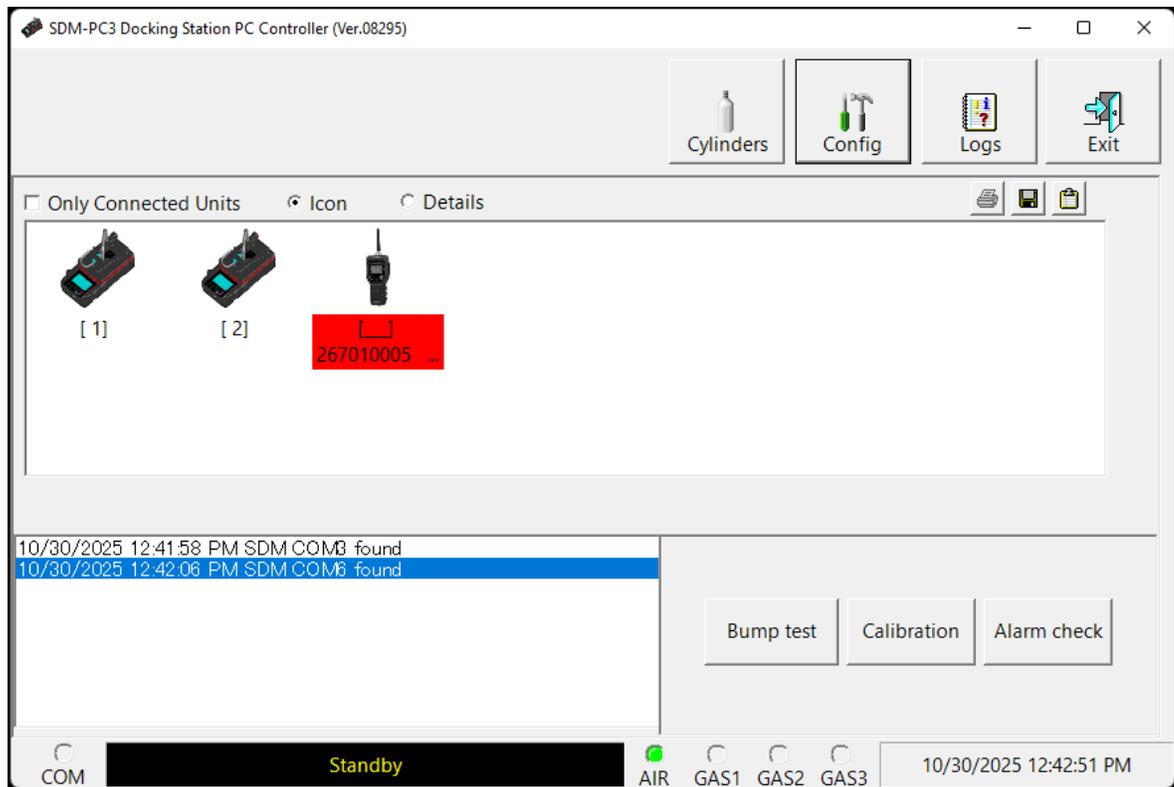


Figure 29: SDM-Force Connection

- When the docking station is connected to the PC Program, the date and time of the docking station are automatically updated to the current date and time on the PC Program's screen.
- Make sure the GX-Force is turned off. Plug the USB C cable into the back of the docking station and into the GX-Force.
- Install the GX-Force into the docking station's instrument cradle.
- The GX-Force will automatically turn on and connect to the SDM-Force. The instrument will beep and vibrate.

1 CH ₄ G1		2 O ₂ G1	
50 %LEL		120 %	
3 H ₂ C1		4 CO G1	
200 ppm		100 ppm	
TRANSMIT			

- Repeat step 1 - step 10 for any additional SDM-Forces and GX-Forces.

- For each GX-Force, the PC Program will indicate that a GX-Force was found and it will download the instrument's basic parameters.

NOTE: Turn each GX-Force on 10-15 seconds after the previous instrument to minimize the possibility of the GX-Force not connecting to the PC Program. If a GX-Force does not connect, use the instrument's POWER MODE button to turn it off and turn it back on again.

- When all GX-Forces have been turned on, connected, and downloaded, the main program window will appear as shown below. When the GX-Force is connected to the PC Program, the date and time of the instrument are automatically updated to the current date and time on the PC Program's screen.

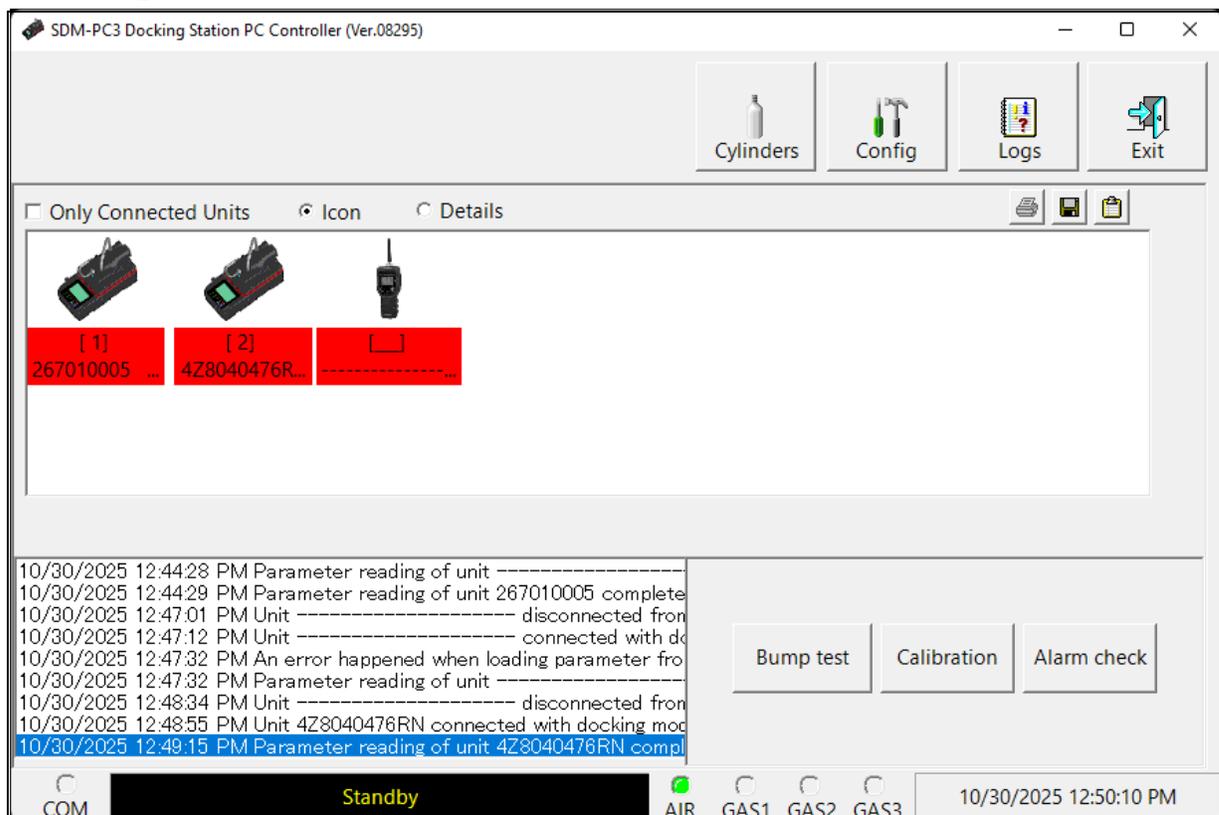


Figure 30: GX-Forces Connected and Downloaded

- If a GX-Force is due for calibration, the docking station number and instrument serial number will be highlighted in red.
- If a GX-Force is due for calibration within the next 10 days, the docking station number and instrument serial number will be highlighted in orange.
- If a GX-Force's basic parameters could not be downloaded properly, a red triangle will appear over the GX-Force/SDM-Force icon.

Icon View vs. Details View

GX-Forces that are currently connected or have been previously connected can be viewed in either Icon View or Details View. Choose Icon or Details View by clicking the **Icon** or **Details** radio button below the control buttons.

Icon View

Icon View allows you to view connected GX-Forces and previously connected GX-Forces in an icon configuration. Connected GX-Forces are shown as a GX-Force inserted in an SDM-Force icon. Previously connected GX-Forces are shown as GX-Force icons. Right clicking a GX-Force causes the Instrument Function Menu to appear.

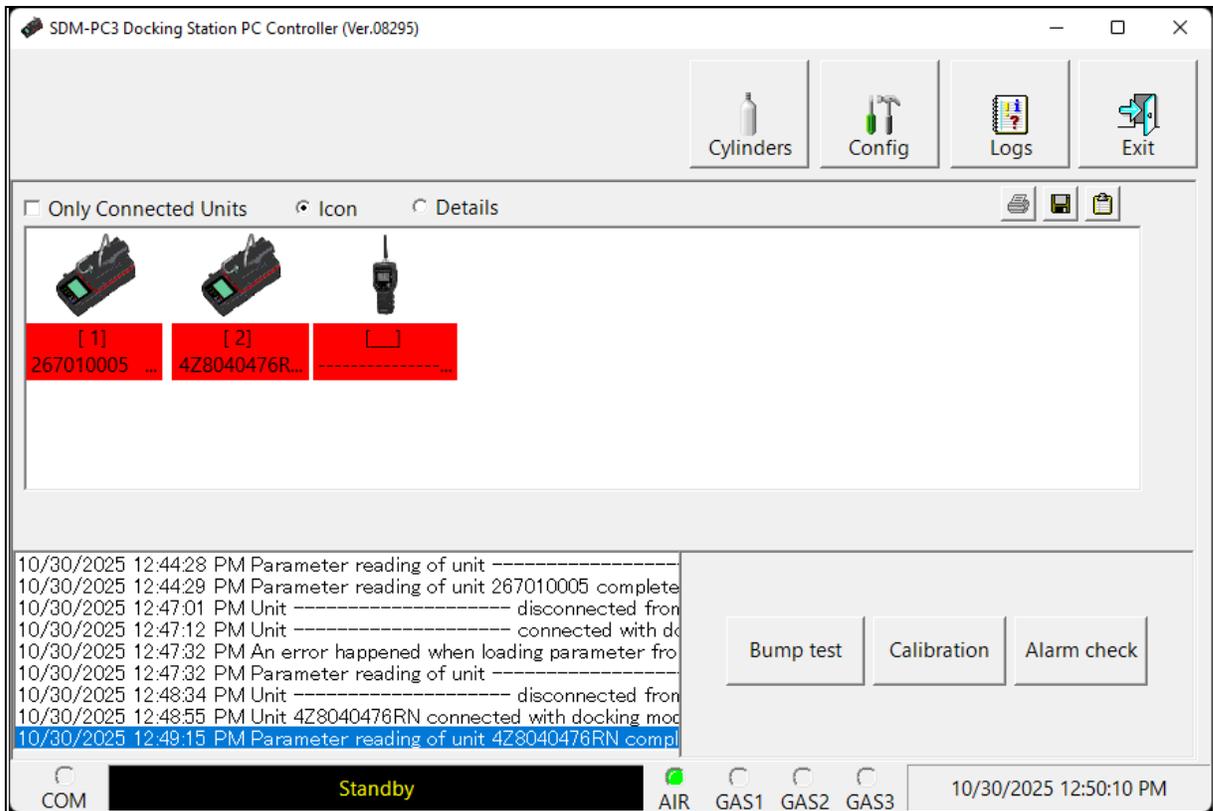


Figure 31: Main Program Window, Icon View

Details View

Details View allows you to view connected GX-Forces and previously connected GX-Forces in a table format. Scrolling to the right in Details View allows you to view existing GX-Force parameters. For a description of these parameters and instructions to change them, see page 90.

SDM-PC3 Docking Station PC Controller (Ver.08295)

Only Connected Units
 Icon
 Details

SDM No	Serial No	Connection	Model	Station ID	User ID	Next Test Date	Next Cal Date	AI
1	267010005	COM3	GX-Force	SID_002	UID_005	4/29/2023	10/25/2022	
2	4Z8040476RN	COM6	GX-Force	-----	-----	4/4/2025	6/3/2025	
---	-----	---	GX-Force	-----	UID_001	3/31/2022	5/30/2022	

10/30/2025 12:44:28 PM Parameter reading of unit -----
 10/30/2025 12:44:29 PM Parameter reading of unit 267010005 complete
 10/30/2025 12:47:01 PM Unit ----- disconnected from
 10/30/2025 12:47:12 PM Unit ----- connected with d
 10/30/2025 12:47:32 PM An error happened when loading parameter fro
 10/30/2025 12:47:32 PM Parameter reading of unit -----
 10/30/2025 12:48:34 PM Unit ----- disconnected from
 10/30/2025 12:48:55 PM Unit 4Z8040476RN connected with docking mod
 10/30/2025 12:49:15 PM Parameter reading of unit 4Z8040476RN compl

Bump test Calibration Alarm check

COM Standby AIR GAS1 GAS2 GAS3 10/30/2025 12:49:52 PM

Figure 32: Main Program Window, Details View

Printing and Exporting an Instrument List from the Main Program Window

You can print, save, or copy the instrument list to the clipboard in the main program window. You can only print the list if it is viewed in Details format. The list cannot be printed when viewed in Icon format.

Printing the Instrument List

1. Select the **Details** radio dot near the top of the main window.

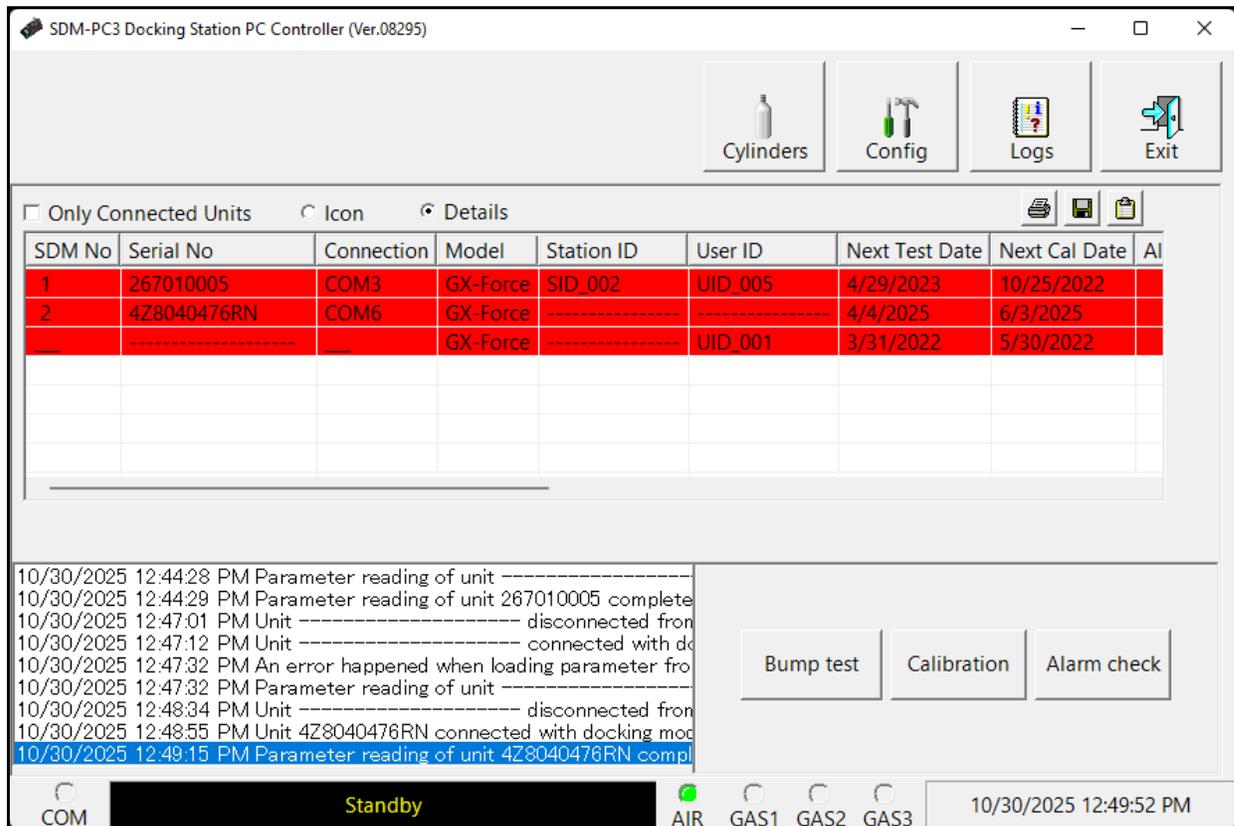


Figure 33: Details View

2. Click the **Print** icon located just below the **Logs** button.
3. Click **OK** in the window that appears.

Saving the Instrument List to a .csv File

1. Click the **Save** icon located just below the **Logs** button.
2. Choose a file path and enter a file name and click **Save**.

Saving the Instrument List to the Clipboard

1. Click the **Clipboard** button located just below the **Exit** button. The serial number, model, station ID, user ID, next bump test date, next calibration date, the calibration interval, and the data logging interval time for each GX-Force in the main program window will be saved to the clipboard in a table format.

2. Open a spreadsheet program such as Excel or a word processing program such as Word and paste the clipboard data into it.

Automatic Procedures

This section briefly describes the automatic procedures that may begin once the GX-Force is turned on and connected to the PC Program.

Automatic Data Download

The PC Program will automatically start a download of the instrument's logged data if **Down Load Data Logger** in the **Config** window is **Selected**. The download will begin as soon as the instrument is connected to the PC Program and the basic parameters are downloaded. An automatic data download will occur first before any other setup automatic process such as an automatic bump test.

NOTE: A data download will take approximately 2 minutes to complete.

Automatic Bump Test or Calibration

If **Auto Bump Test** or **Auto Calibration** is selected in the Parameter Tab of the Configuration window, the PC Program will automatically bump test or calibrate a connected GX-Force as long as a bump test or calibration is due on that instrument. See "Parameter Tab" on page 36 for a description of these parameters. The use of this feature allows the user to launch the PC Program, turn on the GX-Force and walk away. No oversight of the bump test or calibration is needed. For this reason, the calibration cylinders need to already be in place and the **Cylinders** window needs to be set up appropriately. The bump test or calibration will begin in the time defined by the **Waiting Time for Auto Process** parameter in the Parameter Tab of the **Config** window after the instrument is connected to the PC Program and the basic parameters have been downloaded.

Performing a Bump Test

Bump test parameters are defined in the **Config** window. See page 36 for a description of the bump test configuration setup.

1. Establish a connection between the SDM-Force, GX-Force and the PC Program as described on page 54.
2. Verify that all of the bump test parameters are set correctly as described on page 36.
3. Verify that the appropriate calibration gas cylinders are connected to the gas fittings on the left side of the SDM-Force. See page 28 for calibration gas cylinder options and calibration gas connection procedures.

4. Highlight the GX-Force(s) you wish to bump test.

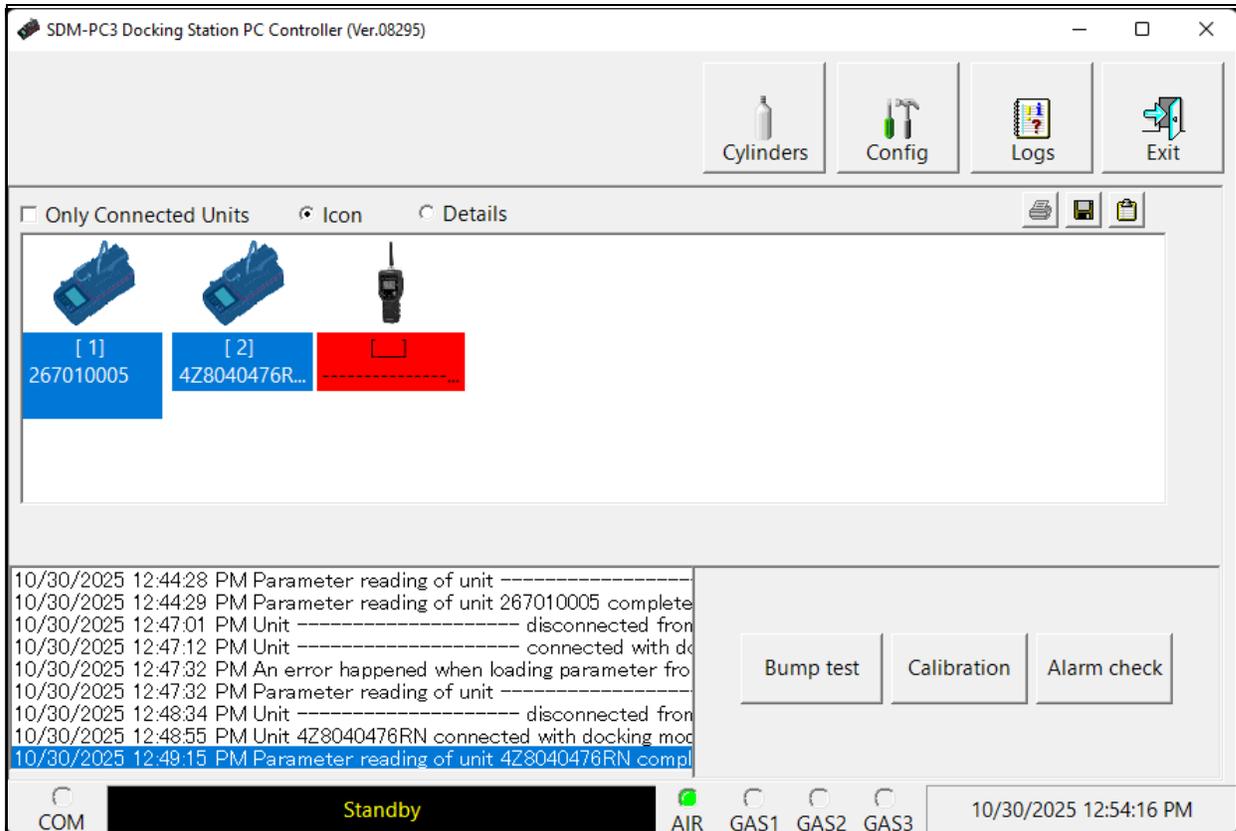


Figure 34: Instrument Selection

5. Click **Bump test** in the lower right corner of the main program window.

- You are asked to confirm which gases will use the GAS 1 fitting for the bump test. Each gas will only appear once, even if multiple instruments with the same target gas are being bump tested.

The gas concentration shown next to each gas name is the auto calibration value for that gas. If it does not match the gas concentration listed on the cylinder, change the auto calibration value for the instrument(s) associated with that gas. See page 106 for instructions.



Figure 35: GAS 1 Selection

- Select the gases that you want to bump test and click **Next >**.
- The gas order confirmation screen appears. This screen shows you GX-Force serial numbers and the gas combinations.

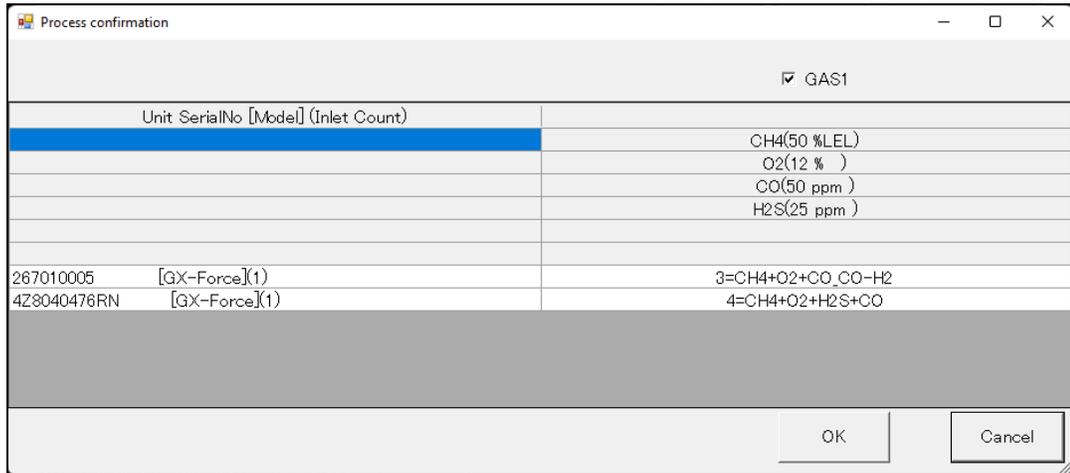


Figure 36: Instrument/Gas Confirmation Screen

- If you have more than 1 solenoid valve installed in your SDM-Force, use the dropdown menus to assign each gas to an inlet. If you only have 1 solenoid valve installed but have more than 1 cylinder, each gas will be assigned to **GAS1** and this screen will indicate that you have to change the cylinders in between gas applications. Use the selection box below each inlet assignment to select or deselect that gas for bump testing.

NOTE: Your SDM-Force will only have as many gas inlet choices as it has solenoid valves. For example, an SDM-Force with only one solenoid valve will only have GAS1 as a choice.

- Click **OK**.

- The GX-Force pump(s) start and the program indicates that air is flowing. The **AIR** indicator on the program screen is solid green. Air is applied to the GX-Force(s) for 15 seconds.

NOTE: If the GX-Force was not on for 40 seconds before the bump test was initiated, air will flow until the GX-Force has been on for 40 seconds.

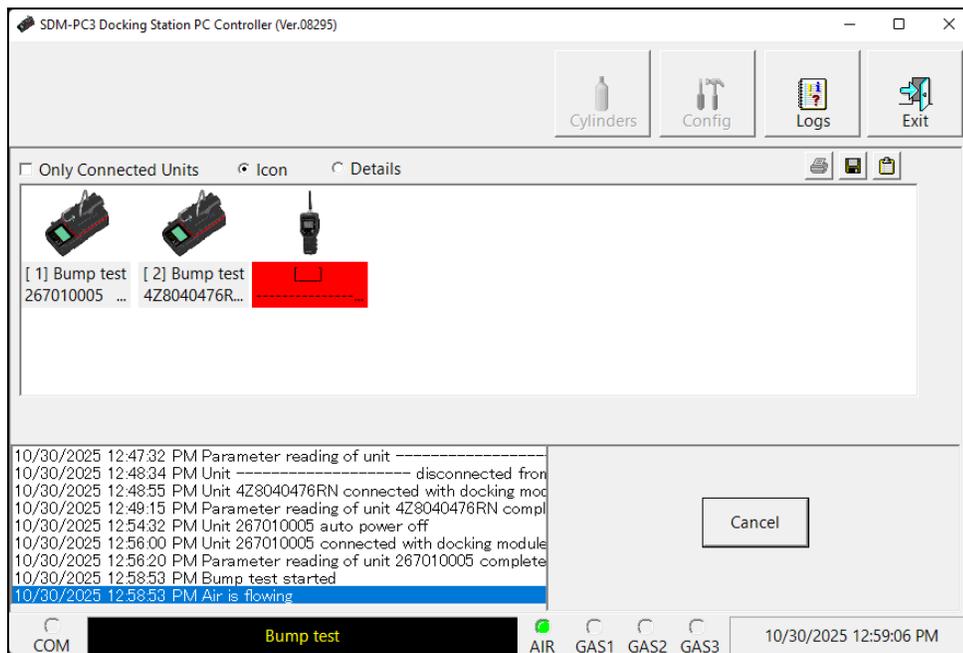


Figure 37: Air Flowing

- The PC Program performs a zero adjustment and analyzes the results. If any sensors failed the zero adjustment, the bump test for that instrument is aborted.
- The SDM-Force then applies calibration gas in the order of the gas inlets. The exposure time for each gas inlet is determined by the **Gas Exposure Time** parameter in the **Bump Test** section of the **Config** window's **Parameter** tab (see page 43).
If **Fast Bump** is selected in the **Config** window, gas is applied for only 15 seconds.
- If the test requires a cylinder change, the pump will stop and the PC Program will prompt you to change the cylinder. Change the cylinder and click **OK** to continue with the bump test.

- The SDM-Force analyzes the results after the end of each gas application. If the bump test fails and **Auto Cal If Bump Fails** is selected in the **Config** window, the gas keeps flowing and a calibration automatically begins.

The exposure time for each gas inlet is determined by the **Gas Exposure Time** parameter in the **Calibration** section of the **Config** window's **Parameter** tab (see page 42).

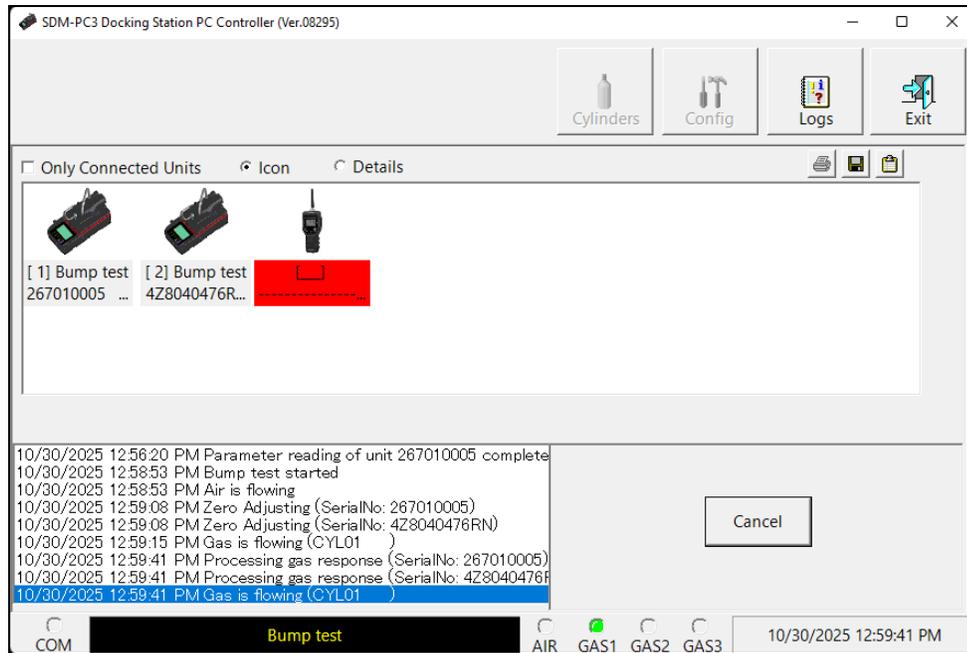


Figure 38: Auto Calibration Gas Flowing

- Once the calibration is over, the SDM-Force continues with the next gas application, if necessary.
- After calibration gas is applied, the docking station purges with fresh air for 15 seconds.

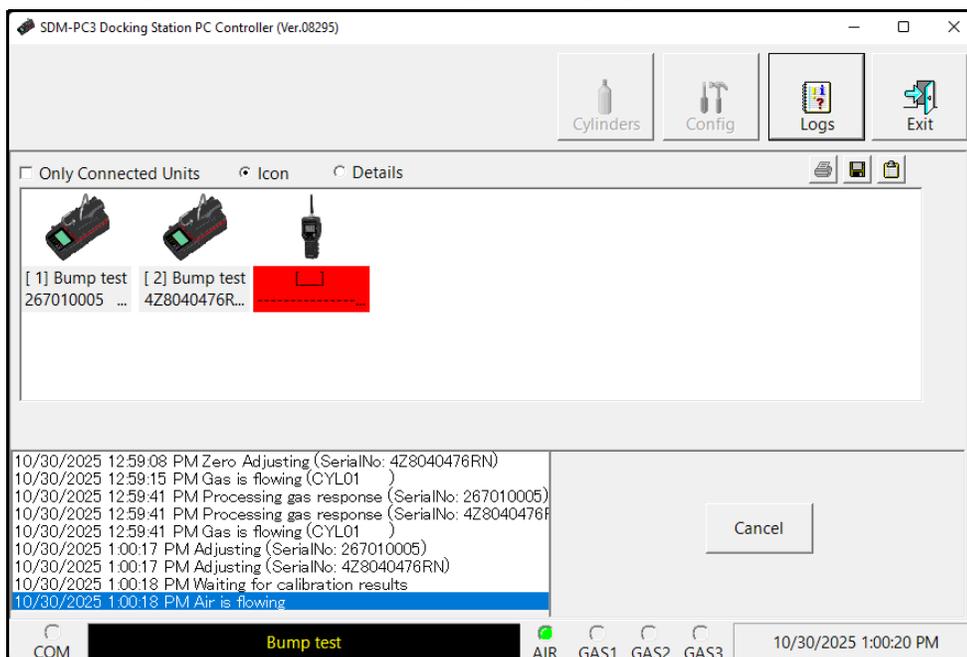


Figure 39: Fresh Air Purge

18. A pop-up window shows the bump test results. If the bump test failed and **Auto Cal If Bump Fails** was selected in the **Config** window, the screen shows calibration results, too.

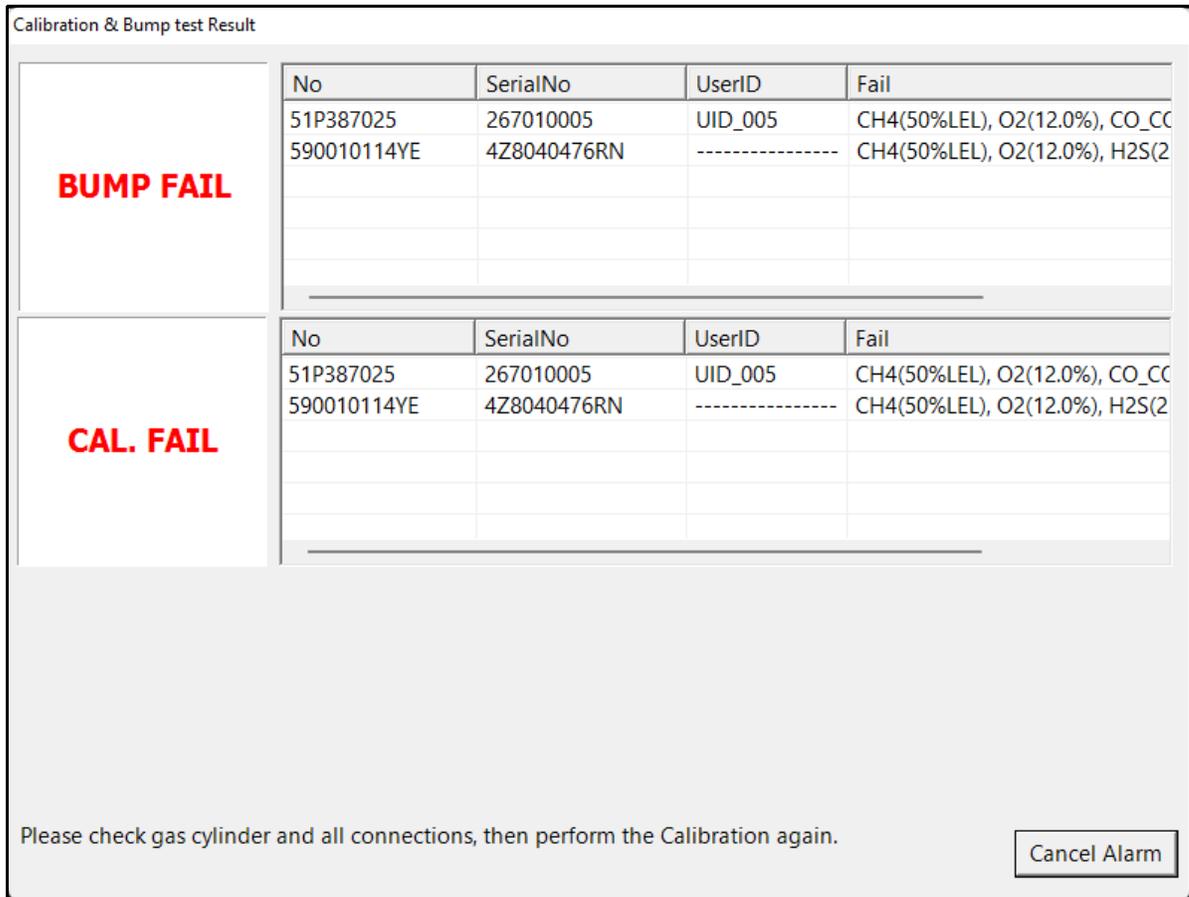


Figure 40: Bump Test/Calibration Result Screen

19. The docking station will perform an alarm check. The buzzer will sound, the LEDs will turn on for a few seconds, and the SDM-Force will determine if these actions were completed successfully.
20. Click **OK** to return to the main program window or double click an instrument information line to view the bump test and/or calibration results in the **Logs** window.
21. For all bump test result outcomes, the GX-Forces are displayed in the main program window in Details View. To return the main program window to Icons View, click the **Icons** radio button.
22. All bump test results can be viewed in the **Logs** window. See “Bump Test Data” on page 136 for instructions for viewing bump test data.

Performing a Calibration

1. Establish a connection between the SDM-Force, GX-Force, and the SDM-PC3 program as described on page 54.
2. Verify that all of the calibration parameters are set correctly. See page 36 for instructions.
3. Verify that the appropriate calibration gas cylinders are connected to the gas fittings on the left side of the SDM-Force. See page 28 for calibration gas cylinder options and calibration gas connection procedures.
4. Highlight the GX-Force(s) you wish to calibrate.

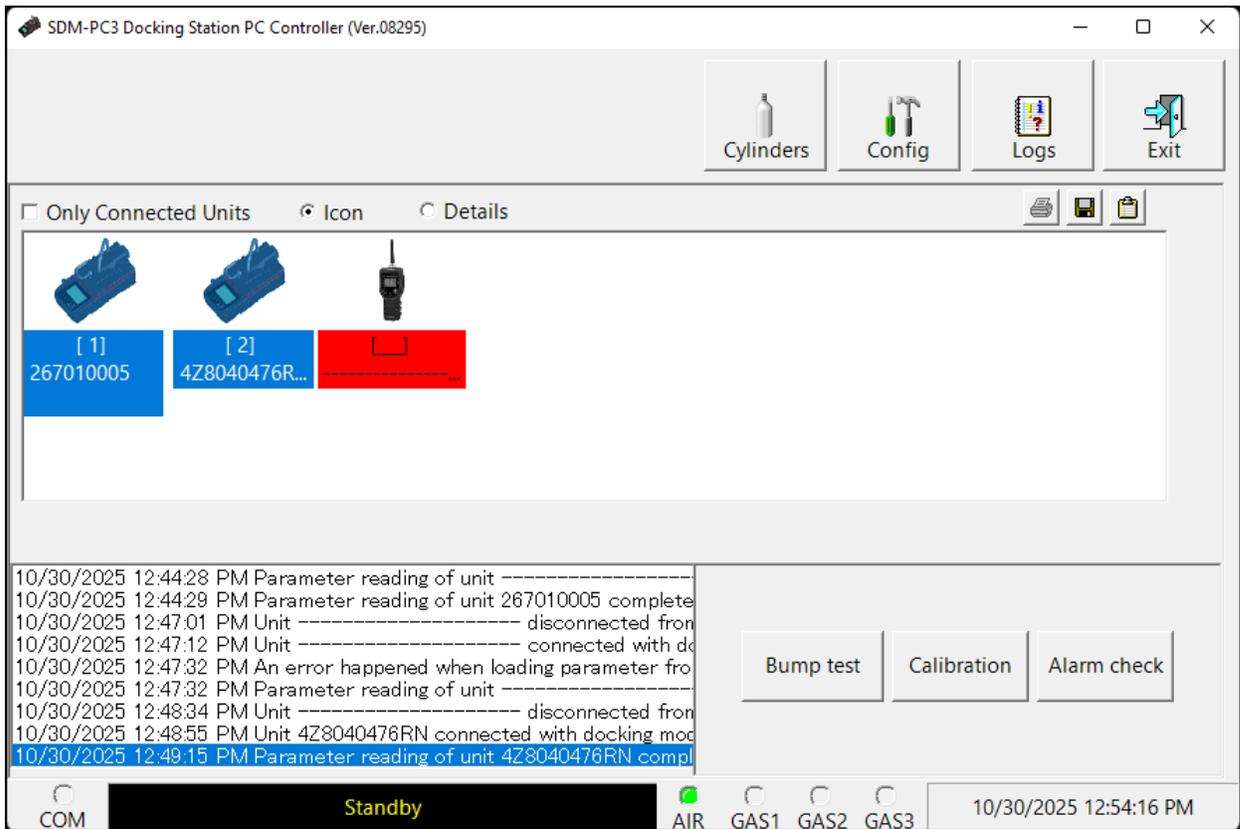


Figure 41: Instrument Selection

5. Click **Calibration** in the lower right corner of the main program window.

- Select the gases that you want to calibrate and click **OK**.

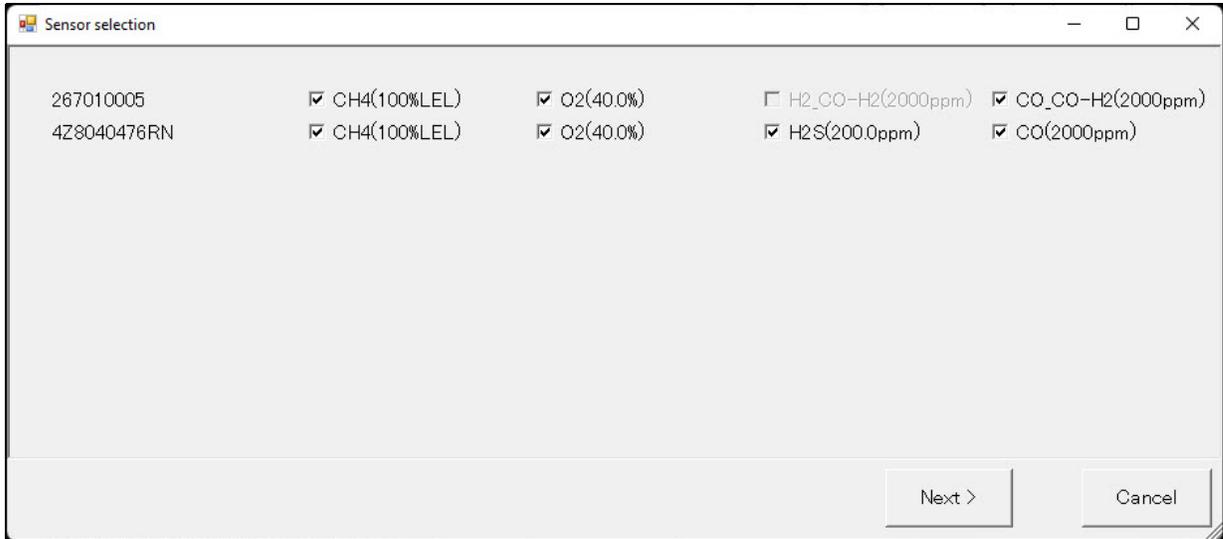


Figure 42: GAS Selection for H₂-Compensated CO Sensor

- The gas order confirmation screen appears. This screen shows you GX-Force serial numbers and the gases associated with each instrument.

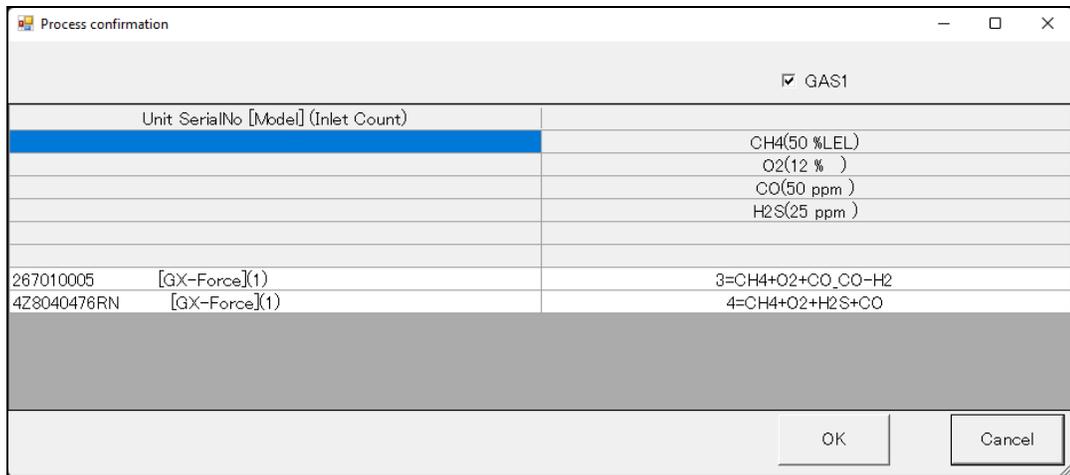


Figure 43: Instrument/Gas Confirmation Screen

- If you only have 1 solenoid valve installed but have more than 1 cylinder, each gas will be assigned to **GAS1** and this screen will indicate that you have to change the cylinders in between gas applications. Use the selection box below each inlet assignment to select or deselect that gas for calibrating.

NOTE: Your SDM-Force will only have as many gas inlet choices as it has solenoid valves. For example, an SDM-Force with only one solenoid valve will only have **GAS1** as a choice.

- Click **OK**.

10. The GX-Force pump(s) start and the program indicates that air is flowing. The AIR indicator on the program screen is solid green. Air is applied to the GX-Force(s) for 15 seconds.

NOTE: If the GX-Force was not on for 40 seconds before the bump test was initiated, air will flow until the GX-Force has been on for 40 seconds.

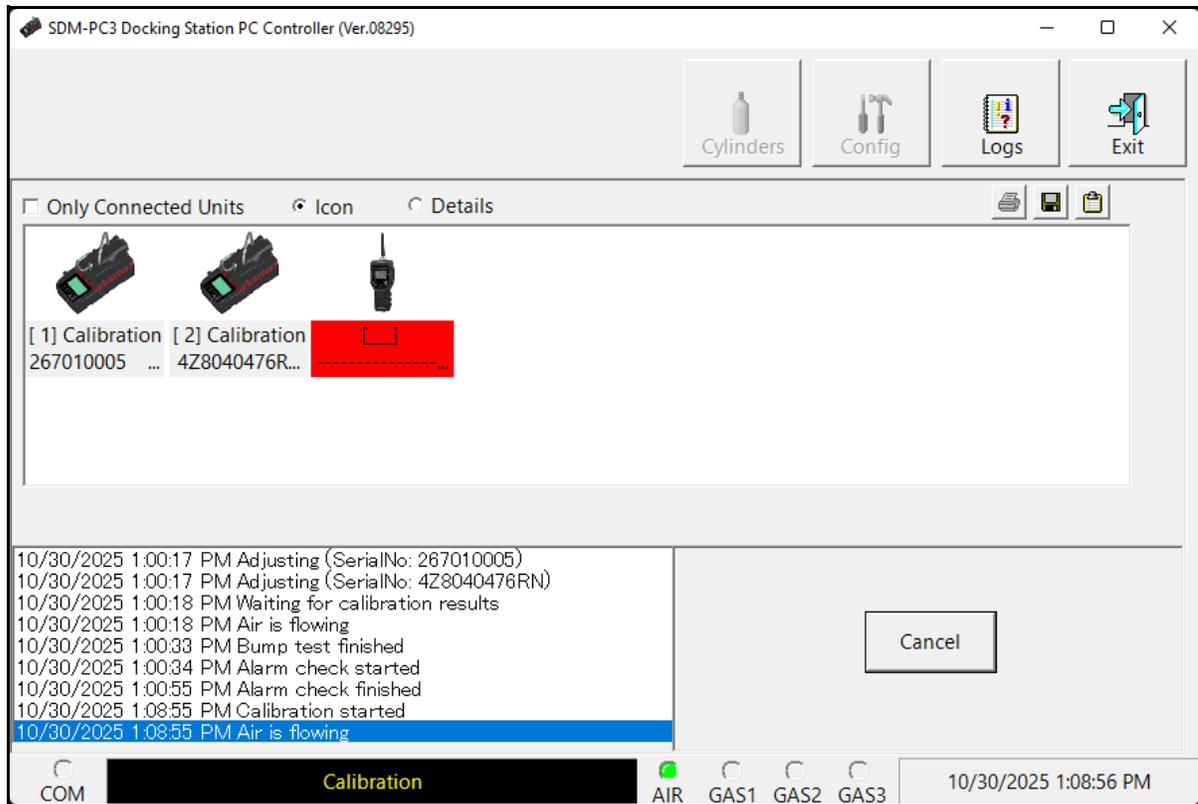


Figure 44: Air Flowing

11. The SDM-PC3 program performs a zero adjustment and analyzes the results.
12. If any sensors failed the zero adjustment, the calibration for that instrument is aborted.

13. The SDM-Force then applies calibration gas in the order of the gas inlets. The exposure time for each gas inlet is determined by the **Gas Exposure Time** parameter in the **Calibration** section of the **Config** window's **Parameter** tab (see page 42).

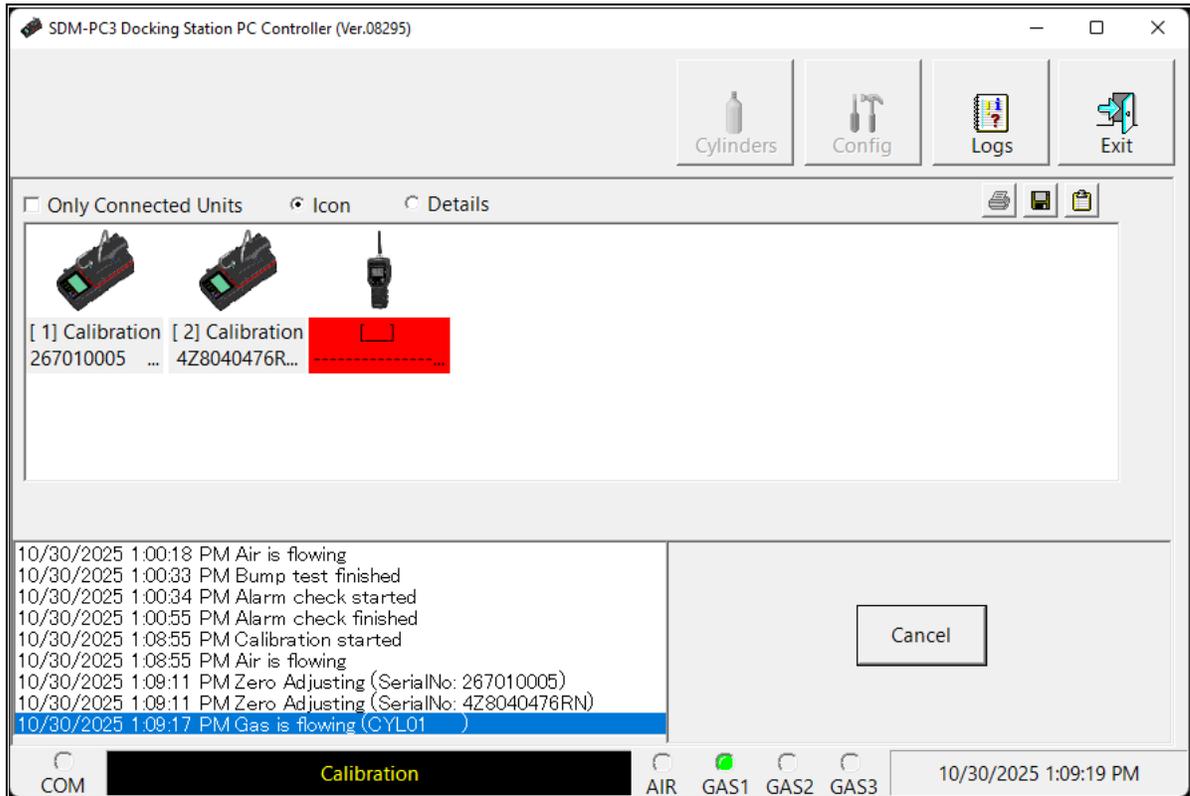


Figure 45: Calibration Gas Flowing

14. If the test requires a cylinder change, the pump will stop and the SDM-PC3 program will prompt you to change the cylinder. Change the cylinder and click **OK** to continue with the calibration.

15. After calibration gas is applied, the docking station purges with fresh air for 15 seconds.

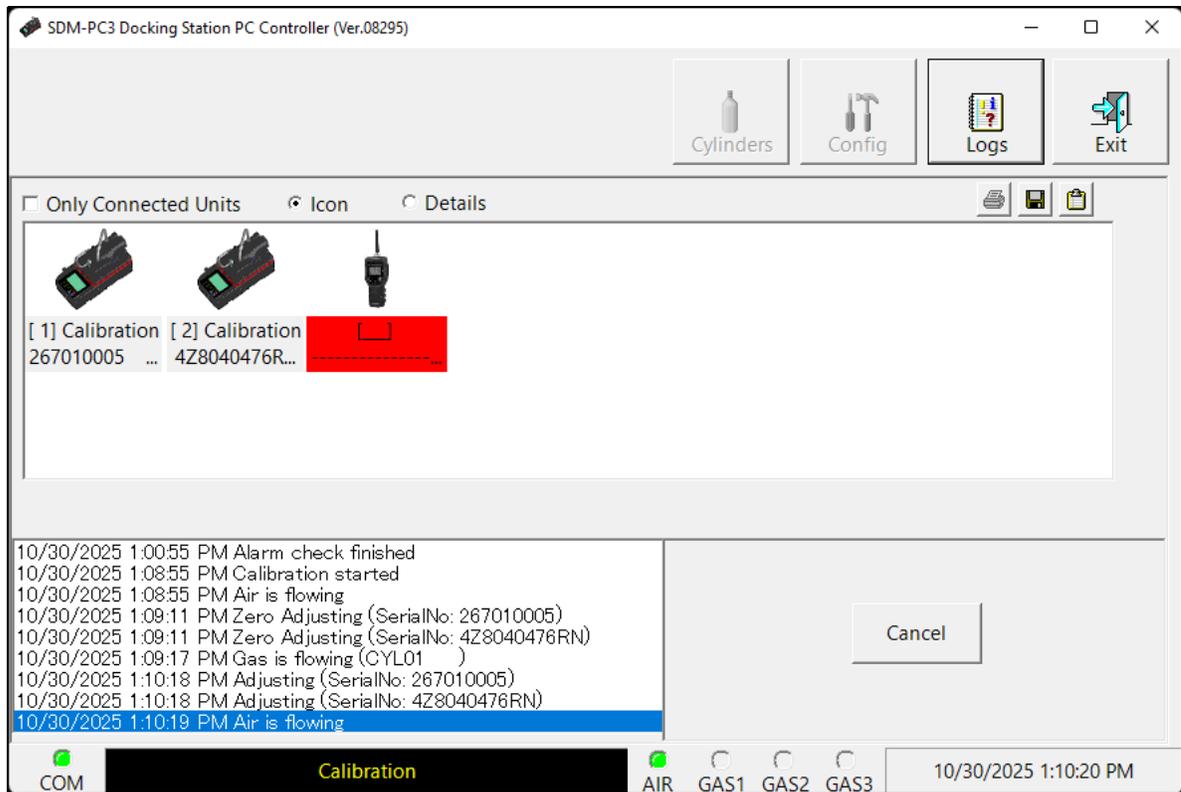


Figure 46: Fresh Air Purge

16. A pop-up window shows the calibration results.

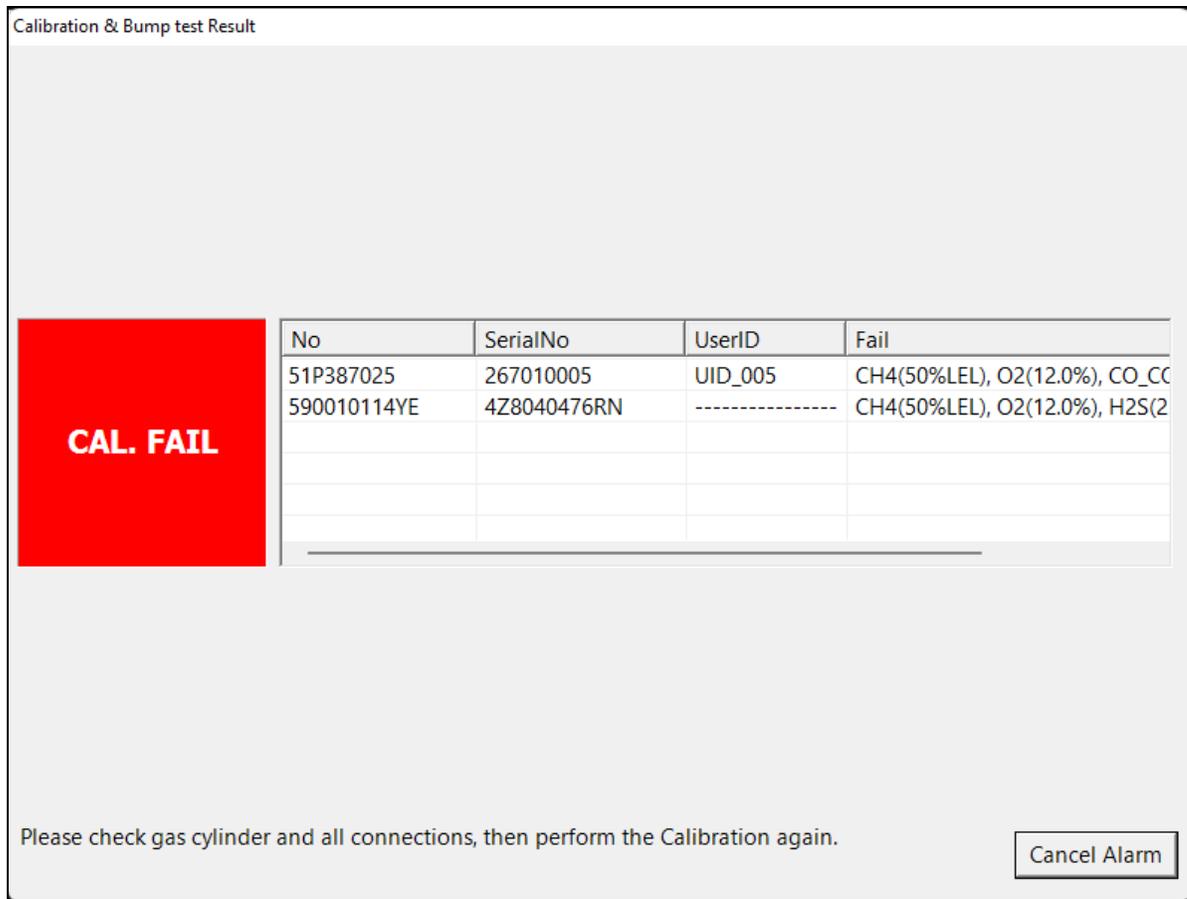


Figure 47: Calibration Result Screen

17. Click **OK** to return to the main program window or double click an instrument information line to view the calibration results in the **Logs** window.
18. For all calibration result outcomes, the GX-Force(s) are displayed in the main program window in Details View. To return to Icons View, click the **Icons** radio button.
19. All calibration results can be viewed in the **Logs** window. See page 123 for instructions for viewing calibration data.

Performing an Alarm Check

The SDM-PC3 program is capable of performing an alarm check both manually and automatically on a GX-Force. When an alarm check is performed, the SDM-PC3 program checks the operation of the instrument's LEDs and buzzer. The SDM-PC3 program analyzes the alarm check results and determines if the GX-Force passed the alarm check.

1. Establish a connection between the SDM-Force, GX-Force and the SDM-PC3 program as described on page 54.

2. Highlight the GX-Force(s) you wish to alarm check.

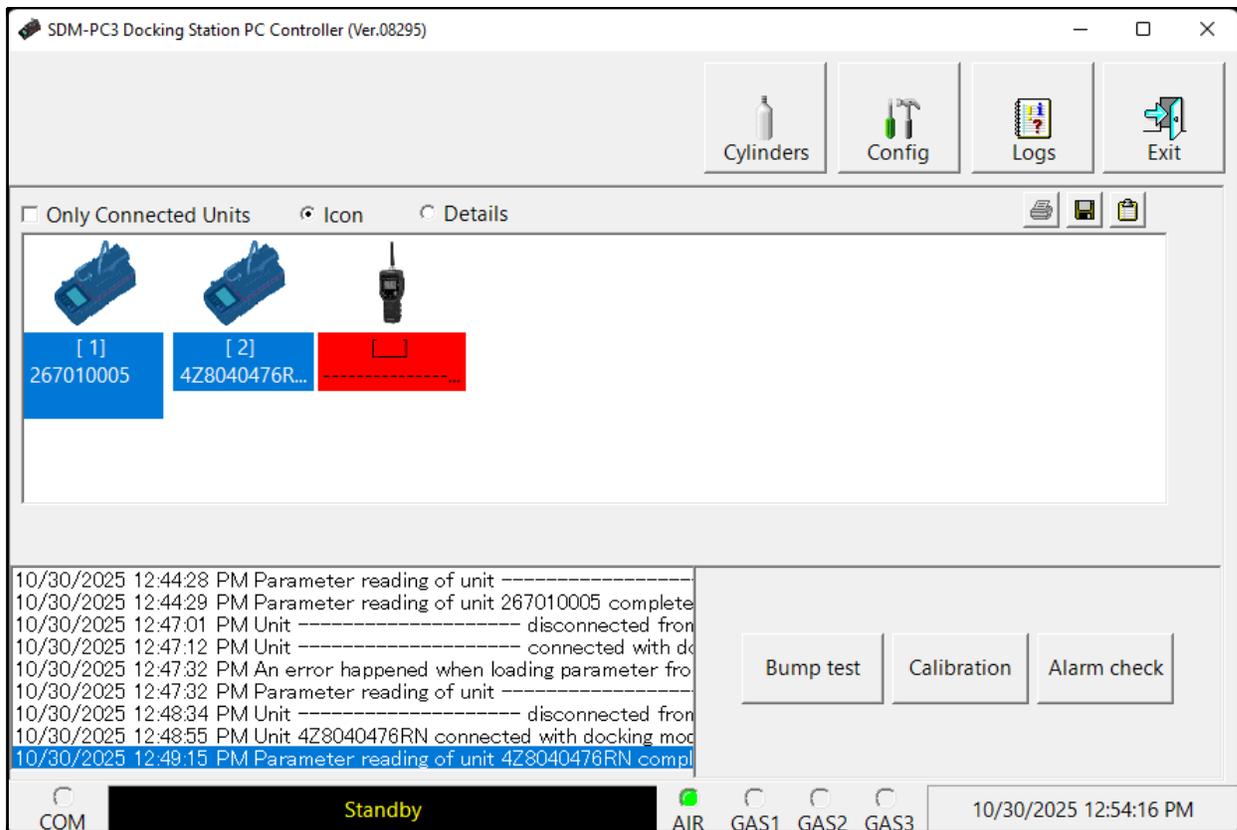
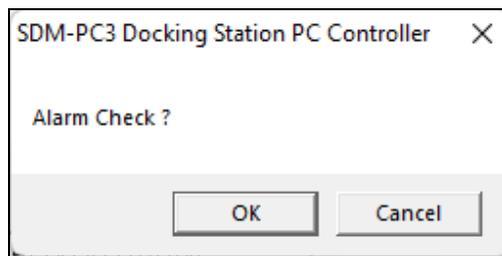


Figure 48: Instrument Selection

3. Click **Alarm Check** in the lower right corner of the main program window.
4. Click **OK** to proceed.



5. The docking station will perform an alarm check. The instrument buzzer will sound, the LEDs will turn on for a few seconds, and the SDM-Force will determine if these actions were completed successfully.

6. A pop-up window shows the alarm check results.

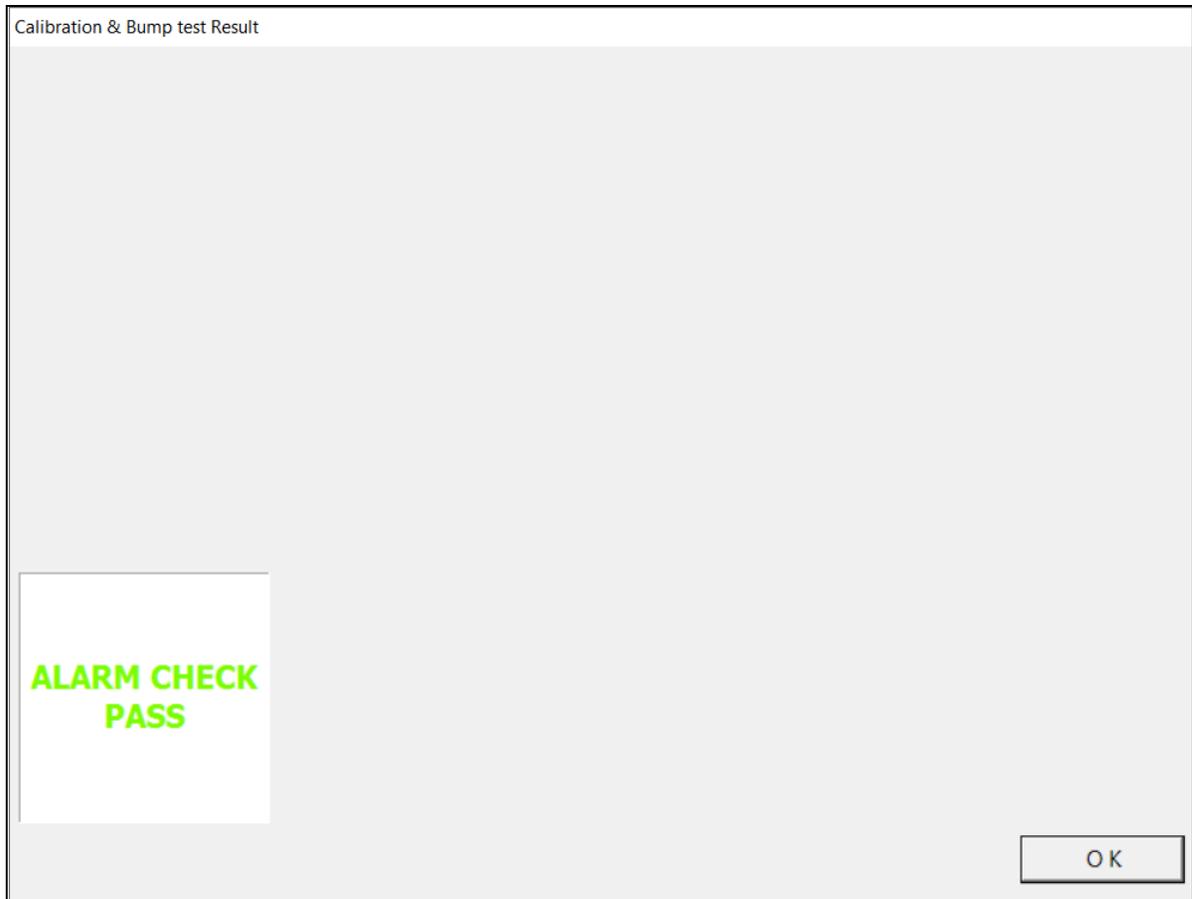


Figure 49: Alarm Check Result Screen

7. Click **OK** to return to the main program window or double click an instrument information line to view the alarm check results in the **Logs** window.
8. For all alarm check result outcomes, the GX-Force(s) are displayed in the main program window in Details View. To return to Icons View, click the **Icons** radio button.
9. All alarm check results can be viewed in the **Logs** window. See page 140 for instructions for viewing alarm check data.

Chapter 6: SDM-Force Parameters for Standalone Operation

The parameters available for editing in the **SDM** window are parameters that are saved in the SDM-Force. *These parameters do not affect SDM-PC3 program operation but they will affect Standalone operation.*

See “Chapter 4: Program Setup” on page 30 for a description of parameters that affect only operation of the SDM-PC3 program.

The **SDM** window has 5 tabs:

- Bump & Cal 1
- Bump & Cal 2
- Internal
- Automatic
- Cylinder

A station’s settings can be saved to a file and a file can be imported using this window.

Entering the SDM Window

1. Open the SDM-PC3 program.
2. Confirm that the AC adapter is connected to the SDM-Force and to an AC wall socket.
3. Connect the Type A to Type B USB cable to the SDM-Force and to an available USB port on your computer.
4. Press the docking station’s POWER button. When the SDM-Force connects to the SDM-PC3 program, it appears in the SDM-Force/GX-Force display area.

NOTE: When the SDM-Force is connected to the SDM-PC3 program, the date and time of the docking station are automatically updated to the current date and time on the SDM-PC3 program’s screen.

5. Right click on the SDM icon.

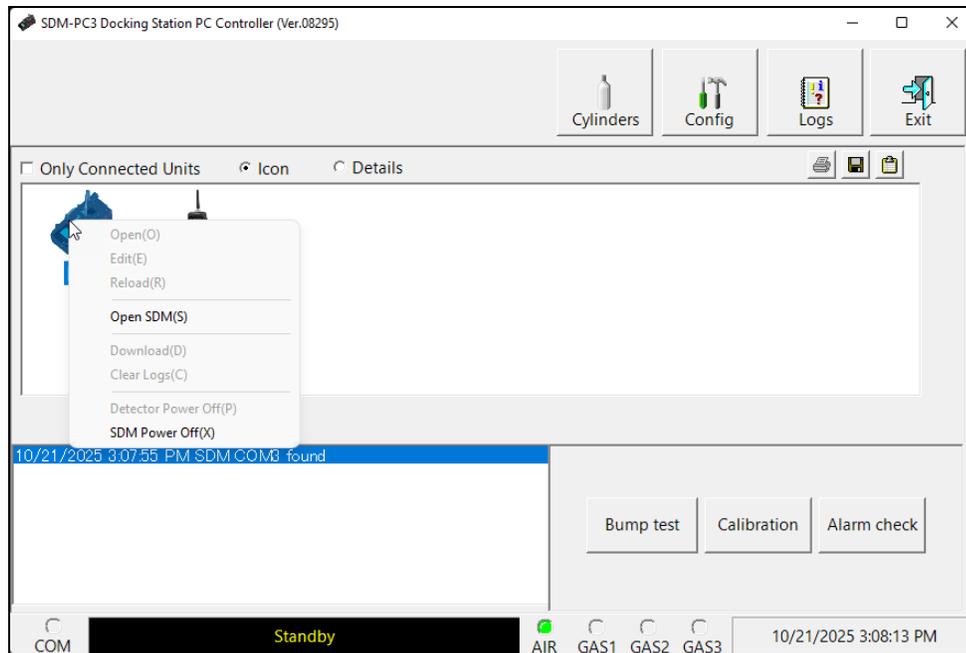


Figure 50: Instrument Function Menu

6. Click **Open SDM(S)**.
7. If the **Password** parameter in the **Bump & Cal 2** Tab of the **SDM** window is selected (factory setting is deselected), the program prompts you for a password to enter the **SDM** window. Enter the password and click OK.

8. The **SDM** window opens and the **Bump & Cal 1** Tab is displayed. Each tab in the **SDM** window is described in the sections that follow.

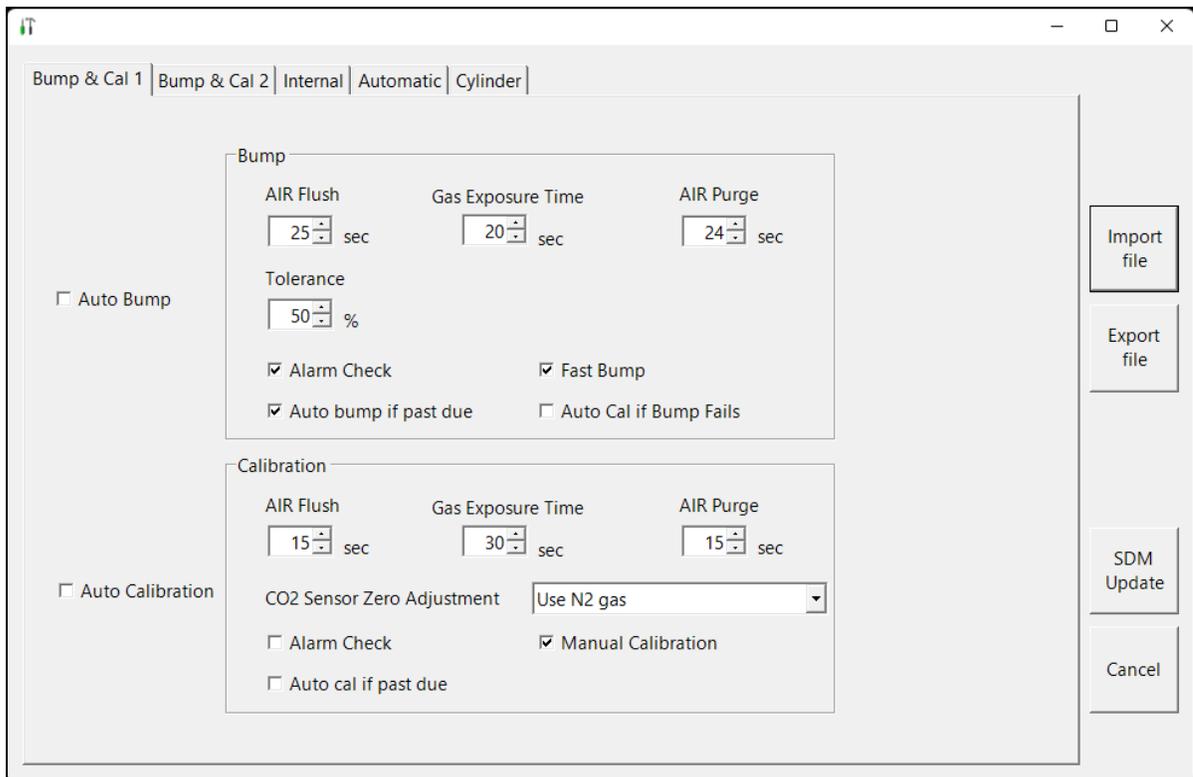


Figure 51: Bump & Cal 1 Tab

Bump & Cal 1 Tab

This section describes the **Bump & Cal 1** Tab of the **SDM** window.

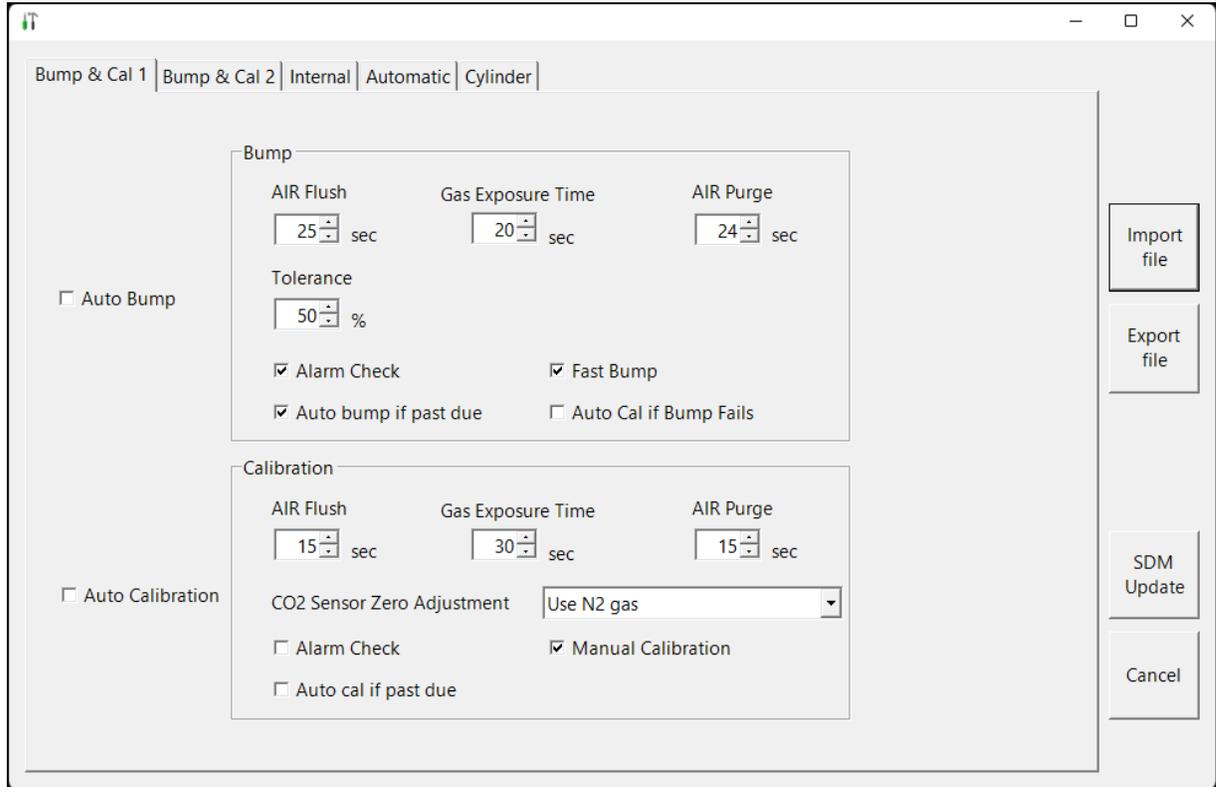


Figure 52: Bump & Cal 1 Tab

The parameters available for editing are in Table 8 along with their available options and factory settings.

Table 8: Bump & Cal 1 Tab Parameters

	Parameter Name	Available Choices	Factory Setting
Bump Parameters	Auto Bump	<ul style="list-style-type: none"> Selected (On) Deselected (Off) 	Deselected (Off)
	AIR Flush	15 - 120 seconds	15 seconds
	Gas Exposure Time	20 - 120 seconds	20 seconds
	AIR Purge	5 - 120 seconds	15 seconds
	Tolerance ¹	10 - 50%	50%
	Alarm Check	<ul style="list-style-type: none"> Selected (On) Deselected (Off) 	Selected (On)
	Fast Bump	<ul style="list-style-type: none"> Selected (On) Deselected (Off) 	Selected (On)

Table 8: Bump & Cal 1 Tab Parameters

	Parameter Name	Available Choices	Factory Setting
Bump Parameters (cont.)	Auto bump if past due	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Deselected (Off)
Calibration Parameters	Auto Calibration	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Deselected (Off)
	AIR Flush	15 - 120 seconds	15 seconds
	Gas Exposure Time	20 - 120 seconds	60 seconds
	AIR Purge	5 - 120 seconds	15 seconds
	CO2 Sensor Zero Adjustment	N/A	N/A
	Alarm Check	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Selected (On)
	Manual Calibration	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Selected (On)
	Auto cal if past due	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Deselected (Off)

¹ The **Fast Bump** feature has its own factory-set tolerances: $\pm 37\%$ for oxygen (O₂) and $\pm 50\%$ for all other gases. The **Tolerance** setting has no effect on the fast bump feature.

Auto Bump (for bump only)

- **Selected:** A bump test automatically begins whenever a GX-Force is connected to SDM-Force, whether the instrument is due for a bump test or not.
- **Deselected** (factory setting): A bump test will not automatically begin whenever a GX-Force is connected to the SDM-Force.

AIR Flush (for bump and calibration)

The pre-sample flush time is the length of time that the SDM-Force draws air through the AIR fitting before performing an air adjust operation. It can be set from **15** to **120** seconds. The factory setting for bump test and calibration is **15** seconds.

NOTE: If the GX-Force was not on for 40 seconds before the bump test was initiated, air will flow until the GX-Force has been on for 40 seconds regardless of the **AIR Flush** setting.

Gas Exposure Time (for bump and calibration)

The gas exposure time is the length of time that the SDM-Force draws calibration gas through each of the gas fittings. Each fitting can be individually set from **20** to **120** seconds. The factory setting for bump test is **20** seconds. The factory setting for calibration is **60** seconds.

AIR Purge (for bump and calibration)

The post-sample purge time is the length of time that the SDM-Force draws air through the AIR fitting to purge calibration gas from the system. It can be set from **5** to **120** seconds. The factory setting is **15** seconds.

Tolerance (for bump only)

The bump test check tolerance determines how close the GX-Force gas reading must be to the calibration gas concentration for each channel during a bump test in order to pass the bump test. It is defined as a percentage of the calibration gas concentration. The amount that the GX-Force gas reading differs from the calibration gas concentration must be equal to or less than this percentage of the calibration gas concentration.

For example, if the tolerance is set to 50%, and the %LEL calibration gas concentration is 50% LEL, then the bump test gas reading for the LEL channel on the GX-Force must be 50% LEL \pm 25% LEL.

The available options are **10%**, **20%**, **30%**, **40%**, **50%** (factory setting).

NOTE: The **Fast Bump** feature has its own factory-set tolerances: $\pm 37\%$ for oxygen (O₂) and $\pm 50\%$ for all other gases. The **Tolerance** setting has no effect on the fast bump feature.

Fast Bump (for bump only)

Turning on **Fast Bump** allows calibration gas to be saved when the tested sensors respond quickly and accurately. The **Fast Bump** feature has its own factory-set tolerances: $\pm 37\%$ for oxygen (O₂) and $\pm 50\%$ for all other gases.

- If **Fast Bump** is deselected, the gas application during a bump test continues for the time period defined by the **Gas Exposure Time** bump test parameter regardless of the sensor reading(s).
- If **Fast Bump** is selected (factory setting) and the gas reading for the sensor(s) being tested is above the lower tolerance and below the upper tolerance within a 15-second gas application the sensor(s) pass bump testing, the gas application is stopped, and the test moves on to the next sensor(s) or to the fresh air purge.
- If **Fast Bump** is selected (factory setting) and the gas reading on any of the tested channels is below the lower tolerance or above the upper tolerance within a 15-second gas application, the bump test fails. The next step depends on the **Auto Cal If Bump Fails** setting.

Consider the following scenario as an example:

- 50% LEL methane used for bump testing the combustible gas channel
- **Fast Bump** selected
- Factory-set fast bump tolerance is set to $\pm 50\%$, which means that the acceptable reading range is 25% LEL - 75% LEL

Table 9 shows possible readings after the 15-second gas application and the effect on the gas application.

Table 9: Example Fast Bump Scenarios

Gas Reading After 15 Seconds of Gas Application	Outcome
15% LEL (-70% of 50% LEL)	<ul style="list-style-type: none"> • Bump test fails • Next step determined by Auto Cal If Bump Fails setting
35% LEL (-30% of 50% LEL)	<ul style="list-style-type: none"> • Gas application stops • Sensor passes bump testing
60% LEL (+20% of 50% LEL)	<ul style="list-style-type: none"> • Gas application stops • Sensor passes bump testing
80% LEL (+60% of 50% LEL)	<ul style="list-style-type: none"> • Bump test fails • Next step determined by Auto Cal If Bump Fails setting

Auto Cal If Bump Fails (for bump only)

- **Selected** (factory setting): The docking station automatically performs a calibration if a bump test fails.
- **Deselected**: The docking station will not automatically perform a calibration if a bump test fails.

Alarm Check (for bump and calibration)

- **Selected** (factory setting): A GX-Force LED and buzzer test is done at the end of the bump test or calibration. The LEDs turn on for a few seconds, the buzzer sounds, and the SDM-Force determines if these actions were completed successfully.
- **Deselected**: An LED and buzzer test is not done at the end of a bump test or calibration.

Auto Bump If Past Due (for bump only)

- **Selected**: If the connected GX-Force is due for a bump test, the SDM-Force automatically performs a bump test on all channels immediately after the GX-Force is connected.
- **Deselected** (factory setting): An automatic bump test is not performed, even if the GX-Force is due for one.

Auto Calibration (for calibration only)

- **Selected:** A calibration on all channels automatically begins whenever a GX-Force is connected to SDM-Force, whether the instrument is due for a calibration or not.
- **Deselected** (factory setting): A calibration does not automatically begin whenever a GX-Force is connected to the SDM-Force.

Manual Calibration (for calibration only)

- **Selected** (factory setting): A calibration can be manually initiated using the docking station's CAL ▲ button.
- **Deselected:** A calibration cannot be manually initiated using the docking station's CAL ▲ button.

Auto cal if past due (for calibration only)

- **Selected:** If the connected GX-Force is due for a calibration, the SDM-Force automatically performs a calibration on all channels immediately after the GX-Force is connected.
- **Deselected** (factory setting): An automatic calibration is not performed, even if the GX-Force is due for one.

Bump & Cal 2 Tab

This section describes the **Bump & Cal 2** Tab of the **SDM** window.

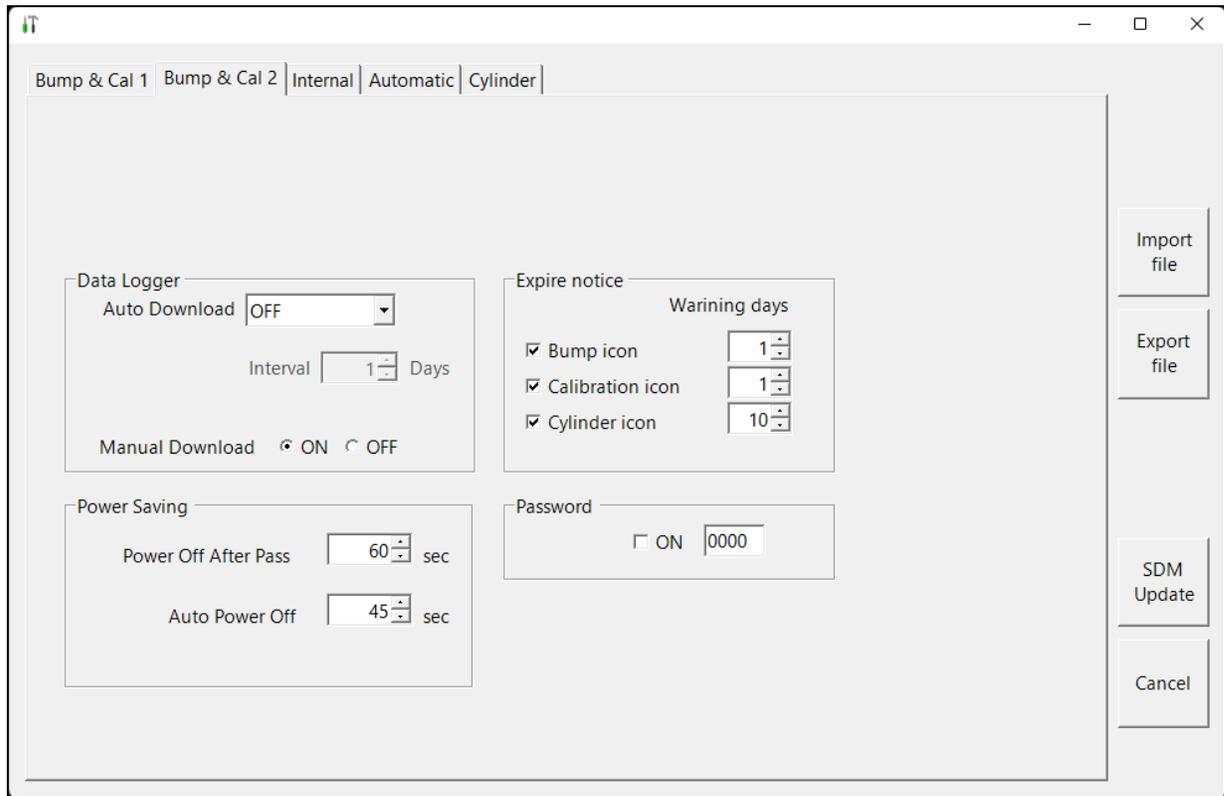


Figure 53: Bump & Cal 2 Tab

The parameters available for editing are shown in Table 10 along with their available options and factory settings.

Table 10: Bump & Cal 2 Tab Parameters

	Parameter	Available Choices	Factory Setting
Data Logger	Data Logger Auto Download	<ul style="list-style-type: none"> • OFF • Every Time • Interval 	OFF
	Data Logger Interval <i>NOTE: Only active if "Interval" is selected for Data Logger Auto Download.</i>	1 - 60 days	1 day
	Manual Download	<ul style="list-style-type: none"> • ON • OFF 	ON

Table 10: Bump & Cal 2 Tab Parameters

	Parameter	Available Choices	Factory Setting
Expire notice	Bump icon	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Selected (On)
	Warning Days (Bump)	0-180 days	1 day
	Calibration icon	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Selected (On)
	Warning Days (Calibration)	0-180 days	1 day
	Cylinder icon	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Selected (On)
	Warning Days (Cylinder)	0-180 days	10 days
Power Saving	Power Off After Pass	0 - 99,999 seconds	15 seconds
	Auto Power Off	0 - 99,999 seconds	600 seconds
Password	Password	<ul style="list-style-type: none"> • Selected (On) • Deselected (Off) 	Deselected (Off) (0000)

Data Logger Auto Download

This parameter allows you to turn on an automatic download of a connected GX-Force's saved data. A manual data download can be performed at any time.

- **OFF** (factory setting): No data download is performed when a GX-Force is connected to the SDM-Force.
- **Every Time**: A data download automatically occurs every time a GX-Force is connected to the SDM-Force and a USB drive is installed in the USB port on the front of the SDM-Force.
- **Interval**: A data download is performed once per interval when a GX-Force is connected to the SDM-Force and a USB drive is installed in the USB port on the front of the SDM-Force. If this option is selected, the **Data Logger Interval** parameter becomes active and needs to be set. The **Data Logger Interval** parameter is described below.

NOTE: A data download takes approximately 2 minutes to complete.

Data Logger Interval

The **Data Logger Interval** is the length of time, in days, that will pass before data is automatically downloaded from a GX-Force if **Data Logger Auto Download** is set to **Interval**. It can be set anywhere from **1** to **60** days. The factory setting is **1** day. Use the arrows to the right of the current setting to change the interval or highlight the current setting and type in the desired value.

If the GX-Force is connected to an SDM-Force before the interval has passed, a data download will not automatically occur.

Manual Download

- **ON** (factory setting): GX-Force data can be manually downloaded to a USB drive.
- **OFF**: GX-Force data cannot be manually downloaded to a USB drive.

Expire Notice Bump Icon

The Bump Icon appears on the GX-Force LCD to indicate whether one or more sensors has an expired bump test date. The factory setting is enabled.

The **Warning** days setting has a dropdown that allows the user to set how many days before expiration the icon should display a warning icon. The factory setting is **1 day**.

-  : All sensors are up to date on their bump tests.
-  : One or more sensors is approaching their bump test expiration date.
-  : One or more sensors is an expired bump test date and requires bump testing.

Expire Notice Calibration Icon

The Calibration Icon appears on the GX-Force LCD to indicate whether one or more sensors has an expired calibration date. The factory setting is enabled.

The **Warning** days setting has a dropdown that allows the user to set how many days before expiration the icon should display a warning icon. The factory setting is **1 day**.

-  : All sensors are up to date on their calibrations.
-  : One or more sensors is approaching their calibration expiration date.
-  : One or more sensors has an expired calibration date and requires calibration.

Expire Notice Cylinder Icon

The Calibration Icon appears on the GX-Force LCD to indicate whether one or more sensors has an expired calibration date. The factory setting is enabled.

The **Warning** days setting has a dropdown that allows the user to set how many days before expiration the icon should display a warning icon. The factory setting is **10 days**.

-  : All cylinders configured to the SDM-Force are still usable.
-  : One or more cylinders configured to the SDM-Force is approaching their expiration date.
-  : One or more cylinders configured to the SDM-Force has expired and requires replacement.

Power Off After Pass

This is the length of time that passes after a successful bump test, calibration, or alarm check before the program will automatically shut off the GX-Force. Use the arrows to the right of the current setting to change the value or highlight the current setting and type in the desired value. It is defined in seconds with a maximum setting of **99,999** seconds. The factory setting is **15** seconds. If this parameter is set to **0** seconds, the GX-Force will not be turned off after a successful bump test, calibration, or alarm check.

Auto Power Off

This is the length of time that passes after the last operation is finished before the program will automatically shut off the GX-Force. If a successful bump test, calibration, or alarm check is performed, the program will automatically shut off the GX-Force in the time defined in **Power Off After Pass** regardless of the **Auto Power Off** setting. Use the arrows to the right of the current setting to change the value or highlight the current setting and type in the desired value. It is defined in seconds with a maximum setting of **99,999** seconds. The factory setting is **600** seconds.

Password

Turning the password on (factory setting is **OFF**) adds password protection to the **SDM** window in the SDM-PC3 program and to the Configuration Menu if the SDM-Force is used in standalone configuration. The factory set password is **0000** but a user selected password can be entered in the space to the right of the **ON** selection box.

Internal Tab

The **Internal** Tab is used for setting up a LAN connection on a non-DHCP network, selecting the Language setting, date format, and LCD contrast setting. Instructions for using the Network portion of the **Internal** Tab can be found in the *SDM-Force Docking Station Operator's Manual*.

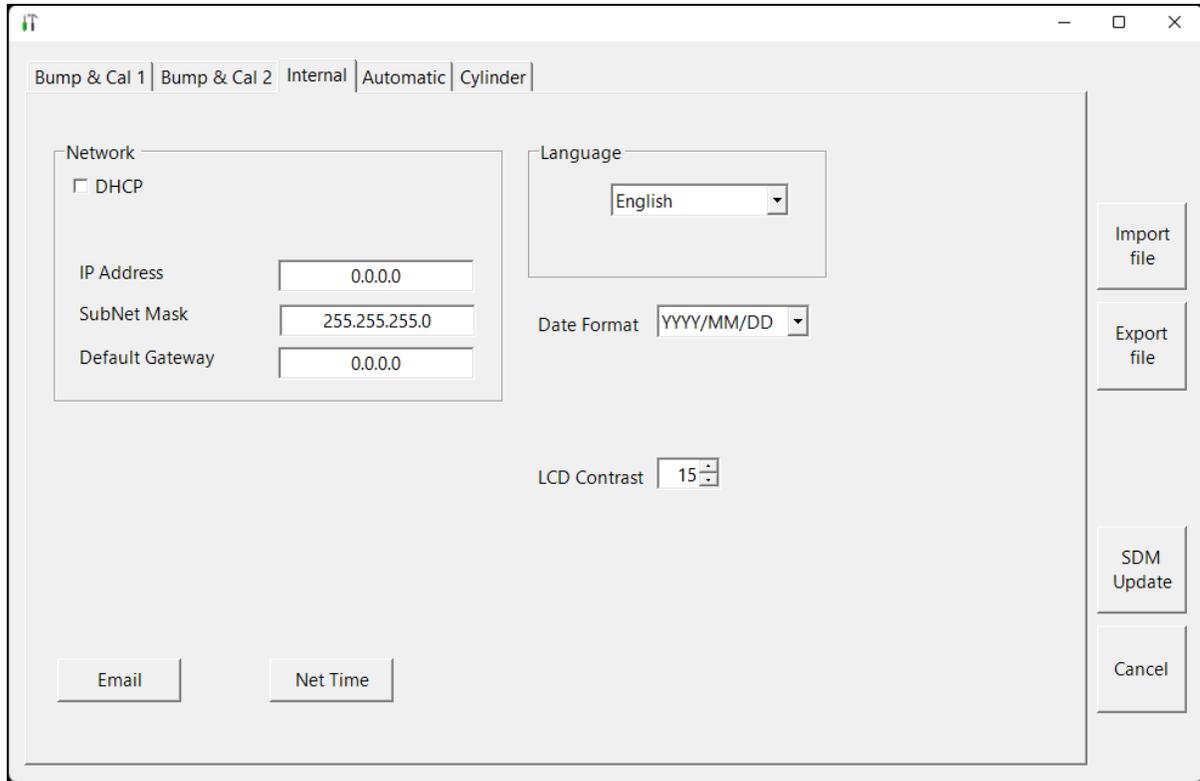


Figure 54: Internal Tab

Language

You may change the instrument language to **English** (factory setting), **Japanese**, **Spanish**, **Italian**, **Spanish**, **German**, **French**, **Portuguese**, **Russian**, **Korean**, or **Chinese**.

Date Format

- **MM/DD/YYYY** (factory setting): month/day/year
- **YYYY/MM/DD**: year, month, day
- **DD/MM/YYYY**: day, month, year

LCD Contrast

Higher number means darker background. Lower number means lighter background. Available settings are **1-50**. **20** is the factory setting.

Automatic Tab

This section describes the **Automatic** Tab of the **SDM** window.

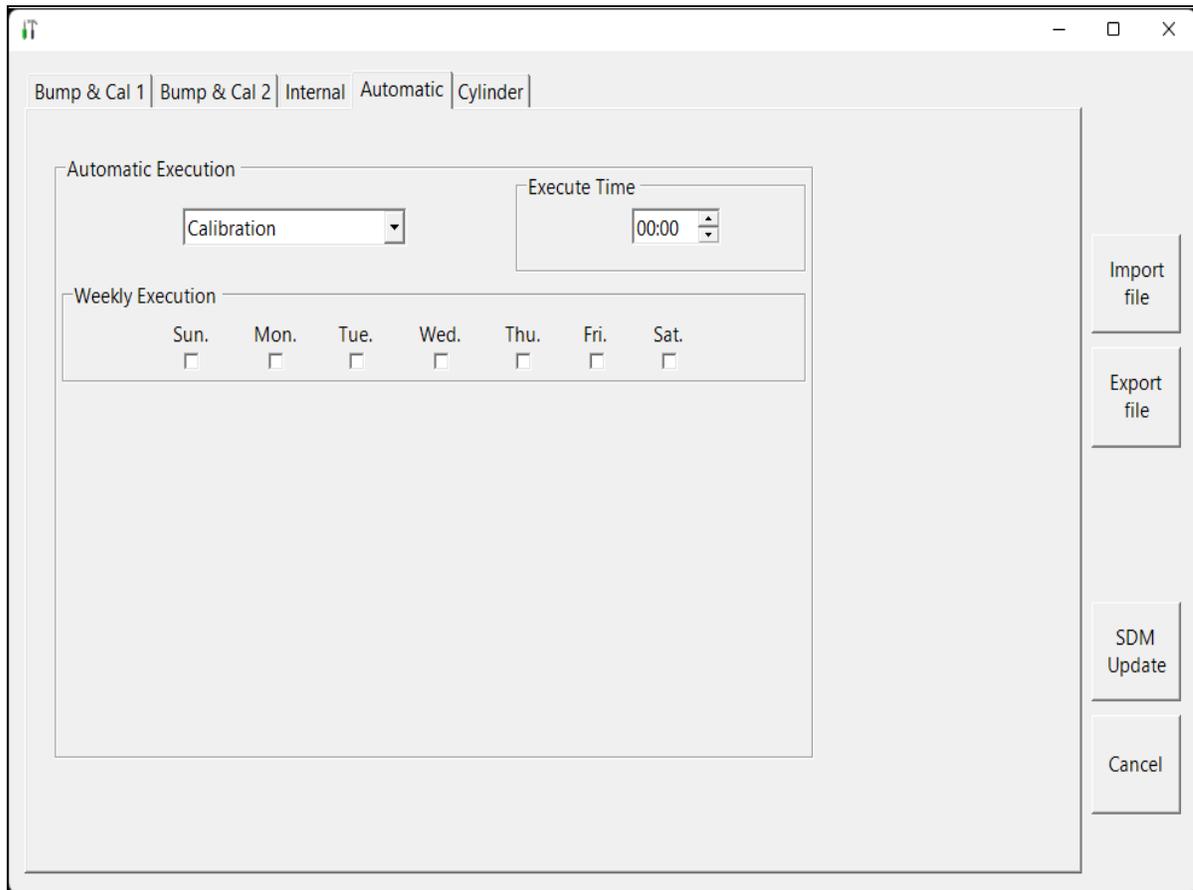


Figure 55: Automatic Tab

The **Automatic** Tab allows you to set up a bump test, calibration, or alarm check to automatically occur at a specific time on the desired day(s). If a GX-Force is installed in an SDM-Force at the specified day/time, the SDM-Force will turn the GX-Force on, perform the test, then turn the GX-Force off.

1. Use the drop down menu to select **Bump Test**, **Calibration**, or **Alarm Check**. Only 1 test can be selected. Multiple tests cannot be done automatically.
2. Highlight the hours or minutes portion of the **Execute Time** and then use the arrows to change the selection or type in the desired value.
3. Select what day(s) you would like the test to occur.

Cylinder Tab

This section describes the **Cylinder** Tab of the **SDM** window. This tab allows you to set up cylinder parameters and profiles that get used by the connected SDM-Force *during standalone operation*.

For more information, refer to “Setting Up Cylinders” on page 32.

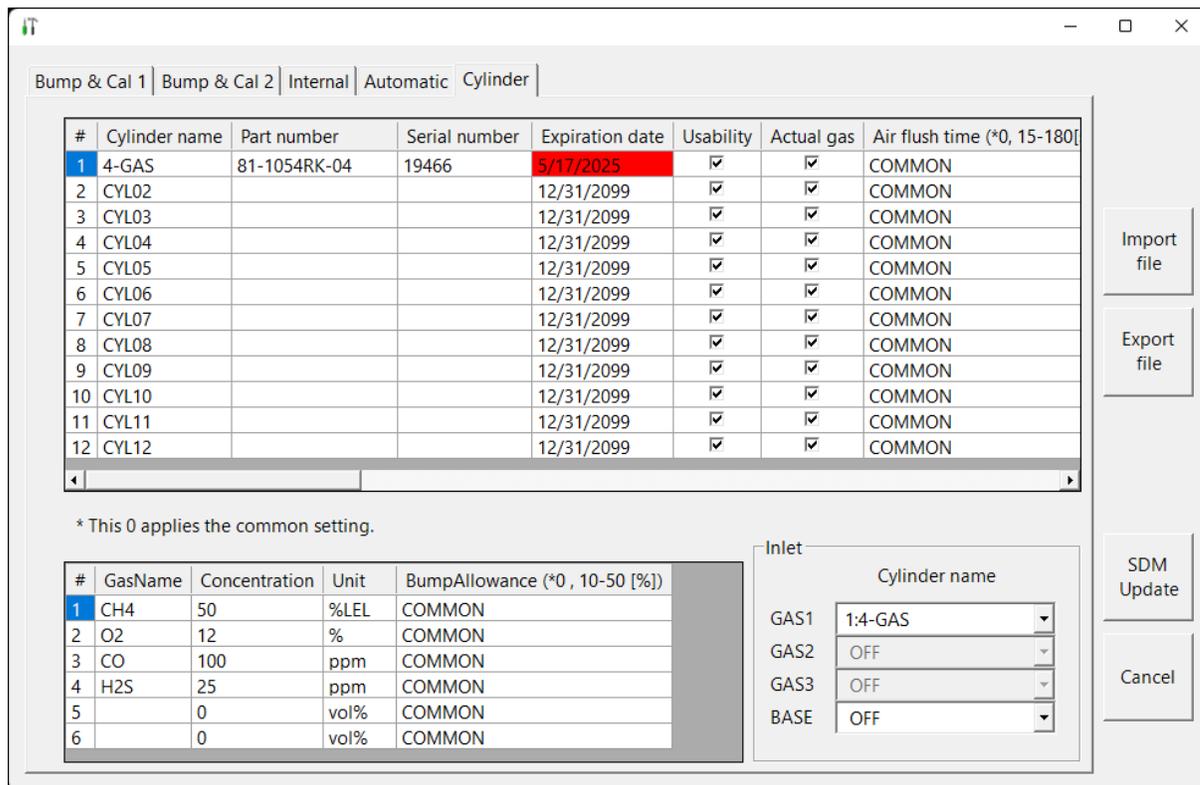


Figure 56: Cylinder Tab

Exporting an SDM File

Use the **Export File** button on the right side of the **SDM** window to save a parameter configuration file based on a connected docking station’s parameter settings. The file can then be uploaded at a later time to another SDM-Force to make its parameter settings match the original docking station’s parameter settings or to restore the parameter settings of the original SDM-Force if they have been changed.

1. Be sure that all of the parameters in the **Bump & Cal 1**, **Bump & Cal 2**, **Interval**, **Automatic**, and **Cylinder** tabs are appropriately set for your application.
2. Click **Export File**.
3. Choose a destination for the file and type in a file name. The storage location should be somewhere convenient. The name should be indicative of the setup or SDM-Force that the file came from. The file type is .sdm.

4. Click **Save**.

Importing an SDM File

Use the **Import File** button on the right side of the **SDM** window to load a parameter configuration file that can be uploaded to the SDM-Force. The parameter configuration files have a .sdm extension and are only readable by the SDM-PC3 program. See “Exporting an SDM File” on page 88 for a description of how to create and save a parameter configuration file.

When you upload a parameter configuration file, you are uploading SDM-Force parameters to the SDM-Force. GX-Force parameters are not affected.

1. Click **Import File**.
2. Navigate to the location of your stored .sdm file.
3. Click **Open**.
4. The parameters in the **SDM** window’s tabs will automatically be changed, if necessary, to agree with the parameters in the imported .sdm file.

Returning to the Main Window

1. Click **SDM Update**.
2. If you want to save the changes, click **Yes** in the window that comes up. If you do not want to save the changes, click **No** in the window that comes up.
3. To exit the **SDM** window and return to the main program window without saving any changes, click **Cancel** in the **SDM** window and click **OK** in the confirmation screen that comes up.

Chapter 7: Changing GX-Force Parameters

All of the parameters that can be changed in the Edit function tabs are GX-Force parameters only. Any changes made do not affect operation of the SDM-Force or the PC Program.

1. Establish a connection between the SDM-Force, GX-Force and the PC Program as described on 54.
2. Right click a GX-Force.
3. Select **Edit(E)**. The password is **1939**.
4. Change parameters in the **Parameter**, **Sensor**, and **Station & User** tabs.
5. Click **OK** and then click **Yes** in the window that comes up to save the changes.

Parameter Tab

This tab allows you to view and change various instrument parameters and settings and has information in four sub tabs: the **Disp Mode** tab, the **User Mode 1** tab, the **User Mode 2** tab, and the **Maintenance Mode** tab.

Table 11 lists the instrument parameters shown in the **Parameter** tab along with the parameter's available choices and the factory setting.

Table 11: Parameter Tab Items

Location	Parameter Tab Name (pg. # of description)	Available Choices	Factory Setting
Common Parameters	Serial No. (page 94)	N/A	N/A
	Station ID (page 94)	N/A	N/A
	User ID (page 94)	N/A	N/A
	Cal Interval (Day) (page 94)	1 - 365 days	90 days
	Interval Time (Sec) (page 95)	<ul style="list-style-type: none">• 10 sec• 20 sec• 30 sec• 60 sec• 180 sec• 300 sec• 600 sec	300 sec

Table 11: Parameter Tab Items

Location	Parameter Tab Name (pg. # of description)	Available Choices	Factory Setting
Disp Mode Tab	HC Gas List (page 97)	See complete list on page 97	CH4(100%LEL)
	Buzzer Volume (page 97)	<ul style="list-style-type: none"> • Low • High 	High
User Mode 1 Tab	Backlight Time (page 98)	0 - 255 seconds	30 seconds
	Beep Time (page 98)	0.5 minutes and 1-99 minutes in 1 minute increments	5 minutes
	Beep Select (page 98)	<ul style="list-style-type: none"> • OFF • LED • BUZZER • LED+BUZZER • BUMP/CAL • ALARM ALERT • BUMP/CAL/ALARM 	OFF
	Need to get Bump Log (page 99)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	Data Log Overwrite (page 99)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Key Tone (page 99)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Lunch Break (page 99)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	User Mode Password (page 100)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	Automatic Start After Successful Bump Test (page 100)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Automatic Start After Successful Calibration (page 100)	<ul style="list-style-type: none"> • selected • deselected 	selected

Table 11: Parameter Tab Items

Location	Parameter Tab Name (pg. # of description)	Available Choices	Factory Setting
User Mode 1 Tab (cont'd)	D Mode Setting (page 100)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Cal Reminder (page 100)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Cal Past Due Act (page 100)	<ul style="list-style-type: none"> • Confirm to Cal • Must Calibrate • Notification Only 	Confirm to Cal
User Mode 2 Tab	Bump Reminder (page 101)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	Bump Test Interval (Day) (page 101)	0 - 30 days	30 days
	Bump Test Past Due Act (page 101)	<ul style="list-style-type: none"> • Confirm to Bump Test • Must Bump Test • Notification Only 	Confirm to Bump Test
	Bump Test Time (Sec) (page 102)	<ul style="list-style-type: none"> • 30 sec • 45 sec • 60 sec • 90 sec 	30 sec
	Bump Test Threshold (%) (page 102)	<ul style="list-style-type: none"> • 10% • 20% • 30% • 40% • 50% 	50%
	Calibration After Bump Test Failed (page 102)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Calibration Time (sec) After Bump Test Failed (page 102)	<ul style="list-style-type: none"> • 90 sec • 120 sec 	90 sec

Table 11: Parameter Tab Items

Location	Parameter Tab Name (pg. # of description)	Available Choices	Factory Setting
Maintenance Mode Tab	ID Display (page 103)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	Disp Suppress (page 103)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Disp Follower (page 104)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Display of pump stop start (page 104)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	Leak check (page 104)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	Leak Check Display Range (page 104)	<ul style="list-style-type: none"> • 10%F.S. • 20%F.S. • 40%F.S. • 100%F.S. 	100%F.S.
	Leak check buzzer (page 105)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Display contents (page 105)	<ul style="list-style-type: none"> • NC • NC+CO • NC+O2 • NC+CO+O2 	NC
	Restore Def (page 105)	N/A	N/A
	Alarm Latching (page 105)	<ul style="list-style-type: none"> • selected • deselected 	selected
	Auto Fresh Air Adj (page 105)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	Zero Adjustment on Demand (page 105)	<ul style="list-style-type: none"> • selected • deselected 	selected
Alarm Silence (page 105)	<ul style="list-style-type: none"> • selected • deselected 	selected	

Table 11: Parameter Tab Items

Location	Parameter Tab Name (pg. # of description)	Available Choices	Factory Setting
Maintenance Mode Tab (cont'd)	Password Protection (page 106)	<ul style="list-style-type: none"> • selected • deselected 	deselected
	Maintenance Password (page 106)	<ul style="list-style-type: none"> • selected • deselected 	selected (8102)
	Pump Change (page 106)	Any date	N/A
	Battery Change (page 106)	Any date	N/A

Common Parameters

Several parameters are always selectable and do not depend on which sub tab is selected.

Serial No.

To change the current GX-Force serial number, place the cursor in the Serial No. field and enter the desired serial number. If you change the serial number, once you upload the changes to the GX-Force and return to the main program window, the PC Program will indicate that the GX-Force with the old serial number was disconnected. A GX-Force with the new serial number will then connect to the PC Program.

Station ID

The current station ID will display. If you want to select a new station ID:

1. Go to the **Station & User** tab.
2. Click **Read** for the station ID.
3. Go back to the **Parameter** tab. and use the drop-down menu to select the desired station ID.
4. To change the station ID list, see “Station & User Tab” on page 109.

User ID

The current user ID will display. If you want to select a new user ID:

1. Go to the **Station & User** tab.
2. Click **Read** for the user ID.
3. Go back to the **Parameter** tab. and use the drop-down menu to select the desired user ID.
4. To change the user ID list, see “Station & User Tab” on page 109.

Cal Interval (Day)

The calibration interval is the length of time between scheduled calibrations. To change the calibration interval, use the arrows to the right of the current value to increase or decrease the interval. You may also highlight the current setting and type in the new desired setting. It can be set anywhere between **1** and **365** days. The factory setting is **90** days.

Interval Time (Sec)

The interval time is how often the GX-Force will log interval trend readings. It can be set to **10, 20, 30, 60, 180, 300** (factory setting), or **600** seconds. To change the interval time, use the arrows to the right of the current value to increase or decrease it. You may also highlight the current setting and type in the new desired setting. The value that you type in must match the allowable interval settings. If it does not, when you save your changes, your entered value will be shifted to the closest match. For example, if you enter 90 seconds, when you save the changes, the interval will adjust itself to **60** seconds.

Memo Section

The Memo section allows the user to enter remarks for a GX-Force that is connected to the program. The Memo may be used to document anything of interest, such as maintenance records (noting when a sensor or the battery was changed). The Memo section is empty until the user enters information.

The first time information is entered, a Memo file is created in the Logs window. If the Memo is changed in the same operating session, that Memo file is updated. When the GX-Force is disconnected from the PC Program and connected again, a new Memo file is created with the current memo. If you edit the memo field in that operating session, the new Memo file is updated. If you clear the Memo field for a GX-Force, the Memo file that was created when the GX-Force was connected to the PC Program will be deleted since it is now empty. All memos from previous operating sessions will always be available in the Logs window. They cannot be deleted.

To enter information into the Memo section,

1. Place the cursor in the Memo field. If a memo has been previously entered, it will still appear in the Memo field.
2. If necessary, delete the old memo. Enter the information you wish to document.
3. Click **OK** to save the changes.

Disp Mode Sub Tab

267010005

Serial No. 267010005 Station ID SID_002 Date Time 10/29/2025 2:55:57 PM
Model GX-Force User ID UID_005 Load Date 10/29/2025 2:55:57 PM

Parameter | Sensor | Station & User

Serial No. 267010005
Station ID
User ID
Cal Interval(Day) 90
Interval Time(Sec) 300

Memo

Disp Mode | User Mode 1 | User Mode 2 | Maintenance Mode

HC Gas List CH4(100%LEL)

Buzzer Volume
 Low High

(Left space 20) OK Cancel

Figure 57: Parameter Tab, Disp Mode Sub Tab

HC Gas List

This parameter allows you to set one of the following target gases for the % LEL sensor.

- | | |
|---|--|
| • CH ₄ (methane) | • C ₆ H ₆ (benzene) |
| • i-C ₄ H ₁₀ (isobutane) | • n-C ₆ H ₁₄ (hexane) |
| • H ₂ (hydrogen) | • C ₇ H ₈ (toluene) |
| • CH ₃ OH (methanol) | • n-C ₇ H ₁₆ (heptane) |
| • C ₂ H ₂ (acetylene) | • C ₈ H ₁₀ (xylene) |
| • C ₂ H ₄ (ethylene) | • n-C ₉ H ₂₀ (nonane) |
| • C ₂ H ₆ (ethane) | • EtAc (ethyl acetate) |
| • C ₂ H ₅ OH (ethanol) | • IPA (isopropyl alcohol) |
| • C ₃ H ₆ (propylene) | • MEK (methyl ethyl ketone) |
| • C ₃ H ₆ O (acetone) | • MMA (methyl methacrylate) |
| • C ₃ H ₈ (propane) | • DME (dimethyl ether) |
| • C ₄ H ₆ (butadiene) | • MIBK (methyl isobutyl ketone) |
| • C ₅ H ₁₀ (cyclopentane) | • THF (tetrahydrofuran) |

Buzzer Volume

- **Low:** Buzzer volume is low.
- **High** (factory setting): Buzzer volume is high.

User Mode 1 Sub Tab

267010005

Serial No. 267010005 Station ID SID_002 Date Time 10/29/2025 2:55:57 PM
Model GX-Force User ID UID_005 Load Date 10/29/2025 2:55:57 PM

Parameter | Sensor | Station & User

Serial No. 267010005
Station ID
User ID
Cal Interval(Day) 90
Interval Time(Sec) 300

Memo

Disp Mode | User Mode 1 | User Mode 2 | Maintenance Mode

Backlight Time(Sec) 30 Cal Reminder
Beep Time(Min) 5.0 Key Tone Cal past due Act Confirm to Cal
Beep Select OFF Lunch Break Must Calibrate
 Need to get Bump Log User Mode Password 1000 Notification Only
 Automatic start after successful bump test
 Automatic start after successful calibration
 Data Log Overwrite D Mode Setting

(Left space 20) OK Cancel

Figure 58: Parameter Tab, User Mode 1 Sub Tab

Backlight Time(Sec)

The **Backlight Time(Sec)** is how long the backlight stays on after the last button push. It can be set anywhere from **0** to **255** seconds or **OFF**. The factory setting is **30** seconds. Use the arrows to the right of the value to make your selection or highlight the existing value and enter the desired value.

Beep Time(Min)

The **Beep Time(Min)** parameter defines how often the confirmation alert or non-compliance indicator occurs. It can be set at any time but it only applies if the **Beep Select** parameter is set to something other than **OFF**. The available choices are **0.5** minutes and **1-99** minutes in 1 minute increments. The factory setting is **5** minutes.

Beep Select

- **OFF** (factory setting): The instrument does not provide a confirmation alert or non-compliance indicator.
- **LED**: The instrument's LEDs double flash as often as defined in **Beep Time(Min)**.
- **BUZZER**: The instrument's buzzer double beeps as often as defined in **Beep Time(Min)**.

- **LED+BUZZER:** The instrument's LEDs double and the buzzer double beeps as often as defined by the **Beep Time(Min)** parameter.
- **BUMP/CAL:** If a bump test of a calibration is due and if **Bump Test Time Remaining** or **Cal Reminder** is set to **Confirm to Bump/Cal** or **Notification Only**, the instrument's LEDs double flash as often as defined in **Beep Time(Min)** to indicate a non-compliance. Once a bump test or calibration (depending on which is due) is done, the LEDs will stop flashing.
- **ALARM:** If the instrument goes into any gas alarm, the instrument's LEDs double flash as often as defined in **Beep Time(Min)** to indicate a non-compliance. Requirements for clearing the non-compliance depends on the setting of **Need to get Bump Log**.
- **BUMP/CAL/ALARM:** A non-compliance indication can occur if any of the following happens:
 - Bump test is due and **Bump Test Time Remaining** is set to **Confirm to Bump** or **Notification Only**.
 - Calibration is due and **Cal Reminder** is set to **Confirm to Cal** or **Notification Only**.
 - Instrument goes into any gas alarm.

The instrument's LEDs will double-flash as often as defined in **Beep Time(Min)**. To clear a bump non-compliance, you must perform a successful bump test. To clear a calibration non-compliance, you must perform a successful calibration. The requirements for clearing an alarm non-compliance depend on the setting of **Need to get Bump Log**.

Need to get Bump Log

- **Selected:** In order to clear an alarm non-compliance, you must perform a successful bump test or calibration and download the instrument data. Instrument data can be downloaded being either a) connecting to the PC Program and performing a **Download** operation or b) connecting to the GX-Force Datalogging program and performing a **Complete Download**.
- **Deselected** (factory setting): In order to clear an alarm non-compliance, you must only perform a successful bump test or calibration.

Data Log Overwrite

- **Selected** (factory setting): The GX-Force writes over the oldest data with new data when the data logger memory is full.
- **Deselected:** The GX-Force stops saving data to the data logger when the data logger memory is full.

Key Tone

- **Selected** (factory setting): The instrument will beep every time a button is pressed.
- **Deselected:** The instrument will not beep when a button is pressed.

Lunch Break

- **Selected:** The Lunch Break Screen displays during startup. From this screen, you can choose to continue accumulating TWA and PEAK readings and the time in operation from the last time the GX-Force was used or start collecting new readings and reset the time in operation.

- **Deselected** (factory setting): The GX-Force automatically starts new TWA and PEAK reading collection and resets the time in operation at startup.

User Mode Password

- **Selected**: The GX-Force prompts you for a password when you enter User Mode. The box to the right of this selection allows the user to change the password required if **User Mode Password** is selected (factory set password is 0405).
- **Deselected** (factory setting): No password is required to enter User Mode.

Automatic Start After Successful Bump Test

- **Selected** (factory setting): If only one calibration cylinder is assigned, the GX-Force automatically starts its warmup sequence after a successful bump test. If multiple calibration cylinders are assigned, these parameters have no effect on operation.
- **Deselected**: The GX-Force does not automatically start its warmup sequence after a successful bump test.

Automatic Start After Successful Calibration

- **Selected** (factory setting): If only one calibration cylinder is assigned, the GX-Force automatically starts its warmup sequence after a successful calibration. If multiple calibration cylinders are assigned, these parameters have no effect on operation.
- **Deselected**: The GX-Force does not automatically start its warmup sequence after a successful calibration.

D Mode Setting

- **Selected** (factory setting): The **LIST** item does appear in Display Mode. **USER ID** and **STATION ID** screens appear in Display Mode if **ID DISPLAY** in the instrument's Maintenance Mode is also set to **ON** (factory setting is **OFF**).
- **Deselected**: The **LIST**, **USER ID**, and **STATION ID** items do not appear in Display Mode.

Cal Reminder

- **Selected** (factory setting): The GX-Force will give an indication at start up if it is due for calibration. The type of indication will depend on the **Cal Past Due Act** setting.
- **Deselected**: There will be no indication at start up if the instrument is due for calibration.

Cal Past Due Act

- **Confirm to Cal** (factory setting): The GX-Force will sound an alarm and the user will have to press and release the AIR button to continue.
- **Must Calibrate**: The GX-Force cannot be used until a calibration has been performed.
- **Notification Only**: The GX-Force will display that a calibration is due but will continue with the warm up sequence.

User Mode 2 Sub Tab

267010005

Serial No. 267010005 Station ID SID_002 Date Time 10/29/2025 2:55:57 PM
Model GX-Force User ID UID_005 Load Date 10/29/2025 2:55:57 PM

Parameter | Sensor | Station & User

Serial No. 267010005
Station ID
User ID
Cal Interval(Day) 90
Interval Time(Sec) 300

Memo

Disp Mode | User Mode 1 | User Mode 2 | Maintenance Mode

Bump Reminder Bump Test past due Act Confirm to Bump Test
 Must Bump Test
 Notification Only

Bump Test Interval(Day) 30

Bump Test Parameter
Bump Test Time(Sec) 30 Bump Test Threshold(%) 50
 Calibration after Bump Test Failed Calibration Time(sec) after Bump Test Failed 90

(Left space 20) OK Cancel

Figure 59: Parameter Tab, User Mode 2 Sub Tab

Bump Reminder

- **Selected:** The GX-Force will give an indication at start up if it is due for bump testing. The type of indication will depend on the **Bump Test Past Due Act** setting.
- **Deselected** (factory setting): The GX-Force will not give an indication at start up if it is due for bump testing.

Bump Test Interval (Day)

The **Bump Test Interval** defines the amount of time between bump tests. The time can be set between **0** and **30** days in 1 day increments. The factory setting is **30** days.

Bump Test Past Due Act

- **Confirm to Bump Test** (factory setting): The GX-Force will sound an alarm and the user will have to press and release the AIR button to continue.
- **Must Bump Test:** The GX-Force cannot be used until a bump test has been performed.
- **Notification Only:** The GX-Force will display that a bump test is due but will continue with the warm up sequence. See the *GX-Force Operator's Manual* for a description of the start up sequence.

Bump Test Time (Sec)

The **Bump Test Time** parameter is the amount of time that the GX-Force is exposed to gas during a bump test. The available choices are **30** (factory setting), **45**, **60**, and **90** seconds.

Bump Test Threshold (%)

The **Bump Test Threshold** parameter is the bump test tolerance value and is represented as a percentage. It is the percentage that the bump test reading can differ from the actual gas concentration. If the bump test reading differs more, the bump test will fail. The available values are **10%**, **20%**, **30%**, **40%**, and **50%** (factory setting).

Calibration After Bump Test Failed

- **Selected** (factory setting): If a bump test fails, the GX-Force will automatically begin a calibration.
- **Deselected**: When a bump test fails, nothing will happen.

Calibration Time (sec) After Bump Test Failed

The **Calibration Time After Bump Test Failed** parameter is the total time the GX-Force is exposed to calibration gas when a bump test fails if **Calibration After Bump Test Failed** is selected. The bump test time is deducted from the calibration time. For example, if **Calibration Time After Bump Test Failed** is set to 90 seconds and the **Bump Test Time** is set to 30 seconds, if the bump test fails, the GX-Force will only be exposed to gas for an additional 60 seconds. The available values are **90** seconds (factory setting), and **120** seconds.

Maintenance Mode Sub Tab

267010005

Serial No. 267010005 Station ID SID_002 Date Time 10/29/2025 2:55:57 PM
Model GX-Force User ID UID_005 Load Date 10/29/2025 2:55:57 PM

Parameter | Sensor | Station & User

Serial No. 267010005
Station ID
User ID
Cal Interval(Day) 90
Interval Time(Sec) 300

Memo

Disp Mode | User Mode 1 | User Mode 2 | Maintenance Mode

ID Display Alarm Latching Password Protection
 Disp Suppress Auto Fresh Air Adj Maintenance Password 9999
 Disp Follower Zero Adjustment on demand Pump Change 1/ 1/2022
 Display of pump stop start Alarm Silence Battery Change 1/ 1/2022
 Leak check 100%F.S.
 Leak check buzzer Display contents NC

Restore Def

(Left space 20) OK Cancel

Figure 60: Parameter Tab, Maintenance Mode Sub Tab

ID Display

- **Selected:** The User ID and Station ID screens appear in startup sequence. If **D Mode Setting** in User Mode 1 Sub Tab is also set to ON, then the IDs can be changed in Display Mode.
- **Deselected** (factory setting): The User ID and Station ID screens do not appear in startup sequence and the IDs cannot be changed in Display Mode.

Disp Suppress

NOTE: It is not normally necessary to have the zero suppression menu item appear in User Mode. Contact RKI Instruments before turning this setting on.

- **Selected** (factory setting): Zero suppression menu item appears in User Mode.
- **Deselected:** Zero suppression menu item does not appear in User Mode. Zero suppression menu item is always available in Maintenance Mode.

Disp Follower

NOTE: It is not normally necessary to have the zero follower menu item appear in User Mode. Contact RKI Instruments before turning this setting on.

- **Selected** (factory setting): Zero follower menu item appears in User Mode.
- **Deselected:** Zero follower menu item does not appear in User Mode. Zero follower menu item is always available in Maintenance Mode.

Display of Pump Stop Start Def

- **Selected:** The **PUMP.OFF** item is accessible in the GX-Force **Display Mode**.
- **Deselected** (factory setting): The **PUMP.OFF** item does not appear in the GX-Force **Display Mode**.

Leak Check

- **Selected:** The Mode Select screen appears during startup and in Display Mode. This allows the user to choose to startup in Normal Mode or Leak Check Mode.
- **Deselected** (factory setting): The Mode Select screen does not display during startup or in Display Mode.

NOTE: The Mode Select screen is only available for instruments with firmware 08085 or higher.

NOTE: If the **GAS.COMB** parameter in the GX-Force's Gas Select Mode is set to any gas other than **CH₄** or **i-C₄H₁₀**, the Mode Select menu will not display at startup or in Display Mode, regardless of the L.C. MODE setting. See the *GX-Force Operator's Manual* for more information.

Leak Check (Display Range Setting)

The **Leak Check** parameter sets the max reading that the instrument displays. The following values are available:

- **10%F.S.:** LEL channel displays as 500 ppm for CH₄ and 200 ppm for instruments calibrated to isobutane
- **20%F.S.:** LEL channel displays as 1000 ppm for CH₄ and 400 ppm for instruments calibrated to isobutane
- **40%F.S.:** LEL channel displays as 2000 ppm for CH₄ and 800 ppm for instruments calibrated to isobutane
- **100%F.S.** (factory setting): the displays as 5000 ppm for CH₄, 2000 ppm for instruments calibrated to isobutane

Leak Check Buzzer

- **Selected** (factory setting): The alarm buzzer can be turned on and off manually in Leak Check Mode
- **Deselected**: The alarm buzzer cannot be turned off in Leak Check Mode.

Display Contents

- **NC** (factory setting): Only the LEL channel displays in Leak Check Mode
- **NC+CO** (factory setting): The LEL and CO channels are displayed in Leak Check Mode
- **NC+O₂** (factory setting): The LEL and O₂ channels are displayed in Leak Check Mode
- **NC+CO+O₂** (factory setting): The LEL, CO, and O₂ channels are displayed in Leak Check Mode

NOTE: If any channel has been disabled with the **GAS.COMB** setting in the GX-Force Gas Select Mode, these channels will not be displayed in Leak Check Mode, regardless of the **Display Contents** setting selected.

Restore Def

Performing a default operation in Maintenance Mode returns all parameters to their RKI factory settings.

Alarm Latching

- **Selected** (factory setting): The GX-Force remains in alarm until the alarm condition passes *and* POWER MODE is pressed.
- **Deselected**: The GX-Force automatically resets an alarm when the alarm condition passes.

Auto Fresh Air Adj

- **Selected**: The GX-Force will ask if you want to perform a fresh air adjustment at the end of the startup sequence.
- **Deselected** (factory setting): The GX-Force does not ask if you want to perform a fresh air adjustment at the end of the startup sequence.

Zero Adjustment on Demand

- **Selected** (factory setting): You can manually perform a fresh air adjust in Measuring Mode by pressing AIR.
- **Deselected**: You cannot manually perform a fresh air adjust in Measuring Mode.

Alarm Silence

- **Selected** (factory setting): The GX-Force's buzzer can be silenced during an alarm condition by pressing the POWER MODE or AIR buttons.
- **Deselected**: The GX-Force's buzzer cannot be silenced during an alarm condition.

Password Protection

- **Selected:** A password is required to turn off the GX-Force, reset an alarm, clear the peak readings, perform an auto zero, perform a demand zero, or enter User Mode from the warmup sequence to perform a bump test or calibration. The password is 0405.
- **Deselected** (factory setting): A password is not required for any of the above operations.

Maintenance Password

- **Selected** (factory setting): A password is required to enter Maintenance Mode. The factory-set password is 8102. Enter a password in the field to the right of the Maintenance Password selection box.
- **Deselected:** A password is not required to enter Maintenance Mode.

Pump Change

The **Pump Change** menu item allows you to keep track of when the pump was replaced. Click the drop down menu and use the calendar to select a replacement date.

Battery Change

The **Battery Change** menu item allows you to keep track of when the battery was replaced. Click the drop down menu and use the calendar to select a replacement date.

Sensor Tab

The **Sensor** tab displays the alarm settings and auto calibration values for all installed sensors. It also shows the date and time of the most recent calibration and bump test for each channel.

Serial No. 267010005 Station ID SID_002 Date Time 10/23/2025 3:00:33 PM
 Model GX-Force User ID UID_005 Load Date 10/23/2025 3:00:32 PM

Parameter Sensor Station & User

Sensor	Warning	Alarm	AlarmH	STEL	TWA	CAL GROUP	Auto Cal.	Last Calibration	Last Bump test	ZERO SUPPRESS	ZERO FOLLOWER
CH4(100%LEL)	1.0	50	50	*****	*****	A	50	10/23/2025 9:51:53 AM	10/23/2025 9:51:53 AM	On	On
O2(40.0%)	18.0	18.0	25.0	*****	*****	A	13.0	10/23/2025 9:51:53 AM	10/23/2025 9:51:53 AM	On	On
H2_OO-H2(2000ppm)	*****	*****	*****	*****	*****	A	25	8/22/2022 12:30:18 PM	3/30/2023 1:09:03 AM	On	On
OO_OO-H2(2000ppm)	25	50	50	200	25	A	40	8/19/2022 2:25:12 PM	3/30/2023 1:09:03 AM	On	On

Reset alarm point

(Left space 20) OK Cancel

Figure 61: Sensor Tab

Alarm Points (Warning, Alarm, Alarm H, STEL, TWA)

View or change the alarm points for all channels. Factory settings are shown below.

	Detection Range	Warning	Alarm	Alarm H	STEL	TWA
Combustible Gas	0 - 100% LEL	10% LEL	25% LEL	50% LEL	n/a	n/a
Oxygen (O₂)	0 - 40% volume	19.5% volume, decreasing*	18.0% volume, decreasing*	23.5% volume, increasing**	n/a	n/a
Hydrogen Sulfide (H₂S)	0 - 200.0 ppm	5.0	30.0 ppm	100.0 ppm	5.0 ppm	1.0 ppm
Carbon Monoxide (CO)	0 - 2,000 ppm	25 ppm	50 ppm	1200 ppm	200 ppm	25 ppm

* Cannot be set higher than 20.0% volume.

** Cannot be set lower than 21.8% volume.

CAL GROUP

Allows you to group channels together for calibration. As shipped from the factory, the standard 4 channels (LEL, O₂, H₂S, CO) in the GX-Force are assigned to Cylinder A which means all 4 channels are calibrated at once.

There are 5 cylinder assignments available: A, B, C, D, and E. If you want to calibrate each channel separately, you need to assign each channel to a different cylinder (i.e. Cylinder A: LEL, Cylinder B: O₂, Cylinder C: H₂S, Cylinder D: CO).

NOTE: The H₂ response for H₂-compensated CO sensors will always have a separate cylinder assignment.

Auto Cal.

View or change the auto calibration value for each channel. The value should match the concentration listed on the calibration cylinder you are using.

Last Calibration/Last Bump Test

The date of the last successful calibration or bump test.

SENSOR DATE

The date that each sensor was replaced. Double click the sensor date you want to change and type in a new date. The format is YYMMDD (year, month, day).

ZERO SUPPRESS

This menu item only appears if **ZSUP.DISP** is set to **ON** in the GX-Force's Maintenance Mode (factory setting is **OFF**). The **ZERO.SUP** setting is not intended for field adjustment. The default setting for each sensor is **ON**.

ZERO FOLLOWER

This menu item only appears if **ZFLW.DISP** is set to **ON** in GX-Force's Maintenance Mode (factory setting is **OFF**). The **ZERO.FLW** setting is not intended for field adjustment. The default setting is **ON**. The oxygen channel does not support zero follower functionality.

Reset Alarm Point

Clicking **Reset Alarm Points** and then **OK** in the window that comes up resets the alarm points to the RKI factory settings or to the values saved if the user performed a **SAVE-AP** for (GX-Force) in the instrument's Gas Select Mode.

Editing Parameters

1. Double click the white box whose value you want to change. Shaded boxes cannot be edited.
2. Type in the new desired value.
3. Repeat steps 1 through 3 for any other values you wish to change.
4. Change any other parameters in the **Parameter** and **Station & User** tabs.
5. Click **OK** and then click **Yes** in the window that comes up to save the changes.

Station & User Tab

The **Station & User** tab allows you to update the Station ID and User ID lists in a connected GX-Force.

To edit the Station ID or User ID list, you will need to import a .csv (comma separated values) file into the program. You can generate .csv files for editing from the program.

Creating ID Files

1. Click **Read** for each list type to populate the Station and User fields.
2. Click **Export csv file** for either the Station or User ID list.

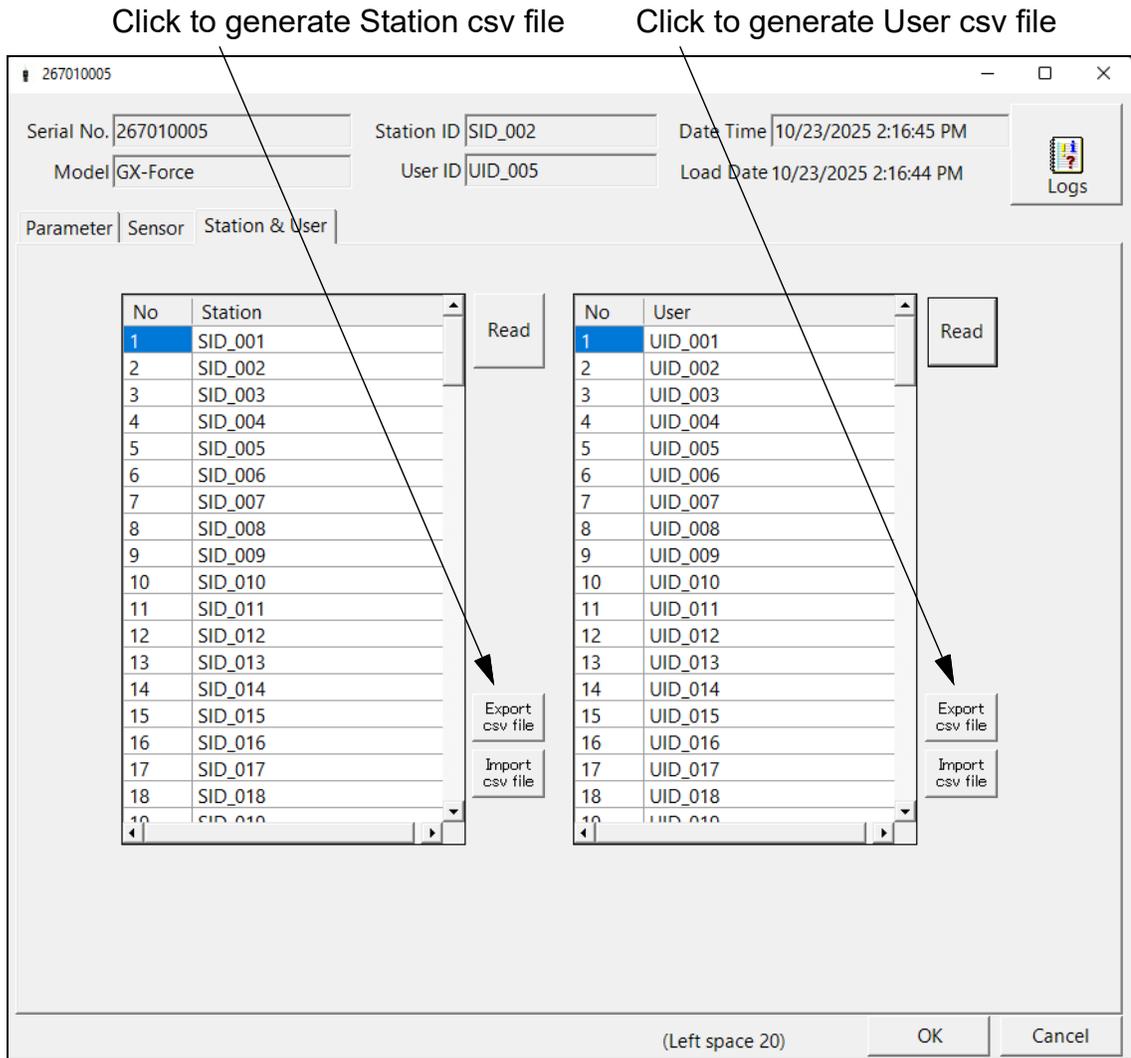


Figure 62: Station and User Tab

3. Navigate to the location you want to save the file, type in a file name, and click **Save**. You can save multiple station and user ID files if desired.

- Open the .csv file in a word processing program such as Word, WordPad, or Notepad. The Station and User .csv files consist of the Station or User ID number and its associated name. Below is an example of a Station .csv file opened in WordPad.

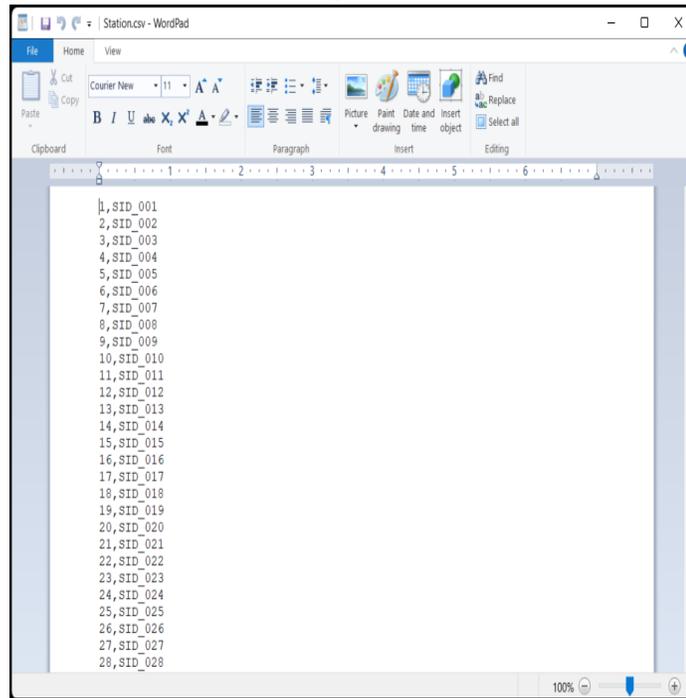


Figure 63: Station ID .csv File Opened in WordPad

- Any existing Station or User IDs will be displayed as S_ID_XXX or U_ID_XXX with the “XXX” being the ID number. To edit a Station or User ID, delete the existing name and replace it with the desired name. The name can be 16 characters long and may consist of any uppercase letter or number.

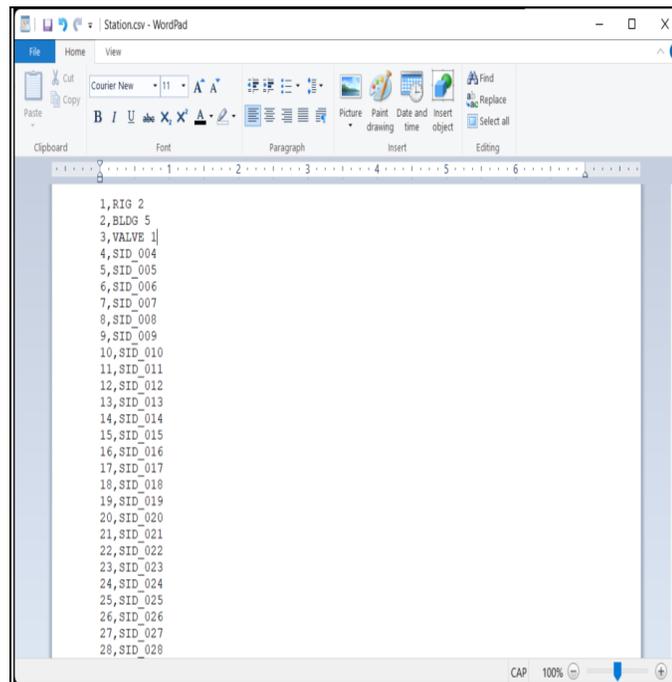


Figure 64: Station ID .csv File Opened in WordPad

6. Save the changes you made to the .csv file.

Loading ID Files

1. In the **Station & User** Tab, click **Import csv file** for either the Station ID list or User ID list.

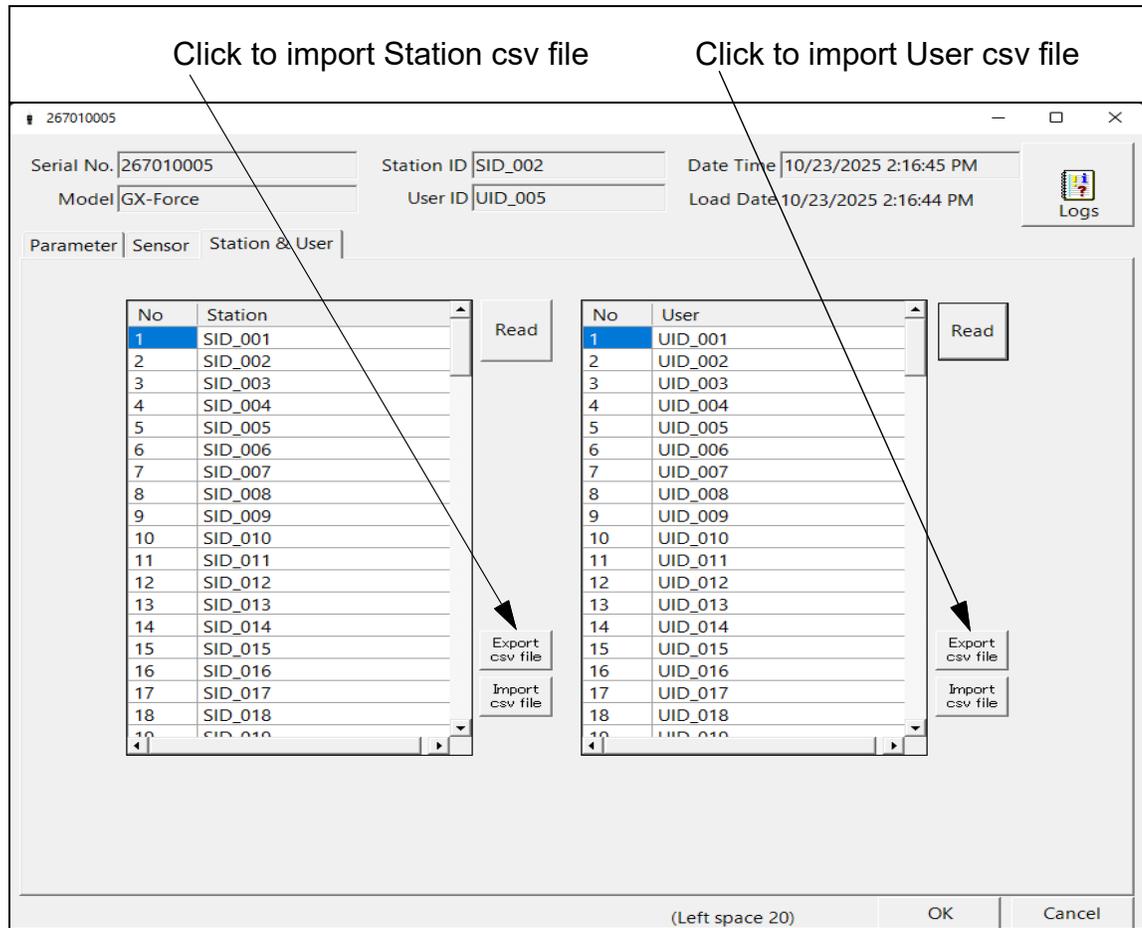


Figure 65: Station and User Tab

2. Navigate to the file you wish to import and click **Open**.

- Once you have imported the Station ID and/or User ID csv files, the new list will be reflected in the **Station & User** Tab.

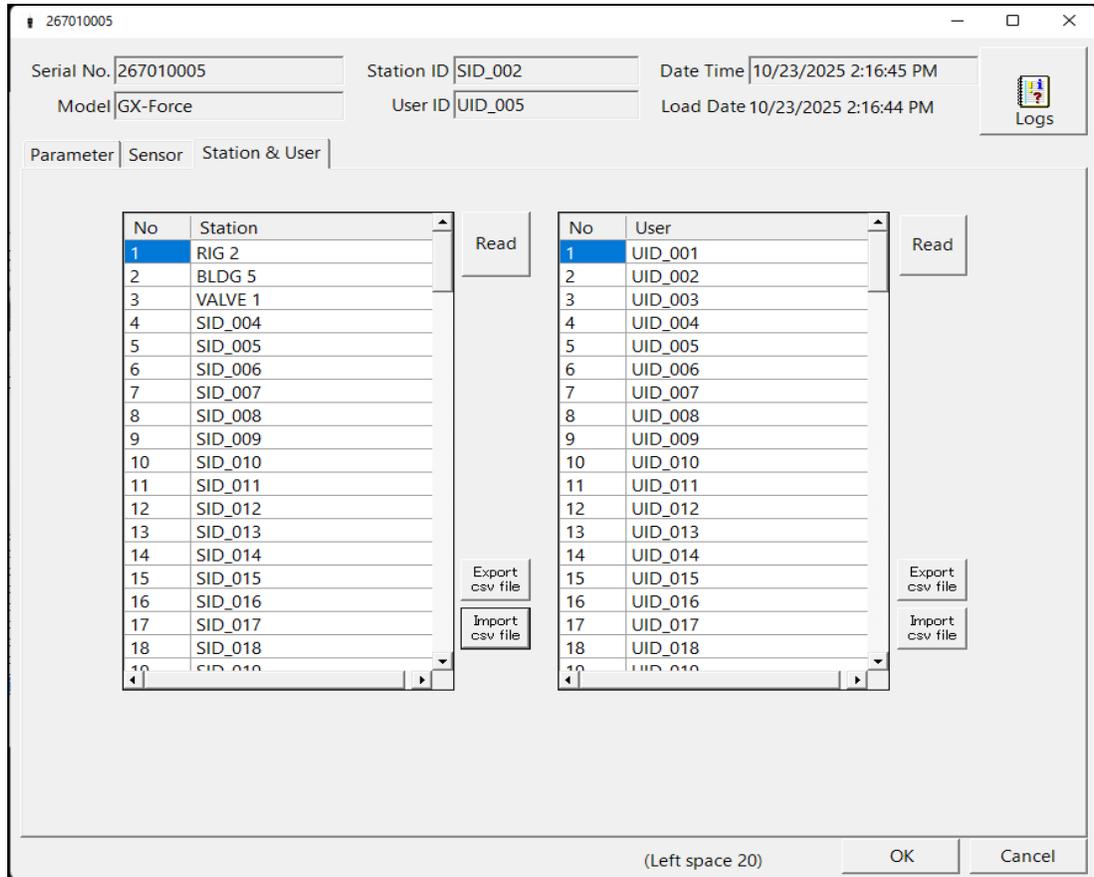


Figure 66: New Station and User IDs

- Change any other parameters in the **Parameter** and **Station & User** tabs. To select a Station ID Or User ID for the instrument, go back to the **Parameter** tab.
- Click **OK** and then click **Yes** in the window that comes up to save the changes.

Chapter 8: Maintenance

Troubleshooting

NOTE: This troubleshooting guide describes SDM-Force problems only. See the *GX-Force Operator's Manual* for problems you may encounter with the GX-Force.

Table 12: Troubleshooting the SDM-Force

Symptoms	Probable Causes	Recommended Action
Fresh air adjustment fails	<ul style="list-style-type: none"> The SDM-Force is not in a fresh air environment or the cylinder connected to the AIR fitting is not a zero air cylinder. If a zero air cylinder is used, the calibration cylinder is out of gas. The GX-Force is not correctly inserted in the instrument cradle. 	<ol style="list-style-type: none"> Confirm that the SDM-Force is in a fresh air environment or that a zero air cylinder is attached to the AIR fitting. If a zero air cylinder is used, verify that it contains an adequate supply of test sample. Check to make sure the GX-Force is correctly inserted in the instrument cradle. If a zero air cylinder is used, check all calibration tubing for leaks or for any bad connections. If the fail condition continues, replace the sensor(s) in the GX-Force. If the difficulties continue, contact RKI Instruments, Inc. for further instruction.
Calibration fails	<ul style="list-style-type: none"> The auto calibration values do not match the cylinder gas concentrations. The calibration cylinder is out of gas or is outdated. The calibration cylinder is not connected to the appropriate gas inlet fitting. The GX-Force is not correctly inserted in the instrument cradle. The tubing from the regulator to the gas inlet fitting is not connected. The tubing from the SDM-Force is not connected to the GX-Force gas inlet fitting. 	<ol style="list-style-type: none"> Confirm that the auto calibration values match the concentrations listed on the gas cylinder. Verify that the calibration cylinder contains an adequate supply of fresh test sample. Verify that the calibration cylinder is connected to the appropriate gas inlet fitting. Check to make sure the GX-Force is correctly inserted in the instrument cradle. Check all calibration tubing for leaks or for any bad connections. Make sure the Gas In tubing is connected between the SDM-Force to the GX-Force gas inlet fitting. If the fail condition continues, replace the sensor(s) in the GX-Force. If the difficulties continue, contact RKI Instruments, Inc. for further instruction.

Symptoms	Probable Causes	Recommended Action
Cannot Initiate Bump Test or Calibration of a GX-Force	<ul style="list-style-type: none"> The USB-C cable is disconnected from the instrument, docking station, or both 	<ol style="list-style-type: none"> Check the cable connections between the instrument and docking station
Insufficient Flow	<ul style="list-style-type: none"> There are kinks in the fresh air, gas cylinder, or exhaust lines. The gas cylinder is empty. 	<ol style="list-style-type: none"> Check to make sure there are no kinks or blockages in the fresh air, gas cylinder, and exhaust lines. Check to make sure your gas cylinder is not empty. If the difficulties continue, contact RKI Instruments, Inc. for further instructions.
No connection between GX-Force and SDM-PC3 program	<ul style="list-style-type: none"> SDM-Force is not turned on. The USB-C cable is disconnected from the instrument, docking station, or both. The USB cable is not properly plugged into the SDM-Force or the PC. 	<ol style="list-style-type: none"> Turn on the SDM-Force. If it does not turn on, check that the AC adapter is plugged into an AC socket and to the jack on the left side of the SDM-Force. Check the USB-C cable connection between the instrument and the docking station. Check to make sure the USB cable is plugged into the back panel of the SDM-Force and to a USB port on your PC. If the difficulties continue, contact RKI Instruments, Inc. for further instruction.
The Li-ion battery in the GX-Force is not charging	<ul style="list-style-type: none"> The Li-ion battery is faulty. The USB-C cable is disconnected from the instrument, docking station, or both. The charger is malfunctioning. 	<ol style="list-style-type: none"> Check to make sure your GX-Force doesn't have an alkaline battery pack installed. Check the USB-C cable connection between the instrument and the docking station. If the difficulties continue, contact RKI Instruments, Inc. for further instruction.

Charging a GX-Force in an SDM-Force

The SDM-Force can be used to charge the GX-Force. To maximize the GX-Force's run time and the battery life, make sure the batteries' charge is as low as possible before recharging them.

- Perform a bump test, calibration, or alarm check on a GX-Force as described in "Performing a Bump Test" on page 60, "Performing a Calibration" on page 66, or "Performing an Alarm Check" on page 71.
- Turn off the GX-Force(s) by selecting the GX-Force(s), right clicking on them, and selecting **Power Off**.
 - If the bump test, calibration, or alarm check was successful, the docking station will automatically turn the GX-Force(s) off in the time period defined by the **Power Off After Pass** parameter in the **Config** window.
 - The docking station will also turn the GX-Force(s) off if there is no activity for the time period defined by **Auto Power OFF Time** in the **Config** window.

3. Before the GX-Force is turned off, the **CHARGE** LED will be blinking green. Once the GX-Force is turned off, the **CHARGE** LED will blink orange if the GX-Force needs to be charged. The **CHARGE** LED will be solid green if the GX-Force is already fully charged.

NOTE: The SDM-Force does not start charging the batteries until the GX-Force is off.

4. If the battery is drained enough for the docking station to charge it, the **CHARGE** LED will continue to blink orange while charging is taking place. The SDM-Force will take approximately 3 hours to charge a fully discharged GX-Force.

NOTE: If the charging process encounters a fail condition, the **CHARGE** LED will turn steadily red. A fail condition could indicate that there is something wrong with the Li-ion battery, or that there is something wrong with the charger.

5. When the charge is complete, the **CHARGE** LED will turn solid green.

Batteries Too Drained for PC Controlled Operation

If the batteries in the GX-Force do not have enough power to keep the GX-Force on during operations with the SDM-Force, the GX-Force will turn off.

The GX-Force goes into a 5 minute charge cycle and the LCD indicates **CHARGE**. Once the 5 minute charge cycle has ended, the GX-Force will automatically turn back on and connect to the SDM-Force.

Chapter 9: Viewing Data in the Logs Window

Logs Button Overview

The Logs window contains the following types of data:

- Alarm check
- Alarm trend (**Download** operation required)
- Bump test
- Calibration
- Event (**Download** operation required)
- Interval trend (**Download** operation required)
- Memo

Organizing the Data

The lower left frame contains three selection boxes for organizing data. When viewing the data, it can be organized in two ways: Base View Format or ID View Format.

Base View Format

If you do not select **Serial No**, **Station ID**, or **User ID**, the Base view box appears next to the selection boxes. The data can be organized by either data type or by the year and month of the saved data.

Date Base View Format

1. Select **Date** in the Base view box.

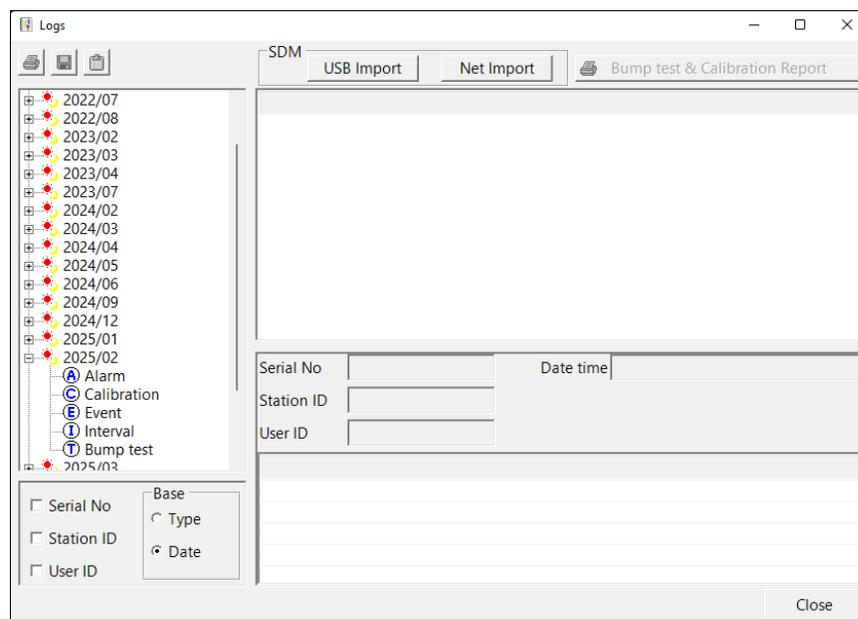


Figure 74: Logs Window in Base View Format, Date

2. Click the (+) next to a date folder in the Data frame of the Logs window or double click the folder to view its contents.
3. Single click on the data type folder (Alarm, Calibration, etc.). All of the files in that data type folder will appear in the upper right frame of the **Logs** window.

Type Base View Format

1. Select **Type** in the Base view box.

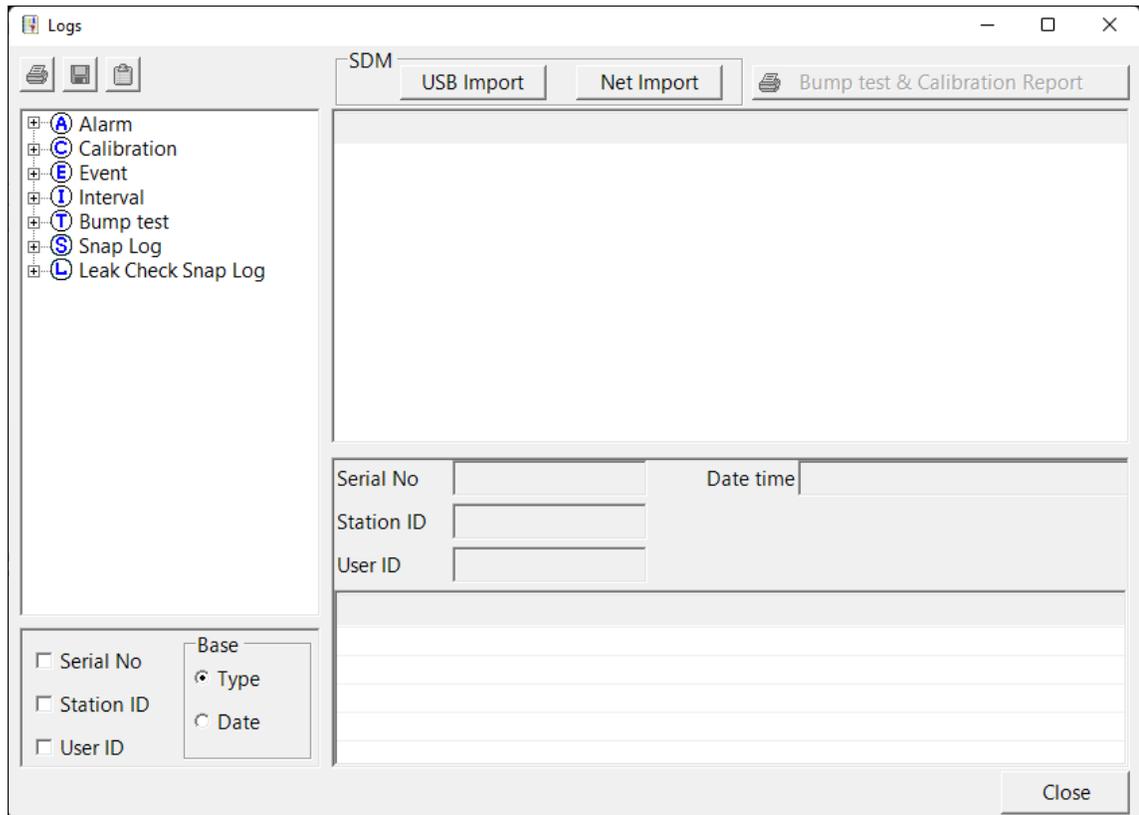


Figure 68: Logs Window in Base View Format, Type

2. Click the expanded view symbol (+) next to a data type folder (Alarm, Calibration, etc.) in the Data frame of the Logs window or double click the folder to view the contents below it.
3. Single click on a date folder. The dates are displayed in year/month format. All of the files in that date folder will appear in the upper right frame of the **Logs** window.

ID View Format

The data may be organized by one or more of the following parameters: serial number, Station ID, User ID.

When viewing data by Serial No., if two GX-Forces have the same serial number and have data for the same year/month, they will be distinguished by their different Station ID or User ID.

When viewing data by Station ID or by User ID, if two GX-Forces have the same Station ID and/or User ID and have data for the same year/month, they will be distinguished by their different serial numbers.

1. Select one or more of the ID view choices: **Serial No.**, **Station ID**, or **User ID**.

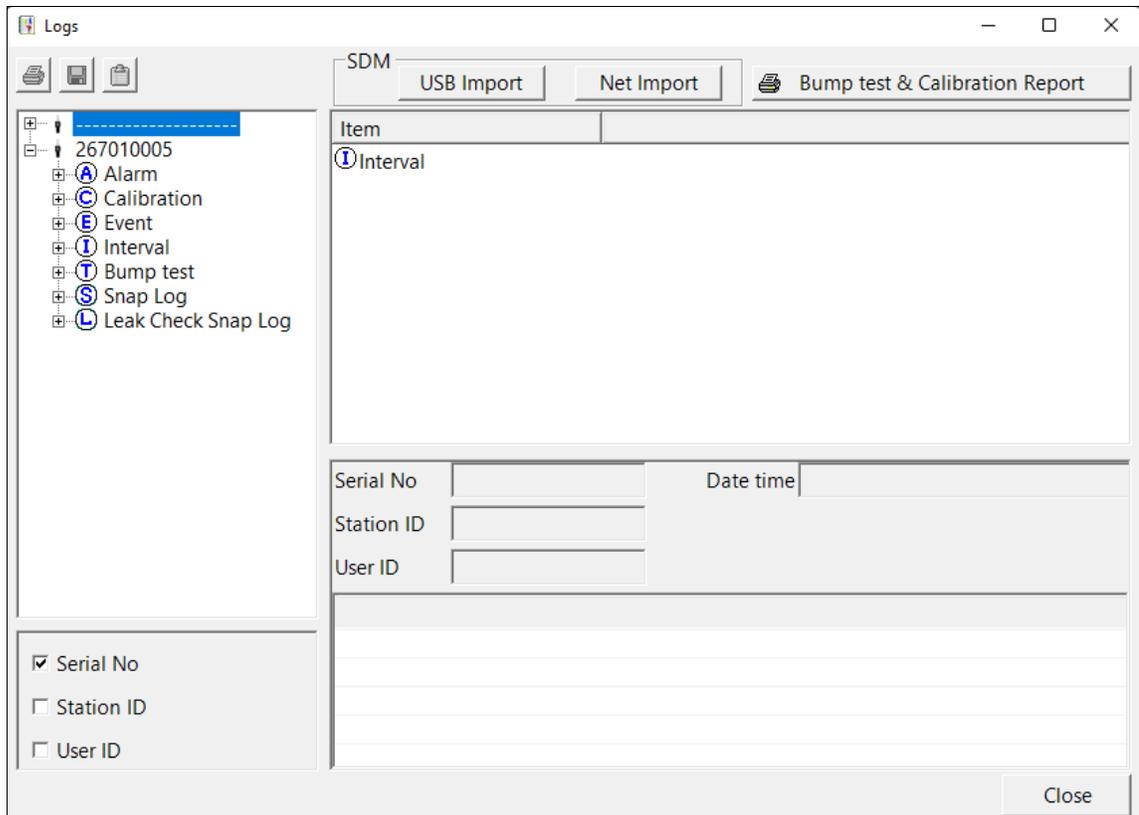


Figure 69: Logs Window in ID View Format

2. Click the (+) next to an ID folder (**Serial No.**, **Station ID**, or **User ID**) in the Data frame of the Logs window or double click the folder.
3. Click the (+) next to the data type folder (Alarm, Calibration, etc.) you wish to view or double click the folder.
4. Single click on a date folder. The dates are displayed in year/month format. All of the files in that date folder will appear in the upper right frame of the **Logs** window.

Alarm Trend Data

If an alarm event (Warning, Alarm, Alarm H, STEL, or TWA) occurs, then an alarm trend file is saved in the GX-Force. The peak (minimum for oxygen) readings are saved every 5 seconds for 30 minutes before and 30 minutes after the alarm. If the GX-Force was not on for 30 minutes before the alarm, the data during this time is left blank. If the GX-Force is turned off less than 30 minutes after an alarm event occurs, the data file will only have logged data until the GX-Force was turned off.

The GX-Force saves up to 8 alarm trend files. When an alarm event triggers an alarm trend file to be saved, subsequent alarm events must occur 15 minutes after the previous triggering event in order to trigger the saving of another alarm trend file. If 8 alarm trend files are already saved in the GX-Force's memory, the oldest alarm trend file is overwritten when a new alarm trend file is saved.

Alarm trend data is downloaded from a GX-Force when a complete download is performed or if it is imported from a USB drive.

1. While in the Logs window, find your GX-Force by serial number, then click the (+) of or double-click the serial number folder.
2. Click the (+) of or double-click the **Alarm** folder. Alarm trend data folders are arranged by year/month.
3. Click the year/month folder you wish to view. All alarm trend data files for that GX-Force in that particular year/month will appear in the upper right frame.

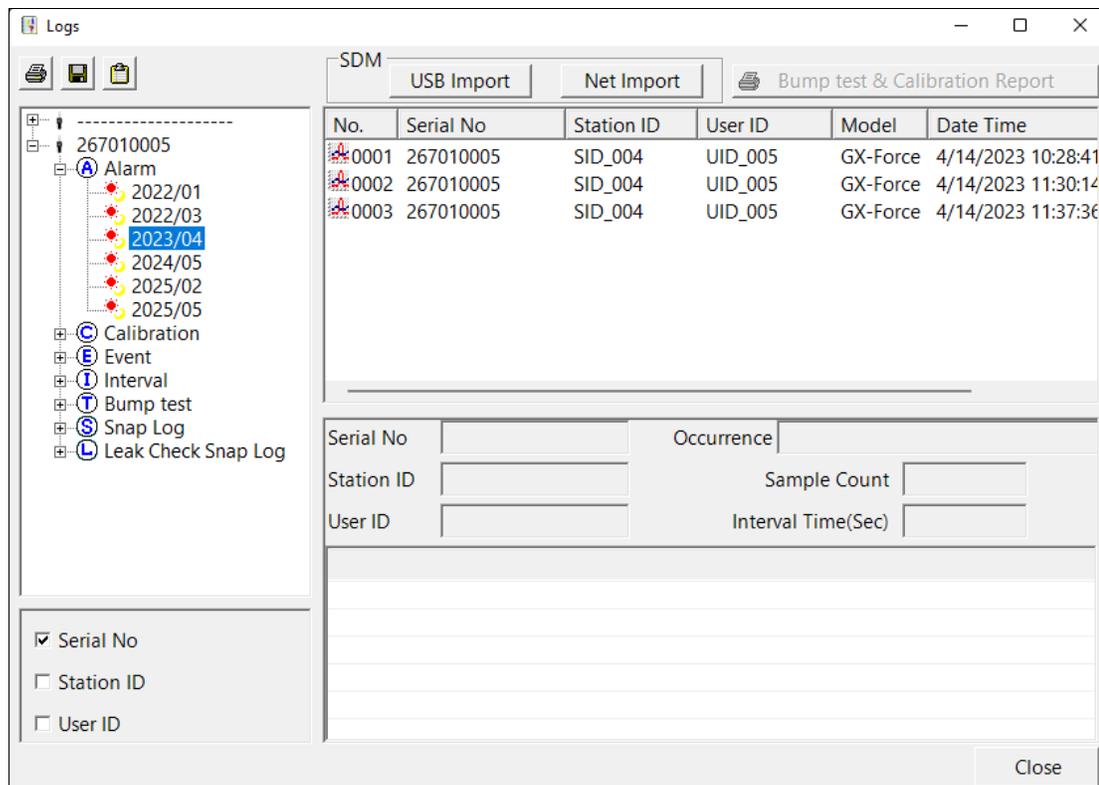


Figure 70: Viewing Alarm Trend Files

- Click a file to see the GX-Force information, gas readings at the time of the event, and the alarm setpoints in the lower right frame.

The screenshot shows the 'Logs' window with the following data:

No.	Serial No	Station ID	User ID	Model	Date Time
0001	267010005	SID_004	UID_005	GX-Force	4/14/2023 10:28:41
0002	267010005	SID_004	UID_005	GX-Force	4/14/2023 11:30:14
0003	267010005	SID_004	UID_005	GX-Force	4/14/2023 11:37:36

Serial No	267010005	Occurrence	4/14/2023 11:30:14 AM			
Station ID	SID_004	Sample Count	720			
User ID	UID_005	Interval Time(Sec)	5			

Sensor	Value	Warning	Alarm	AlarmH	STEL	TWA
CH4(100...	1 %LEL	10 %LEL	50 %LEL	50 %LEL	*****	*****
O2(40.0%)	18.0 %	18.0 %	18.0 %	25.0 %	*****	*****
CO_CO-H...	0 ppm	25 ppm	50 ppm	50 ppm	200 ppm	25 ppm
Temperat...	24.6 °C	*****	*****	*****	*****	*****

Figure 71: Instrument Info and Alarm Trend Data

5. To view the alarm trend data, double click the desired file.

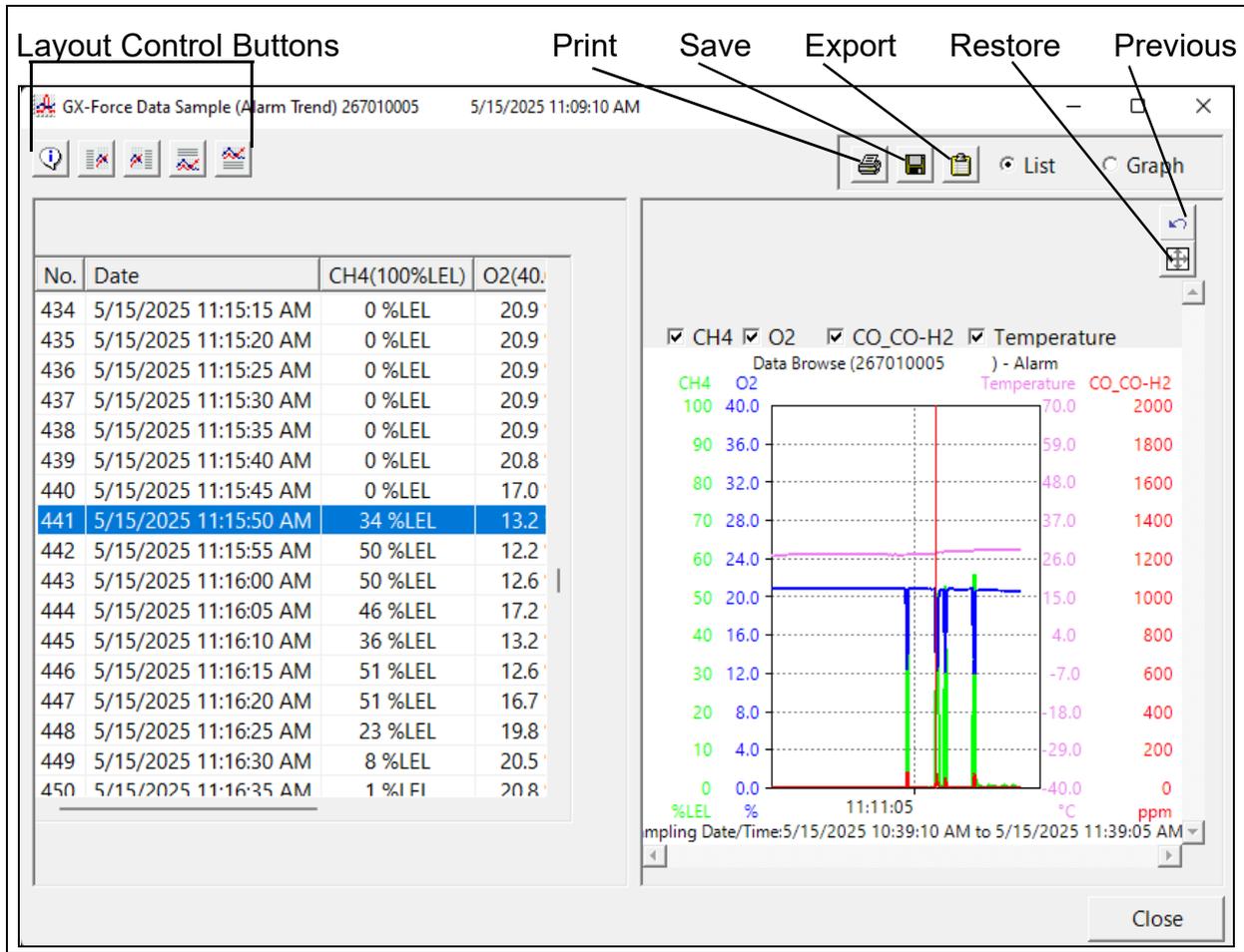


Figure 72: Alarm Trend Data

- a. To change the layout of the table and chart in relation to each other, click any of the four layout control buttons in the upper left corner of the screen.
 - b. To change the proportions of the table to the graph, click the divider between the two and move it.
 - c. To display instrument information along with the data table and graph, click the “i” control button in the upper left corner.
6. The table section of the screen displays the following:
- a. The gas readings at the time of the alarm event around which the logged data is centered are highlighted in red and are the instantaneous readings at that time.
 - b. Peak readings (minimum for oxygen) are shown in 5-second intervals.

7. The graph section of the screen displays the following:
 - a. You can choose which gas(es) you want to graph by selecting or deselecting the boxes next to each gas name.
 - b. To zoom in on a particular part of the graph, drag a box around that area so that it is highlighted in gray. The graph will zoom in. To return to a previous zoom, click the Previous control button in the upper right corner of the graph section. To return to the original zoom, click the Restore control button in the upper right corner of the graph section.
 - c. A vertical red line appears on the graph at the point that created the alarm trend file. Clicking anywhere on the graph will move that red line and highlight that data point in the table. Clicking a data point in the table will move the red line in the graph to that data point.

Printing Data

1. Select either **List** or **Graph** in the upper right corner of the window.
2. Click the **Print** control button in the upper right corner of the window. The **Print** control button has a printer icon on it.
3. If **Graph** is selected, the data will print as a graph. If **List** is selected, the data will print as a table.

Saving Data

1. Select either **List** or **Graph** in the upper right corner of the window.
2. Click the **Save to File** control button. The **Save to File** control button has a floppy disk icon on it.
3. A dialog box will appear for you to specify the file name, file location, and file type.
4. Specify the file name and file location and click **Save**. If **List** is selected, the file type is “.csv” (comma-separated values). If **Graph** is selected, the file type is “.bmp” (Windows bitmap).

Copying Data

1. Select either **List** or **Graph** in the upper right corner of the window.
2. Click the **Copy to Clipboard** control button. The **Copy to Clipboard** control button has a clipboard icon on it. The table or graph will be saved to the clipboard.
3. Paste the data into a document using the application’s Paste command.

Calibration Data

Calibration data in the Logs window can come from 3 different sources. The icon next to each calibration file indicates the file source.

Calibration Data Source	Icon
Performing calibration using SDM-PC3 program	
Imported data from one of the following methods: <ul style="list-style-type: none"> • using the USB Import or Net Import buttons • using the Download(D) option by right-clicking on the SDM-Force icon in the SDM-PC3 Program 	

1. While in the Logs window, find your GX-Force by serial number, then click the (+) or double-click the serial number folder.
2. Click the (+) or double-click the **Calibration** folder to view the contents. Calibration data folders are arranged by year/month.
3. Click the year/month folder you wish to view. All calibration data files for that GX-Force in that particular year/month will appear in the upper right frame. You may need to download the data from the instrument again to get more recent information,

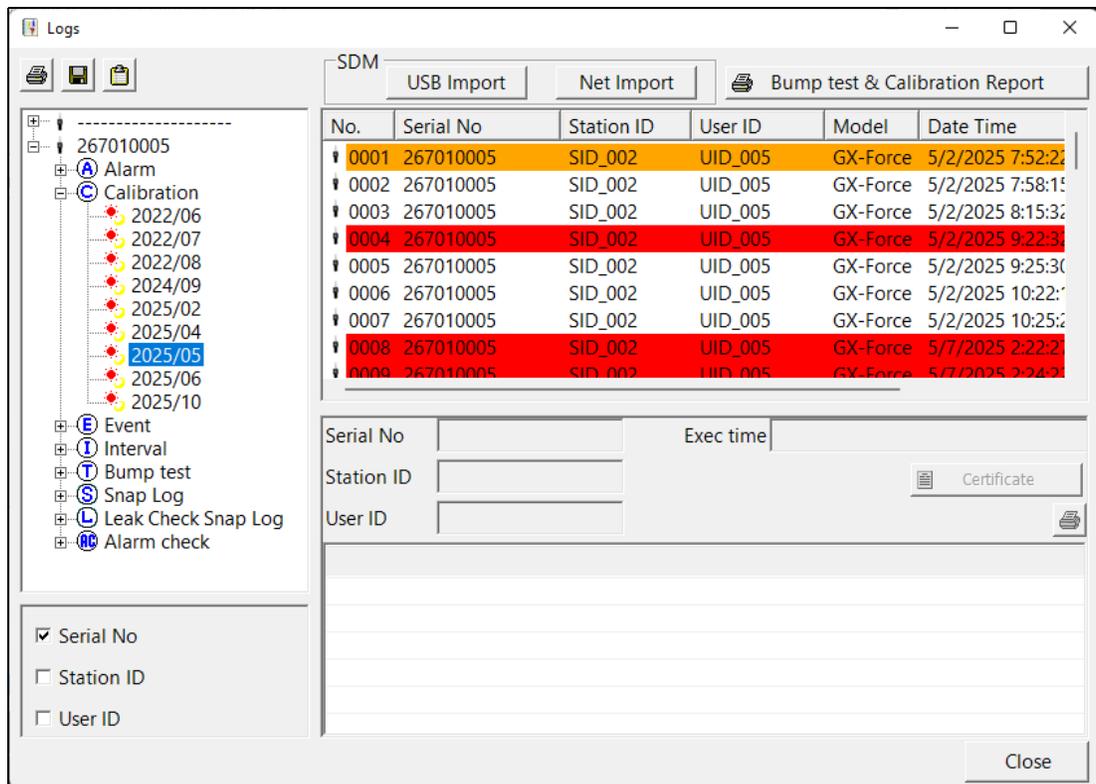


Figure 73: Viewing Calibration Log Files

- Click one of the calibration data files. The fields in the bottom right frame will fill in. The instrument information will be displayed along with the calibration information. The tested sensors will be displayed along with the final gas concentration, the calibration gas values, and the result of the calibration. A **Certificate** button will also appear along the right side of the screen. This button is only active if the selected calibration passed.

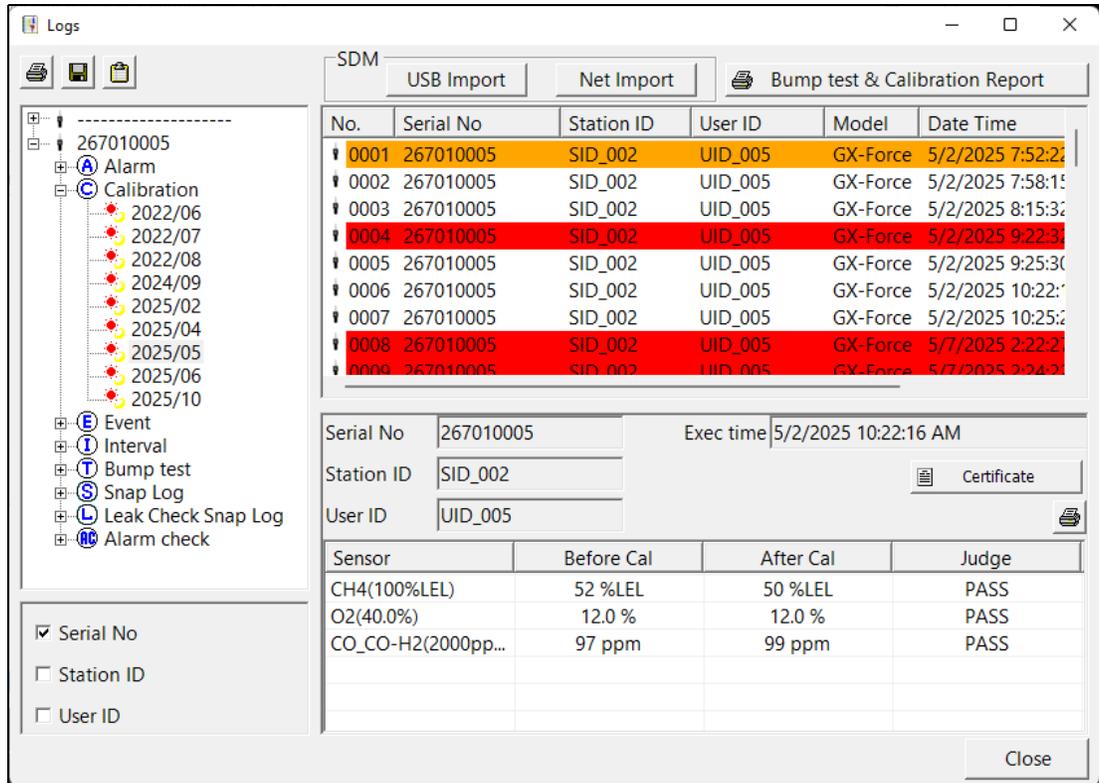


Figure 74: Viewing Calibration Data

- Files that record a failed calibration on all channels are highlighted in red. Files that record a calibration where not all channels passed are highlighted in orange.
- Calibrations that required more than one calibration cylinder will have separate calibration files for each cylinder.

For example, a calibration performed on a GX-Force with an LEL, O₂, and H₂-compensated CO sensor would result in one calibration file for the LEL, O₂, and CO channels and one calibration file for H₂ detection.

Printing Data

- To print the calibration data (everything in the lower right frame of the screen) for a selected calibration file, click the **Print** control button located just above the calibration judge column.

The screenshot shows the 'Logs' window with a tree view on the left and a main data table. The tree view shows a folder for '2025/05' selected. The main table displays calibration records for various sensors. A red arrow points to the 'Print' button (represented by a printer icon) located above the 'Judge' column of the calibration data table. A second window, titled '[Calibration Log]', shows the detailed calibration data for a specific file, including sensor readings before and after calibration and the final judge status.

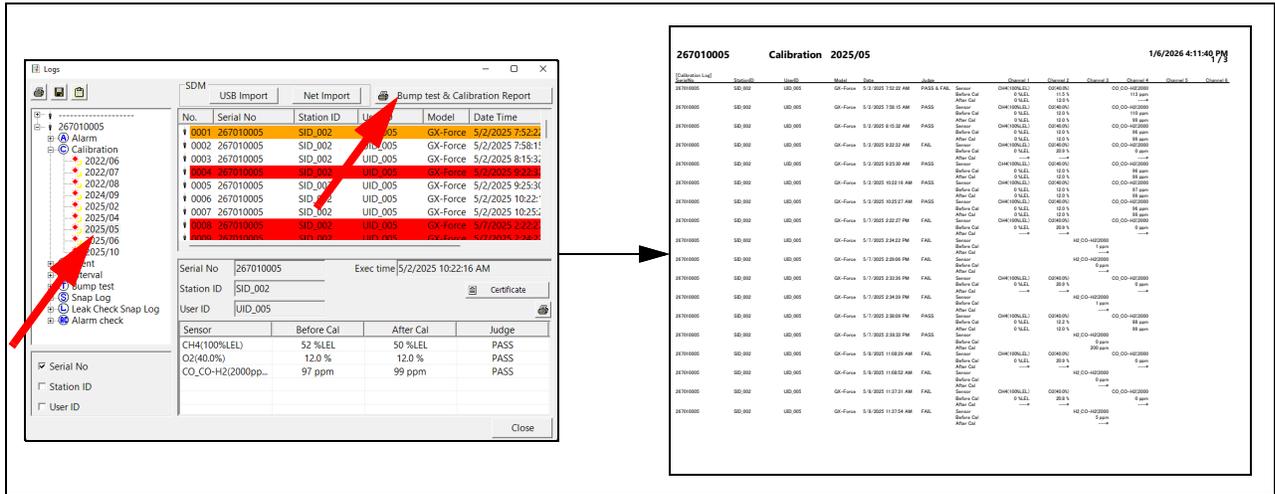
Item	Value		
Exec time	5/2/2025 10:22:16 AM		
Serial No	267010005		
Station ID	SID_002		
User ID	UID_005		
<hr/>			
Sensor	Before Cal	After Cal	Judge
CH4(100%LEL)	52 %LEL	50 %LEL	PASS
O2(40.0%)	12.0 %	12.0 %	PASS
CO,CO-H2(2000ppm)	97 ppm	99 ppm	PASS

- To print the basic calibration results from a date folder (everything in the upper right frame), be sure that the desired date folder is selected and click the **Print** control button in the upper left corner of the Logs window.

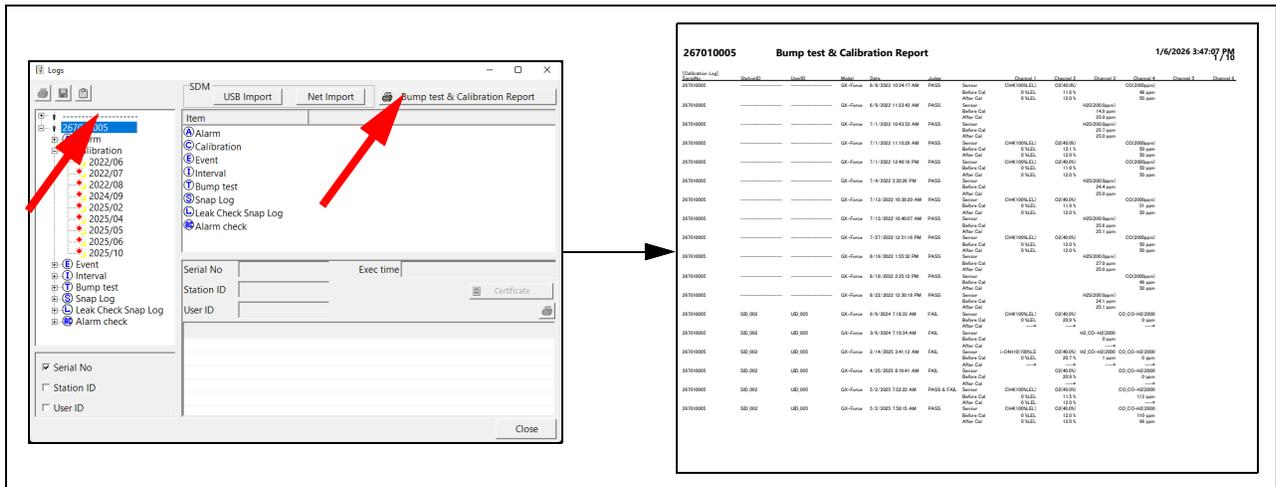
The screenshot shows the 'Logs' window with the tree view on the left showing a date folder selected. A red arrow points to the 'Print' button (printer icon) in the upper left corner of the window. A second window, titled '267010005 Calibration 2025/05 1/6/2026 4:09:51 PM 1 / 1', displays a list of calibration records for that specific date folder, including columns for No., Serial No., Station ID, User ID, Model, Date Time, and Judge.

No.	Serial No	Station ID	User ID	Model	Date Time	Judge
0001	267010005	SID_002	UID_005	GX-Force	5/2/2025 7:52:22 AM	PASS & FAIL
0002	267010005	SID_002	UID_005	GX-Force	5/2/2025 7:58:15 AM	PASS
0003	267010005	SID_002	UID_005	GX-Force	5/2/2025 8:15:32 AM	PASS
0004	267010005	SID_002	UID_005	GX-Force	5/2/2025 9:22:32 AM	FAIL
0005	267010005	SID_002	UID_005	GX-Force	5/2/2025 9:25:30 AM	PASS
0006	267010005	SID_002	UID_005	GX-Force	5/2/2025 10:22:16 AM	PASS
0007	267010005	SID_002	UID_005	GX-Force	5/2/2025 10:25:27 AM	PASS
0008	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:22:27 PM	FAIL
0009	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:24:22 PM	FAIL
0010	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:29:06 PM	FAIL
0011	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:33:36 PM	FAIL
0012	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:34:39 PM	FAIL
0013	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:38:09 PM	PASS
0014	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:38:33 PM	PASS
0015	267010005	SID_002	UID_005	GX-Force	5/8/2025 11:08:29 AM	FAIL
0016	267010005	SID_002	UID_005	GX-Force	5/8/2025 11:08:52 AM	FAIL
0017	267010005	SID_002	UID_005	GX-Force	5/8/2025 11:37:31 AM	FAIL
0018	267010005	SID_002	UID_005	GX-Force	5/8/2025 11:37:54 AM	FAIL
0019	267010005	SID_002	UID_005	GX-Force	5/8/2025 1:34:39 PM	FAIL
0020	267010005	SID_002	UID_005	GX-Force	5/8/2025 1:35:03 PM	FAIL
0021	267010005	SID_002	UID_005	GX-Force	5/8/2025 1:36:30 PM	FAIL
0022	267010005	SID_002	UID_005	GX-Force	5/8/2025 1:36:57 PM	FAIL
0023	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:16:16 AM	FAIL
0024	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:23:52 AM	FAIL
0025	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:24:19 AM	FAIL
0026	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:33:04 PM	FAIL
0027	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:34:47 PM	FAIL
0028	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:07:07 PM	FAIL
0029	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:07:30 PM	FAIL
0030	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:12:07 PM	FAIL
0031	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:12:30 PM	FAIL
0032	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:29:19 PM	PASS
0033	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:29:52 PM	FAIL
0034	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:31:13 PM	PASS
0035	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:31:36 PM	FAIL
0036	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:33:56 PM	PASS
0037	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:34:08 PM	FAIL
0038	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:39:06 PM	PASS
0042	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:39:28 PM	FAIL
0040	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:40:46 PM	PASS
0041	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:41:17 PM	PASS
0042	267010005	SID_002	UID_005	GX-Force	5/23/2025 10:59:01 AM	FAIL
0043	267010005	SID_002	UID_005	GX-Force	5/23/2025 10:59:24 AM	FAIL
0044	267010005	SID_002	UID_005	GX-Force	5/23/2025 11:06:07 AM	FAIL
0045	267010005	SID_002	UID_005	GX-Force	5/23/2025 11:06:30 AM	FAIL
0046	267010005	SID_002	UID_005	GX-Force	5/23/2025 11:09:55 AM	FAIL
0047	267010005	SID_002	UID_005	GX-Force	5/23/2025 11:10:35 AM	FAIL

- To print detailed calibration data for each calibration file in a date folder, be sure that the desired date folder is selected and click the **Bump Test & Calibration Report** control button along the top of the Logs window.



- To print detailed calibration and bump test data (if available) for each calibration and bump test file for a specific serial number, be sure that the desired serial number is selected in the upper left frame and click the **Bump Test & Calibration Report** control button along the top of the Logs window.



Saving Data

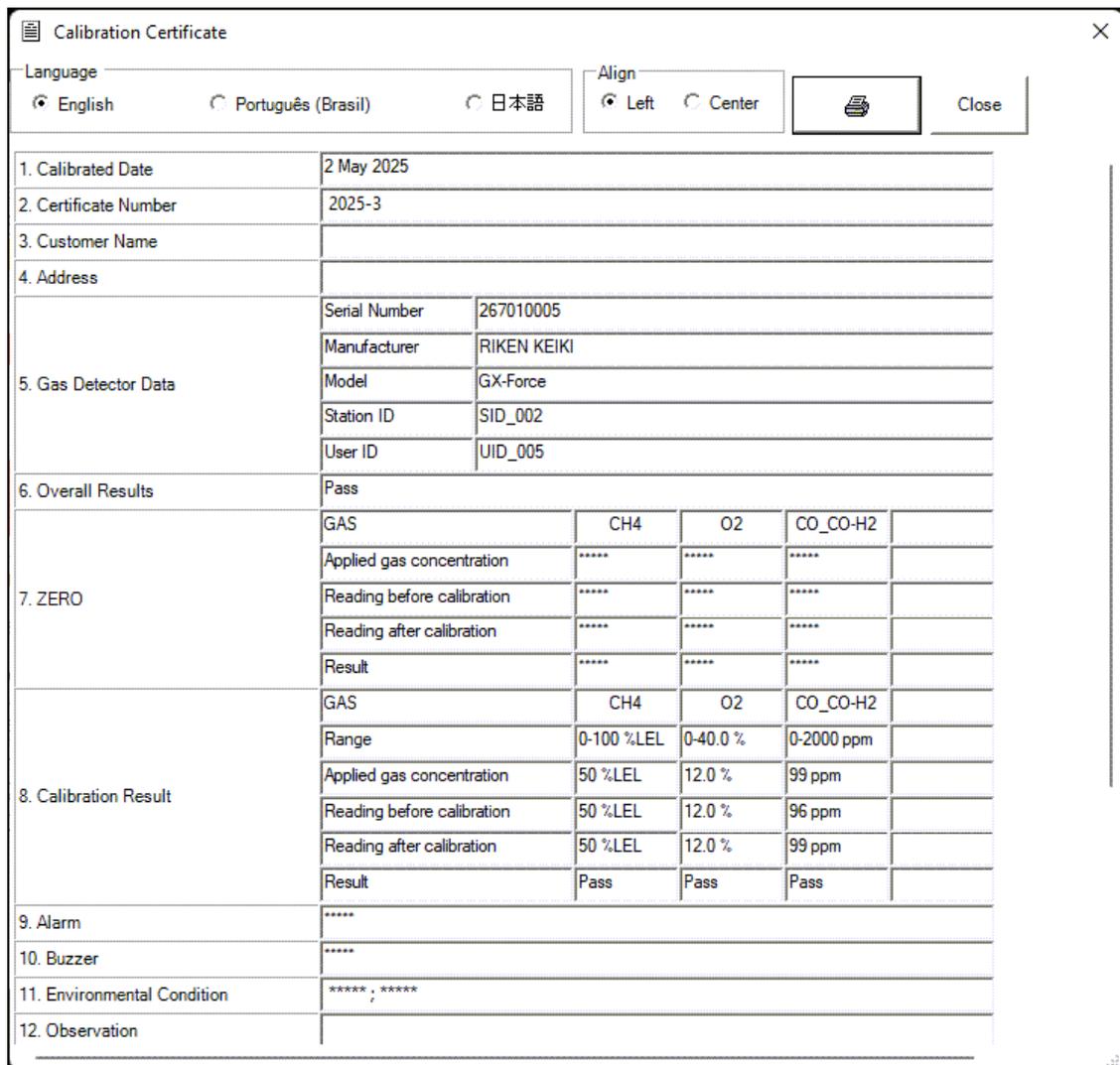
- Be sure the desired date folder is highlighted.
- Click the **Save** control button in the upper left corner of the Logs window.
- A “Save As” dialog box will appear for you to specify the file name and file location. The file type will be “.csv” (comma separated values).
- Specify the file name and location and click **Save**.

Copying Data

1. Be sure the desired date folder is selected.
2. Click the **Save to Clipboard** control button. The data will be saved to the clipboard.
3. Paste the data into a document by using the Paste command in an application.

Printing a Calibration Certificate

1. Select a calibration file.
2. Click the **Certificate** button along the right side of the window. The calibration certificate will appear.



The screenshot shows a window titled "Calibration Certificate" with a close button (X) in the top right corner. The window contains several sections:

- Language:** Radio buttons for English (selected), Português (Brasil), and 日本語.
- Align:** Radio buttons for Left (selected) and Center.
- Buttons:** A printer icon button and a "Close" button.
- Fields:**
 - 1. Calibrated Date: 2 May 2025
 - 2. Certificate Number: 2025-3
 - 3. Customer Name: (empty)
 - 4. Address: (empty)
 - 5. Gas Detector Data:

Serial Number	267010005
Manufacturer	RIKEN KEIKI
Model	GX-Force
Station ID	SID_002
User ID	UID_005
 - 6. Overall Results: Pass
 - 7. ZERO:

GAS	CH4	O2	CO_CO-H2	
Applied gas concentration	*****	*****	*****	
Reading before calibration	*****	*****	*****	
Reading after calibration	*****	*****	*****	
Result	*****	*****	*****	
 - 8. Calibration Result:

GAS	CH4	O2	CO_CO-H2	
Range	0-100 %LEL	0-40.0 %	0-2000 ppm	
Applied gas concentration	50 %LEL	12.0 %	99 ppm	
Reading before calibration	50 %LEL	12.0 %	96 ppm	
Reading after calibration	50 %LEL	12.0 %	99 ppm	
Result	Pass	Pass	Pass	
 - 9. Alarm: *****
 - 10. Buzzer: *****
 - 11. Environmental Condition: ***** ; *****
 - 12. Observation: (empty)

Figure 75: Calibration Certificate

3. Use the **English**, **Portuguese**, or **Japanese** selection dots in the Language section at the top of the screen to choose the displayed language.
4. Use the **Left** and **Center** selection dots in the Align section at the top of the certificate to change the alignment of the information that's manually typed in.

5. Information in fields with a white background can be edited. Information in fields with a grey background cannot be edited. Add or edit information, as desired.
6. The prefix for the certificate number, “2025” in the example above, is defined in the **UserData** tab of the **Config** window.
7. To print a certificate, click the **Print** button in the top right corner of the screen. The calibration certificate will print to the computer’s default printer OR to the printer defined in the **UserData** tab of the **Config** window. If you defined a logo location in the **UserData** tab of the **Config** window, the logo will print in the lower left corner of the certificate.

Calibration Certificate



1. Calibrated Date	2 May 2025			
2. Certificate Number	2025-3			
3. Customer Name				
4. Address				
5. Gas Detector Data	Serial Number	267010005		
	Manufacturer	RIKEN KEIKI		
	Model	GX-Force		
	Station ID	SID_002		
	User ID	UID_005		
6. Overall Results	Pass			
7. ZERO	GAS	CH4	O2	CO_CO-H2
	Applied gas concentration	*****	*****	*****
	Reading before calibration	*****	*****	*****
	Reading after calibration	*****	*****	*****
	Result	*****	*****	*****
8. Calibration Result	GAS	CH4	O2	CO_CO-H2
	Range	0-100 %LEL	0-40.0 %	0-2000 ppm
	Applied gas concentration	50 %LEL	12.0 %	99 ppm
	Reading before calibration	50 %LEL	12.0 %	96 ppm
	Reading after calibration	50 %LEL	12.0 %	99 ppm
Result	Pass	Pass	Pass	
9. Alarm	*****			
10. Buzzer	*****			
11. Environmental Condition	***** ; *****			
12. Observation				
13. Replacement part				
14. Next Calibration Date				

This calibration certificate results that the inspection and calibration was carried out in accordance with the operation manual or the maintenance manual officially published by the manufacturer Riken Keiki Co., Ltd.



Issued Date : 7 January 2026
 Company Name :
 Diploma No. :
 Signature :

Figure 76: Printed Calibration Certificate

Event Data

The GX-Force saves the 100 most recent alarm events and the 100 most recent trouble events. When a GX-Force is connected to the SDM-PC3 program and a complete download is performed, the alarm and trouble event files are retrieved and saved in the program. They can also be imported using the **USB Import** button.

Alarm event files save the time, instrument channel, gas, and alarm type of every gas alarm event that occurs on a particular GX-Force. Warning, Alarm, Alarm H, STEL, TWA, overscale, man down, and panic events are saved.

Trouble event files note the time, instrument channel, whether the event is an instrument system failure or sensor failure, and the specific type of failure. Calibration failures, dead battery alarms, and sensor failures are among the trouble events that are saved.

Even though two types of files are saved, the PC Program does not distinguish between the two and shows them together and with the same lightning bolt symbol.

1. While in the Logs window, find your GX-Force by serial number, then click the expanded view symbol (+) of or double-click the serial number folder to view the contents.
2. Click the expanded view symbol (+) of or double-click the **Event** folder to view the contents. Event data folders are arranged by year/month.
3. Click the year/month folder you wish to view. All event data files for that GX-Force in that particular year/month will appear in the upper right frame.

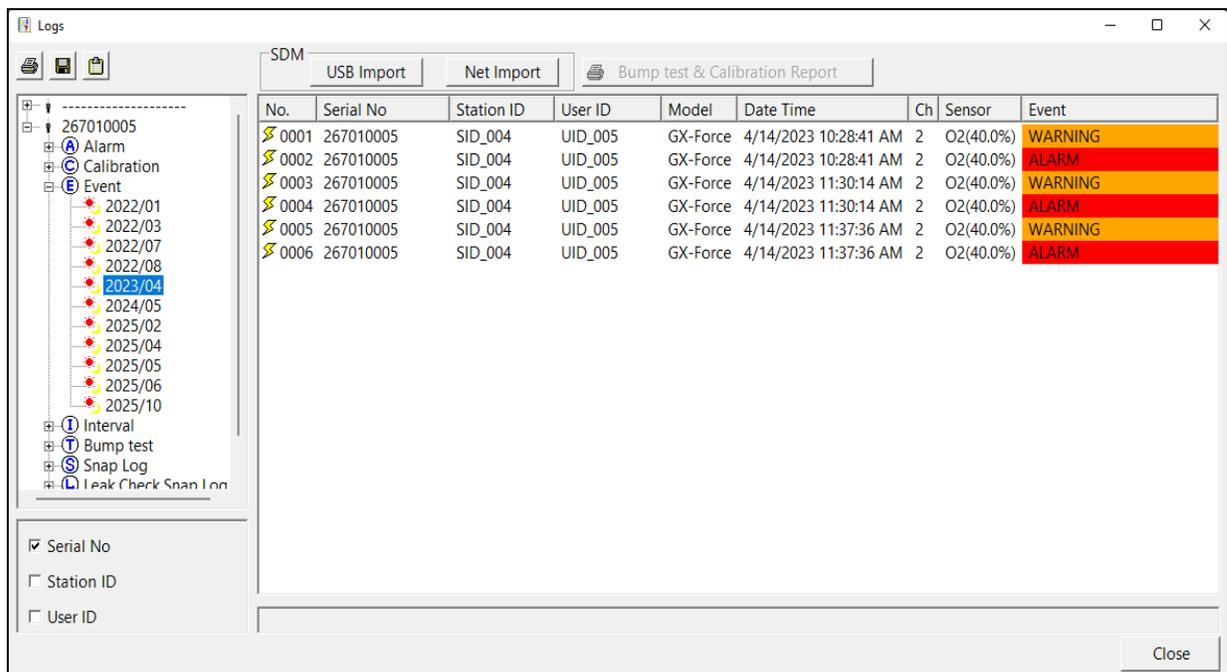


Figure 77: Viewing Event Data

Printing Data

1. Be sure the desired date folder is selected.
2. Click the **Print** control button in the upper left corner of the **Logs** window.

Saving Data

1. Be sure the desired date folder is selected.
2. Click the **Save** control button in the upper left corner of the **Logs** window.
3. A “Save As” dialog box will appear for you to specify the file name and file location.
4. Specify the file name and location and click **Save**. The file type will be “.csv” (comma separated values).

Copying Data

1. Be sure the desired date folder is selected.
2. Click the **Save to Clipboard** control button. The data will be saved to the clipboard.
3. Paste the data into a document using the application’s Paste command.

Interval Trend Data

Average gas concentrations over the user defined interval trend time are logged in the interval trend data files. The interval trend time is set using either the **Interval Time** menu item in the Edit Function Screen. See “Chapter 7: Changing GX-Force Parameters” on page 90 for instructions to set the interval trend time. Events such as gas alarms or sensor failures are saved in the interval trend data file when they occur.

An interval trend data file is created and saved in the GX-Force when the instrument is turned *off* or when a user ID, or station ID is changed during operation. The serial number, user ID, and station ID that are entered in the instrument when it is turned *on* or that are updated during operation are saved for the corresponding interval trend file. If the instrument’s user ID or station ID are changed during operation, any interval trend files that result from subsequent operating sessions will have the new user ID or station ID saved in them.

The data may be viewed in both table format and graph format if at least 5 scheduled data points have been logged at the programmed interval trend time. This does not include events. If an interval data file has fewer than five scheduled data points, the graph controls are not functional and the data is shown only in table format.

Interval trend data will not appear unless a complete download is performed or if an import is done using the **USB Import** button.

1. While in the **Logs** window, find your GX-Force by serial number, then click the expanded view symbol (+) of or double-click the serial number folder to view the contents.
2. Click the expanded view symbol (+) of or double-click the Interval folder to view the contents. Interval data folders are arranged by year/month.

- Click the year/month folder you wish to view. All interval trend data files for that GX-Force in that particular year/month will appear in the upper right frame.

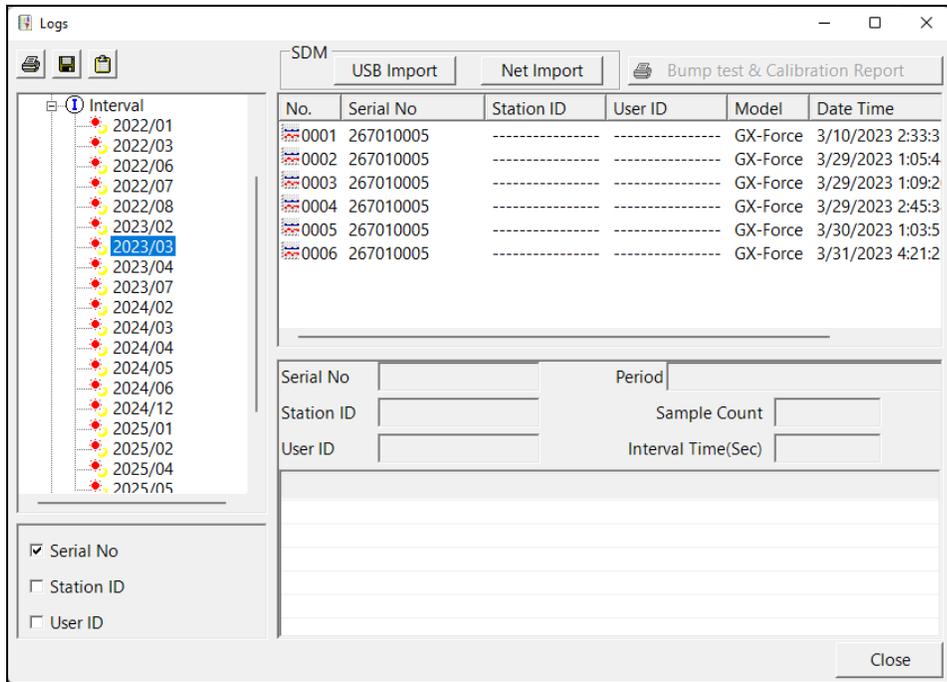


Figure 78: Viewing Interval Trend Files

- Click one of the interval trend data files. The fields in the bottom right frame will fill in. The instrument information will be displayed along with the average, minimum, and maximum gas readings for the operating session. Also displayed are the minimum date, the maximum date, and the warning, alarm, alarm H, STEL, and TWA setpoints.

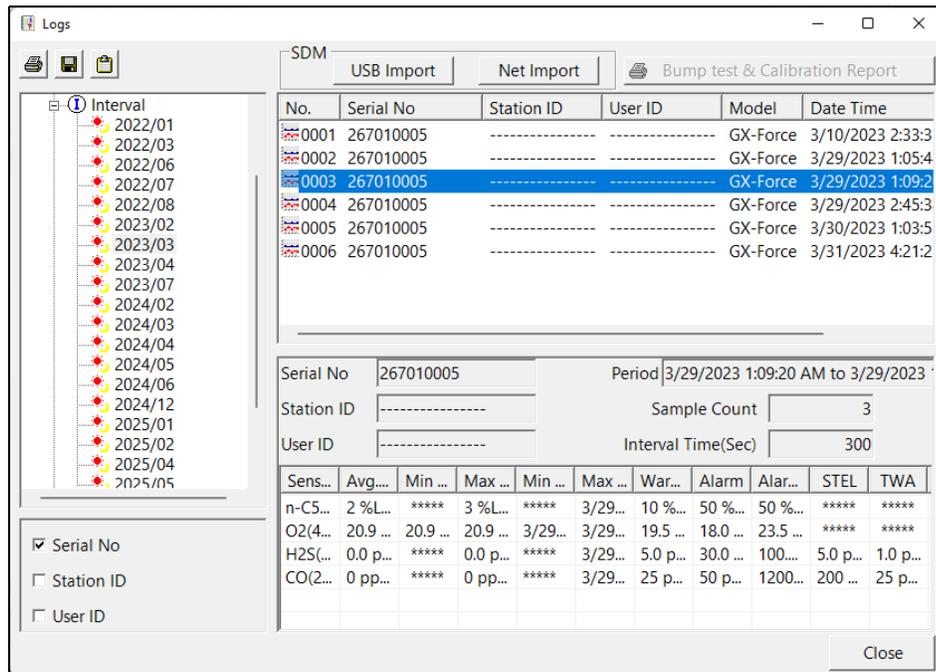


Figure 79: Interval Trend Data

5. To view the interval trend data, double click the desired file.

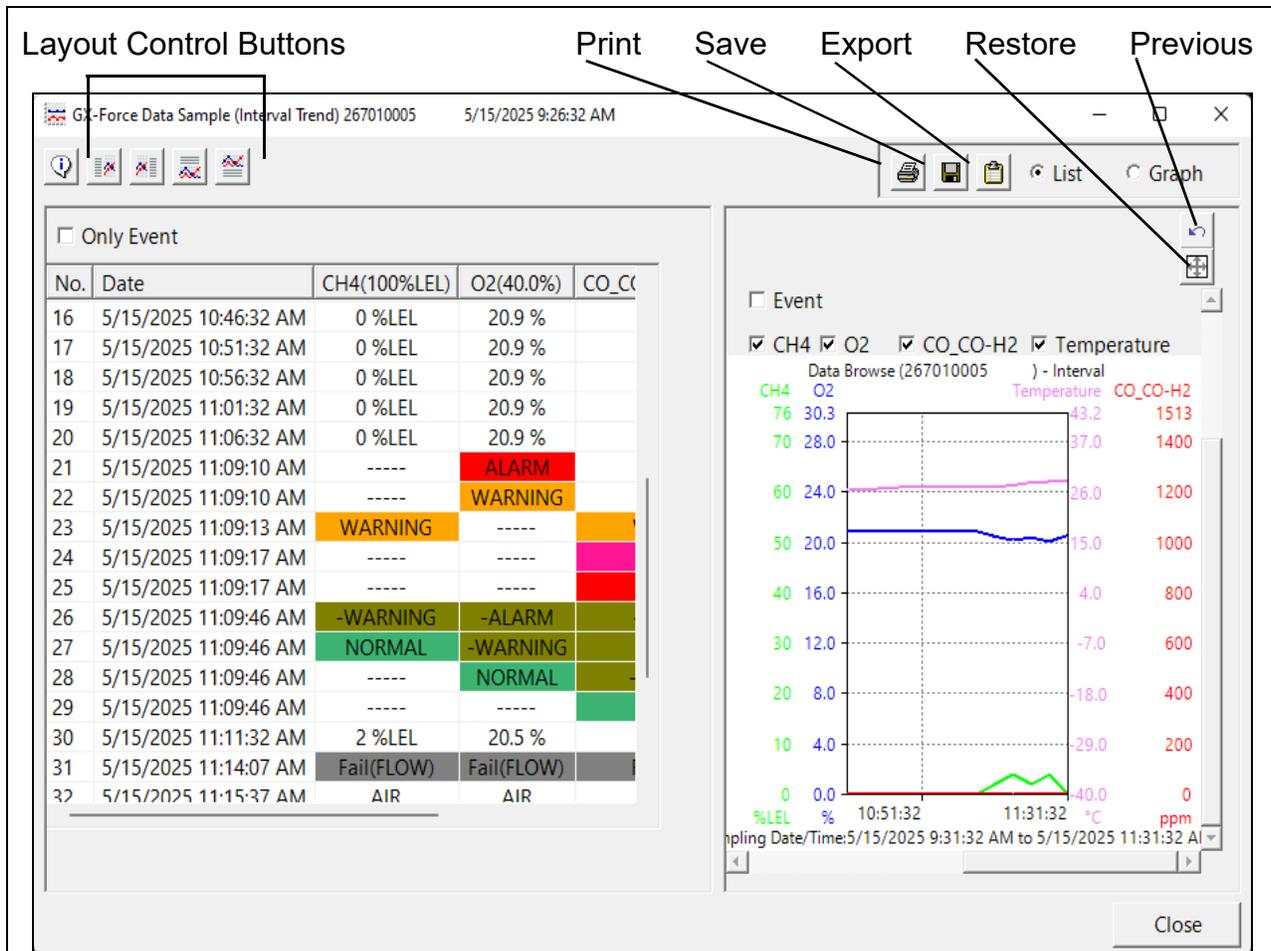


Figure 80: Interval Trend Data

- a. To change the layout of the table and chart, click any of the four layout control buttons in the upper left corner of the screen.
 - b. To change the proportions of the table to the graph, click the divider between the two and move it.
 - c. To display instrument information along with the data and graph, click the “i” control button in the upper left corner.
6. In the table part of the screen:
- a. The interval trend data is shown as the average gas readings over the user defined interval trend time. So if the data logging session started at 4:13:38 PM and the interval time is set to 1 minute, then the readings logged at 4:14:38 PM are the average reading for each channel over that one minute period. If a channel went into Warning or Alarm, it will be indicated.
 - b. Events are displayed whether they occurred at scheduled log times or in between them. Events include gas alarms such as a warning condition, trouble conditions such as a sensor failure, and an indication that the GX-Force is returning to “normal” condition after an alarm has been reset using the POWER MODE button.
 - c. To view only events in the interval trend data file, click the **Only Event** selection box.

7. In the graph part of the screen:
 - a. You can choose which gas(es) you want to graph by selecting or deselecting the boxes next to each gas name.
 - b. To zoom in on a particular part of the graph, drag a box around that area so that it is highlighted in gray. The graph will zoom in. To return to a previous zoom, click the **Previous** control button in the upper right corner of the graph section. To return to the original zoom, click the **Restore** control button in the upper right corner of the graph section.
 - c. Clicking anywhere on the graph will cause a vertical red line to appear and the corresponding data point will be highlighted in the table. Clicking a data point in the table will move the red line in the graph to that data point.

Printing Data

1. Select either **List** or **Graph** in the upper right corner of the window.
2. Click the **Print** control button in the upper right corner of the window. The **Print** control button has a printer icon on it.
3. If **Graph** is selected, the data will print as a graph. If **List** is selected, the data will print as a table.

Saving Data

1. Select either **List** or **Graph** in the upper right corner of the window.
2. Click the **Save to File** control button. The **Save to File** control button has a floppy disk icon on it.
3. A dialog box will appear for you to specify the file name, file location, and file type.
4. Specify the file name and file location and click **Save**. If **List** is selected, the file type is “.csv” (comma-separated values). If **Graph** is selected, the file type is “.bmp” (Windows bitmap).

Copying Data

1. Select either **List** or **Graph** in the upper right corner of the window.
2. Click the **Copy to Clipboard** control button. The **Copy to Clipboard** control button has a clipboard icon on it. The table or graph will be saved to the clipboard.
3. Paste the data into a document using the application’s Paste command.

Memo Data

Any information entered into the Memo field in the Edit window is saved in a file in the Logs window. If there is text in the Memo field, a new file is created every time a GX-Force is connected to the SDM-PC3 program. If a change is made to the Memo, the change is saved in the Memo file for that operating session. See “Parameter Tab” on page 90 for instructions to use the Memo field.

1. While in the Logs window, find your GX-Force by serial number, then click the expanded view symbol (+) of or double-click the serial number folder to view the contents.
2. Click the expanded view symbol (+) of or double-click the Memo folder to view the contents. Memo data folders are arranged by year/month.
3. Click the year/month folder you wish to view. All memo files for that GX-Force in that particular year/month will appear in the upper right frame.

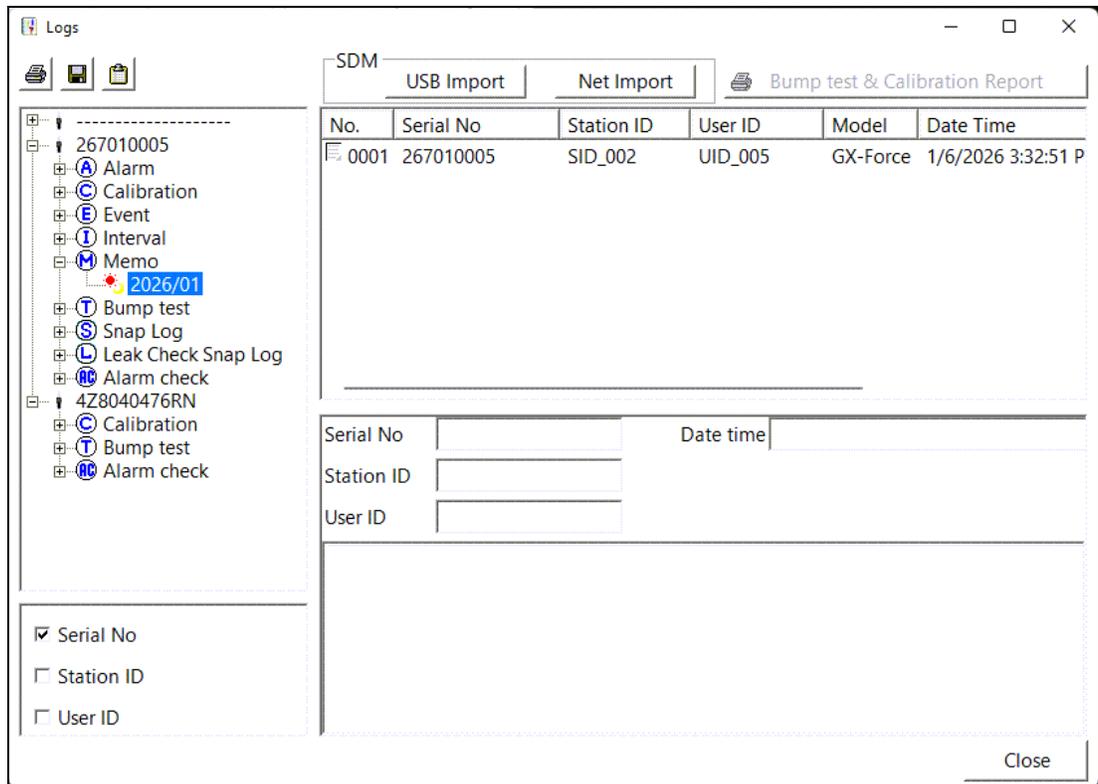


Figure 81: Viewing Memo Files

- Click on one of the memo files. The fields in the bottom right screen will fill in. The instrument information will be displayed along with the memo information.

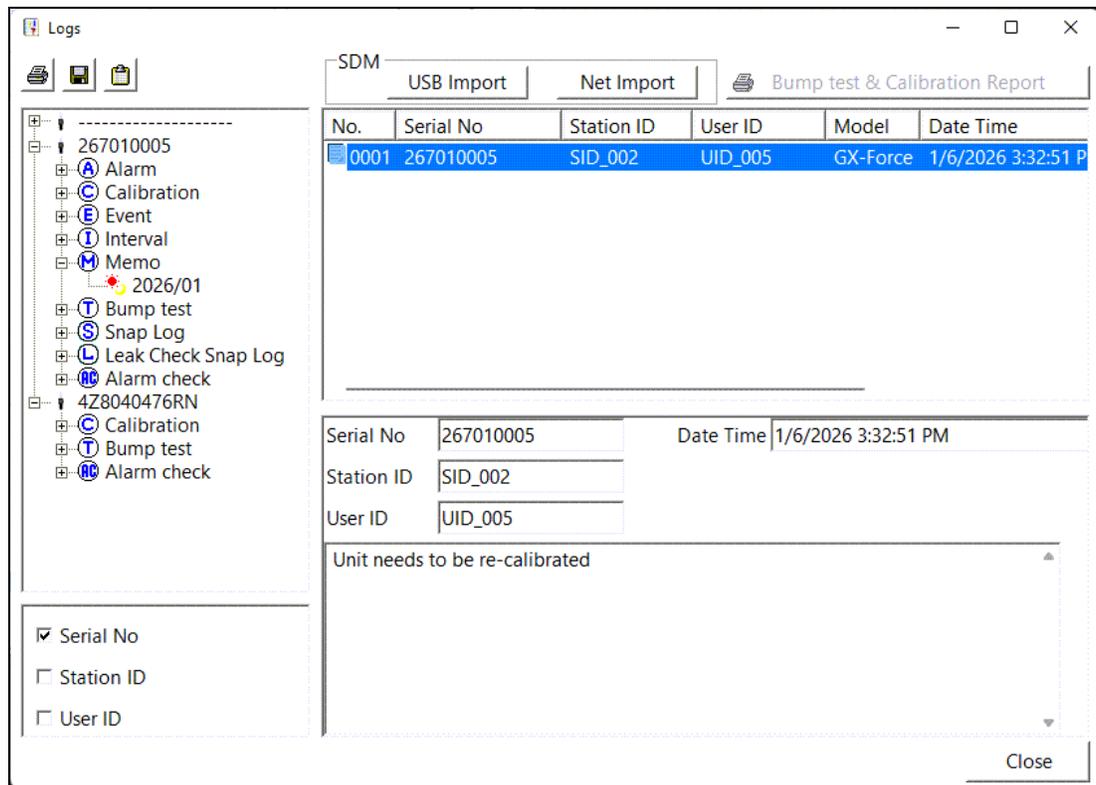


Figure 82: Viewing Memo File Data

Printing Data

- Click the **Print** control button in the upper left corner of the Logs window.

Saving Data

- Click the **Save** control button in the upper left corner of the Logs window.
- A “Save As” dialog box will appear for you to specify the file name and file location.
- Specify the file name and location and click **Save**.

Copying Data

- Click the **Save to Clipboard** control button. The data will be saved to the clipboard.
- Paste the data into a document using the application’s Paste command.

Bump Test Data

Bump test data in the Logs window can come from 3 different sources. The icon next to each bump test file indicates the file source.

Bump Test Data Source	Icon
Performing calibration using SDM-PC3 program	
Imported data from one of the following methods: <ul style="list-style-type: none"> • using the USB Import or Net Import buttons • using the Download(D) option by right-clicking on the SDM-Force icon in the SDM-PC3 Program 	

1. While in the **Logs** window, find your GX-Force by serial number, then click the expanded view symbol (+) of or double-click the serial number folder to view the contents.
2. Click the expanded view symbol (+) of or double-click the **Bump Test** folder to view the contents. Bump test data folders are arranged by year/month.
3. Click the year/month folder you wish to view. All bump test data files for that GX-Force in that particular year/month will appear in the upper right frame. You may need to download the data from the instrument again to get more recent information,

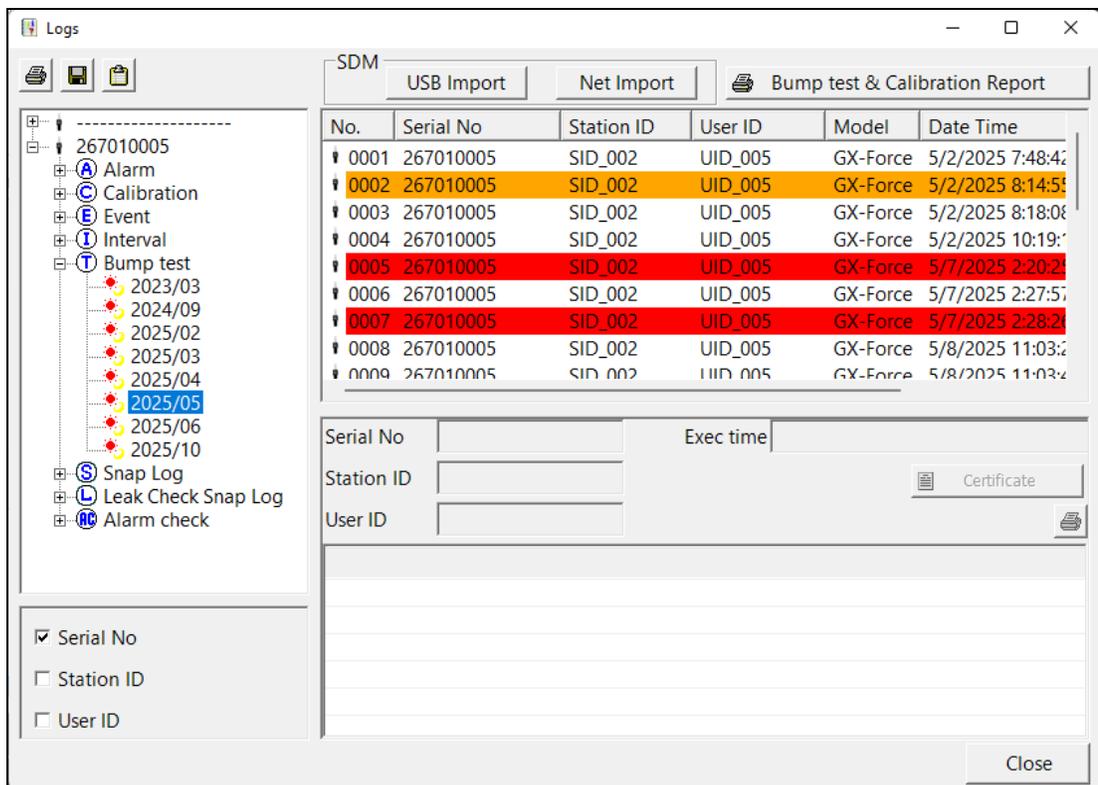


Figure 83: Viewing Bump Test Log Files

- Click on one of the bump test data files. The fields in the bottom right screen will fill in. The instrument information will be displayed along with the bump test information. The tested sensors will be displayed along with the bump test gas reading, the bump test gas values, and the result of the bump test.

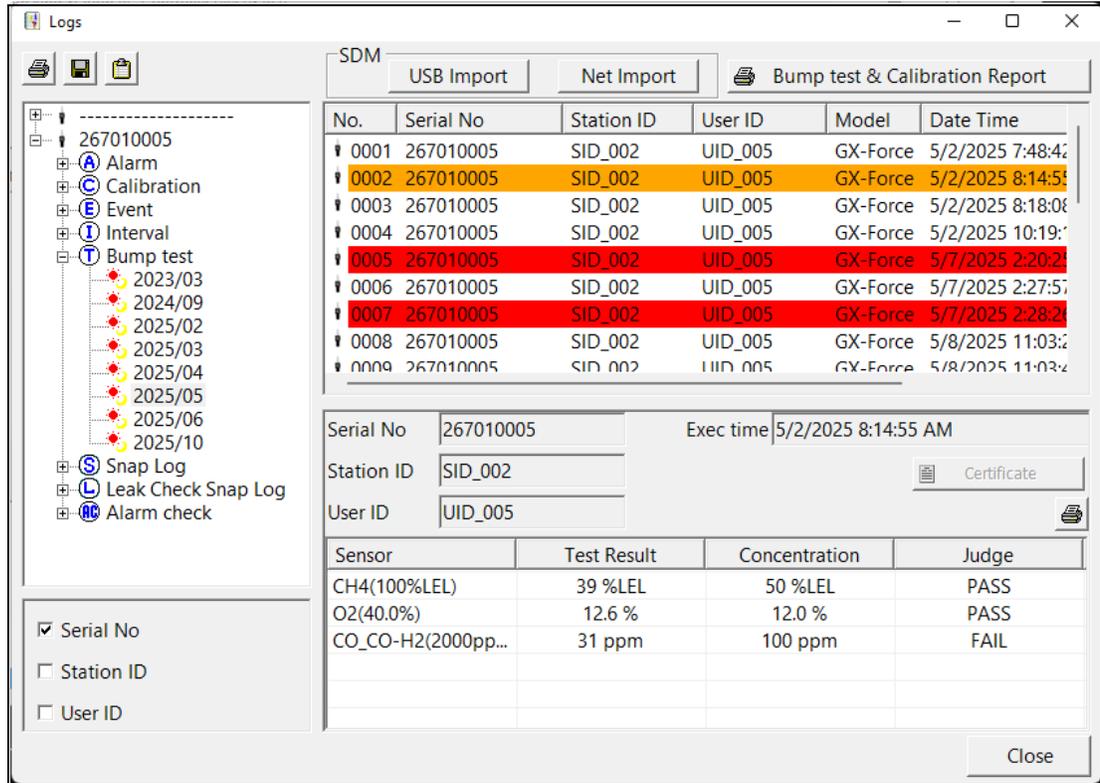


Figure 84: Viewing Bump Test Data

- Files that record a failed bump test on all channels are highlighted in red. Files that record a bump test where not all channels passed are highlighted in orange.
- Bump tests that require more than one calibration cylinder will have separate bump test files for each cylinder.

For example, a bump test performed on a GX-Force using CH₄, O₂, and CO (H₂-compensated) sensors would result in one bump test file for the CH₄, O₂, and CO sensors if a +3-gas mix was used and one bump test file for CO sensor's H₂ compensation.

Printing Data

- To print the bump test data (everything in the lower right frame of the screen) for a selected bump test file, click the **Print** control button located just above the bump test judge column.

The screenshot shows the SDM software interface. On the left, the 'Logs' window displays a tree view with 'Bump test' selected. The main window shows a table of bump test results. A red arrow points to the 'Print' button above the 'Judge' column. Another red arrow points to the 'Print' button in the detailed view window on the right.

[Bump Test Log] 1/6/2026 3:42:13 PM

Item	Value			
Exec time	5/2/2025 8:14:55 AM			
Serial No	267010005			
Station ID	SID_002			
User ID	UID_005			
Sensor	Test Result	Concentration	Judge	
CH4(100%LEL)	39 %LEL	50 %LEL	PASS	
O2(40.0%)	12.6 %	12.0 %	PASS	
CO ₂ -CO-H2(2000ppm)	31 ppm	100 ppm	FAIL	

- To print the basic bump test results from a date folder (everything in the upper right frame), be sure that the desired date folder is selected and click the **Print** control button in the upper left corner of the Logs window.

The screenshot shows the SDM software interface. In the 'Logs' window, the 'Bump test' folder is selected, and a date folder '2025/05' is highlighted. A red arrow points to the 'Print' button in the upper left corner of the Logs window. Another red arrow points to the 'Print' button in the detailed view window on the right.

267010005 Bump test 2025/05 1/6/2026 3:43:19 PM 1 / 1

No.	Serial No	Station ID	User ID	Model	Date Time	Judge
0001	267010005	SID_002	UID_005	GX-Force	5/2/2025 7:48:42 AM	PASS
0002	267010005	SID_002	UID_005	GX-Force	5/2/2025 8:14:55 AM	PASS & FAIL
0003	267010005	SID_002	UID_005	GX-Force	5/2/2025 8:18:08 AM	PASS
0004	267010005	SID_002	UID_005	GX-Force	5/2/2025 10:19:15 AM	PASS
0005	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:20:25 PM	FAIL
0006	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:27:57 PM	PASS
0007	267010005	SID_002	UID_005	GX-Force	5/7/2025 2:28:26 PM	FAIL
0008	267010005	SID_002	UID_005	GX-Force	5/8/2025 11:03:25 AM	PASS
0009	267010005	SID_002	UID_005	GX-Force	5/8/2025 11:03:41 AM	PASS
0010	267010005	SID_002	UID_005	GX-Force	5/8/2025 11:08:28 AM	FAIL
0011	267010005	SID_002	UID_005	GX-Force	5/8/2025 11:08:51 AM	FAIL
0012	267010005	SID_002	UID_005	GX-Force	5/8/2025 1:34:38 PM	FAIL
0013	267010005	SID_002	UID_005	GX-Force	5/8/2025 1:35:01 PM	FAIL
0014	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:15:51 AM	PASS
0015	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:16:09 AM	PASS
0016	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:17:50 AM	PASS
0017	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:18:15 AM	FAIL
0018	267010005	SID_002	UID_005	GX-Force	5/15/2025 11:24:18 AM	FAIL
0019	267010005	SID_002	UID_005	GX-Force	5/15/2025 1:33:23 PM	FAIL
0020	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:07:06 PM	FAIL
0021	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:07:29 PM	FAIL
0022	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:33:55 PM	PASS
0023	267010005	SID_002	UID_005	GX-Force	5/15/2025 2:41:16 PM	PASS

- To print detailed bump test data for each bump test file in a date folder, be sure that the desired date folder is selected and click the **Bump Test & Calibration Report** control button along the top of the Logs window.

The screenshot shows the 'Logs' window with the 'Bump test & Calibration Report' button highlighted. The left pane shows a tree view with '2025/05' selected. The right pane displays a detailed report for station 267010005, listing multiple bump tests with columns for Date Time, Model, and Date Time.

- To print detailed calibration (if available) and bump test data for each calibration and bump test file for a specific serial number, be sure that the desired serial number is selected in the upper left frame and click the **Bump Test & Calibration Report** control button along the top of the Logs window.

The screenshot shows the 'Logs' window with the 'Bump test & Calibration Report' button highlighted. The left pane shows a tree view with '267010005' selected. The right pane displays a detailed report for station 267010005, listing multiple bump tests with columns for Date Time, Model, and Date Time.

Saving Data

- Be sure the desired date folder is highlighted
- Click the **Save** control button in the upper left corner of the Logs window.
- A “Save As” dialog box will appear for you to specify the file name and file location.
- Specify the file name and location and click **Save**.

Copying Data

1. Be sure the desired date folder is selected.
2. Click the **Save to Clipboard** control button. The data will be saved to the clipboard.
3. Paste the data into a document using an application's Paste command.

Alarm Check Data

Alarm check data in the Logs window can come from 2 different sources. The icon next to each alarm check file indicates the file source.

Calibration Data Source	Icon
Performing calibration using SDM-PC3 program	
Imported data using the USB Import or Net Import buttons	

1. While in the **Logs** window, find your GX-Force by serial number, then click the expanded view symbol (+) of or double-click the serial number folder to view the contents.
2. Click the expanded view symbol (+) of or double-click the **Alarm Check** folder to view the contents. Alarm check data folders are arranged by year/month.

- Click the year/month folder you wish to view. All alarm check data files for that GX-Force in that particular year/month will appear in the upper right frame.

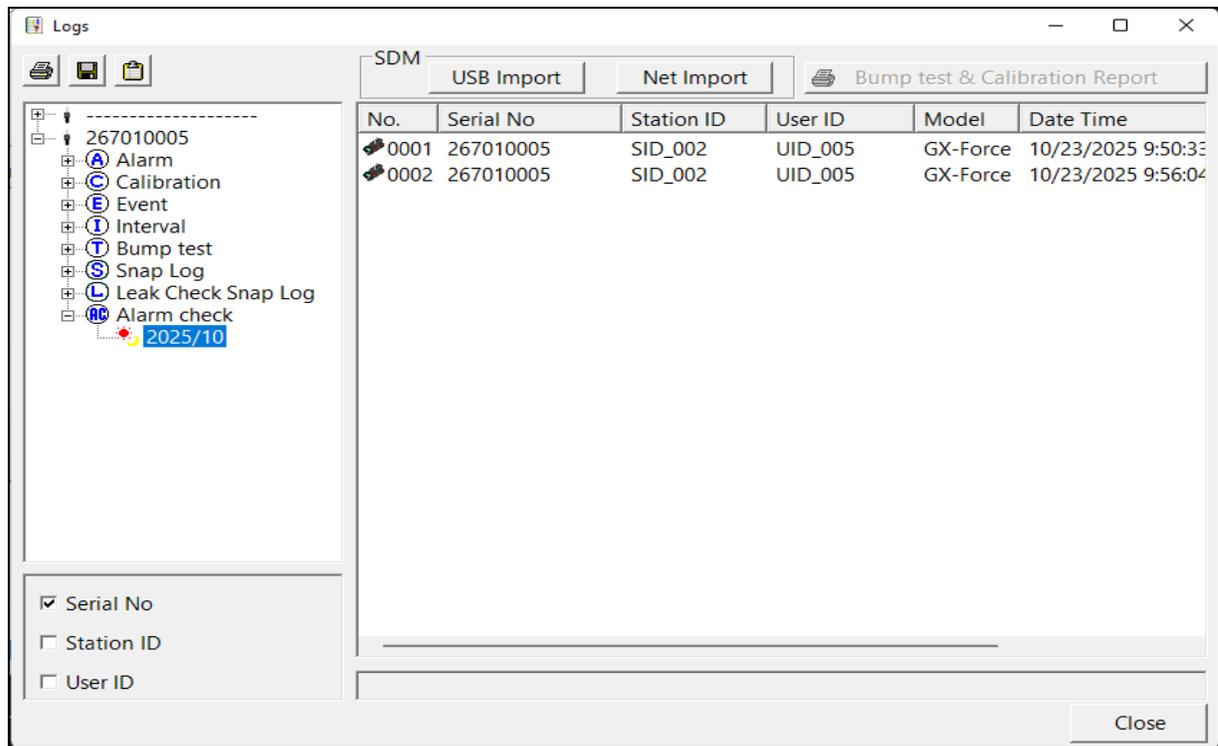


Figure 85: Viewing Alarm Check Log Files

- Files that record a failed alarm check on all tests are highlighted in red. Files that record an alarm check where not all tests passed are highlighted in orange.

Printing Data

- Be sure the desired date folder is selected
- Click the **Print** control button in the upper left corner of the Logs window.

Saving Data

- Be sure the desired date folder is highlighted.
- Click the **Save** control button in the upper left corner of the Logs window.
- A “Save As” dialog box will appear for you to specify the file name and file location.
- Specify the file name and location and click **Save**. The file type will be “.csv” (comma separated values).

Copying Data

1. Be sure the desired date folder is selected.
2. Click the **Save to Clipboard** control button. The data will be saved to the clipboard.
3. Paste the data into a document using the application's Paste command.

Deleting Data in the Logs Window

Data can be deleted from the Logs window by right clicking on the folder or file you wish to delete. Any file or folder except for **Memo** data may be deleted.

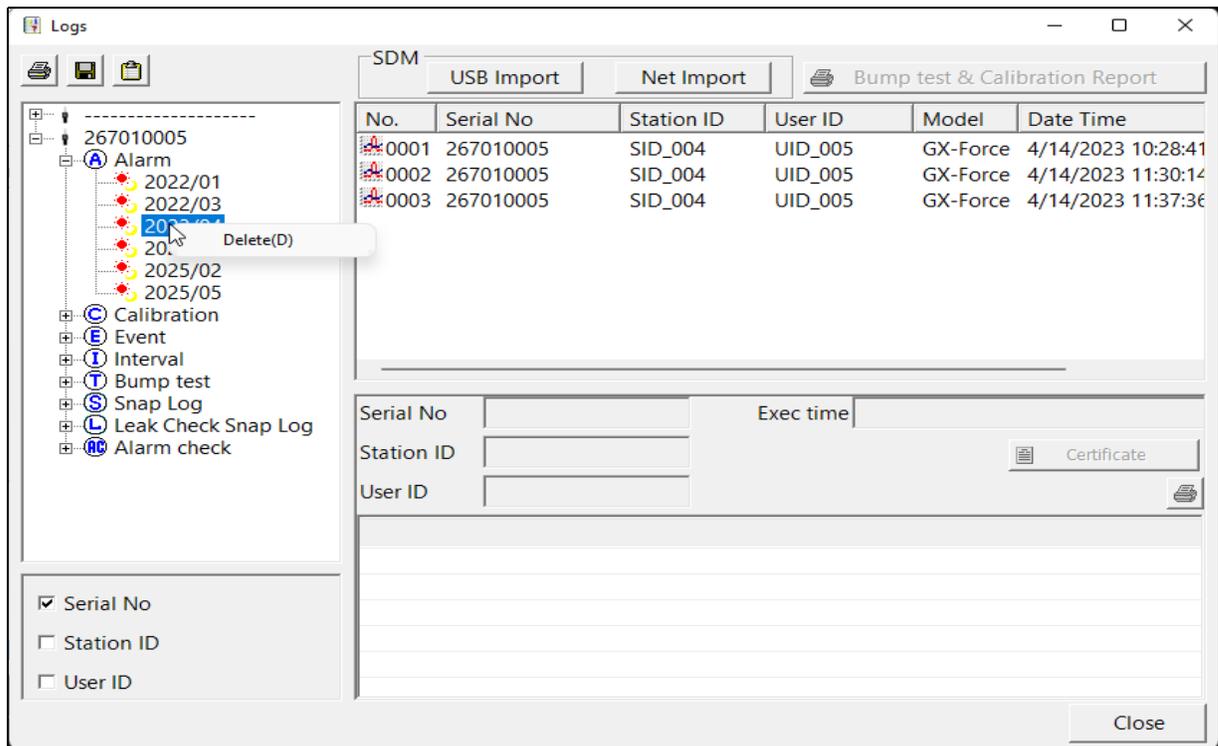


Figure 86: Deleting Data in the Logs Window

1. Right click on the folder or file you wish to delete and click **Delete**.
2. You will be prompted for a password. The factory set password is **ABCDE**. It is case sensitive. After you have entered the password, click **OK**.
3. To delete the folder or file, click **OK** in the confirmation window that comes up. If you do not want to delete the data, click **Cancel**.

Chapter 10: Instrument Function Menu

Overview

When you are in the main program window, if you right click on a GX-Force or a docking station, the Instrument Function Menu appears.

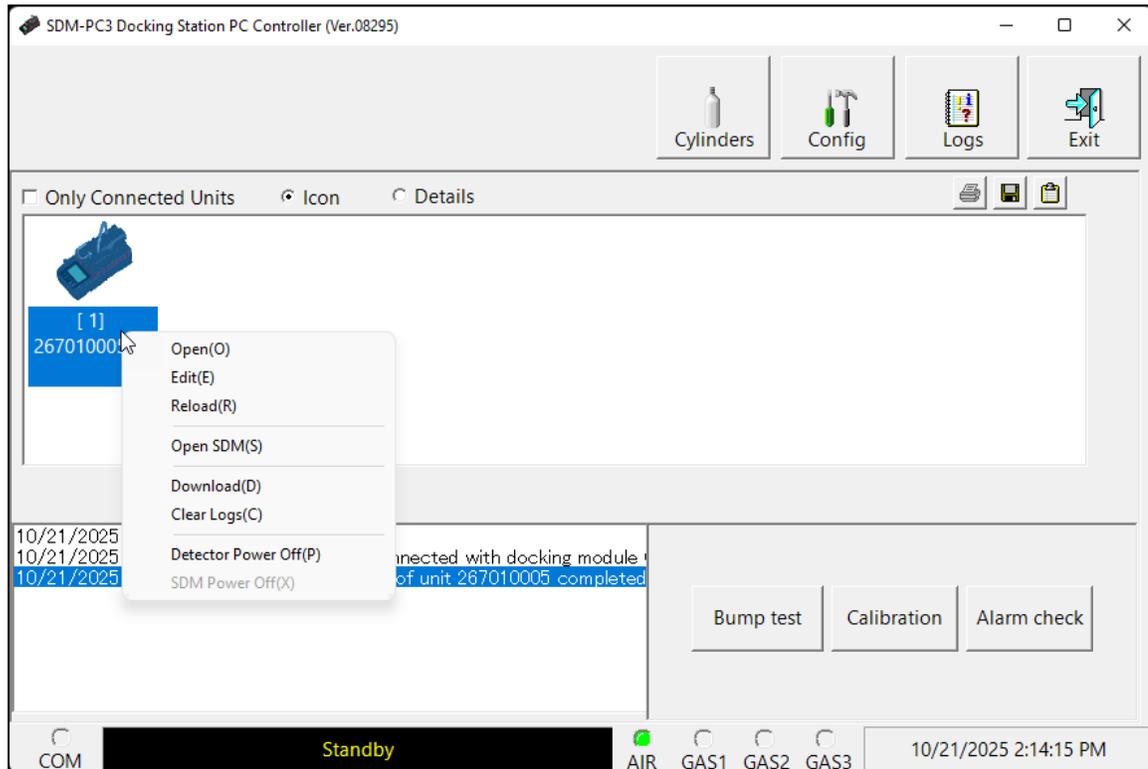


Figure 87: Instrument Function Menu

The items in the Instrument Function Menu are: **Open(O)**, **Edit(E)**, **Reload(R)**, **Open SDM(S)**, **Download(D)**, **Clear Logs(C)**, and **Detector Power Off(P)**.

If you right click on a GX-Force that is currently connected to a docking station, all items in the Instrument Function Menu are selectable as shown above in Figure 87.

If you right click on a GX-Force that is not currently connected to the PC Program but that has previously been connected, only the **Open(O)** item is selectable. The other items will be grayed out.

If you right click on an SDM-Force that is connected to the PC Program but does not have a GX-Force in it, only the **Open SDM(S)** item is selectable. The other items will be grayed out.

Open Function

The **Open** function brings up the Instrument Information window for viewing only. No changes can be made with the **Open** function. The Instrument Information Window consists of the Parameter Tab, the Sensor Tab, and the Station & User Tab. For further explanation of each tab, see “Chapter 7: Changing GX-Force Parameters” on page 90.

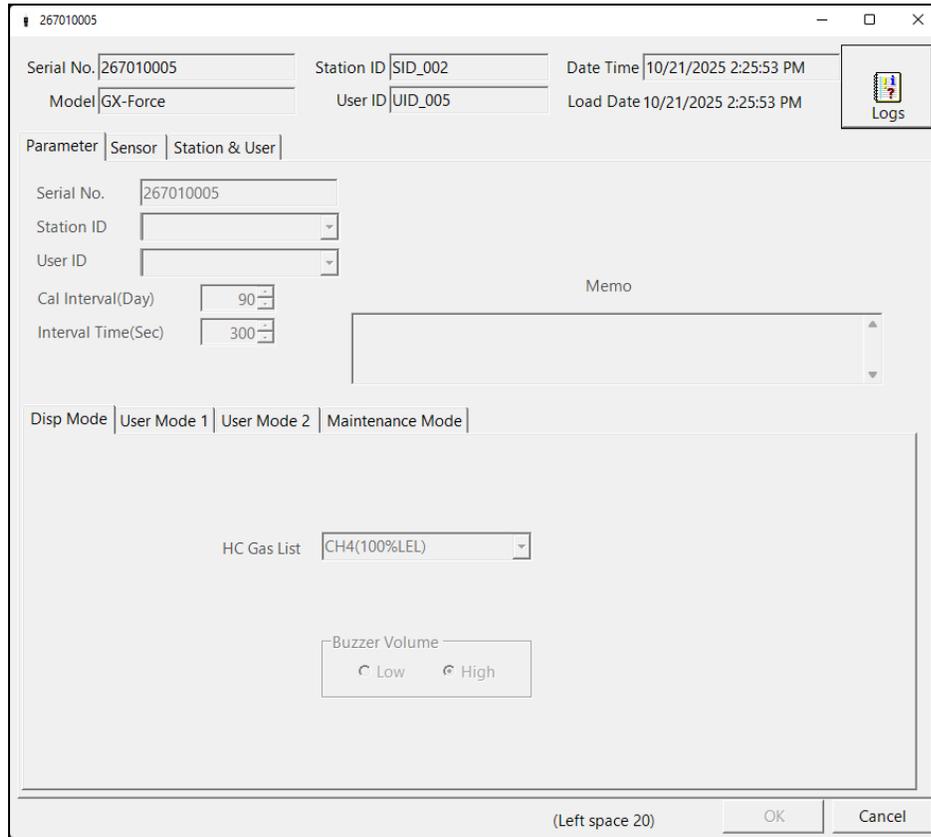


Figure 88: Instrument Information Window, Parameter Tab

To exit the Instrument Information Window and return to the main program window, click **Cancel**.

Edit Function

See “Chapter 7: Changing GX-Force Parameters” on page 90 for instructions.

Reload Function

The **Reload** function reloads the GX-Force parameters. This can be used to confirm that instrument changes made using the SDM-PC3 program actually got saved to the instrument.

1. Right click a GX-Force and select **Reload(R)** when the pull down menu appears.
2. A confirmation box appears. Click **OK** to proceed with the reload operation.

Download Logs Function

The Download function downloads all logged data from the GX-Force to the PC Program.

1. Right click a GX-Force and select **Download(D)** when the pull down menu appears.
2. A confirmation box appears. Click the **OK** button to proceed with the data download. A data download will take approximately 2 minutes to complete.

NOTE: Downloaded data is saved to the PC Program's database and is not saved to the SDM-Force.

Clear Logs Function

The Clear Logs function clears all logged data from a GX-Force.

1. Right click a GX-Force and select **Clear Logs(C)** when the pull down menu appears.
2. A confirmation box appears. Click the **OK** button to proceed with clearing all the data from the GX-Force.
3. The message window will indicate that the data is being cleared. When the data has been cleared, the message window will indicate this.

Power Off Function

The Power Off function turns off the selected GX-Force.

1. Right click a GX-Force and select **Power Off(P)** when the pull down menu appears.
2. A confirmation box appears. Click **OK** to turn off the selected GX-Force.

SDM Power Off Function

The SDM Power Off function turns off the selected SDM-Force. This function is only available if the GX-Force is already turned off.

1. Right click a GX-Force and select **SDM Power Off(X)** when the pull down menu appears.
2. A confirmation box appears. Click **OK** to turn off the selected GX-Force.

Chapter 11: Spare Parts List

Table 13: Spare Parts List

Part Number	Description
06-1248RK	Polyurethane tubing, 5/16-inch OD x 3/16-inch ID, for connecting to inlet fittings
06-1248RK-03	3 foot length of 5/16-inch OD x 3/16-inch ID, for connecting calibration cylinder to inlet fittings
06-1254RK	Polyurethane tubing, 7/16-inch OD x 5/16-inch ID, for exhaust tube, 15 feet maximum
06-1254RK-10	10 foot length of 7/16-inch OD x 5/16-inch ID, for exhaust tube
10-1233-06	Screw, M4 x 8 mm, for connection brackets, wall mounting brackets, and/or panel on right side of SDM-Force
14-0401-02	Wall mounting brackets, set of 2, with screws
14-0402	Connection brackets, set of 2, with screws, for connecting SDM-Forces together
16-0611RK	T-fitting for exhaust manifold
17-4710	Sample fitting plugs
32-0504RK	Check valve for exhaust fitting (when manifolded)
33-0167RK	Particle air filter replacement, CF-8369
47-5073RK	USB cable, Type A to Type B, for connecting to a computer
47-5088	Ethernet cable, black, 5 ft.
47-5128	USB C male to USB C male cable, 1-foot, for communication between SDM-Force and GX-Force
49-0144	Single-station AC adapter
71-0696	Operator's Manual, SDM-Force Docking Station Standalone Configuration
71-0710	Operator's Manual, SDM-Force Docking Station PC Controlled Configuration (this document)
81-0000RK-51	Calibration cylinder, 200 ppm H ₂ in air, 34 liter steel
81-0012RK-01	Calibration cylinder, 50% LEL CH ₄ in air, 34 liter steel
81-0012RK-03	Calibration cylinder, 50% LEL CH ₄ in air, 103 liter
81-0018RK-01	Calibration cylinder, 50% LEL isobutane in air, 34 liter steel
81-0018RK-03	Calibration cylinder, 50% LEL isobutane in air, 103 liter
81-0076RK	Calibration cylinder, zero air, 17 liter

Table 13: Spare Parts List

Part Number	Description
81-0076RK-01	Calibration cylinder, zero air, 34 liter steel
81-0076RK-03	Calibration cylinder, zero air, 103 liter
81-0078RK-01	Calibration cylinder, 100% N ₂ , 34 liter steel
81-0078RK-03	Calibration cylinder, 100% N ₂ , 103 liter
81-0090RK-01	Calibration cylinder, 3-gas (50% LEL CH ₄ /12% O ₂ /50 ppm CO), 34 liter steel
81-0090RK-03	Calibration cylinder, 3-gas (50% LEL CH ₄ /12% O ₂ /50 ppm CO), 103 liter
81-0154RK-02	Calibration cylinder, 4-gas (50% LEL CH ₄ /12% O ₂ /50 ppm CO/25 ppm H ₂ S), 58 liter
81-0154RK-04	Calibration cylinder, 4-gas (50% LEL CH ₄ /12% O ₂ /50 ppm CO/25 ppm H ₂ S), 34 liter aluminum
81-0158RK-02	Calibration cylinder, 4-gas (50% LEL Isobutane/12% O ₂ /50 ppm CO/25 ppm H ₂ S), 58 liter
81-0158RK-04	Calibration cylinder, 4-gas (50% LEL Isobutane/12% O ₂ /50 ppm CO/25 ppm H ₂ S), 34 liter aluminum
81-1054RK-H2S	Regulator, demand-flow type, for CO, H ₂ S, zero air, and LEL combustible gases in 34-liter aluminum, 58-liter, and 103-liter calibration cylinders (cylinders with internal threads)
81-1055RK	Regulator, demand-flow type, for all gases in 17- and 34-liter steel cylinders (cylinders with external threads)
81-1500RK	Cylinder holder for 58 liter calibration cylinder
81-1501RK	Cylinder holder for 103 liter calibration cylinder
81-1502RK	Cylinder holder for 34 liter calibration cylinder
81-SDMFRC101	Docking station for GX-Force, 1 solenoid, includes docking station, single-station AC adapter, air filter, exhaust tubing, USB cable, Ethernet cable, and USB drive
81-SDMFRC201	Docking station for GX-Force, 2 solenoids, includes docking station, single-station AC adapter, air filter, exhaust tubing, USB cable, Ethernet cable, and USB drive
81-6105RK	USB drive
82-6050RK	4-port USB hub
82-6051RK	7-port USB hub

